



ICRC

independent competition and regulatory commission

Draft report

Regulated water and sewerage services prices 2018–23

Report 11 of 2017, December 2017

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The Commission has responsibilities for a broad range of regulatory and utility administrative matters. The Commission has 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. The Commission also has responsibility for arbitrating infrastructure access disputes under the ICRC Act. In discharging its objectives and functions, the Commission aims to provide independent robust analysis and advice.

The Commission's objectives are set out in section 7 and 19L of the ICRC Act and section 3 of the *Utilities Act 2000*.

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The draft report provides an opportunity for stakeholders to inform the development of the final report. It will also ensure that relevant information and views are made public and brought to the Commission's attention.

Submissions may be mailed to the Commission at:

Independent Competition and Regulatory Commission
PO Box 161
Civic Square ACT 2608

Alternatively, submissions may be emailed to the Commission at icrc@act.gov.au. The Commission encourages stakeholders to make submissions in either Microsoft Word format or PDF (OCR readable text format – that is, they should be direct conversions from the word-processing program, rather than scanned copies in which the text cannot be searched).

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The Commission may be contacted at the above addresses, by telephone on (02) 6205 0799 or by fax on (02) 6207 5887. The Commission's website is at www.icrc.act.gov.au.

Submissions on the draft report close on **23 February 2018**.

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Executive summary

On 13 December 2016 the Independent Competition and Regulatory Commission (the Commission) received from the ACT Treasurer Terms of Reference requiring it to conduct an investigation into and make a price direction for regulated water and sewerage services provided by Icon Water Limited. This report explains the Commission's draft findings resulting from that investigation and the proposed water and sewerage services tariffs for the period from 1 July 2018 to 30 June 2023.

In conducting its investigation the Commission used an open and consultative process, producing an issues paper in March 2017 that set out the Commission's preferred approach and pricing principles. Icon Water's comprehensive submission proposing tariffs for water and sewerage services was subsequently received on 30 June 2017 and made publicly available on the Commission's website.

While Icon Water commented on the issues paper in framing its submission, no other submissions were received in response to the issues paper. To ensure that members of the public were aware of the matters being canvassed in the investigation and to provide another opportunity for consultation, the Commission held an informal public forum on 28 September 2017 to discuss Icon Water's submission.

Table E.1 shows the Commission's draft decision on prices for water and sewerage services for 2018–19 alongside current 2017–18 water and sewerage services tariffs and Icon Water's proposed tariffs for 2018–19.

Table E.1 Current tariffs, Icon Water's proposed tariffs and the Commission's draft decision, 2018–19

	Current tariffs (2017–18)	Icon Water proposed 2018–19	Commission's draft decision 2018–19
Water prices			
Supply charge (\$/pa)	104.21	120.00	120.00
Tier 1 price (\$/kL)	2.68	2.73	2.55
Tier 2 price (\$/kL)	5.38	4.95	4.95
Sewerage services prices			
Sewerage services charge (\$/pa)	537.34	541.84	536.51
Sewerage fixtures (\$/pa)	525.51	529.92	524.70

Sources: Commission's calculations and Icon Water (2017).

The impact of the draft decision prices on a typical household consuming 200 kilolitres (kL) of water a year would be a slight decrease (1.2 per cent, or \$14) in the total annual water and sewerage services bill in the first year of the forward regulatory period (2018–19). A typical household would pay \$1,283 for its annual combined bill in

2022–23, which is an increase of \$83 over the five-year regulatory period. The annual average increase of a water and sewerage services bill for a household consuming 200kL a year over the regulatory period is 1.35 per cent; in real terms, this is equivalent to an annual average change of –1.12 per cent.

Although this decision represents the Commission’s best judgement, it necessarily takes account of the work done by the Commission’s expert advisors and the information provided by Icon Water. In arriving at its draft decision, the Commission sought the assistance of a team of independent engineering experts to perform a detailed review of Icon Water’s capital and operational expenses. Where appropriate, the Commission presents and cites material from these external sources.

The Commission’s draft decision largely agrees with Icon Water’s submission on aspects of the form of regulation, such as retaining the use of the building block methodology to calculate prices for water and sewerage services. The Commission’s draft decision retains the Industry Panel’s end of period demand volatility adjustment mechanism (the deadband) in order to share demand volatility risk between Icon Water and consumers. Icon Water proposed a new annual unders and overs mechanism, which is not supported in the Commission’s draft decision. The Commission believes improvements in demand forecasting will minimise potential deviation between forecast and actual demand.

The Commission’s draft decision on prices differs slightly from Icon Water’s submitted prices as a result of adjustments to operating and capital expenditure allowances, parameters for rate of return and imputed tax values. In addition, the draft decision equally adjusts Tier 1 and Tier 2 usage prices for CPI over the regulatory period, whereas Icon Water had proposed to adjust only Tier 1 usage prices.

Icon Water’s proposal and the Commission’s draft decision on water and sewerage services tariffs are set out in Table E.2 and E.3. The Commission’s draft decision on prices for the forward regulatory period assumed broad inflation of 2.5 per cent a year and no material changes in Icon Water’s non-controllable costs. The tables show the incremental impacts on Icon Water’s prices for each year of the regulatory period, from 1 July 2018 to 30 June 2023. The Commission has accepted Icon Water’s proposal to increase the water supply charge by \$20 a year across the forward period but has provided for lower usage charges for both Tier 1 and Tier 2 consumption.

Table E.2 The Commission's draft decision and Icon Water's proposal for water tariffs, 2018–23

	2017–18 ^a	2018–19	2019–20	2020–21	2021–22	2022–23
Icon Water proposed water						
Supply charge (\$/pa)	104.21	120	140	160	180	200
Tier 1 price (\$/KL)	2.68	2.73	2.76	2.79	2.81	2.84
Tier 2 price (\$/KL)	5.38	4.95	4.95	4.95	4.95	4.95
Commission draft decision water						
Supply charge (\$/pa)	104.21	120	140	160	180	200
Tier 1 price (\$/KL)	2.68	2.55	2.57	2.6	2.62	2.65
Tier 2 price (\$/KL)	5.38	4.95	5.00	5.04	5.09	5.14

Notes: ^a Data for 2017–18 (last year of the current regulatory period) are presented for comparison purposes. Actual charges payable from 2019–20 to 2022–23 could differ from the indicative charges in this table if actual inflation differs from forecast inflation or if the cost pass through mechanism is triggered.

Sources: Commission's draft decision and Icon Water (2017).

Table E.3 The Commission's draft decision and Icon Water's proposal for sewerage services tariffs, 2018–23

	2017–18 ^a	2018–19	2019–20	2020–21	2021–22	2022–23
Icon Water proposed sewerage services						
Sewerage services charge (\$/pa)	537.34	541.84	546.39	550.97	555.59	560.24
Sewerage fixtures (\$/pa)	525.51	529.92	534.36	538.84	543.35	547.91
Commission draft decision sewerage services						
Sewerage services charge (\$/pa)	537.34	536.51	535.68	534.85	534.02	533.2
Sewerage fixtures (\$/pa)	525.51	524.70	523.88	523.07	522.26	521.46

Notes: ^a Data for 2017–18 (last year of the current regulatory period) are presented for comparison purposes. Actual charges payable from 2019–20 to 2022–23 could differ from the indicative charges in this table if actual inflation differs from forecast inflation or if the cost pass through mechanism is triggered.

Sources: Commission's draft decision and Icon Water (2017).

The Commission recognises the importance of ensuring Icon Water's financial viability. A financial viability test was conducted by calculating a selection of financial ratios for Icon Water from 2018–19 to 2022–23. The Commission is satisfied its draft decision on prices for water and sewerage services and the proposed price path for the forward regulatory period adequately provides for Icon Water's financial viability and ensures it is capable of investing to meet future demand.

The Commission seeks comments on this draft report and the proposed findings and recommendations. The report is open for comment until 23 February 2018. Interested parties are invited to submit comments in writing (via email or post). A public hearing on the draft decision is expected to be held in February 2018.

Summary of the Commission's draft decision

This section sets out the primary features of the Commission's price investigation and draft decision for Icon Water's water and sewerage services tariffs for the period 1 July 2018 to 30 June 2023.

S1 The draft decision on water and sewerage services tariffs 2018–23

Icon Water's proposal and the Commission's draft decision on water and sewerage services tariffs are set out in Table S.1 and Table S.2 for each year of the regulatory period.

The Commission's draft decision adjusts Icon Water's proposal for the water tariff:

- To retain the existing water tariff structure with a fixed supply charge and a two-tier inclining block usage charge for the forward regulatory period
- To decrease the Tier 1 usage price from \$2.68 to \$2.55 per kL and then adjust it for changes in the Consumer Price Index (CPI) and any pass-through amounts approved as part of the annual price reset mechanism during the forward regulatory period
- To decrease the current Tier 2 usage price of \$5.38 to \$4.95 per kL in 2018–19 and then adjust it for changes in the CPI and any pass-through amounts approved as part of the annual price reset mechanism
- To accept Icon Water's proposal to increase the fixed supply charge in a gradual manner, by \$20 a year to \$200 by 2022–23.

For the sewerage services tariff the Commission's draft decision is:

- To retain the existing sewerage services tariff structure, comprising a fixed supply charge for residential premises and the same fixed supply charge plus an additional annual charge for flushing fixtures in excess of two for non-residential consumers.

Table S.3 shows the Commission's draft decision on prices for water and sewerage services alongside current 2017–18 water and sewerage services tariffs and Icon Water's proposed tariffs for 2018–19. The impact of the draft decision on the average residential consumer would be a slight decrease in the combined water and sewerage services bill in the first year of the forward regulatory period (2018–19). A typical household consuming 200kL a year will see a decrease in its annual bill of 1.2 per cent (or \$14) in 2018–19 compared with 2017–18. In 2022–23 a typical household will pay \$1,283 for its annual combined bill, which is an increase of \$83 over the regulatory period. The annual average increase of a water and sewerage bill for a household

consuming 200kL a year over the regulatory period is 1.35 per cent. In real terms, this is equivalent to an annual average change of -1.12 per cent.

Table S.1 The Commission's draft decision on water tariffs, 2018–23

	2018–19	2019–20	2020–21	2021–22	2022–23
Icon Water proposal					
Supply charge (\$/pa)	120.00	140.00	160.00	180.00	200.00
Tier 1 price (\$/kL)	2.73	2.76	2.79	2.81	2.84
Tier 2 price (\$/kL)	4.95	4.95	4.95	4.95	4.95
Commission draft decision					
Supply charge (\$/pa)	120.00	140.00	160.00	180.00	200.00
Tier 1 price (\$/kL)	2.55	2.57	2.60	2.62	2.65
Tier 2 price (\$/kL)	4.95	5.00	5.04	5.09	5.14

Note: Actual charges payable from 2019–20 to 2022–23 could differ from the indicative charges in this table if actual inflation differs from forecast inflation or if the cost pass-through mechanism is triggered.

Sources: Commission's calculations and Icon Water (2017).

Table S.2 The Commission's draft decision on sewerage services tariffs, 2018–23

	2018–19	2019–20	2020–21	2021–22	2022–23
Icon Water proposal					
Sewerage services charge (\$/pa)	541.84	546.39	550.97	555.59	560.24
Sewerage fixtures (\$/pa)	529.92	534.36	538.84	543.35	547.91
Commission draft decision					
Sewerage services charge (\$/pa)	536.51	535.68	534.85	534.02	533.20
Sewerage fixtures (\$/pa)	524.70	523.88	523.07	522.26	521.46

Note: Actual charges payable from 2019–20 to 2022–23 could differ from the indicative charges in this table if actual inflation differs from forecast inflation or if the cost pass-through mechanism is triggered.

Sources: Commission's calculations and Icon Water (2017).

Table S.3 Current tariffs, Icon Water's proposed tariffs and the Commission's draft decision for 2018–19

	Current tariffs (2017–18)	Icon Water proposal 2018–19	Commission's draft decision 2018–19
Water prices			
Supply charge (\$/pa)	104.21	120.00	120.00
Tier 1 price (\$/kL)	2.68	2.73	2.55
Tier 2 price (\$/kL)	5.38	4.95	4.95
Sewerage services prices			
Sewerage services charge (\$/pa)	537.34	541.84	536.51
Sewerage fixtures (\$/pa)	525.51	529.92	524.70

Sources: Commission's calculations and Icon Water (2017).

The Commission proposes to update miscellaneous fees and charges by the change in the CPI in each year of the 2018–23 regulatory period, including a Capital Contributions Code that will partially fund infrastructure augmentations required due to urban infill.

The Commission welcomes Icon Water’s commitment to consider introducing a pricing regime for trade waste during the 2018–23 regulatory period.

S2 Regulatory objectives and process

The Commission’s investigation is guided by the Terms of Reference the ACT Treasurer issued on 13 December 2016 and the requirements specified in the *Independent Competition and Regulatory Commission Act 1997* (the ICRC Act).

As required by the Terms of Reference, the Commission has:

- Outlined its intended approach to achieving its regulatory objectives
- Continued to use the current regulatory model except where improvements were considered appropriate
- Proposed minor changes to the structure of tariffs, consistent with the economic, social and environmental objectives and the policies of the ACT Government
- Considered the scope for incentive schemes for service levels and operating and capital expenditure and concluded that these should be considered separately during the forward regulatory period
- Identified the incremental impact on Icon Water’s revenues and prices of its recommendations.

In March 2017 the Commission released an issues paper that set out its approach and proposed pricing principles for determining the tariff levels and tariff structures for water and sewerage services prices during the period 1 July 2018 to 30 June 2023. To ensure that members of the public were aware of the matters being canvassed in the investigation and to provide another opportunity for consultation, the Commission held an informal public forum on 28 September 2017 to discuss Icon Water’s submission.

Icon Water prepared a comprehensive submission setting out its proposed tariffs for water and sewerage services; the submission is available on the Commission’s website. No other submissions were received in response to the issues paper. Stakeholders’ submissions to the Commission’s review of tariff structures in 2016 and 2017 have been considered in this draft report.

S3 The Commission's approach

S3.1 Regulatory objectives and pricing principles

The Commission's role is to regulate prices, access and other matters in relation to industries involved in the provision of water, sewerage services and electricity services in the ACT. It conducted its previous review of prices for regulated water and sewerage services in 2013. On that occasion the Commission's decision was appealed, and an Industry Panel conducted an investigation and provided a report and substituted price direction in 2015. As required by a reset principle specified by the Industry Panel, the Commission also conducted a review of the tariff structure for Icon Water's regulated water and sewerage services in 2016 and 2017.

In this draft report the Commission sets out its approach to achieving the relevant regulatory objectives, and the pricing principles it applied in arriving at the draft decision on water and sewerage services tariffs.

In setting prices for regulated water and sewerage services, the Commission's approach is to seek economic efficiency while also giving due consideration to social, environmental and other specific objectives. Economic efficiency has several aspects, among them efficiency in the use of a service and efficiency in the provision of a service, which encompasses efficient operation and the promotion of efficient investment. Economic efficiency should include environmental objectives when properly defined.

The various aspects of economic efficiency were taken account of in the development of this draft report, consistent with the ICRC Act's requirement that price decisions the Commission makes consider the long-term interests of consumers, including social impact considerations. Social impact considerations can cover a wide range of matters, but the main aspect usually relates to the community's concern about fairness or equitable outcomes. Concerns about fairness, if prices need to increase, can in part be redressed by making gradual and limited changes, particularly for low-income households. The Commission has also made it clear that tariff structures and levels should be simple to understand and implement and be subject to public consultation and scrutiny.

S3.2 The regulatory model and form of price control

Consistent with the Terms of Reference the Commission adopted as a starting point the current regulatory model, as specified in the Industry Panel's report and substitute price direction. This draft report identifies any modifications made to improve regulatory outcomes in the light of new information and the views of stakeholders.

S3.2.1 The regulatory period

As specified in the Terms of Reference, the forward regulatory period is the five years from 1 July 2018 to 30 June 2023. Consistent with the Industry Panel's report, the Commission proposes no annual or biennial recalibrations for the period.

S3.2.2 The building block methodology

The current regulatory model uses a ‘building block’ methodology to establish allowable costs and revenues during the regulatory period. The building block approach identifies expected prudent and efficient costs for each year of the regulatory period and estimates expected demand. Prices are calculated on the basis of estimates of expected costs and expected demand. The model also provides for full pass-through of specified unexpected costs.

The building block approach is consistent with the Industry Panel’s report and Icon Water’s submission. It provides a strong assurance that prudent and efficient costs will be fully recovered through expected revenues. It is also the most widely used approach in Australia for determining utility businesses’ allowed revenue to be recovered through prices.

Among the building block cost components are prudent and efficient operating expenditure and capital expenditure, the return on capital, depreciation and taxation. Application of the approach also requires decisions about the extent of pass-through of controllable and non-controllable costs and the extent to which the regulated entity and its consumers are to share in cost and demand risks and cost savings.

For the purposes of this investigation, the Commission has relied on the following definitions of ‘prudent’ and ‘efficient’:

- *Prudent expenditure.* This encompasses whether the project, program or activity would reasonably be expected of a utility operating in the circumstances that apply. Evidence considered for prudence would include substantiation of the benefits of and the need for the project, program or activity.
- *Efficient expenditure.* This entails whether the project, program or activity is delivered or proposed to be delivered with the best value for money. Evidence considered for efficiency would include substantiation of alternative service delivery options, assessment of lowest cost over the life cycle, and the ‘deliverability’ of the proposed project, program or activity.

Important aspects of the form of price control implemented with the building block methodology are identified in the following paragraphs.

S3.2.3 The hybrid price and revenue cap and demand risk

The building block approach can be implemented in conjunction with various forms of price control. The current regulatory model uses a hybrid form of price and revenue control, whereby Icon Water bears demand risk up to a specified threshold. If demand is lower than the threshold then consumer prices would increase. If demand is higher than the threshold then consumer prices would decrease.

In adopting a hybrid price and revenue cap model the Industry Panel considered the approach taken by other regulators and judged that this form of regulation would best

help achieve reasonable price stability, financial viability of the regulated business, and economic efficiency. The Industry Panel's report expressed the view that other regulatory approaches did not provide an appropriate allocation of risks between consumers and the regulated business.

Icon Water's proposed unders and overs mechanism differs from the Industry Panel's decision. The Industry Panel's decision provided for an end-of-period demand volatility adjustment mechanism with a six per cent threshold. Should the total revenue over the regulatory period vary above or below the maximum allowed revenue by greater than the threshold amount, an end-of-period adjustment would be made.

The Commission has considered that an annual unders and overs mechanism would minimise the risk of under-recovery of revenue for Icon Water. This approach also has disadvantages, the most notable of which is that implementation of an unders and overs mechanism would mean that consumers bear most of the demand risk. This would also entail potential price instability for consumers. The Commission further considers that adoption of Icon Water's proposed mechanism might not be necessary given Icon Water's improvements to the water forecasting model, which are aimed at reducing demand forecasting risk, and the Commission's draft decision to retain the end-of-period demand volatility adjustment mechanism, whereby demand risk is shared and balanced over the regulatory period. The Commission also notes that the proposed 'unders and overs' mechanism might necessitate a change in Icon Water's inherent risk alignment, requiring a change in the beta parameter used to calculate return on capital. Similarly, Icon Water has suggested that it retain the financing benefits associated with capital underspend. This represents another form of risk sharing.

The Commission's draft decision is to maintain the end-of-period demand volatility adjustment mechanism to account for any material deviations of demand. The demand volatility adjustment mechanism considers water sales revenue over the entire regulatory period, from 1 July 2018 to 30 June 2023. The Commission's draft decision adopts a threshold (deadband) at plus or minus six per cent of the allowed revenue in net present value terms. Under this approach, Icon Water bears the demand risk up to the level of the deadband and consumers bear the risk beyond the deadband.

S3.2.4 The tariff structure

The tariff structure refers to the levels of fixed (supply) and variable (usage) components in consumers' water and sewerage services charges. As well as determining the overall average cost to a consumer, there is a need to determine the fixed and usage components of the water and sewerage services bills.

The current ACT water tariff structure comprises one fixed supply and two usage tiers, described as an inclining block tariff structure. For the 2017–18 financial year, the annual fixed supply charge is set at \$104.21, and the two-tier inclining block tariff usage charge sets the Tier 1 usage charge at \$2.68 per kL for the first 200kL of water

used and the Tier 2 usage charge at \$5.38 per kL for consumption above 200kL a year.¹

The tariff structures for water and sewerage services and trade waste were reviewed in 2016 and 2017. This tariff review developed and applied pricing principles based on the Commission's regulatory objectives and relevant government policies to determine preferred directions for gradual change in the tariff structure.

In its main submission to the current price investigation, Icon Water supported the Commission's view on retaining the current two-part inclining block tariff structure while introducing a measured and gradual approach to water tariff reforms, as identified in the earlier tariff review. Icon Water also supported retention of the existing sewerage services tariff structure with a single fixed charge and confirmed its intention to introduce a liquid trade waste charging regime during the forward regulatory period, with a supporting submission to be presented in due course. Icon Water's submission called for flexibility to negotiate separate pricing arrangements with large users to minimise the risks of potential uneconomic bypass issues it might face during the forward regulatory period.

The Commission has broadly accepted Icon Water's proposed tariff structure subject to further improvements, as described in the pricing section. It welcomes Icon Water's commitment to consider introducing a pricing regime for trade waste during the 2018–23 regulatory period.

The Commission proposes to update miscellaneous fees and charges by the change in the CPI in each year of the regulatory period.

In relation to Icon Water's proposal for separate pricing arrangements to prevent uneconomic bypass, the Commission notes that its price direction sets a maximum price and a revenue cap. This arrangement gives Icon Water substantial latitude to tailor prices and negotiate accordingly. Icon Water's submission did not demonstrate an inability to negotiate prices that would prevent both uneconomic bypass and full cost recovery. The Commission does not believe that further action is required in this draft decision to prevent uneconomic bypass.

S3.2.5 Cost pass-through measures

The Commission's draft decision is to accept Icon Water's proposal to apply a CPI escalation mechanism as part of its annual reset. It proposes to adjust the CPI using the current 'four quarter on four quarter' approach, with the CPI measure being the weighted average of eight capital cities available from the Australian Bureau of Statistics.

¹ Charges are calculated on a daily pro rata basis and billing occurs quarterly, so the Tier 2 price can apply for consumption that is less than the annual amount of 200kL.

Although the Commission does not support Icon Water's proposed unders and overs mechanism, it considers that an annual cost pass-through mechanism is warranted to deal with material changes (positive and negative) in uncontrollable costs related to certain specified events during the regulatory period. The pass-through arrangements, including price trigger events and materiality thresholds, are in effect the same as specified in the Industry Panel's report.

In its submission Icon Water proposed a new pass-through event for the contingent 'Best for Region' sewage treatment project. This project would treat sewage from the eastern side of the ACT and from Queanbeyan in cooperation with Queanbeyan–Palerang Regional Council.

The Commission's draft decision does not endorse the Best for Region project as a pass-through event during the next regulatory period. In its view, the project is contingent on further planning, consultation and agreement. It does not originate from legislation, regulatory or administrative processes, and there does not appear to be any ministerial direction to declare the costs as a pass-through fee. Regulatory obligation events are listed as pass-through events in the current and proposed price direction.

S3.2.6 An ex post capital expenditure review mechanism

The Industry Panel's substituted price direction provided scope for an ex post capital expenditure review mechanism. This allows the Commission to assess the prudence and efficiency of Icon Water's capital expenditure actually undertaken in the current regulatory period, before rolling it into the regulatory asset base (RAB) at the beginning of the next regulatory period.

In view of the fact that the Industry Panel's substituted price direction provided scope for an ex post capital review and the Commission's Terms of Reference require it to continue the current regulatory model, subject to any improvements, the Commission has reviewed Icon Water's capital expenditure before rolling it into the next regulatory period's RAB.

The Commission's issues paper raised the question of the financing benefit Icon Water would receive in a situation where actual capital expenditure is materially less than the forecast allowed expenditure. What is under consideration is whether all or part of the value of this financing benefit should be determined and deducted from allowed revenue or the RAB in the next regulatory period. There is a symmetrical issue in the case of where there is overspending of capital but the overspending is considered prudent and efficient.

In its main submission Icon Water strongly opposed the removal of the ex ante prospect of a financing benefit, arguing this would have an adverse impact on incentives to reduce capital expenditure relative to forecasts.

In relation to the financing benefit or cost from underspending or overspending of capital, the Commission notes that Icon Water will receive a potential financing benefit associated with underspending of capital of \$56.4 m.²

As the Commission is proposing to retain for the forthcoming regulatory period, elements of the incentive mechanisms adopted by the Industry Panel, the Commission's draft decision to allow Icon to retain the financing benefit it received during the 2013-18 regulatory period. The determination of potential future financing benefits, and the extent to which these should be deducted from allowed revenue or the RAB in the next regulatory period, will be considered in a future review of incentive mechanisms.

S3.2.7 Capital contribution charges

On 30 March 2017 Icon Water submitted for the Commission's consideration an application to introduce new capital contribution arrangements for developers where redevelopment projects trigger water and sewerage infrastructure upgrades. Icon Water seeks to recover from developers the costs that arise from its 20-year capital works program, which cannot be recovered from a general tariff. A single charge of \$1,200 per Equivalent Population (a common sewerage metric) applicable to all precincts or zones in the ACT was proposed, with an annual update of this charge based on updated population projections and project costs.

The Commission received from Icon Water information to show that project costs funded by the Capital Contribution Code are not funded again under the water and sewerage services tariffs. The Commission was assisted in its analysis by an independent expert review by the consulting firm Calibre to ensure that the pricing regime does not double up on cost recovery.

S4 Operating expenditure

To facilitate efficient operation and investment, it is necessary to allow Icon Water to recover the cost of both efficient operating expenditure and efficient capital expenditure. Icon Water's operating expenditure in 2016–17 comprised controllable expenditure (79 per cent of total operating expenditure) and non-controllable expenditure (21 per cent of total operating expenditure).

The Commission received expert and independent technical assistance from Calibre in reviewing the operating and capital expenditure of Icon Water. It accepted Calibre's main findings in relation to operating expenditure and incorporated them in its draft decision.

² Icon Water, 2017 (Attachment 6): 1.

S4.1 Operating performance during the current regulatory period

The primary findings of the review of Icon Water's operating expenditure performance for the current regulatory period are as follows:

- Icon Water's operating expenditure over the current regulatory period was \$888.6m real (\$856.5m nominal) compared with the Industry Panel's allowed expenditure of \$904.4m real (\$870m nominal) – a \$15.7m (1.74 per cent) underspend.
- Icon Water's operating expenditure for water supply appears lower than the average for other large water utilities.
- Based on average performance across a range of measures, Icon Water's water supply system appears to have performed on par with other Australian water utilities during the current regulatory period.
- Icon Water's sewerage system appears to operate at a comparatively high operating cost but generally with lower performance levels in comparison with Australian peers. Sewage treatment outcomes are comparable with those of the highest performing large water utilities in Australia, but sewer mains breaks and overflows incidents have remained relatively frequent.

S4.2 Forecast operating expenditure for the forward regulatory period

Icon Water undertook a program of consumer research and engagement to help strike an appropriate balance between network reliability and price from the perspective of consumers. The Commission commends Icon Water on these efforts but notes that further work might help in developing and agreeing on service standard targets and supporting expenditure levels. In particular, further alignment with consumer engagement processes with actionable outcomes would increase Icon Water's awareness of the consumer environment in which it operates, and help it target investment. This is discussed in Chapter 3.

Icon Water has forecast operating expenditure for the forward regulatory period of \$922.1m nominal (see Table S.4). In real terms (\$ 2017–18) this figure is \$855 m, which is about 3.7 per cent lower than expenditure in the current regulatory period. The majority of the decrease is a result of significantly lower controllable expenditure, which is partially offset by a forecast increase in non-controllable expenditure. Other controllable operating expenditure categories remain relatively stable or exhibit small changes.

Table S.4 Icon Water’s proposal: forecast operating expenditure, 2018–23 (\$m, nominal)

	2017–18 ^a	2018–19	2019–20	2020–21	2021–22	2022–23	Total ^b
Water	99.90	96.49	98.77	101.48	106.09	108.99	511.82
Sewerage services	79.60	78.17	79.48	81.14	84.84	86.63	410.26
Total operating expenditure	179.50	174.66	178.25	182.62	190.93	195.62	922.08

Notes: ^a Data for 2017–18 (last year of the current regulatory period) are presented for comparison purposes.

^b Total is for 2018–23.

Source: Icon Water (2017).

Icon Water used 2016–17 as the base year on which to build its forecast operating expenditure, having realised operational efficiency savings in that year and achieved expenditure similar to the Industry Panel’s recommendation. It proposed some reductions in base year operating expenditure (in 2016–17 prices) related to:

- A reduction in costs associated with the agreement to purchase corporate services from ActewAGL (-\$3.5m)
- A workers compensation provision that was not required (-\$2.7m)
- Actual costs associated with preparing its regulatory submission to the Commission (\$1.8m).

Icon Water also identified two step changes to the base year operating expenditure (in 2017–18 prices):

- Higher costs associated with preparing regulatory submissions of \$2.51m in 2017–18 and \$5.35m towards the end of the forward regulatory period
- Lower costs associated with lower electricity usage totalling \$3.59m – as a result of investing in renewable energy generation infrastructure.

The Commission commends Icon Water for its proposed reductions in operational expenditure and its ongoing focus on aligning service provision with consumer needs.

The independent review of operating expenditure conducted for the Commission by Calibre found the step changes in regulatory costs were not substantiated on the grounds of prudence and efficiency. The regulatory costs are related to the Corporate Services Agreement (CSA) between Icon Water and ActewAGL. This agreement, due to expire in 2023, establishes a payment scale for the provision of a series of business support services, including regulatory affairs and customer billing.

Calibre’s investigation found that the proposed step change increase in regulatory costs for the 2018–2023 period might be too high. Icon Water proposes to increase the base year amount from \$1.8m to \$2.5m and then include additional allowances in 2021–22 and 2022–23 totalling \$5.35m. Given the stable regulatory environment and internal

functions of staff (whose costs are already included in base operations), the large (24 per cent) increase in regulatory costs was not assessed as efficient.

The independent review by Calibre found that the operating expenditure step change adjustments for electricity savings are reasonable.

Table S.5 shows the Commission’s draft decision on allowable operating expenditure for 2018–23. The draft decision adopts Calibre’s recommendation for a reduction (\$2.1m nominal) in Icon Water’s proposed operating expenditure of \$922m nominal during the forward regulatory period.

Table S.5 The Commission’s draft decision on allowable operating expenditure, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water	96.49	98.77	101.48	105.22	108.88	510.85
Sewerage services	78.17	79.48	81.14	83.86	86.51	409.16
Total operating expenditure	174.66	178.25	182.62	189.08	195.39	920.00

Source: Commission’s calculations.

S5 Capital expenditure

The Commission reviewed Icon Water’s capital investment for the current regulatory period and its proposed expenditure for the forward regulatory period. The review considered whether the expenditure was prudent and efficient, as defined. If actual and proposed capital expenditure are considered to be both prudent and efficient they are added to the current RAB or the forecast RAB, depending on when they occur.

In forming a draft decision on allowable capital investment, the Commission evaluated information from a variety of sources, including from Icon Water’s submission, Calibre’s independent review of the Icon Water submission, and previous price investigations by the Commission and the Industry Panel.

S5.1 Capital expenditure during the current regulatory period

Icon Water’s submission stated actual total capital expenditure of \$404m (nominal value) over the current regulatory period. In real value (\$ 2017–18), this is equivalent to \$416m and is \$57m lower than the Industry Panel’s allowed capital expenditure for the period.

Calibre’s review of the prudence and efficiency of Icon Water’s capital expenditure in the current regulatory period found that no adjustments to actual expenditure were required. On the basis of that review and information in the Industry Panel’s report, the Commission supports Icon Water’s proposed actual capital expenditure for the current regulatory period and confirms it will be added to the RAB.

S5.2 Capital expenditure during the forward regulatory period

Icon Water's submission proposed total capital expenditure, including projects financed through the Capital Contribution Code, of \$469.0m (nominal) for the forward regulatory period. Excluding the funding received via the Code, the nominal value of capital expenditure proposed to be financed from water and sewerage services tariffs is \$434.7m (see Table S.6).

Table S.6 Icon Water's proposal: forecast capital expenditure, 2018–23 (\$m, nominal)

	2017–18 ^a	2018–19	2019–20	2020–21	2021–22	2022–23	Total ^b
Water	40.15	38.38	43.76	42.48	36.82	28.28	189.72
Sewerage services	87.50	67.73	47.17	46.91	44.89	38.28	244.98
Total operating expenditure	127.66	106.11	90.93	89.39	81.71	66.56	434.70

Notes: ^a Data for 2017–18 (last year of the current regulatory period) are presented for comparison purposes.

^b Total is for 2018–23.

Source: Icon Water (2017).

In real terms (\$ 2017–18), the total proposed capital expenditure for the 2018–2023 period, including capital contributions projects, is a five per cent (\$20.7m) increase on the 2013–18 period (\$437.6m, up from \$416.8m). In real terms, the total proposed expenditure, including capital contributions projects, on sewerage infrastructure increases from \$245.4m to \$260.6m and the expenditure on water increases from \$170.6m to \$176.8m between the two regulatory periods.

In its independent review of proposed capital expenditure Calibre chose a number of major projects for detailed investigation; the projects comprised over half the total forward capital expenditure program. Calibre identified several projects for which prudence or efficiency in expenditure could not be established. It also recommended that further catch-up (1.4 per cent a year) and continuing efficiencies (0.4 per cent a year) be applied to Icon Water's proposed capital expenditure program.

The Commission acknowledges Icon Water's positive engagement with it and Calibre during the process of this investigation. Its draft decision is formed on the basis of the best information available at the time of the investigation.

In total, the Commission's draft decision is for a capital expenditure allowance of \$382.6m nominal (\$358.0m real) for the forward regulatory period. Icon Water proposed a total water and sewerage capital program of \$435.0m nominal (\$405.9m real) for the same regulatory period.

The Commission evaluated the information provided by Calibre's and Icon Water's engagement throughout the price investigation. The Calibre review recommended project delivery efficiencies, which the Commission adopted. The Commission was

unable to include uncertain project expenditure in its draft decision on allowable capital expenditure.

The Commission did not adopt Calibre’s recommended catch-up and ongoing efficiency targets for Icon Water’s proposed capital expenditure program in this draft decision but will consider this matter further in making its final determination. The targets reduced the annual capital expenditure by 1.5 and 0.4 per cent respectively.

Further information on the Commission’s considerations is detailed in Chapter 4.

Table S.7 shows the Commission’s draft decision on total approved capital expenditure for Icon Water over the forward regulatory period.

Table S.7 The Commission’s draft decision on Icon Water’s allowable capital expenditure, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water	37.99	43.23	41.77	35.84	27.06	185.90
Sewerage services	64.13	35.95	35.76	29.17	31.69	196.70
Total capital expenditure	102.12	79.18	77.53	65.01	58.75	382.60

Source: Commission’s calculations.

The Commission is aware that further information about planning, deferral and benefits might become available during the draft report consultation period and that this might lead to revisions to approved capital expenditure for Icon Water for the forward regulatory period.

S6 The regulatory asset base and depreciation

Under the building block methodology, capital expenditure is recovered through the return on capital and depreciation building blocks. This requires calculation of a RAB for each year of the next regulatory period. Consistent with the Industry Panel’s approach, the Commission proposes to allow capital expenditure to be incorporated in the RAB where this expenditure is shown to be prudent and efficient. The RAB is also indexed by inflation to maintain its real value, and separate adjustments are made to the allowed nominal return on capital to ensure there is no double-counting.

The roll forward calculation can be described thus:

$$\begin{aligned} \text{Opening } RAB_{t+1} &= \text{Opening } RAB_t + \\ &\text{Actual net capital expenditure}_t - \text{Actual asset disposals}_t - \text{Forecast depreciation}_t + \\ &\text{Actual inflation indexation}_t \end{aligned}$$

Net capital expenditure is capital expenditure after allowing for capital contributions from other parties. Depreciation is calculated on a straight-line basis, which allows for an equal proportion of the asset’s value to be calculated over each year of the useful

life of the asset. It is not necessary to use actual depreciation as long as the accumulated forecast depreciation does not exceed the value of actual capital expenditure in both the current and the forward periods.

S7 The return on capital and taxation

S7.1 The return on capital

The return on capital that forms part of allowed revenue for Icon Water is the allowed rate of return on assets multiplied by the RAB. The Commission proposes to adopt the Industry Panel's approach and calculate the rate of return using a weighted average cost of capital (WACC) formulation, measured on a post-tax nominal vanilla basis.³ This is the standard methodology used for price regulation of utilities in Australia, and was proposed by Icon Water in its submission. The Industry Panel adopted a nominal post-tax vanilla WACC and calculated the associated net tax liabilities using a benchmark efficient entity reference point.

There are a number of parameters that need to be established in estimating an appropriate WACC and net tax liabilities. The Commission has made two adjustments to Icon Water's proposed parameters for the nominal post-tax vanilla WACC. First, it intends to lower the market risk premium. Second, it considers that the value of imputation credits, used to calculate net tax expenses, should be higher than proposed by Icon Water, which would mean lower net tax expenses.

In the Commission's view, the recent decisions by the Australian Energy Regulator (AER) and the Queensland Competition Authority (QCA) cover a wide range of material and give appropriate weight to relevant methodologies. The Commission's draft decision for a market risk premium of 6.5 per cent reflects its consideration of these recent decisions.

In combination with all the other parameters proposed by Icon Water, the Commission's preferred estimate for the market risk premium means that the allowed nominal post-tax vanilla WACC should be 5.93 per cent, which is slightly lower than Icon Water's proposal of 6.07 per cent. The return on capital under the Commission's proposed WACC is \$19.3m lower than that under Icon Water's proposal, assuming the same level of forecast capital expenditure programme.

S7.2 Taxation

The post-tax return methodology requires separate estimates of taxation expenses, which in turn requires the estimation of a tax asset base, the calculation of taxable

³ The term 'nominal' means that the return components are in nominal as opposed to real (inflation-adjusted terms), so that an inflation premium is already included in the components. The term 'vanilla' refers to the simple form of the WACC, where explicit tax effects are not included in the formula but are treated separately in defining allowed revenue requirements.

profit and deduction of the value of imputation credits. The Commission supports Icon Water's proposed approach, which is consistent with the approach of the Industry Panel.

In calculating net tax liabilities using a benchmark approach of a typical privately owned entity, there is a need to estimate the extent to which Australia's dividend imputation system reduces tax expenses. The key parameter that reflects the impact on dividend imputation is referred to as 'gamma'. The value of gamma depends on the extent to which imputation credits for tax paid are distributed to shareholders and the extent to which shareholders can utilise imputation credits to obtain a tax rebate.

Icon Water is proposing a gamma of 0.25 based on a distribution rate of 0.7 and a utilisation rate of 0.35 for imputation credits. It maintains that the value of imputation credits should be a market value concept rather than being based on the eligibility of investors to redeem imputation credits. Its proposed estimate of the utilisation rate is based on a single dividend drop-off study based on market information.

Both the AER and the QCA have noted a number of problems with the reliability and relevance of dividend drop-off studies. The Commission also notes that the Federal Court, in reviewing an Australian Competition Tribunal decision, accepted the AER's interpretation of the value of imputation credits and not the market value concept endorsed by the Tribunal.

The Commission considers that most weight should be given to the equity ownership methodology, as used by the AER and the QCA. On the basis of estimates provided by the AER, the Commission considers that a gamma estimate of 0.4 is most appropriate and notes that this is lower than the Industry Panel report's estimate of 0.5.

The impacts of the Commission's preferred estimates for the return on capital and net tax liabilities are summarised in the following section.

S8 Total revenue allowance

For the Commission's consideration, Icon Water submitted a total revenue requirement of \$1,758.8m (nominal) for water and sewerage services over the five year forward regulatory period commencing 1 July 2018. Icon Water proposed \$994m for water services and \$764m for sewerage services over this period. Icon Water's proposed total revenue requirement for 2018–23 is set out in Table S.8.

Table S.8 Icon Water's proposed total revenue requirement for water and sewerage services, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water						
Return on Capital	54.62	56.34	58.06	59.58	60.79	289.39
Depreciation	31.09	34.53	37.63	40.44	41.78	185.46
Operating Expenditure	96.49	98.77	101.48	106.09	108.99	511.83
Net tax liabilities	1.82	1.57	1.48	1.25	1.53	7.65
Total water revenue requirement	184.01	191.22	198.65	207.36	213.08	994.32
Sewerage						
Return on Capital	31.93	33.84	35.27	36.59	37.69	175.33
Depreciation	26.53	30.53	33.63	36.38	38.77	165.85
Operating Expenditure	78.17	79.48	81.14	84.84	86.63	410.26
Net tax liabilities	3.46	2.93	2.64	2.02	1.99	13.04
Total sewerage revenue requirement	140.10	146.78	152.68	159.83	165.08	764.48
Total revenue requirement	324.11	338.00	351.33	367.20	378.17	1,758.80

Source: Icon Water (2017).

The Commission's draft decision on Icon Water's total revenue requirement is shown in Table S.9; it is based on its draft decisions on operating expenditure, return of capital, return on capital and net tax expenses.

Table S.9 The Commission's draft decision on the total revenue requirement for water and sewerage services, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water						
Return on capital	52.34	53.97	55.60	57.03	58.15	277.09
Depreciation	31.08	34.51	37.58	40.36	41.65	185.17
Operating expenditure	96.49	98.77	101.48	105.22	108.88	510.85
Net tax liabilities	0.72	0.50	0.53	0.60	0.79	3.14
Total water revenue requirement	180.63	187.76	195.18	203.21	209.47	976.25
Sewerage						
Return on capital	30.54	32.11	33.10	33.91	34.58	164.25
Depreciation	26.49	30.33	33.17	35.51	37.52	163.02
Operating expenditure	78.17	79.48	81.14	83.86	86.51	409.16
Net tax liabilities	2.55	1.96	1.58	1.14	0.81	8.04
Total sewerage revenue requirement	137.76	143.88	148.99	154.42	159.42	744.46
Total revenue requirement	318.38	331.64	344.17	357.62	368.88	1,720.71

Source: Commission's calculations based on Icon Water (2017).

The Commission's draft decision on allows a total revenue requirement of \$1,720.7m for Icon Water over the five years forward regulatory period. The total revenue requirement is made up of \$976.3m for water services and \$744.5m for sewerage services. These amounts are approximately 1.8 per cent and 2.6 per cent lower than Icon Water's proposed total revenue requirements for water and sewerage services respectively.

The difference between the Commission's draft decision and Icon Water's proposal reflects the Commission's decision to:

- Decrease the market risk premium from Icon Water's proposed 7.03 to 6.5 per cent in the calculation of the rate of return, as discussed in Chapter 6
- Increase the gamma value from Icon Water's proposed 0.25 to 0.4 in the calculation of net tax liabilities, as discussed in Chapter 6
- Decrease Icon Water's proposed operating expenditure (by \$2.1 m) and capital expenditure (by \$52.1 m) on the basis of the prudence and efficiency analysis conducted by the Commission's independent consultant Calibre and supporting information, as discussed in Chapters 3 and 4.

These revenue estimates are further adjusted to take account of revenue from a number of sources other than ACT consumers. The additional adjustments include allowances for certain community service obligations, as explained in Chapter 7.

As set out in Table S.10, Icon Water proposed a total net revenue requirement of \$1,598.4m (nominal) for the forward regulatory period with \$908.2m for water services and \$690.2m for sewerage services.

Table S.10 Icon Water proposed net revenue requirement for water and sewerage services, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water						
Total water revenue requirement	184.01	191.22	198.65	207.36	213.08	994.32
Less adjustments	16.52	16.80	17.21	17.61	18.03	86.17
Net water revenue requirement	167.49	174.41	181.44	189.75	195.05	908.15
Sewerage						
Total sewerage revenue requirement	140.10	146.78	152.68	159.83	165.08	764.48
Less adjustments	14.10	14.52	14.86	15.22	15.57	74.27
Net sewerage revenue requirement	126.00	132.26	137.82	144.61	149.51	690.21
Net revenue requirement	293.49	306.68	319.26	334.37	344.57	1,598.36

Source: Icon Water (2017).

Table S.11 shows the Commission’s draft decision on Icon Water’s net revenue requirement for water and sewerage services to be recovered from regulated prices.

Table S.11 The Commission’s draft decision on the net revenue requirement for water and sewerage services, 2018–23 (\$m, nominal)

Water	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water						
Total water revenue requirement	180.63	187.76	195.18	203.21	209.47	976.25
Less adjustments	16.57	16.87	17.27	17.67	18.08	86.46
Net water revenue requirement	164.06	170.89	177.92	185.54	191.38	889.78
Sewerage						
Total sewerage revenue requirement	137.76	143.88	148.99	154.42	159.42	744.46
Less adjustments	14.13	14.55	14.89	15.25	15.61	74.43
Net sewerage revenue requirement	123.63	129.33	134.10	139.17	143.81	670.03
Net revenue requirement	287.68	300.22	312.01	324.71	335.19	1,559.81

Source: Commission’s calculations.

The Commission’s draft decision allows a total net revenue requirement for Icon Water of \$1,559.8m over the five year regulatory period, which is \$38.5m lower than Icon Water’s proposal. The Commission’s draft decision on net revenue requirement is \$18.4m (2.02 per cent) lower for water and \$20.2m (2.92 per cent) lower for sewerage services than Icon Water’s proposal.

S9 Forecast sales and installations

To appropriately price Icon Water's water and sewerage services for the 2018–23 period, the Commission must decide on Icon Water's forecast water sales and numbers of consumer installations. Five key sets of figures need to be forecast: total water releases, billed water consumption at Tier 1 and Tier 2, the number of water supply consumers, the number of sewerage service consumers, and the number of billable sewerage services fixtures.

The Commission reviewed the forecasting methodology used to establish previous price directions, as suggested by Icon Water in its submission. With the notable exception of the forecast of water demand, Icon Water's submission supported continued use of the methods used by the Industry Panel for forecasting each demand component.

The Industry Panel model forecast materially higher water sales volumes than were observed. This inaccuracy was the result of changed water consumption patterns in the ACT. Icon Water estimates a revenue shortfall of approximately \$56m for the 2013–18 regulatory period as a result of the inaccuracy of the forecast.

Icon Water's submission proposed the adoption of the ARIMA forecasting model for the 2018–23 regulatory period. The ARIMA model is a variant of a model previously proposed by the Commission for the 2013–18 regulatory period. The Commission considers that Icon Water's proposed ARIMA approach delivers greater forecast accuracy than the Industry Panel model and accepts Icon Water's proposed method and forecast numbers for water releases and water demand.

Given the potential for change in behaviour and climatic conditions in the 2018–2023 regulatory period and the importance of this for setting water prices, the Commission intends to re-evaluate the method for forecasting water demand. This re-evaluation will occur during the 2018–2023 regulatory period.

The Commission also accepts Icon Water's forecast methodology for Tier 1 and Tier 2 water consumption, but it proposes an adjustment to correct for an outlying observation.

S10 Effects on customers and Icon Water's financial viability

The Commission evaluated the impact of the draft decision tariffs on residential and non-residential bills for water and sewerage services.

Table S.12 shows the estimated combined water and sewerage services bill for two levels of residential water consumption for 2017–18 and each year of the forward regulatory period, along with the percentage variation for the change from the preceding year. This assumes broad inflation of 2.5 per cent per annum and no material

changes in Icon Water’s non-controllable costs. For comparison purposes, the table also presents estimated bill impacts of Icon Water’s proposed prices.

Table S.12 Combined residential water and sewerage services bill at two levels of consumption, 2017–18 to 2022–23

		Annual water usage (kL)	2017–18	2018–19	2019–20	2020–21	2021–22	2022–23
Icon Water's proposal	200	\$/year	1,200	1,227	1,257	1,286	1,316	1,346
		\$ change		27	29	30	30	30
		Percentage change		2.3	2.4	2.4	2.3	2.3
	400	\$/year	2,254	2,199	2,228	2,258	2,288	2,318
		\$ change		-55	30	30	30	30
		Percentage change		-2.4	1.4	1.3	1.3	1.3
Commission's draft decision	200	\$/year	1,200	1,186	1,210	1,234	1,259	1,283
		\$ change		-14	24	24	24	24
		Percentage change		-1.2	2.0	2.0	2.0	1.9
	400	\$/year	2,254	2,156	2,189	2,223	2,256	2,290
		\$ change		-97	33	33	34	34
		Percentage change		-4.3	1.5	1.5	1.5	1.5

Notes: All percentage changes are calculated relative to the previous year. Actual bill impacts from 2019–20 to 2022–23 could differ from the indicative impacts shown if actual inflation differs from forecast inflation or if the cost pass-through mechanism is triggered.

Sources: Commission's calculations and Icon Water (2017).

As Table S.12 shows, a typical household consuming 200kL a year will see a decrease in its annual bill of 1.2 per cent (or \$14) in 2018–19 compared to 2017–18. In 2022–23 a typical household will pay \$1,283 for its annual combined bill, which is an increase of \$83 over the regulatory period. This is \$63 lower than under Icon Water’s proposed prices. Icon Water proposed a nominal increase of \$146 over the same period.

Under the Commission’s draft decision, the annual average increase of a water and sewerage services bill for a household consuming 200kL per year over the forward regulatory period is 1.35 per cent. In real terms, this is equivalent to an annual average change of -1.12 per cent. For the same group of consumers for the forward regulatory period, Icon Water proposed an annual average change of 2.3 per cent (- 0.2 per cent) in nominal (real) terms.

Estimated bill impacts for non-residential customers in 2018–23 range from a 0.1 per cent decrease to a 3.6 per cent increase depending on water usage and the number of

billable fixtures. Table S.13 shows the combined water and sewerage services bill for a non-residential user at two levels of consumption and fixtures.

Table S.13 Combined non-residential water and sewerage services bills at two levels of consumption and two levels of fixtures, 2018–19 to 2022–23

Annual water usage (kL)	Number of billable fixtures	Combined water and sewerage services bill (\$, nominal)					Change 2017–18 to 2018–19	Change 2018–19 to 2022–23
		2018–19	2019–20	2020–21	2021–22	2022–23		
2,500	10	17,798	17,921	18,045	18,171	18,297	5.4	2.8
	50	38,786	38,877	38,968	39,061	39,155	2.6	1.0
7,000	10	40,073	40,406	40,742	41,081	41,423	6.8	3.4
	50	61,061	61,361	61,665	61,972	62,281	4.6	2.0

Notes: Actual bill impacts from 2019–20 to 2022–23 could differ from the indicative impacts shown if actual inflation differs from forecast inflation or if the cost pass through mechanism is triggered.

Source: Commission's calculations.

The foregoing tables outline the draft decision's financial impact on residential and non-residential consumers. As is apparent, consumers will see falls in usage prices relative to the current price regime, and gradual increases over the remainder of the period to 2022–23. The Commission's 2018–19 prices are lower than those proposed by Icon Water. Both Icon Water and the Commission adopt price increases to match inflation over the forward regulatory period.

The Commission's draft decision adopts Icon Water's proposal for changes to water supply charges during the forward regulatory period. Icon Water proposed an annual increase of \$20 a year. The increased fixed charge and decreased variable charge better reflect the utility's underlying cost structure.

In the case of sewerage services, the Commission's draft decision would see prices fall for both residential and non-residential consumers during the coming regulatory period. These decreases are set at levels slightly below Icon Water's proposed charges and reflect the Commission's decisions on the cost of capital and the utility's forward capital investment program.

The Commission examined the impact of its draft decision on Icon Water's financial position across the 2018–23 regulatory period. It recognises the importance of ensuring Icon Water's financial viability. A financial viability test was conducted by calculating a selection of financial ratios for Icon Water from 2018–19 to 2022–23. The Commission is satisfied that its draft decision on water and sewerage services prices and the proposed price path during the forward regulatory period are consistent with Icon Water remaining financially viable.

In broad terms, the Commissions' draft decision aligns closely with both that established in the Industry Panel's report and that proposed by Icon Water. The differences in tariffs proposed by Icon Water and the Commission's draft decision reflect the differences in proposed operating and capital expenditure, calculation of the market risk premium and the treatment of taxation credits. It also reflects the Commission's restructure of the tariffs proposed by Icon.

S11 Incentive mechanisms

The Terms of Reference require the Commission to consider the potential for implementing incentive schemes for Icon Water in the forward regulatory period. In the Commission's view, there are merits in implementing incentive schemes and benefit-sharing mechanisms. In contrast, Icon Water's main submission did not support the introduction of service standards, capital expenditure, or operating expenditure incentive schemes.

The Commission has a longstanding record of using deadbands as an efficiency-sharing mechanism. It did canvass alternatives but decided that for the forthcoming regulatory period the current form of end-of-period demand volatility adjustment mechanism should be maintained.

The Commission is aware that there are alternatives to the end-of-period demand volatility adjustment mechanism in terms of risk sharing between customers and the utility. It therefore intends to further review the potential for implementing incentive schemes for Icon Water's operating expenditure, capital expenditure and service levels during 2018–23. This review would be given effect through a future reset principle specified in the proposed price direction.

1 Regulatory objectives and the review process

This chapter discusses the regulatory objectives and government policy context that underpin the Commission's price investigations and decisions and its intended approach to achieving its various regulatory objectives within the decision-making process.

1.1 Background to the investigation

On 13 December 2016 the Commission received from the ACT Treasurer a Terms of Reference to conduct an investigation into the regulated water and sewerage services provided by Icon Water Limited and the making of a price direction for the utility. The reference is made under section 15(1)(a) of the *Independent Competition and Regulatory Commission Act 1997* (ICRC Act).

The Commission's role is to regulate prices, access and other matters in relation to referred industries. The Commission's last review of regulated water and sewerage services took place in 2013. Following an appeal, an Industry Panel conducted an investigation and provided a substituted price direction in 2015.

1.2 The Terms of Reference

The Terms of Reference issued to the Commission on 13 December 2016 (Disallowable Instrument DI2016-297) identify the considerations, the approach and the reporting timeline for the investigation. They also identify considerations originating in the ICRC Act and ACT government and national policies and other matters relevant to the pricing investigation. (The full Terms of Reference are reproduced in full in Appendix 1.)

The Terms of Reference require the Commission to consider the following:

- (a) Continuing to use the current regulatory model, and, where identified, implement improvements to particular aspects of the methodology
- (b) Appropriate mechanisms to ensure the recovery of the prudent and efficient costs of Icon Water Limited during the regulatory period, while minimising the potential for significant price fluctuations
- (c) Whether there is potential for the implementation of incentive schemes for service levels, operating expenditure or capital expenditure for Icon Water Limited in the future.

Additionally, The Terms of Reference state that the draft report (this report) should be made available for public inspection between 1 September 2017 and 12 December 2017 and that the final report must be submitted between 1 March 2018 and 1 May 2018.

1.3 The legislative context and the role of the Commission

In carrying out its functions under the ICRC Act, the Commission has the following objectives, as set out in section 7 of the Act:

- (a) To promote effective competition in the interests of consumers
- (b) To facilitate an appropriate balance between efficiency and environmental and social considerations
- (c) To ensure non-discriminatory access to monopoly and near-monopoly infrastructure.

In making a price direction, the Commission has the following overarching objective, as set out in section 19L of the Act:

The objective of the commission, when making a price direction in a regulated industry, is to promote the efficient investment in, and efficient operation and use of regulated services for the long term interests of consumers in relation to the price, quality, safety, reliability and security of the service.

In making a price direction, the Commission is also required to have regard to the provisions set out in section 20(2) of the Act:

- (a) The protection of consumers from abuses of monopoly power in terms of prices, pricing policies (including policies relating to the level or structure of prices for services) and standard of regulated services
- (b) Standards of quality, reliability and safety of the regulated services
- (c) The need for greater efficiency in the provision of regulated services to reduce costs to consumers and taxpayers
- (d) An appropriate rate of return on any investment in the regulated industry
- (e) The cost of providing the regulated services
- (f) The principles of ecologically sustainable development mentioned in subsection (5)
- (g) The social impacts of the decision
- (h) Considerations of demand management and least cost planning
- (i) The borrowing, capital and cash flow requirements of people providing regulated services and the need to renew or increase relevant assets in the regulated industry

- (j) The effect on general price inflation over the medium term
- (k) Any arrangements that a person providing regulated services has entered into for the exercise of its functions by some other person.

At a high level there are essentially three considerations: economic efficiency, environmental considerations and social impacts. The concept of economic efficiency encompasses many of the other specific objectives, including financial considerations, monopoly power and certain environmental effects. There are likely to be trade-offs in balancing the various objectives and other objectives set by government policies. The Commission's main considerations in balancing the objectives are discussed in Section 1.5.

1.4 The government policy context

A number of government policies and national agreements are relevant when determining arrangements and prices for regulated water and sewerage services.

1.4.1 The ACT Water Strategy 2014–44

The ACT Water Strategy 2014–44: Striking the Balance sets out the ACT Government's policy for long-term management of water resources. The strategy is intended to achieve three outcomes, the second of which – a sustainable water supply used efficiently – is of primary interest for the price investigation. Strategy 5, directed to this outcome, is to manage and promote the sustainable use of water. Action 15 under the strategy concerns encouraging water users to conserve and use water wisely. The ACT Water Strategy also proposes investigating the use of scarcity pricing to promote water use efficiency.

To help achieve the outcome of a sustainable water supply used efficiently, the ACT has a number of schemes in place, including permanent water conservation measures and a temporary water restrictions scheme that can be imposed at times of acute water shortage. The ACT has been under permanent water conservation measures since Stage 2 temporary restrictions were revoked on 31 October 2010.

The ACT Government's overarching planning instrument, the Territory Plan, also imposes on developers a number of water quality requirements relating to the control of stormwater and run-off.

These various water conservation actions are consistent with the Commission's draft decision.

1.4.2 National agreements

The ACT is a signatory to the Murray–Darling Basin Agreement, an intergovernmental agreement between jurisdictions that share the basin. Among other things, the

agreement sets a long-term cap, or upper limit, on surface water diversions. This allows ACT to take out of the ACT watercourses (dams and rivers) a long-term average of 40.5 gigalitres (GL) net per year for consumption. The net take in the ACT has fallen significantly in recent years, to below or about 20GL per year.

The 2004 National Water Initiative commits the ACT Government to a number of best-practice water pricing and institutional arrangements. These are primarily in relation to economically efficient prices for water infrastructure and water resources.

In 2010 a set of National Water Initiative pricing principles, agreed by all Australian governments and endorsed by the Natural Resource Management Ministerial Council, was developed as the basis for setting water prices in all jurisdictions. The price-setting principles cover various additional aspects of economically efficient prices, including application of two-part tariffs unless demonstrated not to be cost effective.

1.5 The Commission's approach to regulatory objectives

1.5.1 The need for pricing principles

The Terms of Reference refer to regulatory objectives and public policies that are relevant for the Commission when making a determination about prices for water and sewerage services. As part of its investigation, the Commission is required to outline its intended approach to meeting its various regulatory objectives within its decision-making process.

The Commission has established pricing principles that take account of both legislative and government policy objectives as well as generally accepted economic and regulatory principles. The principles clarify how the Commission intends to take account of the regulatory objectives in its decision-making. They also provide the basis for the assessment framework the Commission intends to use in developing its recommendations for prices for water and sewerage services. The principles set out in this section of the draft report are consistent with those recently presented in the Commission's final report on the tariff structure review.⁴

Table 1.1 summarises the main principles the Commission considers relevant to setting prices for regulated water and sewerage services. These principles reflect the Commission's interpretation of the legislative objectives, government policies and national agreements that prescribe and guide its decisions in relation to prices for water and sewerage services.

One challenge faced by the Commission, and regulators more generally, lies in setting priorities. There are multiple objectives that can sometimes conflict and limited policy instruments for the regulator to deal with them. In this respect, it is noted that there is a long-established economic and public policy principle that if one wants to be effective

⁴ ICRC, 2017.

in achieving multiple, potentially conflicting objectives, there need to be at least as many separate, well-designed policy instruments (that is, specific policy actions or mechanisms) as there are objectives. Furthermore, a single policy mechanism needs to be assigned exclusively to a specific objective.

Table 1.1 Regulatory objectives and pricing principles for water and sewerage services tariffs

Category	Aspect	Detail
Objective	Overarching interpretation	<p>To promote efficient investment in, and efficient operation and use of, regulated services for the long-term interests of consumers in relation to the price, quality, safety, reliability and security of the service.</p> <p>The various aspects of economic efficiency are given emphasis but with the ultimate objective being the long-term interests of consumers. 'Economic efficiency' when properly defined encompasses environmental objectives. Consumer interests must take account of equity and other social impacts, as required by the ICRC Act.</p> <p>Economic efficiency considerations related to pricing are a starting point but need to be balanced with environmental and social considerations.</p>
Pricing principle	<p>1 Economic efficiency in use</p> <p>2 Economic efficiency for investment and operation</p> <p>3 Environmental considerations</p> <p>4 Community impact – gradual adjustment</p> <p>5 Community impact – fair outcomes for low-income households</p> <p>6 Regulatory governance – simplicity</p> <p>7 Regulatory governance – transparency</p>	<p>Regulated prices should promote the economically efficient use of Icon Water's water and sewerage services infrastructure and should also encourage economically efficient use of the water resource itself.</p> <p>This includes having regard to uneconomic bypass where water supply is sourced from a higher cost alternative.</p> <p>Regulated prices and supporting regulatory arrangements should facilitate the efficient recovery of the prudent and efficient costs of investment and operation. The finance recovery aspect of this principle is often described as ensuring revenue adequacy or financial viability.</p> <p>Costs also need to be efficient, which is primarily dealt with by auditing and incentive-sharing mechanisms.</p> <p>Regulated prices and complementary mechanisms should ensure that environmental objectives are effectively accounted for.</p> <p>Any change to prices or other regulatory arrangements that will have substantial consumer impacts should be phased in over a transition period to allow reasonable time for consumers to adjust to the change.</p> <p>Adverse impacts on households with low incomes need to be limited or moderated by phasing and other compensating mechanisms or limits on changes to regulated prices or other regulatory arrangements.</p> <p>Regulated prices and their form should be simple for consumers to understand and straightforward for the utility to implement.</p> <p>Regulated prices should be set using a transparent methodology and be subject to public consultation and scrutiny.</p>

The main instrument over which the Commission has control is pricing, yet in setting prices it must have regard to economic efficiency and environmental and social considerations. Primary responsibility for environmental and social objectives lies with other parts of government, but the Commission must give those objectives due consideration in its decisions. This then inevitably requires some compromise and consultation with affected parties in arriving at conclusions that will balance the various objectives.

The principles set out in Table 1.1 are consistent with how the Commission considers that economic regulators in similar jurisdictions examine and assess the various objectives. In balancing competing objectives, the Commission considers economic efficiency aspects as a starting point, but it gives careful and consultative consideration to social and environmental impacts.

1.5.2 An explanation of the principles

As noted, the Commission is required to set prices that accommodate a number of potentially conflicting objectives. The recent inclusion of section 19L in the ICRC Act assists in clarifying objectives and priorities: it highlights the importance of all the main aspects of economic efficiency for the long-term interests of consumers.

The focus on economic efficiency is consistent with the starting point for economics in evaluating virtually all government policies and regulatory decisions. It is consistent with how decisions are made about economic regulation in other sectors and other jurisdictions. The Commission's approach (and that of many other regulators) is, however, to pursue economic efficiency while also giving due consideration to social, environmental and other specific objectives.

To help ensure that the final outcome is well understood and broadly accepted by the community, the Commission endeavours to consult thoroughly and make its recommendations as simple as possible and the reasoning for those recommendations as transparent as possible. In this respect, two of the pricing principles relate to simplicity and transparency.

Pricing principle 1: Economic efficiency in use

The overarching efficiency objective leads to the first proposed pricing principle, which is that tariff structures and prices should promote the economically efficient use of Icon Water's water and sewerage services infrastructure and should also encourage economically efficient use of the water resource itself.

This principle reflects the fundamental economic proposition that the community as a whole will benefit if the usage component of a tariff is based on the additional social costs that are incurred as a result of using an additional unit of water. The social costs in this case need to be defined to include the value of additional water use, including the impact if less water is available for future use.

In addition, the tariff structure and tariff levels may create a risk of uneconomic bypass whereby a large user is able to gain access to a lower priced alternative source of supply but one that is in fact of higher cost than the efficient costs of the regulated natural monopoly. This effect means both inefficient use and a higher cost of supply, an aspect of principle 2.

Pricing principle 2: Economic efficiency for investment and operation

The second pricing principle is that tariff structures should facilitate the efficient recovery of the prudent and efficient costs of investment and operation.

This principle covers two aspects of economic efficiency. First, overall revenue needs to be sufficient to finance the costs of operation and investment. If this is not the case, efficient investment might not occur, which could have a major adverse impact on services. The finance recovery aspect of the principle is often described as ensuring revenue adequacy or financial viability.

Second, the cost of investment and operations expenditure needs to be prudent and efficient, as defined here:

- *Prudent expenditure.* This encompasses whether the project, program or activity would reasonably be expected of a utility operating in the circumstances that apply. Evidence considered for prudence would include substantiation of the benefits of and the need for the project, program or activity.
- *Efficient expenditure.* This entails whether the project, program or activity is delivered or proposed to be delivered with the best value for money. Evidence considered for efficiency would include substantiation of alternative service delivery options, assessment of lowest cost over the life cycle, and the ‘deliverability’ of the proposed project, program or activity.

Other regulatory mechanisms – auditing and incentive mechanisms – are the main means of meeting this objective, although the structure of the tariff or other form of regulation and, in particular, the extent to which revenues are guaranteed can affect these aspects of economic efficiency.

Pricing principle 3: Environmental considerations

Tariff structures, prices and complementary mechanisms should ensure that environmental objectives are effectively accommodated.

Some environmental impacts can be reflected in prices, but typically environmental objectives are primarily accommodated by specific legislated and government policy requirements. This includes giving priority to designated environmental flows and various permanent and temporary water conservation measures or restrictions.

Pricing principle 4: Community impact – gradual adjustment

Any change to the structure of tariffs and prices that will have substantial consumer impacts should be phased in over a transition period to allow reasonable time for consumers to adjust to the change.

Consumers prefer price stability in the overall bills they face. An adequate transition period for any material changes in prices can ease adjustment costs.

Pricing principle 5: Community impact – fair outcomes for low-income households

Adverse impacts on households with low incomes need to be limited or moderated by phasing and other compensating mechanisms or limits on changes to regulated prices or other regulatory arrangements.

Effectively responding to concerns about increases in water bills for households with low incomes is probably the most difficult aspect of developing a set of pricing principles for water and sewerage services. This is especially the case when the Commission does not have the authority to implement specific policies that are aimed at mitigating impacts on households with low incomes or tight budgets. It is also difficult to identify the impacts on all households with low incomes and form a judgement about the value of equity or fairness impacts.

The Commission will carefully consider the likely impacts of price changes on households with low incomes and suggest mechanisms to redress or moderate any adverse impacts. Where such measures cannot be implemented within a reasonable period, the Commission will form a judgement about an acceptable cap for price increases for low and moderate levels of water usage. But the Commission notes this matter is not just limited to low and moderate water users since many low-income households contain large families and have high water usage.

Pricing principle 6: Regulatory governance – simplicity

Tariff structures should be simple for consumers to understand and straightforward for the utility to implement.

This principle seems self-evident. Most consumers of water are likely to prefer regulated prices and regulatory arrangements that are readily understood. Readily understood tariff structures have the added benefit of being easier and cheaper for the utility to implement, which also contributes to economic efficiency.

Pricing principle 7: Regulatory governance – transparency

Tariffs should be set using a transparent methodology and be subject to public consultation and scrutiny.

This principle relates to process and is an important aspect of achieving good governance with respect to regulatory action. The community as a whole needs to have confidence in the regulatory arrangements, and this requires that there is generally a

good understanding in the community of how regulated prices for water and sewerage services are decided.

1.6 The purpose of this draft report

Production of a draft report is required by the Commission's terms of reference for the investigation. The draft report affords an opportunity for public scrutiny of the investigation and the Commission's approach, which includes how it achieves regulatory objectives, the matters presented in the current investigation, the findings and the preliminary decisions.

The Commission is seeking comment on the draft report and its findings and recommendations. The draft report is open for comment until 23 February 2018. Interested parties are invited to submit comments in writing (via email or post) at the address shown on Page iii.

1.7 Investigation timeline

Production of the draft report is the fourth task in the water and sewerage services price investigation and price direction. Table 1.2 shows the Commission's review timeline.

Table 1.2 Indicative timeline for the water and sewerage services price investigation

Task	Date
Terms of Reference signed	13 December 2016
Release of issues paper	31 March 2017
Submissions on issues paper close	28 April 2017
Draft report and proposed price direction	By 12 December 2017
Submissions on draft report close	23 February 2018
Public hearing	February 2018
Release of final report and price direction	May 2018

The closing date for receipt of submissions on the draft report is 23 February 2018. Written submissions received by the closing date will be considered in the development of the final report and the price direction. Under section 17(4)(b) of the ICRC Act the Commission is required to conduct a public hearing for all price regulation investigations. It intends to conduct such a hearing after the draft report is released.

2 The form of regulation

This chapter sets out the Commission’s draft decision on the form of regulation to apply for the regulatory period 2018–23. It summarises and discusses concerns raised in the submissions received on the issues paper and presents the Commission’s responses where relevant.

The Commission’s draft decision

Table 2.1 summarises the Commission’s draft decision on the form of regulation for the 2018–23 regulatory period.

Table 2.1 The Commission’s draft decision on the form of regulation, 2018–23

Component	Icon Water’s proposal	Commission’s draft decision
Regulatory period	Five years, from 1 July 2018 to 30 June 2023.	Five years, from 1 July 2018 to 30 June 2023.
Form of control and measures to deal with demand risks	A hybrid price and revenue cap form of price control with individual price caps for water and sewerage services with an annual unders and overs mechanism.	A hybrid price and revenue cap and a demand volatility adjustment mechanism to account for deviations between actual and forecast volumetric water sales revenue in excess of six per cent deadband over the full five-year regulatory period. If the deadband is triggered the Commission will be required to include any under- or over-recovery of revenue associated with this deviation.
Measures to deal with expenditure risks	An annual price reset process to account for revenue shortfalls and over-collections in the preceding year, and any pass-through amounts subject to an annual materiality threshold and pricing side constraints. Pass-through arrangements to deal with unexpected and uncontrollable events. Pass-through arrangements for the contingent Best for Region sewerage treatment project.	CPI escalation mechanism. Retain annual cost pass-through mechanism to deal with changes in uncontrollable costs. Ex post capital expenditure review.
Measures to deal with unforeseen events	Retain the current price variation trigger event mechanism.	Retain the current price variation trigger event mechanism.
Tariff structure and price reset mechanism	Retain existing water and sewerage services tariff structure while introducing a measured and gradual increase to the water fixed supply charge.	Retain existing water and sewerage services tariff structure while introducing a measured and gradual increase to the water fixed supply charge.

Miscellaneous fees and charges	Retain the current provision of updating miscellaneous fees and charges by CPI.	Retain the current provision of updating miscellaneous fees and charges by CPI.
Capital contribution code	Submitted an application for the Commission's consideration to introduce a new miscellaneous service to allow for capital contribution arrangements.	Ensure there is no double-up of expenditure accounting over and above the existing water and sewerage RAB.
Incentive schemes	Did not support introducing incentive mechanisms.	Incentive mechanisms to be reviewed during the 2018–23 regulatory period.
Pricing methodology	A post-tax building block approach.	A post-tax building block approach.

2.1 Current form of regulation

The prices for regulated water and sewerage services are currently determined in the manner specified in the Industry Panel's report *Substituted price direction: Regulated water and sewerage services – 1 July 2013 to 30 June 2018*.⁵ The substituted price direction was developed and implemented following an application by Icon Water for review of the Commission's 2013 price direction, which was to apply from 1 July 2013 to 30 June 2019.

The original price direction specified a six-year regulatory period with recalibration of prices biennially and adjustment for inflation and cost pass-through of specified items in alternate years. The Industry Panel maintained the price levels in the Commission's original decision for 2013–14 and 2014–15 but used a different methodology to determine prices for the subsequent three years and reduced the regulatory period from six to five years.

The Industry Panel adopted a hybrid price and revenue cap form of control with individual price caps for regulated water and sewerage services. The form of control included a demand volatility adjustment mechanism that would be triggered if deviations between actual and forecast water sales revenue were to fall outside a six per cent deadband.

The Industry Panel's approach specified a Consumer Price Index (CPI) escalation mechanism to provide Icon Water some protection against changes in inflation during the period, and allowed for a cost pass-through of specified items. The annual cost pass-through mechanism was instituted to give Icon Water and consumers some protection against material changes (positive and negative) in non-controllable costs during the period.

⁵ Industry Panel, 2015a.

2.1.1 Submissions in response to the issues paper

As noted, following receipt of the Terms of Reference the Commission released an issues paper on 31 March 2017 as the first step in its price investigation. It sought feedback on the matters discussed in the issues paper, which included components of its current regulatory model, the form of control (such as the current hybrid price and revenue cap approach), and managing demand and expenditure risks. Except for Icon Water's main submission, the Commission did not receive any submissions from other interested parties.

2.1.2 Icon Water's main submission

Icon Water provided its main submission to the Commission on 30 June 2017. Its proposed form of regulation had the following characteristics:

- The Industry Panel's post-tax building block framework to determine maximum allowed revenues for the 2018–23 period
- A hybrid price and revenue cap form of price control over the five year regulatory period with individual price caps for water and sewerage services
- Provision for negotiated contracts to avoid uneconomic bypass.
- An annual unders and overs mechanism for water and sewerage services revenues and prices
- An annual price reset process whereby the Commission adjusts for revenue shortfalls or over-collections in the previous year and any pass-through amounts, subject to materiality threshold and pricing side constraint
- Pass-through arrangements to deal with unexpected uncontrollable events
- Pass-through of costs associated with the contingent transboundary Best for Region sewage treatment project

The following sections discuss the Commission's response to the relevant matters raised and present the Commission's draft decision on the form of regulation. The Commission welcomes feedback on its draft decision.

2.2 The length of the regulatory period

As specified in the Terms of Reference, the price direction will be for the five-year period from 1 July 2018 to 30 June 2023.

Consistent with the Industry Panel's approach, the Commission's draft decision is not to undertake annual or biennial recalibrations during the forward regulatory period (2018–23).

2.3 The form of control

The Commission currently applies a hybrid price and revenue cap form of control for setting prices for regulated water and sewerage services. As specified in the Terms of Reference for this investigation, the Commission is required to consider continuing to use the current regulatory model with improvements to particular aspects of the methodology where identified.

In its main submission Icon Water supported a hybrid price and revenue cap form of price control over the five-year regulatory period, with individual price caps for water and sewerage services.

Forms of control include the following:

- *A pure revenue cap.* This form of control involves placing a cap on the revenue a regulated service provider can earn in a year. To account for deviations between actual revenue and the revenue cap arising as a result of variations between actual and forecast demand, an ‘unders and overs’ account will typically be established. Prices can then be adjusted in the subsequent regulatory period to reflect the extent of any under- or over-recovery.
- *An average revenue cap.* This form of control involves placing a cap on the revenue a regulated service provider can earn per unit of output (for example, revenue per consumer).
- *A price cap on individual services.* This form of control involves placing a cap on the price of each regulated service.
- *A hybrid price and revenue cap.* This form of control contains elements of both a price and a revenue cap. The precise elements combined can vary. One example, used by a number of Australian regulators, is a price cap that can be adjusted for any under- or over-recovery of revenue above a certain threshold (or deadband). Under this hybrid cap, the regulated service provider bears demand risk up to the threshold, while consumers bear the risk beyond this threshold.⁶

The choice between the alternative forms of price control affects how volume (demand) risks are allocated between consumers and the regulated business, how prices are allowed to vary during the regulatory period, the stability of the regulated business’s revenue, and the regulated business’s incentive to encourage efficient utilisation of the assets.

It is helpful to compare revenue and price cap regulatory mechanisms. A pure revenue cap specifies a maximum revenue amount only, whereas a pure price cap specifies maximum prices for each service. A pure revenue cap transfers all volume (demand) risk from the regulated business to its consumers, since prices can be varied to match demand to ensure the revenue target is met; in contrast, a strict price cap means that the

⁶ Industry Panel, 2015: 30

regulated business bears all the demand risk while consumers enjoy stable prices. Both mechanisms can be adjusted to allow prices to change for certain pass-through events and inflation.

Under a revenue cap the removal of demand risk can reduce the incentive for the regulated utility to reduce costs when there is a material reduction in demand. Total revenue can be maintained because prices can be readily adjusted.

In contrast, a price cap provides a stable price but can create the incentive to supply more services if the cost of providing additional services is lower than the maximum price. A price cap exposes the utility to financial risk should insufficient sales volumes be achieved.

The degree of exposure to demand risk, inherent in the choice between a revenue cap and a price cap, will affect the allowed rate of return of the regulated utility. The regulated rate of return varies with the form of regulation and the risks to the regulated utility. A low-risk environment for the regulated utility should be reflected in the rate of return parameter values such as equity beta.⁷ The equity beta should be lower under a revenue cap that transfers all demand risks to consumers, which implies that the rate of return should be lower under a revenue cap relative to that under a price cap.

A hybrid mechanism can be helpful in avoiding the extreme effects of a pure revenue cap or a strict price cap.

The Industry Panel considered forms of control when making the substituted price direction. The panel had regard to consumer price stability and predictability, minimising regulatory costs, ensuring that Icon Water remains financially viable, and promoting economic efficiency. Its decision to adopt a hybrid cap model was guided by the approach taken by other regulators and its judgement that this form of regulation would best satisfy its desire for price stability, financial viability of the regulated business and economic efficiency. It took the view that the other regulatory approaches did not provide an appropriate allocation of the risks between consumers and the regulated business, particularly since the demand for water services may be difficult to predict.

Drawing on the foregoing discussion and the requirements of its Terms of Reference, the Commission's draft position is to continue with the current form of hybrid price and revenue cap regulation, with individual price caps set for water and sewerage services charges.

⁷ Discussed in detail in Chapter 10.

2.4 Measures to deal with demand risks

Icon Water's submission highlighted that the current form of control exposed the utility to a risk of under-recovery of revenue. To reduce the demand risk, Icon Water proposed an annual 'unders and overs' mechanism with a 0.5 per cent threshold to account for variations between estimated and actual revenue.

Icon Water's proposed approach differs from the Industry Panel's decision. The Industry Panel's decision provided for an end-of-period demand volatility adjustment mechanism with a six per cent threshold. Should the total revenue over the regulatory period vary above or below the maximum allowed revenue by greater than the threshold amount, an end-of-period adjustment would be made.

The Commission has considered that an annual unders and overs mechanism would minimise the risk of under-recovery of revenue for Icon Water. But this approach also has disadvantages, the most notable of which is that implementation of an unders and overs mechanism would mean that consumers bear most of the demand risk. This would also entail potential price instability for consumers. The Commission further considers that adoption of Icon Water's proposed mechanism might not be necessary given Icon Water's improvements to the water forecasting model, which are aimed at reducing demand forecasting risk, and the Commission's draft decision to retain the end-of-period demand volatility adjustment mechanism, whereby demand risk is shared and balanced over the regulatory period. Similarly, Icon Water has suggested that it retain the financing benefits associated with capital underspend. This would represent another form of risk sharing and can be viewed as consistent with the Industry Panel's establishment of a six per cent deadband.

The Commission's draft decision is to maintain the Industry Panel's end-of-period demand volatility adjustment mechanism to account for any material deviations of demand. The demand volatility adjustment mechanism considers water sales revenue over the entire regulatory period, from 1 July 2018 to 30 June 2023. Following the Industry Panel's decision, the Commission's draft decision adopts a threshold (deadband) at plus or minus six per cent of the allowed revenue in net present value terms. Under this approach, Icon Water bears the demand risk up to the level of the deadband and consumers bear the risk beyond the deadband.

2.5 Measures to deal with expenditure risks

The Commission proposes to continue to use the following mechanisms to deal with the risk that actual expenditure deviates from the forecast expenditure.

2.5.1 A CPI escalation mechanism

Supporting Icon Water's view, the Commission's draft decision is to retain the CPI escalation mechanism as part of its annual reset, which will provide some protection against actual changes in inflation in the regulatory period 2018–23.

The Commission proposes to adjust the CPI using the following formula, which is based on the ‘four quarter on four quarter’ approach and employs CPI data (a weighted average of eight capital cities) available from the Australian Bureau of Statistics.

$$P_t = P_{t-1} \times \left(\frac{CPI_{June(t-2)} + CPI_{Sept(t-1)} + CPI_{Dec(t-1)} + CPI_{March(t-1)}}{CPI_{June(t-3)} + CPI_{Sept(t-2)} + CPI_{Dec(t-2)} + CPI_{March(t-2)}} \right)$$

2.5.2 A cost pass-through mechanism

Icon Water submitted that the Commission should retain the pass-through events that are provided in the Industry Panel’s substituted price direction to deal with unexpected uncontrollable events during the regulatory period. It noted, ‘Should Icon Water’s proposed form of control and ancillary mechanisms be adopted, variations between forecast and actual WAC, UNFT and subvention payment amounts would be dealt with in the unders and overs account’.⁸

Despite not supporting Icon Water’s proposed unders and overs mechanism, the Commission considers that an annual cost pass-through mechanism is warranted to deal with material changes (positive and negative) in uncontrollable costs over the regulatory period, subject to a materiality threshold.

Consistent with the current price direction, the Commission proposes to retain pass-through arrangements for the following events as part of the annual reset process:

- A Water Abstraction Charge (WAC) event
- A Utilities Network Facilities Tax (UNFT) event
- A Tantangara Transfer payment event
- A subvention payment event
- A change in other taxes event
- A service standard event
- A regulatory obligations event

Following the Industry Panel model, the materiality threshold for the cost pass-through mechanism will be as follows:

- \$0 for WAC, UNFT and subvention payments
- \$2m per event for all other cost pass-through categories

The proposed arrangements to pass-through the costs associated with these events triggered during the next regulatory period are set out in more detail in the proposed price direction.

⁸ Icon Water, 2017 (Attachment 2): 31.

2.5.3 The Best for Region sewage treatment project

Icon Water proposed a new pass-through event for the contingent Best for Region sewage treatment project. This project involves the development of a cooperative arrangement with Queanbeyan–Palerang Regional Council for the treatment of sewage from the eastern side of the ACT and from Queanbeyan.

Icon Water (formerly ACTEW) proposed pass-through events for contingent projects in previous price investigations. The Commission’s response in the 2013–18 regulatory review was to not include contingent projects as pass-through events, noting the additional regulatory and administrative obligations that pass-throughs generate without necessarily producing lower costs to ACT consumers.⁹ In the substituted price direction, the Industry Panel did not include contingent projects among the list of pass-through events.¹⁰

The Commission encourages Icon Water to develop a Best for Region sewage treatment solution at lowest cost. The decision to develop and implement this contingent project is within Icon Water’s discretion.

In the Commission’s view, the Best for Region project does not originate from legislation or regulatory or administrative processes; nor does there appear to be a ministerial direction to declare the costs as a pass-through fee. Should ministerial directions or legislative provisions be implemented to develop a Best for Region project, this event will fall under the category of a regulatory obligations event. Regulatory obligations events are listed as pass-through events in the current regulatory period and in the draft decision for the forward regulatory period.

The Commission’s draft decision is that the Best for Region project will not be included as a pass-through event but will receive the same treatment as existing cross-border projects, which receive the same assessments for prudence and efficiency as assets and operations within the ACT.

2.5.4 An ex post capital expenditure review mechanism

The Industry Panel’s substitute price direction provided scope for an ex post capital expenditure review mechanism. Such a mechanism enables the Commission to assess the prudence and efficiency of Icon Water’s actual capital expenditure in the current regulatory period before adding to the RAB. The Commission sought feedback on the process for ex post capital expenditure review in its issues paper.

Given that the Industry Panel’s substituted price direction has provided an ex post capital review as a reset principle, and the Terms of Reference require the Commission

⁹ ICRC, 2013: 129.

¹⁰ Industry Panel, 2015: 27.

to continue the current regulatory model, the Commission has reviewed Icon Water's capital expenditure before rolling it into the next regulatory period's RAB.

The Commission's issues paper identified the issue of financing benefit accrued to Icon Water by capital underspending. The issue is whether the value of this financing benefit should be determined and deducted from allowed revenue or the RAB in the next regulatory period.

The financing benefit is the revenue earned on planned but not delivered capital expenditure. If there were to be a material underspend of allowed capital, Icon Water would in effect receive a financing benefit that would include both a return on capital component and a return of capital (depreciation) component related to the amount of the underspend. The Commission notes that Icon Water will receive a financing benefit associated with underspending of capital of \$56.4m.¹¹

In its main submission Icon Water strongly opposed any adjustments for financing benefits. It argued that this would adversely affect incentives to reduce capital expenditure relative to forecasts.

In acknowledging the benefits of regulatory certainty, the Commission accepts Icon Water's proposal that no adjustments be made to the additional revenues received from capital underspending during the 2013–18 regulatory period. In the Commission's view, this would represent another form of risk sharing and is consistent with the Industry Panel's establishment of an end-of-period demand volatility adjustment mechanism with a 6 per cent threshold. The Commission observes that consistent receipt of financing benefits could create an incentive for forecasting inefficient capital expenditure. In Chapter 11 the Commission considers the role of incentive mechanisms to respond to this situation.

2.6 Measures to deal with unforeseen events

Following the current regulatory model, the Commission proposes to include a price variation trigger event mechanism that can be activated if one of the following unforeseen events occurs and it satisfies the materiality threshold:

- An act of terrorism
- A major natural disaster
- Major damage to infrastructure
- A significant change in Icon Water's financial or corporate structure, and
- An unforeseen or *force majeure* event

¹¹ Icon Water, 2017 (Attachment 6): 1.

The level of this materiality threshold should ensure that the trigger event mechanism does not undermine Icon Water’s incentive to act in a prudent and efficient manner or give rise to frequent price changes and higher regulatory costs. The materiality threshold adopted by the Industry Panel for the 2013–18 regulatory period is \$12m.¹²

For the next regulatory period the Commission proposes to maintain the Industry Panel’s allowed materiality threshold in real terms by indexing its nominal value for the changes in the CPI. Accordingly, the aforementioned events will be considered price variation triggers only if they severely restrict Icon Water’s ability to provide water or sewerage services and impose a total annualised cost on Icon Water for the remainder of the 2013–18 regulatory period of more than \$13.19m.¹³

2.7 The tariff structure

2.7.1 The current tariff structure

The current ACT water tariff structure comprises one fixed and two variable cost tiers. For 2017–18 year, the annual fixed supply charge is set at \$104.21, and the two-tier inclining block usage charge sets the Tier 1 charge at \$2.68/kL for the first 200kL of water use and the Tier 2 charge at \$5.38 per kL for consumption above 200kL per year.¹⁴

Table 2.2 shows the water tariffs on a year-by-year basis for the current regulatory period.

Table 2.2 Residential water charges, 2013–14 to 2017–18

	2013–14	2014–15	2015–16	2016–17	2017–18
Fixed (\$/pa)	100	102.56	101.14	101.48	104.21
Tier 1 (0–200kL pa) (\$/kL)	2.55	2.64	2.60	2.61	2.68
Tier 2 (+200kL pa) (\$/kL)	5.10	5.29	5.22	5.24	5.38

Sources: ICRC (2017), ICRC (2015) and ICRC (2013).

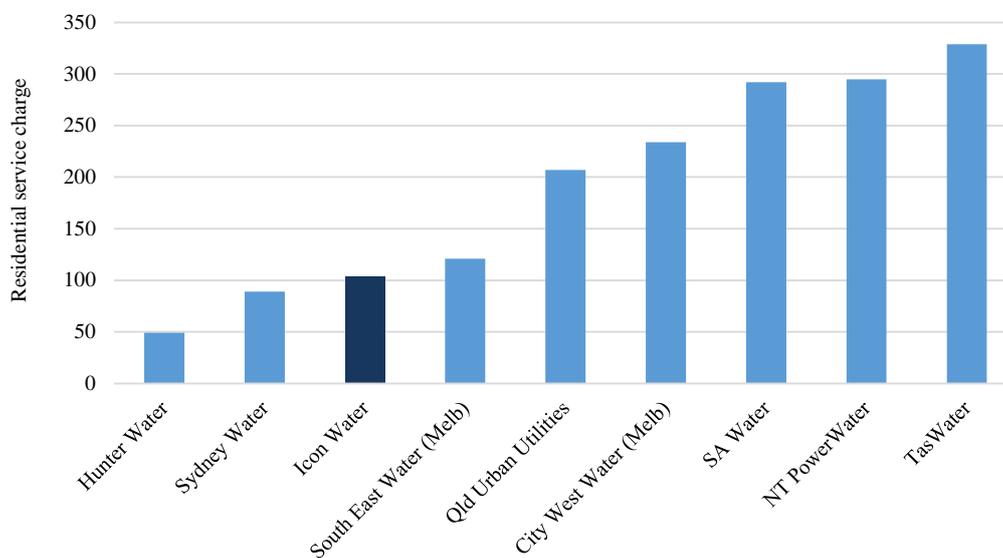
Figure 2.1 and Figure 2.2 compare Icon Water’s residential water tariff structure components with those of a number of urban utilities in Australia. The comparison indicates Icon Water’s Tier 2 price is one of the highest in Australia and its fixed charge one of the lowest.

¹² Industry Panel, 2015: 27.

¹³The proposed materiality threshold for the forward regulatory period (\$13.19m) is obtained by indexing the Industry Panel’s allowed threshold of \$12m (in \$ 2012–13) for the changes in actual inflation of 1.98 per cent, 2.56 per cent, 2.09 per cent, 1.50 per cent and 1.48 per cent, respectively for 2013–14, 2014–15, 2015–16, 2016–17 and 2017–18. $13.19m = \$12\text{ m} * (1+1.98\text{ per cent}) * (1+2.56\text{ per cent}) * (1+2.09\text{ per cent}) * (1+1.50\text{ per cent}) * (1.48\text{ per cent})$.

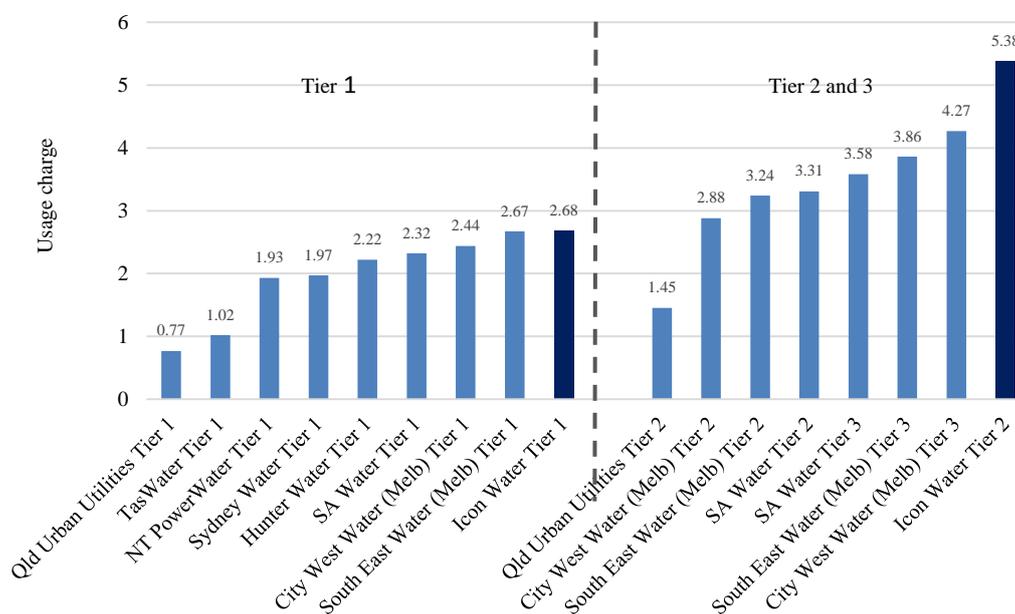
¹⁴ Charges are calculated on a daily pro rata basis and billing occurs quarterly, so the Tier 1 price can apply for consumption that is less than the annual amount of 200kL.

Figure 2.1 Australian utilities' fixed supply charge for water, 2017–18 (\$ per year)



Sources: Hunter Water (2017); Sydney Water (2017); Icon Water (2017b); ESA (2017a); Queensland Urban Utilities (2017); SA Water (2017); NT PowerWater (2017); and TasWater (2015).

Figure 2.2 Australian utilities' water tariff tiers, 2017–18 (\$ per kL)



Sources: Hunter Water (2017); Sydney Water (2017); Icon Water (2017b); ESA (2017a); Queensland Urban Utilities (2017); SA Water (2017); NT PowerWater (2017); and TasWater (2015).

Icon Water's inclining block tariff structure was in place during the Millennium Drought that affected south-east Australia from about 1997 to 2009. The shortage of water in this period led to implementation of temporary water restrictions, permanent

conservation measures and a relatively high usage charge for the higher tier. At the time this structure was viewed as providing a price signal to conserve water, while ensuring that some water was available at a lower charge to meet essential needs. The ACT's water supply and demand balance today is different. Recent evidence suggests that the ACT is more water secure, both currently and over the long term, as a result of lower average consumption and increased storage capacity.

Icon Water's current tariff structure for regulated sewerage services consists of an annual fixed supply charge for residential premises. For non-residential premises the same fixed supply charge applies, plus there is an annual charge per flushing fixture in excess of two. Icon Water does not currently have a trade waste tariff. Table 2.3 shows the sewerage services tariffs for the current regulatory period.

Table 2.3 Residential sewerage services charges, 2013–14 to 2017–18

	2013–14	2014–15	2015–16	2016–17	2017–18
Supply charge (\$/pa)	492.02	505.14	523.18	529.38	537.34
Fixture charge non-residential (\$/pa) ^a	481.18	494.28	511.66	517.73	525.51

Note: ^aFor every additional flushing fixture greater than two.

Sources: ICRC (2013), ICRC (2015) and ICRC (2017).

2.7.2 The preferred direction for change

The Commission reviewed the tariff structure for Icon Water's regulated water and sewerage services in 2016 and 2017. It began the review with the release of an issues paper in November 2015.¹⁵ This was followed by a technical paper on the elasticity of demand for water in the ACT, released in February 2016.¹⁶ A technical paper on marginal cost pricing in the ACT was then published in June 2016.¹⁷ The Commission released its draft report and final report in September 2016¹⁸ and March 2017¹⁹ respectively.

As set out in its final report on the tariff structure review, the Commission's preferred tariff structure for the next regulatory period would include the following features:

- Retaining the existing water tariff structure with a fixed supply charge and a two-tier inclining block usage charge for the next regulatory period, but taking the opportunity to rebalance the components to better reflect costs while taking account of social and environmental objectives and relevant government policies

¹⁵ ICRC, 2015

¹⁶ ICRC, 2016a

¹⁷ ICRC, 2016b

¹⁸ ICRC, 2016c

¹⁹ ICRC, 2017c

- Considering different tariffs for different types of consumers, such as large users, as long as it can be shown that such tariffs are in the long-term interest of consumers
- Making any changes to the tariff structure in a measured and gradual manner as part of price determinations
- Using the pricing principles as a guide in changing the tariff structure and setting any new tariffs

2.7.3 Icon Water's submission

Icon Water presented its main submission to the Commission on 30 June 2017. In summary, its proposed water and sewerage services tariff structure had the following primary characteristics²⁰:

- Retaining the inclining block two tier water usage charges, but adjusting the balance of supply and usage charges in a gradual manner over the regulatory period
- Determining the Tier 1 water usage charge using the current methodology
- Retaining the current sewerage services tariff structure with flexibility to introduce a trade waste charge

2.7.4 The Commission's consideration

The fixed supply charge

The Commission has accepted Icon Water's proposal for increasing the current fixed supply charge, subject to further improvements. The Commission's decision balances a number of considerations, among them reducing the reliance on usage charges to recover Icon Water's efficient costs and improving social equity.

One of the main problems with the current water tariff structure is the high reliance on the usage component relative to the fixed supply component. As mentioned, under the current tariff structure Icon Water recovers about 10 per cent of its revenue from the fixed supply charge and the remainder from usage charges. This is not considered effective in facilitating efficient cost recovery. In the Commission's view a gradual change should be introduced to reduce the reliance on usage charges and increase the reliance on the fixed charge calibrated to recover the efficient costs of water supply services Icon Water provides.

The Commission acknowledges that, relative to the current arrangement, Icon Water's proposed increase in the fixed charge represents a move towards achieving a more efficient outcome. But fairness and equity concerns need to be effectively recognised in deciding on changing the extent of the fixed charge. Some large users might require

²⁰ Icon Water, 2017 (Overview): 33.

proportionately more water transport and connection infrastructure relative to small users, which suggests that there might be a partial cost-causation rationale for a higher fixed charge for large users. Recognising the importance of responding to equity concerns, the Commission therefore considers that a differential fixed supply charge entailing a higher fixed charge for non-residential consumers relative to residential consumers could be considered. This approach would imply a reduction in both Tier 1 and Tier 2 usage charges compared with what they otherwise would be.

The Commission's draft decision is to accept Icon Water's proposal for increasing the fixed supply charge by \$20 per year to \$200 by 2022–23, applicable for residential consumers. It further suggests that Icon Water give consideration to introducing a differential fixed supply charge component set at a higher value for non-residential consumers while providing a long transition period for these customers.

The Tier 1 usage charge

The Commission's draft decision is to retain the current approach to the Tier 1 usage price and support Icon Water's proposal for annual adjustments for any X factor²¹, changes in the CPI and any pass-through amounts as part of the annual price reset mechanism for the 2018–23 period.

As detailed in Section 2.4, the Commission does not support Icon Water's proposal for an annual unders and overs mechanism that would adjust the Tier 1 usage price subject to a three per cent side constraint from 2020–21.

The Tier 2 usage charge

The Commission accepts Icon Water's proposal for decreasing the Tier 2 water usage charge from \$5.38 to \$4.95 per kL on the basis that the current Tier 2 charge remains among the highest nationwide and needs amending to reduce the risk of uneconomic bypass problems. The Commission's decision has also been guided by the fact that a significant proportion of low-income households are current Tier 2 consumers.

The Commission does not support Icon Water's proposal for keeping the reduced Tier 2 price constant over the 2018–23 regulatory period. It considers that, in order to achieve a socially more equitable outcome, the expenditure risks associated with changes in the CPI and non-controllable payments should be shared by both Tier 1 and Tier 2 consumers. The Commission's draft decision retains the current approach of adjusting the Tier 2 usage price for changes in the CPI and any pass-through amounts as part of the annual price reset mechanism over the 2018–23 regulatory period.

Sewerage services tariffs

In the Commission's view the current sewerage services tariff structure does not provide efficient price signals in relation to sewerage services demand. But the central

²¹ X factor has a mathematical function in the price setting formula. It is used to smooth price changes by equalising forecast tariff revenue with target revenue in net present value terms.

practical question in introducing an efficient sewerage services tariff structure is whether the economic efficiency benefits outweigh the implementation challenges.

There are three main implementation challenges. The first is essentially related to the practical difficulty associated with introducing a usage-based pricing structure, since sewage is currently not metered and direct information is not available on the volume of sewage produced by any particular consumer. The second challenge is that, should water be used as a proxy for actual discharge volumes, any revenue uncertainty associated with water volumes would be extended to Icon Water's sewer services revenues. The third concern is that lower sewage volumes entering the sewerage network do not necessarily mean lower costs for Icon Water.

In the Commission's view, particularly in the absence of a reliable measure for actual discharge volumes, it is unlikely that any potential economic efficiency benefits of introducing a sewage volume charge would outweigh the costs. On that basis the Commission accepts Icon Water's proposal for retaining the existing sewerage services tariff structure.

Trade waste pricing

Consistent with cost-reflective pricing, the Commission has in the past noted that costs associated with trade waste should be recouped from trade waste producers. In its previous final decisions – for instance, in 2008 and 2013 – the Commission noted that it was supportive of Icon Water's stated intention to implement a trade waste policy.²²

The Commission welcomes Icon Water's commitment to consider introducing a trade waste pricing regime during the 2018–23 regulatory period to ensure that the actual costs imposed on the sewerage network are signalled to consumers. In view of Icon Water's previous engagement with potential trade waste policies, the Commission expects the utility to introduce a trade waste pricing regime during the 2018–23 regulatory period.

2.8 The annual price reset mechanism

The annual price reset mechanism adjusts maximum price levels for regulated water and sewerage services for each year of the next regulatory period, starting in 2019–20.

Icon Water's submission supports retention of the annual price reset mechanism. Box 1 shows Icon Water's proposed annual price adjustment methods.

²² ICRC, 2008: 158 and ICRC, 2013: 164.

Box 1 The annual price reset process: Icon Water's submission

Year 2 (2019–20)

The Commission adjusts the water supply charge and makes no adjustment to the Tier 2 water price, in keeping with Icon Water's tariff proposal. The Commission adjusts the Tier 1 water price and sewerage services supply and fixture charges for any X factor and the change in the CPI using the formula set out in the current price direction.

Year 3 onwards (2020–21 to 2022–23)

In April–May each year Icon Water provides to the Commission the water and sewerage services unders and overs accounts, containing the latest available revenue data.

The Commission adjusts the water supply charge and makes no adjustment to the Tier 2 water price, in keeping with Icon Water's tariff proposal.

The Tier 1 water price and sewerage services supply and fixture charges are first adjusted for any X factor and changes in the CPI. A second adjustment is made to account for any unders and overs amounts (which includes any pass-through amounts). Icon Water proposes that this calculation follow that currently applied by the Commission when making a pass-through adjustment under the current price direction.

To minimise price increases from year to year, each of the three prices would be subject to a 3 per cent side constraint. This would limit the increase in the combined bill for any level of water user to a maximum of 5.5 per cent. The maximum impact on a 200kL per annum water user would be about 4.5 per cent. Any revenue forgone in years in which the side constraint is binding would be recovered in future years by means of the unders and overs mechanism.

Source: Icon Water (2017).

The Commission's draft decision retains the existing price reset mechanism. The Commission has not adopted Icon Water's proposal for a non-CPI adjusted Tier 2 water price path or the introduction of an annual unders and overs mechanism. The pricing path for the next regulatory period (2018–23) is set out in Chapter 9, which details methods for ascertaining the maximum prices that Icon Water can charge for regulated water and sewerage services.

2.9 Miscellaneous fees and charges

In its submission Icon Water proposed no change to the current form of control for miscellaneous fees and charges. It stated, 'The price to be charged for each

miscellaneous service should be increased in line with the change in the CPI in each year of the regulatory period including 2018–19'.²³

These costs are expected to increase broadly in line with CPI increases. The Commission's decision is to approve Icon Water's proposal to maintain the current provision of updating miscellaneous fees and charges by the CPI in each year of the regulatory period.

2.10 A Capital Contribution Code

On 30 March 2017 Icon Water submitted to the Commission an application to allow for capital contributions to water and sewerage infrastructure upgrades triggered through development projects. Icon Water seeks to recover from developers the costs that arise from augmenting the water and sewerage network to service new customers whose network augmentation costs would not be recovered through water and sewerage services bills alone. A single charge of \$1,200 applicable to all precincts or zones in the ACT was proposed, with an annual update of this charge based on updated population projections and project costs.

The Commission reviewed project cost allocations to ensure that there is no double-up of cost accounting between projects funded by the Capital Contribution Code and the water and sewerage services tariffs. On 4 October 2017 the Commission released its draft decision on Icon Water's proposed water and sewerage services Capital Contribution Code. Further description of the capital expenditure accounting is contained in Chapter 4.

2.11 Negotiated contract arrangements

In its submission Icon Water proposed provisions for negotiated contract arrangements with large users to minimise the risks of potential uneconomic bypass problems it might face during the next regulatory period. The proposal included the following:

Icon Water entering into a negotiated contract with a large consumer that is demonstrably planning to bypass Icon Water's primary water supply network.

Agreeing pricing arrangements including a prudent discount sufficient to discourage bypass plans and a more appropriate tariff structure such as high fixed charge and single volumetric price, and

The ability to recover the prudent discount amount from all Icon Water consumers to ensure full cost recovery.²⁴

²³ Icon Water, 2017(Attachment 2): 23.

²⁴ Icon Water, 2017 (Attachment 2): 20.

As acknowledged in the Commission's recently released final report on the tariff structure review, the current Tier 2 price creates a risk of uneconomic bypass where large users might have incentives to opt out of the supply of water services by Icon Water. If this risk materialised, water bills would have to increase for all Icon Water's remaining consumers.

With specific regard to Icon Water's proposal for separate pricing arrangements to prevent uneconomic bypass, the Commission notes that its price direction sets a maximum price and a revenue cap. This arrangement gives Icon Water substantial latitude to tailor prices and negotiate accordingly. Crucially, Icon Water's submission did not demonstrate an inability to set prices that would prevent both uneconomic bypass and full cost recovery. Any such demonstration would need to establish the volume at risk of uneconomic bypass, the potential impact on general prices, and how these risks differ substantially from the standard demand risk embodied within medium-term forecasting.

The Commission therefore does not propose to take any action in relation to uneconomic bypass arrangements.

2.12 Incentive schemes

The Terms of Reference require the Commission to consider whether there is potential for implementing incentive schemes for Icon Water in the next regulatory period. In the Commission's view there are merits in implementing incentive schemes and benefit-sharing mechanisms. In contrast, Icon Water's main submission did not support the introduction of any service standards, capital expenditure or operating expenditure incentive schemes. Chapter 11 provides further information on incentive mechanisms.

The Commission has a longstanding record of using deadbands as a risk-sharing mechanism, and it proposes to maintain the current form of end-of-period demand volatility adjustment mechanism during the next regulatory period.

It also proposes to further examine the potential for implementing incentive schemes for Icon Water's operating expenditure, capital expenditure and service levels during the 2018–23 regulatory period. This review will be given effect through a future reset principle specified in the proposed price direction.

2.13 Revenue calculation methodology

The Commission considers it appropriate to retain the building block approach for the forward regulatory period to determine the allowed revenue that Icon Water can recover through water and sewerage services prices. In applying the building block methodology to calculate Icon Water's revenue requirement, the Commission retains the following principles and methods.

The building block approach is the most widely used approach in Australia for determining regulated utility businesses' revenue allowed to be recovered through prices. The Commission, and subsequently the Industry Panel, used a building block methodology to determine Icon Water's revenue requirement for the 2013–18 regulatory period.²⁵ In its submission Icon Water proposed the Commission continue to use a post-tax building block revenue model to determine Icon Water's maximum allowed revenue for the 2018–23 regulatory period.

Under the building block methodology capital expenditure is recovered through the return on capital and depreciation building blocks. Consistent with the Industry Panel's approach, the Commission's draft decision allows capital expenditure to be incorporated in the RAB, where this expenditure is shown to be prudent and efficient.

The Commission's draft decision retains the Industry Panel's approach and calculates the rate of return using a WACC formulation, measured on a post-tax basis. In establishing principles for determining the rate of return for 2015 to 2018, the Industry Panel had regard to a number of factors, including the requirements of the ICRC Act, consistency with the approaches used by the majority of Australian regulators, and consistency with the competitive neutrality and allocative efficiency principles. The Industry Panel's final decision was to adopt a nominal post-tax WACC and calculate the associated net tax liabilities using a benchmark efficient entity reference point. The Commission's draft decision is to retain the Industry Panel's straight-line depreciation method.

Subsequent chapters of this draft report discuss in detail the cost components of the proposed building block approach, including the rate of return for calculating the return on capital, the return of capital, the indexation of the value of the regulated asset base and water sales forecasts, prudent and efficient costs of operating and investing over the period, the estimated cost of income tax, and the net of the value of imputation credits.

²⁵ Under the building block approach the allowed revenue of the regulated business is calculated as the sum of the underlying components (building blocks), consisting of the return on capital, the return of capital (depreciation), the prudent and efficient cost of capital and operating expenditure, and other cost components such as taxes and incentive mechanisms.

3 Operating expenditure and performance

Icon Water’s ‘operating expenditure’ refers to the costs incurred in operating and maintaining the ACT’s water and sewerage systems to produce the desired services for ACT consumers. Operating expenditure items include managing and maintaining bulk water storage, treatment and transfer, meter reading, consumer service, planning, corporate services, and ACT Government taxes and charges.

Prudent and efficient operating expenditure is recouped through water and sewerage services tariffs paid by consumers. The Commission reviewed operating expenditure in the current regulatory period (2013–18) and proposed operating expenditure in the forward regulatory period (2018–23).

The Commission’s draft decision

Icon Water proposed total water and sewerage services operating expenditure of \$922m nominal over the five year forward regulatory period beginning 1 July 2018. Its proposed operating expenditure for 2018–23 is set out in Table 3.1.

Table 3.1 Icon Water’s proposal: forecast operating expenditure, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water						
Controllable operating expenditure	61.75	62.61	63.84	66.82	68.03	323.05
Water Abstraction Charge	29.07	30.15	31.25	32.50	33.77	156.74
Utilities Network Facilities Tax	5.67	6.02	6.39	6.78	7.19	32.04
Total water operating expenditure	96.49	98.77	101.48	106.09	108.99	511.83
Sewerage						
Controllable operating expenditure	73.52	74.54	75.90	79.28	80.73	383.96
Utilities Network Facilities Tax	4.65	4.94	5.24	5.56	5.90	26.30
Total sewerage operating expenditure	78.17	79.48	81.14	84.84	86.63	410.26
Total operating expenditure	174.66	178.25	182.62	190.93	195.62	922.09

Source: Icon Water (2017).

Following independent review of Icon Water’s proposed operating expenditure for 2018–23, the Commission’s formulated its draft direction on allowable operating expenditure, as shown in Table 3.2.

Table 3.2 Draft decision: proposed prudent and efficient operating expenditure for Icon Water, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water						
Controllable operating expenditure	61.75	62.61	63.84	65.95	67.92	322.07
Utility Network Facility Tax	5.67	6.02	6.39	6.78	7.19	32.04
Water Abstraction Charge	29.07	30.15	31.25	32.50	33.77	156.74
Total water operating expenditure	96.49	98.77	101.48	105.22	108.88	510.85
Sewerage						
Controllable operating expenditure	73.52	74.54	75.90	78.30	80.61	382.86
Utility Network Facility Tax	4.65	4.94	5.24	5.56	5.90	26.30
Total sewerage operating expenditure	78.17	79.48	81.14	83.86	86.51	409.16
Total operating expenditure	174.66	178.25	182.62	189.08	195.39	920.00

Source: Commission’s calculations.

The Commission’s draft decision on prudent and efficient operating expenditure for Icon Water during the forward regulatory period is \$920m nominal, which is \$2.1m lower than that proposed by Icon Water. The difference arises from the Commission’s adoption of lower increases in the regulatory expenditure than proposed by Icon Water.

The Commission’s draft decision reflects:

- The standard of service provided by Icon Water in the current regulatory period
- The Commission’s acceptance of Icon Water’s operating expenditure calculation method
- Independent review of inclusions and components of operating expenditure
- Pass-through costs.

Drawing on Section 19L of the ICRC Act, the Commission has regard to efficient expenditure and the standard of service. Expenditure includes operating and capital expenditure, which are reviewed in this chapter and Chapter 4. Standard of service,

which includes quality, safety, reliability and security, is assessed through performance measures, as also discussed in this current chapter.

In deliberating on operating expenditure, the Commission has considered the following:

- Desired and actual standards of service in the current regulatory period
- Icon Water's operating expenditure in the current period, including the benchmark year
- Icon Water's proposed operating expenditure in the 2018–23 regulatory period, including calculation and parameters

The Commission provides for, but does not review, pass-through costs such as the Utilities Network Facilities Tax (UNFT) and Water Abstraction Charge (WAC). These costs are government taxes and charges collected from consumers and remitted to the ACT Government by Icon Water. From Icon Water's perspective, the UNFT and WAC are deemed 'non-controllable costs' and are accounted for separately from the utility's 'controllable costs' when the Commission reviews operating expenditure.

3.1 Performance in 2013–18

The Commission supports Icon Water's efforts to balance expenditure and standards of service. Higher operating expenditure can, in theory, deliver a higher standard of service. Icon Water submitted that it focused on finding a balance between network reliability and prices when undertaking 'willingness to pay' research with consumers.²⁶ Icon Water's self-identified key service targets and the Commission's review of performance consider a range of performance metrics beyond network reliability.

Icon Water's submission notes that it conducts performance monitoring for the purpose of self-identified key service targets, regulatory compliance, consumer satisfaction measurement, and external reporting (such as the National Performance Reporting, or NPR). The NPR is undertaken by the Bureau of Meteorology for all Australian water utilities, and there is now a national database from 2007 to 2016. Only three years of NPR data are available for use in comparative analysis of the current regulatory period (2013–14, 2014–15 and 2015–16).

The Commission observes, but does not monitor, Icon Water's compliance with health and environment regulations. Icon Water is monitored by the ACT's Health Directorate and the Environmental Protection Agency.

²⁶ Icon Water, 2017 (Attachment 3).

3.1.1 The water supply system

On a comparative basis, and using the best available cross-sectional data, Icon Water’s water supply system appears to have performed on par with those of other Australian water utilities during the 2013–18 regulatory period. Neither expenditure nor performance appears exceptional, as best can be inferred from NPR data from the Bureau of Meteorology (see Table 3.3).

Table 3.3 Expenditure and performance for Icon Water’s water supply system, 2013–16

	Icon Water average	Average of Australian large water utilities ^a	Indicator and rank (highest to lowest) within large water utilities ^a	
Expenditure				
Operating cost – water (\$/property)	430	554	●	9 of 13
Water supply capital expenditure (\$/property)	220	152	●	2 of 13
Performance				
Percentage of population where microbiological compliance was achieved (per cent)	100	100	●	1 of 13
Water quality complaints (per 1,000 properties)	1.1	1.6	●	7 of 13
Real losses (kL/km water main/d)	2.1	3.5	●	10 of 11
Water main breaks (no. per 100 km of water main)	13	22	●	10 of 13
Water service complaints (per 1,000 properties)	1.4	1.3	●	2 of 12

● Within the four best-performing utilities on this metric. ● Within the four worst-performing utilities. ● Within the middle three, four or five utilities using this metric.

Note: ^a Sample includes the 13 Australian large water utilities reporting data through NPR, although not all utilities have reported all data.

Source: Bureau of Meteorology (2017)

The NPR metrics for operating expenditure indicate that Icon Water provides water supply services at a lower cost per property than the Australian average (\$430 nominal as against the \$554 Australian average). Its capital expenditure on water supply per property appears higher than the Australian average (\$220 nominal as against the \$152 Australian average).

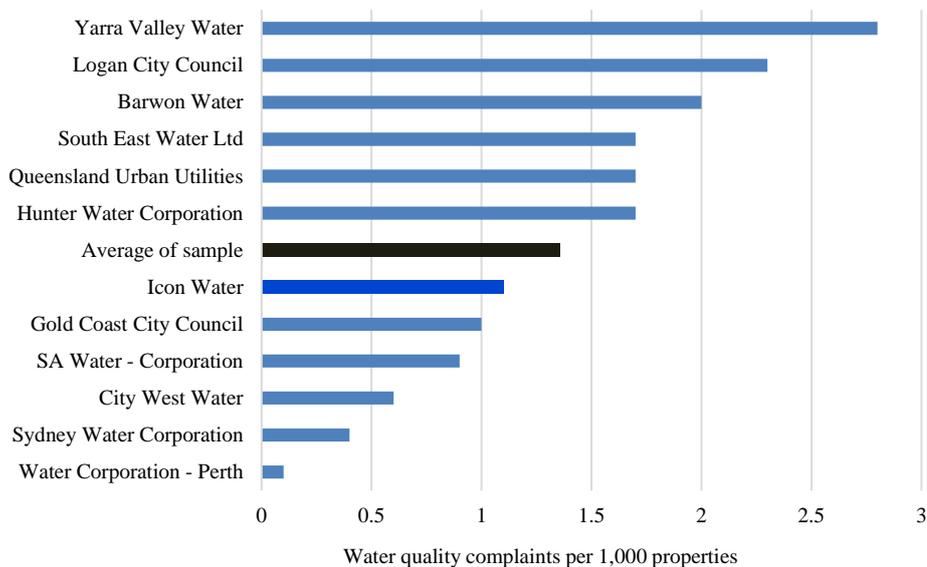
High-quality and safe drinking water

Icon Water’s performance in providing clean and healthy drinking water can be indicated by a range of metrics. Self-identified key service targets include providing 100 per cent of drinking water that achieves microbiological compliance (health regulation compliance), which is monitored by the ACT Health Department. Icon

Water’s performance in providing clean and healthy water was praised in the Chief Health Officer’s most recent report on health in the ACT.²⁷

Apart from complying with minimum health regulations, Icon Water’s performance in providing high-quality, safe drinking water can be compared with other large Australian utilities using NPR data. As measured by water quality complaints, in the most recent year (2015–16) and across the previous three years Icon Water appears to have performed as well as or better than its peer group average (see Figure 3.1). As measured by water service complaints, Icon Water appears to have performed worse than the peer group average (see Figure 3.2). No further data are available on the nature of water service complaints, but it might be inferred that water service complaints reflect ‘how’ Icon Water provides its water services rather than ‘what’ product it provides.

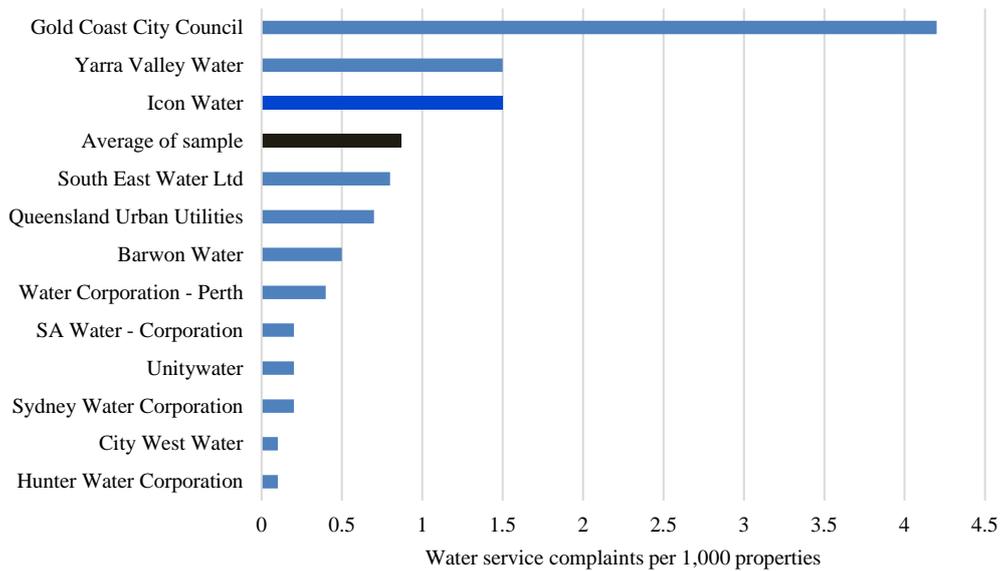
Figure 3.1 Water quality complaints for large Australian water utilities, 2015–16



Source: Bureau of Meteorology (2017).

²⁷ The report is available at www.health.act.gov.au/datapublications/reports/chief-health-officers-report-2016.

Figure 3.2 Water service complaints for large Australian water utilities, 2015–16

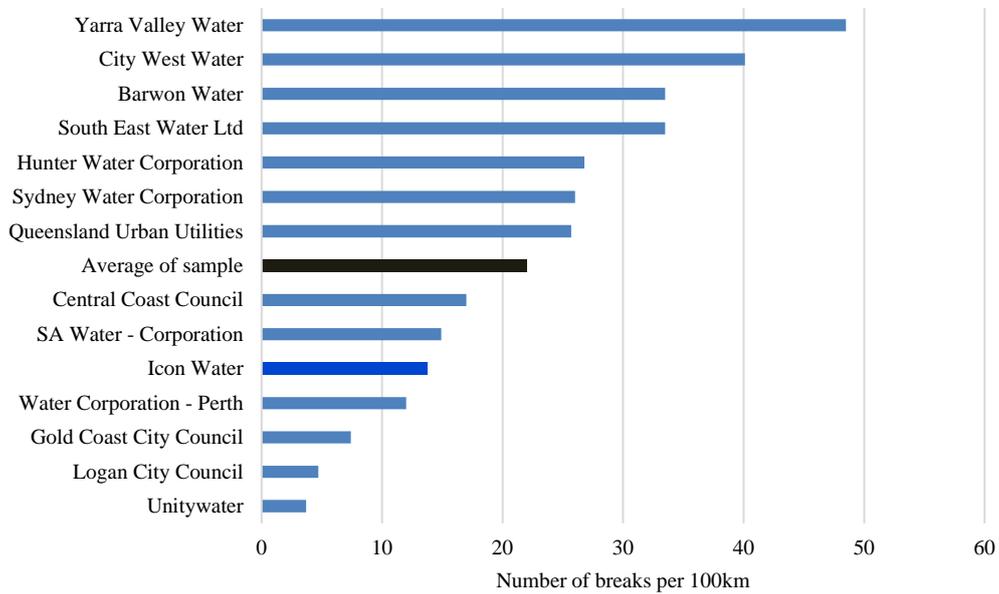


Source: Bureau of Meteorology (2017).

Reliable and secure water

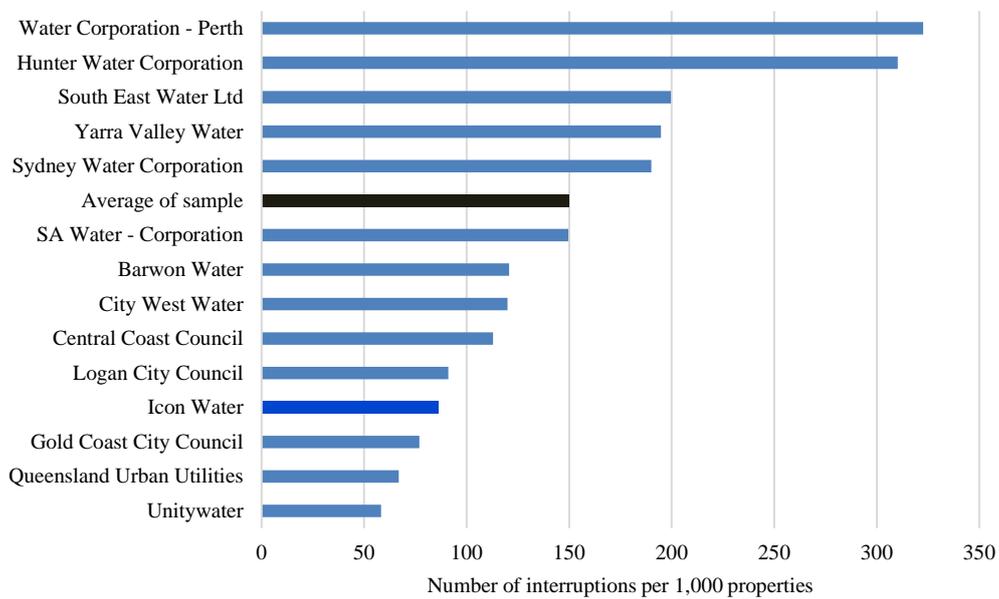
Provision of reliable, secure water is estimated within the NPR framework. Indicators for the number of mains breaks and the frequency of water supply interruptions can allow comparative evaluation of performance. Icon Water’s performance by these metrics within a peer group of large Australian water utilities is shown in Figure 3.3 and Figure 3.4.

Figure 3.3 Number of water mains breaks per 100km mains for large Australian water utilities, 2015–16



Source: Bureau of Meteorology (2017).

Figure 3.4 Frequency of water supply interruptions for large Australian water utilities, 2015–16



Source: Bureau of Meteorology (2017).

The NPR data indicate that, compared with other large Australian water utilities, Icon Water provides reasonably reliable, secure water supplies. In the most recent year for which data are available Icon Water appeared to have fewer than the peer group average for the number of breaks per 100 km of water mains and lower supply interruption frequency.

3.1.2 The sewerage system

The NPR data indicate that, compared with other major water utilities in Australia, Icon Water’s sewerage system operates at a high operating cost with lower performance levels. Table 3.4 shows the expenditure and performance of Icon Water for the 2013–16 period, as indicated by the NPR data.

Safe and high-quality sewerage services

Icon Water’s main location for sewage treatment is the Lower Molonglo Water Quality Control Centre (LMWQCC), although some treatment occurs at the Fyshwick Sewage Treatment Plant. The NPR data show that Icon Water’s high percentage of sewage treatment to tertiary level is comparable with that of the highest-performing Australian large water utilities (see Figure 3.5). This high level of treatment stands in apparent contrast to service complaints, which indicates Icon Water receives a greater than average rate of complaints about sewerage services (see Figure 3.6).

Table 3.4 Expenditure and performance indicators for Icon Water’s sewerage system, 2013–16

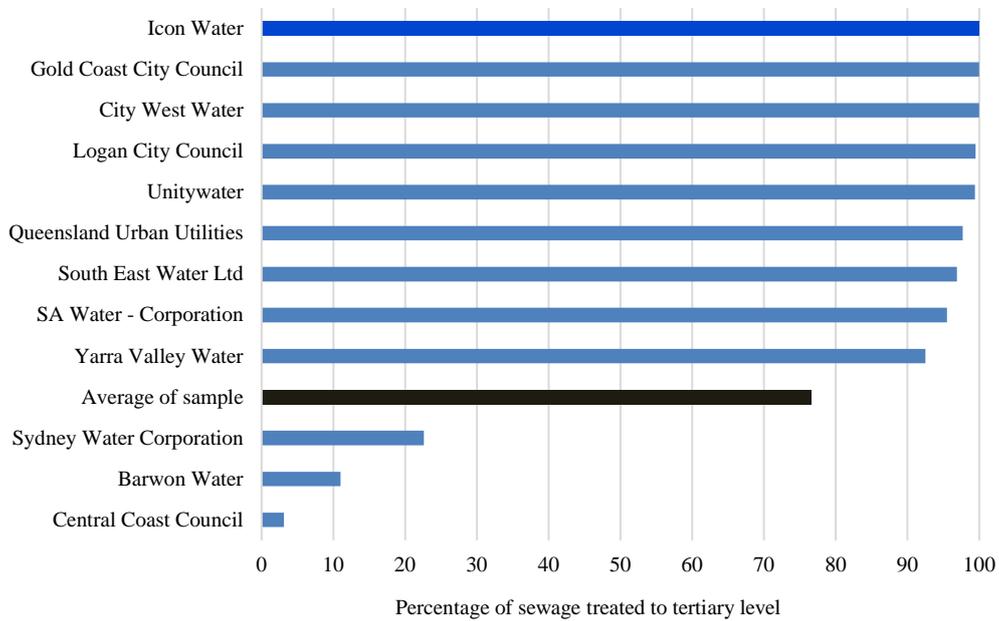
	Icon Water average	Average of Australian large water utilities ^a	Icon Water rank within large water utilities ^a	
Expenditure				
Operating cost – sewerage services (\$/property)	388	332	●	2 of 13
Sewerage capital expenditure (\$/property)	169	215	●	11 of 13
Performance				
Percentage of sewage treated to a tertiary or advanced level (per cent)	100	73	●	1 of 13
Sewer overflows reported to the environmental regulator (no. per 100 km of sewer main)	1.4	0.4	●	1 of 13
Sewerage mains breaks and chokes (no. per 100 km sewer main)	54	31	●	2 of 13
Sewerage service complaints (no. per 1,000 properties)	1.1	0.7	●	2 of 12

● Within the four best-performing utilities on this metric. ● Within the four worst-performing utilities. ● Within the middle four or five utilities using this metric.

Note: ^aSample includes the 13 Australian large water utilities reporting data through National Performance Reporting by the Bureau of Meteorology.

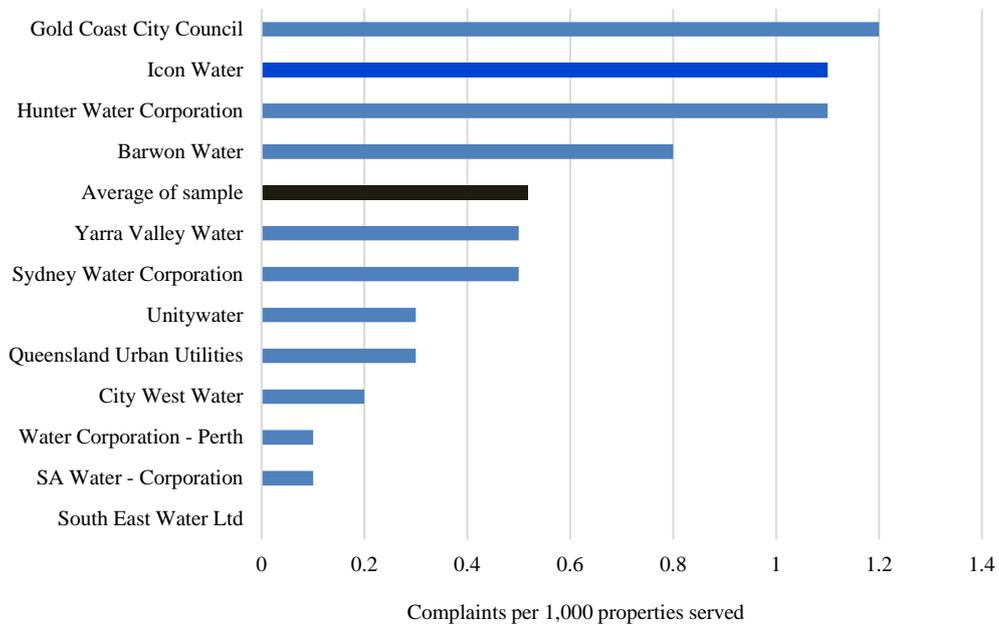
Source: Bureau of Meteorology (2017)

Figure 3.5 Percentage of sewage treated to tertiary level for large Australian water utilities, 2015–16



Source: Bureau of Meteorology (2017).

Figure 3.6 Frequency of sewerage services service complaints for large Australian water utilities, 2015–16



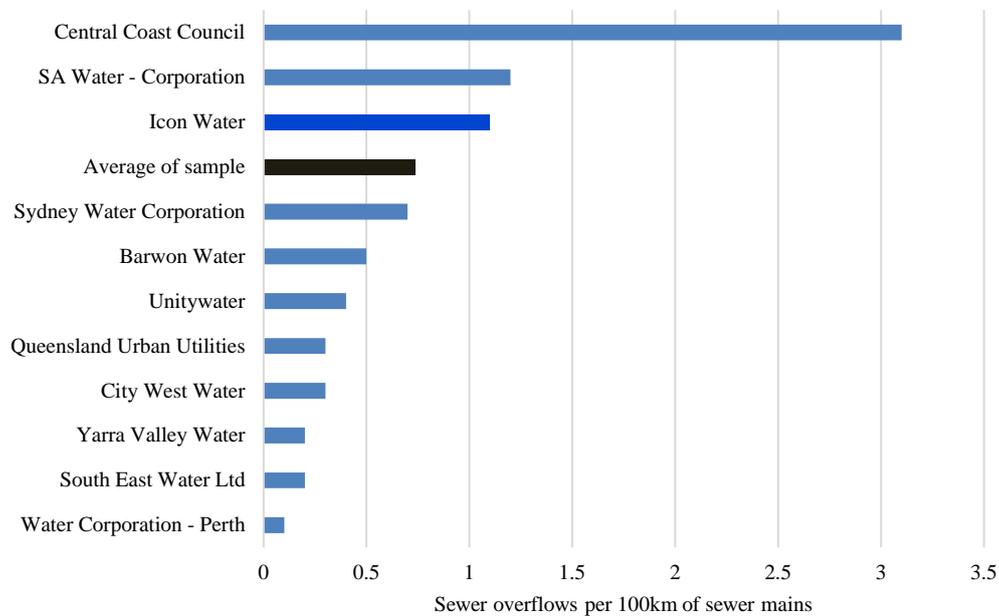
Source: Bureau of Meteorology (2017).

Reliable and secure sewerage services

The NPR data indicate that Icon Water’s sewer overflow incidents occur frequently compared with Australian peers (see Figure 3.7). From the data, the rate of sewer overflows reported in 2015–16 was 1.1 per 100km of sewer mains. Icon Water’s sewer mains extend over 3,200km, and there were over 30 reportable (critical) sewer main overflows in 2015–16.

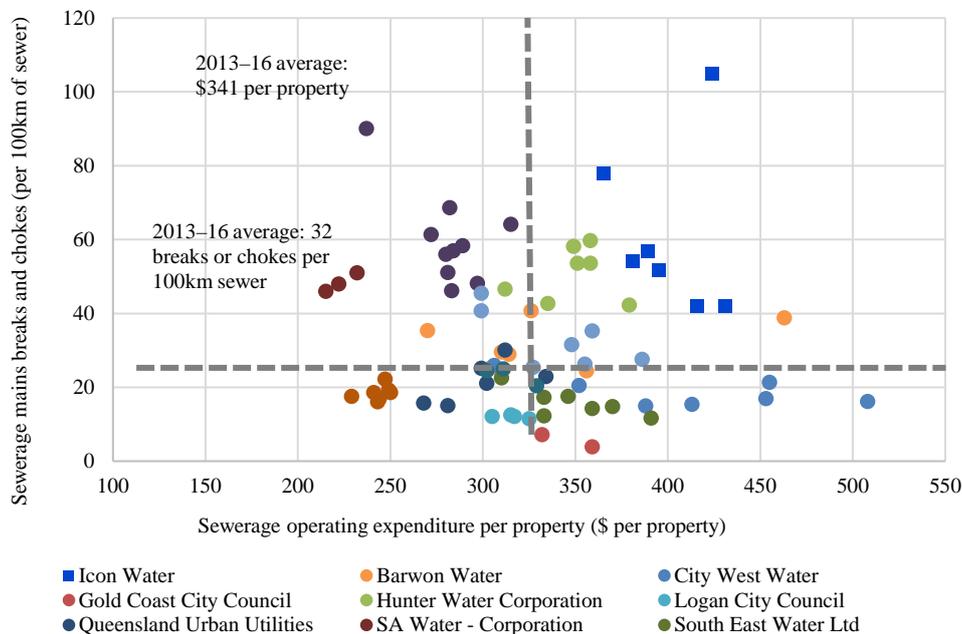
NPR data indicate that in the past six years Icon Water’s operating expenditure per property has remained high while performance, as measured by sewer mains breaks and chokes, has remained low. The data suggest that, compared with peers, Icon Water’s sewerage system operating performance runs at a higher cost while delivering lower reliability of service (see Figure 3.8).

Figure 3.7 Rate of reported sewer overflows for large Australian water utilities, 2015–16



Source: Bureau of Meteorology (2017).

Figure 3.8 Australian water utilities' sewerage system operating expenditure and performance, as measured by breaks and chokes for 2009–2016



Source: Bureau of Meteorology (2017).

3.2 Operating expenditure in 2013–18

Icon Water's proposed regulatory method is to develop a benchmark-level operating expenditure that, with reference to desired performance and service standards, is projected forward over the coming regulatory period. This approach is supported by the Commission and has been adopted in previous price investigations by the Industry Panel and the Commission.

Assessment of economically efficient operation and investment is integral to achieving the Commission's regulatory objectives. In order to assess economically efficient investment the Commission adopts tests for prudence and efficiency. As discussed in Chapter 3, for the purposes of this draft report the Commission has adopted the following definitions for tests for prudence and efficiency:

- *Prudent expenditure.* This encompasses whether the project, program or activity would reasonably be expected of a utility operating in the circumstances that apply. Evidence considered for prudence would include substantiation of the benefits of and the need for the project, program or activity.
- *Efficient expenditure.* This entails whether the project, program or activity is delivered or proposed to be delivered with the best value for money. Evidence considered for efficiency would include substantiation of alternative service

delivery options, assessment of lowest cost over the life cycle, and the ‘deliverability’ of the proposed project, program or activity.

3.2.1 The Industry Panel’s allowable expenditure

When setting Icon Water’s allowable expenditure for 2013–18, the Industry Panel considered the utility’s 2014 Statement of Facts and Contentions (SOFC) which was regarded as the best available estimate of the efficient level of costs. The Industry Panel report made an allowance of \$870.1m nominal operating expenditure, of which \$691m nominal (\$719m real) for water and sewerage services controllable costs and \$177m nominal (\$186m real) for uncontrollable costs (WAC and UNFT). The Industry Panel’s allowable operating expenditure for Icon Water is shown in Table 3.5.

3.2.2 Icon Water’s submission and actual expenditure

Icon Water’s 2017 submission states that water and sewerage services operating expenditures during the current regulatory period were lower than the level set in both the Industry Panel report’s allowable expenditure and in Icon Water’s SOFC.

Icon Water’s 2017 submission provided data on the actual controllable and uncontrollable operating expenditure across water and sewerage services for the current regulatory period of \$856.5m. The controllable expenditure was \$679m nominal (\$704m real) and the uncontrollable \$177m nominal (\$183m real), as shown in Table 3.6. These amounts are respectively 4.8 per cent and 1.5 per cent lower than the allowable expenditure levels set by the Industry Panel.

Table 3.5 Industry Panel final decision on operating expenditure for water in the current regulatory period (\$m, nominal)

	2013–14	2014–15	2015–16	2016–17	2017–18	Total
Water						
Controllable operating expenditure	62.75	66.15	66.91	67.95	70.30	334.09
Water Abstraction Charge	25.01	27.25	27.58	27.92	28.27	136.03
Utilities Network Facilities Tax	4.10	4.52	4.74	4.97	5.09	23.42
Total water operating expenditure	91.86	97.92	99.23	100.84	103.69	493.54
Sewerage						
Controllable operating expenditure	67.70	69.29	70.64	73.33	76.27	357.23
Utilities Network Facilities Tax	3.39	3.72	3.89	4.07	4.25	19.32
Total sewerage operating expenditure	71.09	73.01	74.53	77.40	80.52	376.55
Total operating expenditure	162.95	170.93	173.76	178.24	184.21	870.09

Source: Industry Panel final report (2015).

Table 3.6 Icon Water's submission on operating expenditure for water and sewerage services in the current regulatory period (\$m, nominal)

	2013–14	2014–15	2015–16	2016–17	2017–18	Total
Water						
Controllable operating expenditure	64.08	65.37	57.42	65.15	66.00	315.02
Water Abstraction Charge	24.90	25.52	27.60	27.71	28.60	134.34
Utilities Network Facilities Tax	3.73	5.31	4.62	4.68	5.30	23.64
Total water operating expenditure	92.72	96.20	89.64	94.54	99.90	473.00
Sewerage						
Controllable operating expenditure	74.53	72.10	68.68	73.56	75.20	364.07
Utilities Network Facilities Tax	3.64	3.70	3.75	3.90	4.40	19.39
Total sewerage operating expenditure	78.17	75.80	72.43	77.47	79.60	383.46
Total operating expenditure	170.88	172.01	162.07	172.00	179.50	856.46

Source: Icon Water (2017).

In its submission Icon Water stated that its operating expenditure was lower overall than the Industry Panel allowed due to two factors:

- Adjustments to provisions for Comcare exit costs because provisioned claims were not realised
- Adjustments to provisions for claims for the Commonwealth Superannuation Scheme.

Icon Water's overall controllable operating expenditure was \$12m nominal (\$14m real) lower than the Industry Panel allowed. Controllable operating expenditure on the water supply system was \$19m nominal (\$20m real) lower than allowable over the five-year period, whereas sewerage operating expenditure was higher by \$7m nominal (\$6m real). The higher than expected operating costs for sewerage was not explained by Icon Water.

3.3 Operating expenditure in 2018–23

3.3.1 Icon Water's submission

Icon Water proposed to reduce controllable operating costs between the current (2013–18) and forward (2018–2023) regulatory period. In real terms, controllable

operating will decrease from \$148m in 2013–14 to \$132m in 2022–23. The reduction is equally shared between water and sewerage operating expenditure.

The uncontrollable operating costs of the Water Abstraction Charge (WAC) and Utilities Network Facilities Tax (UNFT) are expected to increase in the forward regulatory period. In real terms, Icon Water’s uncontrollable costs are forecast to increase from \$34.6m in 2013–14 to \$41.1m in 2022–23.

The net effect of Icon Water’s proposed changes in controllable and uncontrollable operating expenditure is a reduction in total annual operating expenditure in the forward regulatory period. Total operating expenditure in the current regulatory period (2013–18) was \$856m nominal (\$889m real). Icon Water has proposed a total operating expenditure of \$922m (\$855m real) in 2018–23. Using real values (inflation adjusted) to compare across periods, the reduction in total operating expenditure is \$34m over five years.

Icon Water’s proposal for operating expenditure during the forward period has been shaped by several factors:

- Meeting operating licence conditions and minimum standards imposed by regulations
- Ongoing implementation of the Business Transformation Program (BTP) and other human resource efficiency efforts
- Renewable energy and energy efficiency programs
- Increased maintenance costs resulting from asset base increases

Methodology

The base-step-trend method is proposed by Icon Water to forecast operating expenditure. The method starts with a base year of operating expenditure, which is adjusted and used to forecast operating expenditure for the forward period. Abnormal items are removed or added in estimating a base year figure. The base year is projected forward, taking account of step changes and adjustments for each of the forecast years.

The base-step-trend method of forecasting operational expenditure has been adopted in previous price investigations by both the Commission and the Industry Panel, as well as by Icon Water in its submission to the investigation. The overall method is supported by the Commission. The analysis that follows focuses on selection of the base year and adjustments.

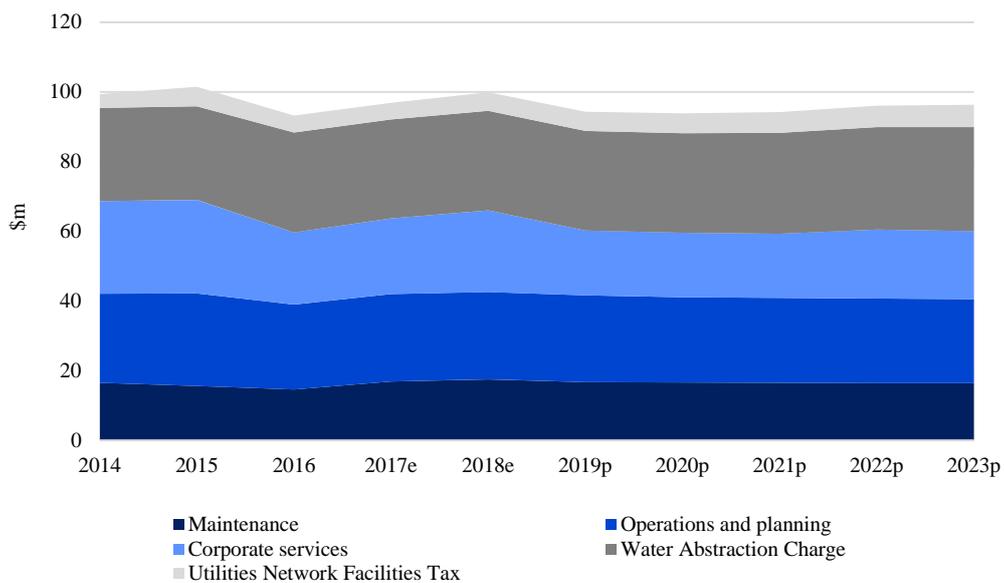
The following adjustments and step changes are of particular note in the Icon Water submission:

- The selection of 2016–17 as the base year, being the most recent year for which full annual costs are available and most representative of the current regulatory and operating environment

- Adjustments for abnormal items, where regulatory costs are removed from the base year, such as a subset of Corporate Services Agreement costs with ActewAGL and historical provisions for workers compensation
- Step changes during the regulatory period, in which Icon water added regulatory costs and removed the value of energy produced from its renewable energy program
- Price growth forecasts, where the input price changes to labour, chemicals, electricity and operational costs are escalated over the forward period at different rates. The escalation factors are described in Attachment 7 to Icon Water’s submission to the Commission.

One consequence of this forecasting method is smoothed values for operational expenditure over the forward period. Operational expenditure in water and sewerage services activities for Icon Water is shown in Figures 3.9 and 3.10, while the values for the forward period are shown in Table 3.7.

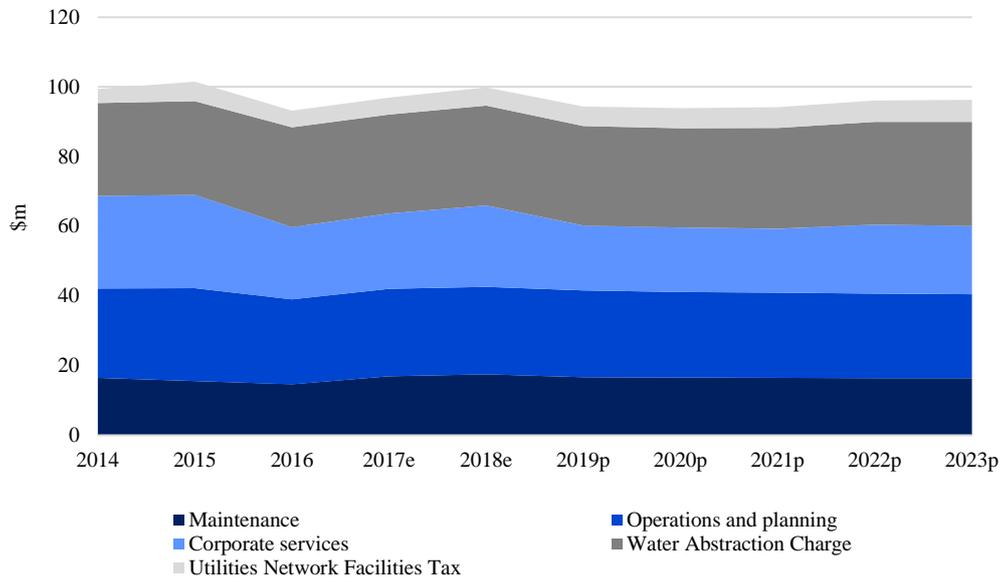
Figure 3.9 Icon Water’s operating expenditure water, 2013–23 (\$m, 2017–18)



Notes: e: Icon Water estimated, p: Icon Water proposed

Source: Icon Water (2017).

Figure 3.10 Icon Water's operating expenditure for sewerage services, 2013–23 (\$m, 2017–18)



Notes: e: Icon Water estimated, p: Icon Water proposed
 Source: Icon Water (2017).

Table 3.7 Icon Water's submission on water and sewerage services operating expenditure for 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water						
Controllable operating expenditure	61.75	62.61	63.84	66.82	68.03	323.05
Water Abstraction Charge	29.07	30.15	31.25	32.50	33.77	156.74
Utilities Network Facilities Tax	5.67	6.02	6.39	6.78	7.19	32.04
Total water operating expenditure	96.49	98.77	101.48	106.09	108.99	511.83
Sewerage						
Controllable operating expenditure	73.52	74.54	75.90	79.28	80.73	383.96
Utilities Network Facilities Tax	4.65	4.94	5.24	5.56	5.90	26.30
Total sewerage operating expenditure	78.17	79.48	81.14	84.84	86.63	410.26
Total operating expenditure	174.66	178.25	182.62	190.93	195.62	922.09

Source: Icon Water (2017).

Consumer engagement

Icon Water's submission to the Commission stated that, when developing its plans for the 2018–23 regulatory period, Icon Water sought to strike a balance between network reliability and price that reflects what its consumers want. The submission further stated that Icon Water conducted several pieces of targeted consumer research into preferences and priorities of consumers.²⁸

Icon Water indicates that its research found evidence of a consumer preference for reductions in prices and service reliability levels for water supply, although reductions in expenditure on water mains maintenance and renewal programs were not evident in the plans submitted to the Commission.

The Commission notes Icon Water's efforts at consumer engagement to improve service delivery. The Commission has identified several challenges in Icon Water's approach and focal areas of consumer research, the conclusions drawn, and the impact of consumer engagement on the plans for the forward regulatory period. The Commission remains willing to engage with Icon Water in advance of future consumer engagement programs.

3.3.2 Independent review

The Commission engaged Calibre to provide an independent review of Icon Water's proposed operating expenditure for the forward period for prudence and efficiency.

Calibre have assessed Icon Water's submission, activities and operating expenditure forecasting methodology. It recommended adjustment to Icon Water's proposed regulatory costs over the forward regulatory period. Icon Water proposed an increase in regulatory costs over the five-year period, but the Calibre analysis found that, given a stable regulatory environment, regulatory costs should remain stable or decrease as efficiencies are achieved. Furthermore, regulatory services are provided through the CSA with ActewAGL, whose costs are already included. The CSA with ActewAGL is explained further in Box 2. Calibre has recommended an adjustment of \$2.1m in nominal value to bring this expenditure towards a prudent and efficient value.

²⁸ Icon Water, 2017 (Attachment 3): 8.

Box 2 **Independent review of the CSA between Icon Water and ActewAGL Distribution**

Icon Water outsources a number of functions to ActewAGL Distribution under the Corporate Services Agreement (CSA).

The CSA is a contract between Icon Distribution Investments Limited and ActewAGL Distribution. ActewAGL Distribution is a partnership between Jemena Networks (ACT) Pty Ltd and ACTEW Corporation. The CSA was formed in 2012 and, in the absence of negotiated renewal, the contract is to expire in 2023.

The CSA follows the Utilities Management Agreement (2005) and the earlier Actew/AGL Umbrella Agreement (2000), which provided the contractual basis for the utilities partnership between ACTEW, Jemena and AGL. The utilities partnership shared functions such as customer billing, security, information and communications technology. The 2012 CSA transferred the water division's operations and maintenance activities back to ACTEW Corporation and retained some outsourced services from ActewAGL Distribution. ACTEW Corporation was renamed Icon Water in 2015.

The CSA defines 'business as usual' services to be provided by ActewAGL Distribution to Icon Water for an annual fee and for any additional requested services at additional fees. The business as usual services include accounts payable, business systems, Oracle support, property and security, human resources, networks, regulatory affairs and pricing, treasury, tax, accounting, procurement, internal audit, legal services, records management, publications, risk management, environment, health, safety and quality.

Calibre identified corporate knowledge retention and long term system ownership as potential issues arising as a consequence of the outsourcing arrangement under the CSA. Some of the outsourced functions could be regarded as essential functions for independent corporate management. Icon Water's Business Transformation Plan addresses some of these matters. Icon Water have advised that its submission to the Commission's 2023 price investigation will detail its review of the CSA. The Commission notes that, in terms of timing, the CSA renewal negotiation precedes the 2023 price investigation. The Commission anticipates Icon Water will address these issues over the forward regulatory period and make a clear case for any continued arrangement, which may include market testing of contract elements.

Calibre has not recommended any adjustments to the CSA costs included in Icon Water's proposed operating expenditure for the forward regulatory period.

Source: Information provided by Icon Water (2017) and Calibre (2017).

Calibre's recommended prudent and efficient operating expenditure are shown in Table 3.8. The table includes the \$2.1m adjustment to Icon Water's proposed operating expenditure.

Table 3.8 Independent review of proposed water and sewerage services operating expenditure, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water						
Controllable operating expenditure	61.75	62.61	63.84	65.95	67.92	322.07
Water Abstraction Charge	29.07	30.15	31.25	32.50	33.77	156.74
Utilities Network Facilities Tax	5.67	6.02	6.39	6.78	7.19	32.04
Total water operating expenditure	96.49	98.77	101.48	105.22	108.88	510.85
Sewerage						
Controllable operating expenditure	73.52	74.54	75.90	78.30	80.61	382.86
Utilities Network Facilities Tax	4.65	4.94	5.24	5.56	5.90	26.30
Total sewerage operating expenditure	78.17	79.48	81.14	83.86	86.51	409.16
Total operating expenditure	174.66	178.25	182.62	189.08	195.39	920.00
Difference from Icon Water proposal	0.00	0.00	0.00	1.85	0.23	2.09

Sources: Calibre (2017) and Icon Water (2017).

3.3.3 The draft decision on operating expenditure for 2018–2023

The Commission reviewed Icon Water’s submission and the independent work done by Calibre in order to develop a draft decision on operating expenditure for the forward period. In developing its draft decision, the Commission has accepted the majority of expenditure proposed by Icon Water as prudent and efficient. It has also adopted the recommendations of Calibre, which result in slight reductions in the allowed controllable operating expenditure. Table 3.9 shows the Commission’s draft decision.

Table 3.9 The Commission's draft decision on operating expenditure for water and sewerage services, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water						
Controllable operating expenditure	61.75	62.61	63.84	65.95	67.92	322.07
Water Abstraction Charge	29.07	30.15	31.25	32.50	33.77	156.74
Utilities Network Facilities Tax	5.67	6.02	6.39	6.78	7.19	32.04
Total water operating expenditure	96.49	98.77	101.48	105.22	108.88	510.85
Sewerage						
Controllable operating expenditure	73.52	74.54	75.90	78.30	80.61	382.86
Utilities Network Facilities Tax	4.65	4.94	5.24	5.56	5.90	26.30
Total sewerage services operating expenditure	78.17	79.48	81.14	83.86	86.51	409.16
Total operating expenditure	174.66	178.25	182.62	189.08	195.39	920.00

Source: Commission's calculations.

4 Capital expenditure

The capital expenditure review is an essential component of the Commission's water and sewerage services price direction. Capital expenditure deemed prudent and efficient receives a return on capital through inclusion in the regulatory base and a return of capital through depreciation. This chapter summarises the assessment of prudent and efficient capital expenditure in the current and forward regulatory periods, 2013–18 and 2018–23.

The Commission's draft decision

Following an independent review, the Commission has accepted Icon Water's capital expenditure of \$404m (\$416m real) in the current regulatory period (2013–18) as prudent and efficient. For 2018–23, Icon Water proposed a total water and sewerage capital expenditure program of \$469m nominal (\$437.6m real), which includes capital expenditure to be financed by the Capital Contribution Code. Excluding capital expenditure financed by the Capital Contribution Code, Icon Water's proposal is for \$435m nominal in total capital expenditure. Its proposed capital expenditure for 2018–23 is shown in Table 4.1.

Table 4.1 Icon Water's proposal: forecast capital expenditure, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water	38.38	43.76	42.48	36.82	28.28	189.72
Sewerage	67.73	47.17	46.91	44.89	38.28	244.99
Total capital expenditure	106.11	90.93	89.40	81.71	66.56	434.70

Source: Icon Water (2017).

Following an independent review, the Commission reached its draft decision on allowable capital expenditure (excluding Capital Contribution Code expenditure) – see Table 4.2. The Commission's draft decision allows \$383m capital expenditure (\$358m real) to be financed by water and sewerage services tariffs.

Table 4.2 Draft decision: allowable capital expenditure for Icon Water, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water	37.99	43.23	41.77	35.84	27.06	185.90
Sewerage	64.13	35.95	35.76	29.17	31.69	196.70
Total capital expenditure	102.12	79.18	77.53	65.01	58.75	382.60

Source: Commission's calculations.

The draft decision reflects the following:

- Icon Water’s pricing review submission including capital expenditure addenda.
- Review of capital expenditure for prudence and efficiency by independent consultants Calibre.
- The Commission’s review of information provided by Icon Water, Calibre and previous price investigations.

The Commission sought independent review by Calibre of Icon Water’s capital investment in the current regulatory period and the proposed expenditure for 2018–23. It conducted the review to ensure that the capital expenditure of the current regulatory period and that proposed for the forward period were suitable for recovery in the water and sewerage services bills of ACT consumers. In forming a draft decision on allowable capital investment, the Commission evaluated information from a variety of sources, including from Icon Water’s submission, the independent review of the Icon Water submission, the draft decision on the Capital Contribution Code²⁹, previous price investigations by the Commission and the Industry Panel, and the information these price investigations used.

Assessment of economically efficient investment is essential to achieving the Commission’s regulatory objectives. In order to assess such investment the Commission adopted tests for prudence and efficiency, as described in Chapter 3 and shown here:

- *Prudent expenditure.* This encompasses whether the project, program or activity would reasonably be expected of a utility operating in the circumstances that apply. Evidence considered for prudence would include substantiation of the benefits of and the need for the project, program or activity.
- *Efficient expenditure.* This entails whether the project, program or activity is being delivered or proposed to be delivered with the best value for money. Evidence considered for efficiency would include substantiation of alternative service delivery options, assessment of lowest cost over the life cycle, and the ‘deliverability’ of the proposed project, program or activity.

Capital expenditure in the current regulatory period that is deemed prudent and efficient is to be added to the RAB for future regulatory periods. Capital expenditure in the forward regulatory period that is deemed prudent and efficient is to be included in the forecast RAB for that period. The addition of assets to the RAB is described in Chapter 5.

²⁹ ICRC, 2017: full report.

4.1 Capital expenditure, 2013–18

The Industry Panel’s decision on Icon Water’s allowable capital expenditure was \$474m (\$ 2017–18) over the five-year period 2013–18. The Industry Panel referred to information contained in the Commission’s 2013 price investigation and Icon Water’s 2014 SOFC. It removed \$20m nominal from Icon Water’s proposed capital expenditure for 2016–17 and 2017–18, citing challenges to successful delivery within the timeframe.

4.1.1 Icon Water’s actual capital expenditure

Icon Water’s submission estimated total actual capital expenditure of \$404m (\$416m real) for the current regulatory period (see Table 4.3). The capital expenditure is weighted towards sewerage system investment in the latter half of the regulatory period.

Table 4.3 Icon Water’s submission on capital expenditure, 2013–18 (\$m, nominal)

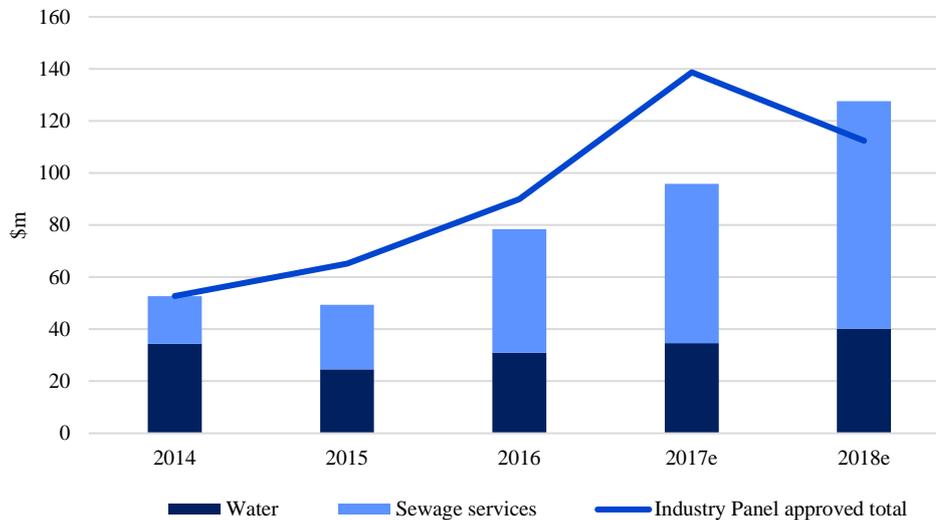
	2013–14	2014–15	2015–16	2016–17 ^a	2017–18 ^a	Total
Water	34.37	24.57	31.02	34.65	40.15	164.76
Sewerage	18.32	24.76	47.48	61.23	87.50	239.29
Total capital expenditure	52.69	49.33	78.50	95.89	127.66	404.05

Note: ^a Estimate.

Source: Icon Water (2017).

The Industry Panel set allowable capital expenditure of \$459m (\$474m real) for the current regulatory period. Icon Water’s estimated actual expenditure is \$57m lower than the allowable capital expenditure. Its estimated actual expenditure and the Industry Panel’s allowable expenditure are shown in Figure 4.1.

Figure 4.1 Icon Water's capital expenditure and the Industry Panel allowance for water and sewerage, 2013–18 (\$m, nominal)



Notes: e: Icon Water estimated

Source: Icon Water (2017).

Water supply system capital expenditure

Icon Water's estimated capital expenditure on water totalled \$171m (real) for the current regulatory period, attributed as follows:

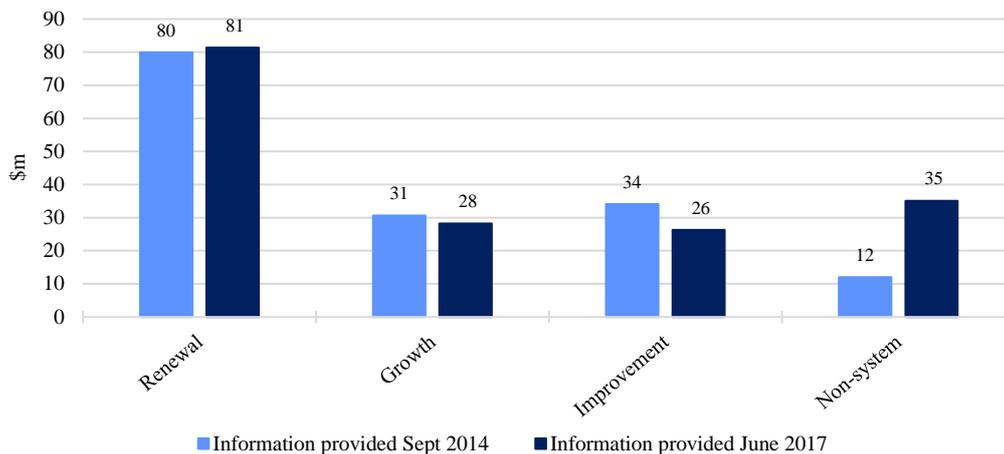
- Icon Water's investment of \$35m (real) in water-related non-system assets such as ICT, buildings, vehicles, programs for working at heights and critical infrastructure³⁰
- Renewals project expenditure of \$81m (real) and deferral of some planned renewals projects, including reservoir roof repairs and Googong water treatment plant upgrades to later regulatory periods
- Growth project expenditure of \$28m (real) and deferral of some planned growth projects in Belconnen, the Molonglo Valley and Gungahlin
- Regulatory and efficiency-driven project expenditure of \$26m (real) and deferral of some planned projects, including asset relocation works at Corin Dam

In its submission to the current price investigation Icon Water provided an allocation of estimated expenditure against renewal, growth, improvement and non-system expenditure. The allocations from the submission to the current price investigation can

³⁰ In the current regulatory period Icon Water invested \$78m in non-system assets such as ICT, buildings, vehicles, programs for working at heights and critical infrastructure. The water system's share of non-system capital expenditure was \$35m. The expenditure on non-system assets was substantially larger than expected.

be compared with those from previous submissions to previous price investigations, as shown in Figure 4.2.

Figure 4.2 Comparison of Icon Water’s proposed and actual water capital expenditure for the current regulatory period (\$m, 2017–18)



Sources: Commission’s calculations based on information received from Icon Water (2014 and 2017).

The Commission considered the evolving capital expenditure plans submitted by Icon Water in 2014 and 2017. It notes the consistency of 2014 and 2017 estimates for renewal, growth and improvement expenditure. The large variation in non-system asset expenditure for the three-year period is discussed further below.

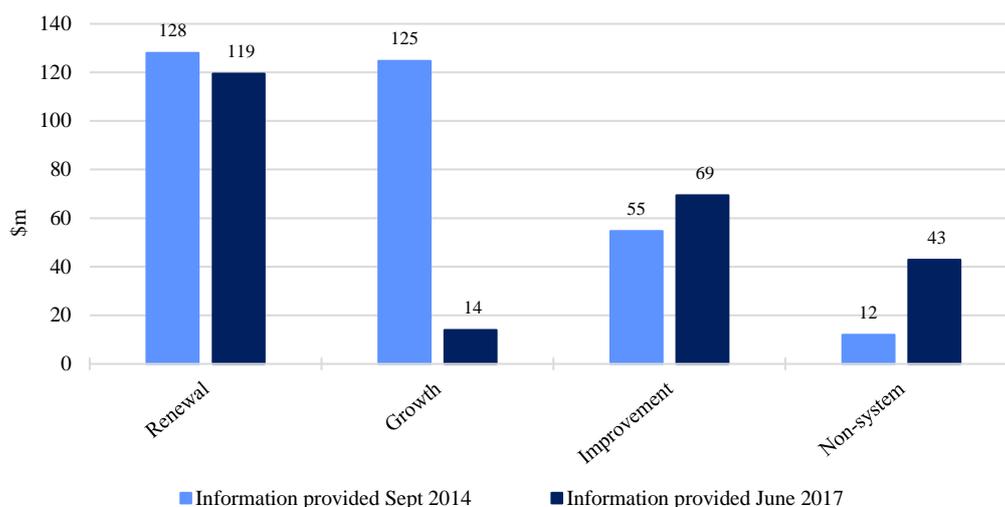
Sewerage system capital expenditure

Icon Water’s submission estimated that capital expenditure on sewerage will total \$246m (real) in the current regulatory period. It attributed this capital expenditure as follows:

- The sewerage system’s share of non-system assets, such as ICT, buildings and vehicles, of \$43m (real)
- Expenditure on renewals projects of \$119m (real) and some deferral of planned projects such as the Fyshwick sewage treatment upgrade
- Expenditure on growth projects of \$14m (real) and deferral of some growth projects to later periods, including Belconnen trunk sewer augmentation and the Molonglo Valley interceptor sewer odour control
- Expenditure on regulatory and efficiency improvement projects of \$69m (real), which includes upgrades to Lower Molonglo Water Quality Control Centre (LMWQCC)

As with capital expenditure on water, the Industry Panel’s decision did not make an allowance for sewerage expenditure across each of the drivers of renewal, growth, improvement and non-system expenditure. The Commission has compared the Icon Water 2014 and 2017 submissions, which both show Icon Water’s expenditure against the relevant driver, as compared in Figure 4.3.

Figure 4.3 Comparison of Icon Water’s proposed and actual sewerage capital expenditure for the current regulatory period (\$, 2017–18)



Sources: Commission’s calculations based on Icon Water (2017) and Cardno (2014).

The Commission notes the broad consistency of estimates for renewal and improvement program expenditure in 2013–18 between the 2014 estimate and the 2017 estimate. The inconsistency in estimates for growth and non-system capital expenditure is discussed below.

Capital expenditure on growth-driven projects for sewerage

For expenditure in the current (2013–18) regulatory period, Icon Water’s 2014 submission to the Industry Panel estimated capital expenditure of \$125m real on growth-driven projects for the sewerage system. Three years later, Icon Water’s 2017 submission to the Commission estimated expenditure to be \$14m (real) over the five year period.

When explaining the reduced expenditure on growth projects, Icon Water noted the deferral of the Belconnen trunk sewer augmentation and the Molonglo Valley interceptor sewer augmentation, as well as arranging for the Constitution Avenue stage 1 trunk sewer to be delivered by the developer. The Commission notes that these projects were estimated to cost \$54.8m (real) by Icon Water in its 2014 submission for delivery before 2018. There is insufficient information to identify the further \$55m of growth projects proposed in 2014 but not delivered during the 2013–18 regulatory period.

Non-system assets

Icon Water's investments in non-system assets during the current regulatory period were much greater than proposed in its earlier submissions to the Commission and the Industry Panel, as shown in Table 4.4.

Table 4.4 Icon Water's estimated expenditure on non-system assets, 2013–18 (\$m, 2017–18)

Submission	Estimated total non-system capital expenditure
Statement of Facts and Contentions, September 2014	21.9
Price proposal, June 2017	77.9
Difference	56.0

Sources: Commission's calculations based on information received from Icon Water (2014 and 2017).

In its 2017 submission to the Commission Icon Water attributed the additional \$56m (real) expenditure to the Business Transformation Program (BTP), the Mitchell building extension and refurbishment, the working at heights program and the critical infrastructure stage 2 program. The BTP includes implementing the outcomes of the Enterprise Asset Management Strategy and the Information and Communications Technology Strategy.

Icon Water noted that the prompt for the BTP was a realisation that it could not use ActewAGL's operational systems. Icon Water has indicated that it has procured an Oracle asset management system.

4.1.2 Independent review

Calibre conducted an independent review of capital expenditure by Icon Water in the current regulatory period. The review assessed the prudence and efficiency of investment. Calibre recommended no adjustments to Icon Water's expenditure before adding to the asset base. The results of the independent review are shown in Table 4.5 and Table 4.6.

Calibre's independent review of Icon Water's capital expenditure over the current regulatory period observed variation between expected and actual expenditure across projects and programs. It found the additional expenditure on non-system assets, the largest unexpected variation, to be prudent and efficient.

Table 4.5 Allowable, actual and independently reviewed prudent and efficient capital expenditure on water, 2013–14 to 2017–18 (\$m, nominal)

	2013–14	2014–15	2015–16	2016–17	2017–18	Total
Industry Panel allowed	34.61	27.04	24.43	28.87	42.20	157.15
Icon Water actual	34.33	24.57	30.97	34.63 ^a	40.20 ^a	164.75
Independent review	34.33	24.57	30.97	34.63 ^a	40.20 ^a	164.75

Note: ^a Estimate.

Sources: Icon Water (2017) and Industry Panel (2015).

Table 4.6 Allowable, actual and independently reviewed prudent and efficient capital expenditure in sewerage (\$m, nominal)

	2013–14	2014–15	2015–16	2016–17	2017–18	Total
Industry Panel allowed	18.10	38.23	65.60	109.85	70.20	301.98
Icon Water actual	18.28	24.76	47.52	61.27 ^a	87.50 ^a	239.29
Independent review	18.28	24.76	47.52	61.27 ^a	87.50 ^a	239.29

Note: ^a Estimate.

Sources: Icon Water (2017) and Industry Panel (2015).

4.1.3 Draft decision on capital expenditure for 2013–18

The Commission has considered Icon Water’s 2017 submission, Calibre’s independent review and the information contained in previous price investigations. It accepts Calibre’s recommendation to recognise Icon Water’s capital expenditure in the current period as prudent and efficient. The draft decision on capital expenditure is to recognise Icon Water’s proposed water and sewerage capital expenditure in the current regulatory period of \$404m (\$416m real) – see Table 4.7.

Table 4.7 Commission’s draft decision on prudent and efficient capital expenditure for Icon Water, 2013–18 (\$m, nominal)

	2013–14	2014–15	2015–16	2016–17	2017–18	Total
Water	34.33	24.57	30.97	34.63	40.20	164.75
Sewerage	18.28	24.76	47.52	61.27	87.50	239.29
Total capital expenditure	52.61	49.33	78.49	95.90	127.70	404.04

Source: Commission’s calculations.

4.2 Capital expenditure in 2018–23

To review capital expenditure in the forward regulatory period, the Commission adopted the same criteria of prudence and efficiency it used for the current regulatory period and for operating expenditure. It sought the assistance of Calibre to conduct a detailed review of Icon Water's proposed capital expenditure over the forward period.

4.2.1 Icon Water's submission

Icon Water's submission for the forward regulatory period proposes total capital expenditure of \$469m nominal to be financed by water and sewerage services tariffs and the Capital Contribution Code.

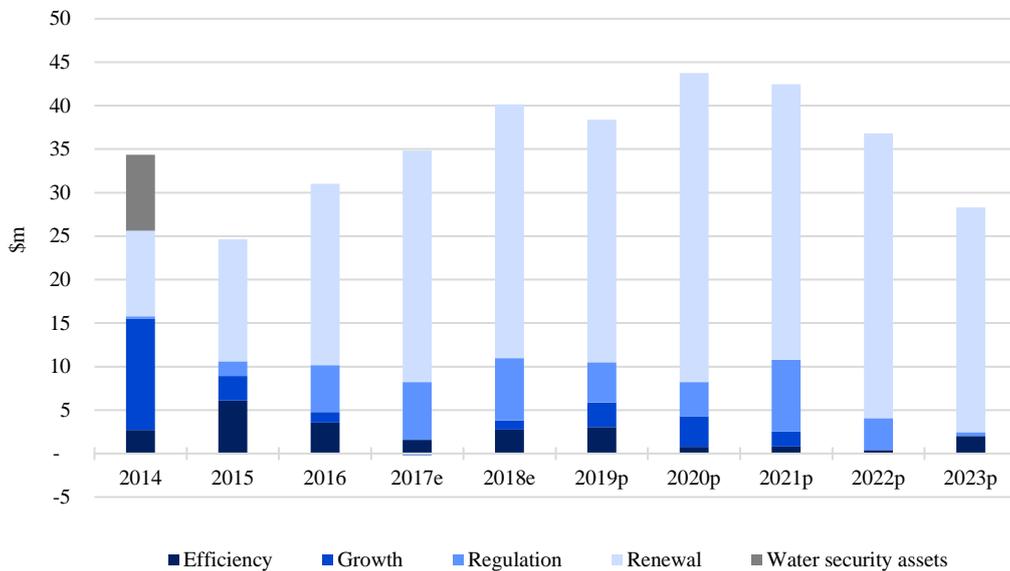
In real terms, this is \$21m greater (5.1 per cent higher) than for the 2013–18 regulatory period (an increase from \$416m to \$437m). Real expenditure on water increases from \$170.6m to \$176.8m (a 3.6 per cent increase) and sewerage expenditure increases from \$245.4m to \$260.6m (a 6.2 per cent increase) between the 2013–18 and 2018–23 regulatory periods.

The proposed capital expenditure for water and sewerage by major cost drivers is shown in Figure 4.4 and Figure 4.5. The major cost categories include renewals, growth, efficiency and regulation. The renewal category captures Icon Water's investments in maintaining, upgrading, renewing and replacing water and sewerage assets. Growth capital expenditure includes investments in new water and sewerage infrastructure, as well as expenditure on completion of remaining works required on the main water security projects undertaken in the previous regulatory period.³¹ Projects designed to deliver cost savings are included in the efficiency category. Regulation includes project costs aimed at ensuring Icon Water's compliance with regulatory obligations.

Section 4.2.3 discusses the treatment of capital expenditure financed by the Capital Contribution Code.

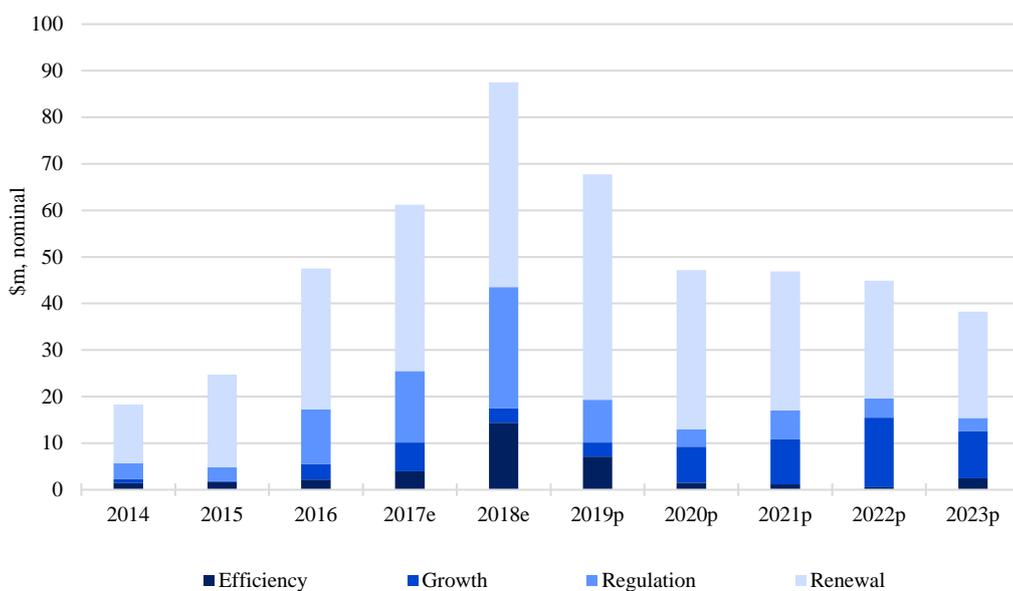
³¹ Icon Water, 2017 (attachment 6):20.

Figure 4.4 Icon Water's capital expenditure on water assets, 2013-14 to 2022-23, by major cost drivers (\$m, nominal)



Notes: e: Icon Water estimated, p: Icon Water proposed
 Source: Icon Water (2017).

Figure 4.5 Icon Water's capital expenditure on sewerage assets, 2013-14 to 2022-23, by major cost drivers (\$m, nominal)



Notes: e: Icon Water estimated, p: Icon Water proposed
 Source: Icon Water (2017).

The Icon Water submission proposed capital expenditure across water and sewerage systems, including the following:

- The majority of water and sewerage capital expenditure to be spent on asset renewals (56 per cent, or \$245m real), which includes roof renewals for Mugga and O'Connor reservoirs, water and sewer mains renewals (renewal targets of 27.5km and 80km respectively) and Lower Molonglo Water Quality Control Centre renewals and upgrades
- Water and sewerage capital expenditure to meet growth demands (18 per cent, or \$79m real), with some expenditure shared on Capital Contribution Code projects such as the Belconnen trunk sewer augmentation and the Fyshwick sewage pump station augmentation.
- Water and sewerage expenditure to meet regulatory requirements and efficiency goals (11 per cent, or \$46m real).
- Non-system asset expenditure of 15 per cent (\$68m real), which is allocated between water and sewerage systems.

4.2.2 Independent review

The Commission engaged Calibre to review Icon Water's proposed capital expenditure over the current and forward regulatory periods. The same criteria of prudence and efficiency were used to assess Icon Water's proposed capital expenditure for the forward period as were used for assessment of expenditure in the current period.

Calibre's review selected a number of planned projects for detailed investigation. The projects comprised over half the total forward capital expenditure program. Calibre sought to identify any systematic issues in the capital expenditure portfolio through investigating this group of major projects.

Calibre's review identified several projects for which prudence or efficiency for all expenditure could not be established as a result of incomplete documentation, uncertain delivery and likely deferral, or uncertain asset ownership, as shown in Table 4.8.

Table 4.8 Project information queries raised through Calibre’s independent review

Project or program (driver)	Calibre assessment
CX11060 Sewer mains renewal program (renewals)	‘The proposed budget for the next regulatory period ... is well above what was actually spent to deliver the current level of service performance which is within Icon Water’s target range. Given that Icon Water’s consumers have identified a clear direction to maintain current performance and expenditure on sewer main renewals, we find no reason for an increase in expenditure in this program.’
CX10066 Belconnen trunk sewer augmentation (growth)	‘The timing of when the next stage of the project is required is not clear as the project has been deferred over a number of regulatory periods, since its conception in 2004–05. The current stage of the project is still at ‘Evaluate’ even after being granted funding in three previous regulatory review processes.’
CX11176 Water meter renewals (renewals)	‘In relation to efficiency, our assessment is that a minor adjustment [should] be made to reduce the proposed expenditure ... based on an historical expenditure level ... The program combines the four current programs and should rationalise and simplify administration.’
CX10846 Fyshwick SPS (growth)	‘There is a significant degree of uncertainty remaining around this project – in particular, the timing of the development which triggers the need for the project and the outcomes and impacts of the Best for Region strategy (currently being prepared) on this project. We have proposed deferring this project commencement ... to account for this current uncertainty and to allow sufficient time for the implications of the Best for Region strategy on this project to be properly assessed.’
CX11065 Water mains renewal program/s (renewals)	‘Icon Water are currently maintaining a burst rate of 14 bursts/100km/year, which is well under their targets of 20-25 bursts/100km/year (Water Distribution, Reticulation and Metering Asset Management Plan) indicating a reduction in spending may be warranted. We have accepted expenditure on hydraulic failure renewals but reduced spend on structural failures in line with clear customer engagement outcomes.’
CX10950 LMWQCC High voltage assets (renewal)	‘There is no clear reason why Icon Water would be required to maintain or replace an asset that they do not own and can therefore cannot capitalise expenditure against this asset. No specific operating or maintenance agreement between Icon Water and ActewAGL was provided to indicate otherwise.’

Source: Calibre (2017).

Calibre’s review revealed that of projects indicated project delivery efficiencies may be made in Icon Water’s proposed capital expenditure program. With adjusted project expenditure, a revised capital expenditure for Icon Water is shown in Table 4.9. The Calibre review identified project delivery efficiencies of \$52.1m of capital expenditure over the forward regulatory period.

Table 4.9 Adjusted capital expenditure for Icon Water, including project delivery efficiencies, as recommended by Calibre’s review, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water	37.99	43.23	41.77	35.84	27.06	185.89
Sewerage	64.13	35.95	35.76	29.17	31.69	196.70
Total capital expenditure	102.12	79.18	77.53	65.01	58.75	382.59
Difference from Icon Water proposal	-3.99	-11.74	-11.87	-16.70	-7.81	-52.11

Source: Calibre (2017).

In addition to project delivery efficiencies, Calibre’s review identified opportunities for catch-up and ongoing efficiencies in Icon Water’s capital expenditure program for the forward regulatory period. Calibre’s review proposed the catch-up and ongoing efficiency adjustments described in Box 3.

Box 3 Calibre’s recommended efficiency adjustment to Icon Water’s proposed capital expenditure

Calibre’s draft report to the Commission noted the following:

Efficiency adjustments

We are proposing to apply catch up and continuing efficiency adjustments to Icon Water’s total capital program at similar levels to those recommended in the Commission’s 2012 Determination. We believe that the implementation of the Business Transformation Program should allow Icon Water to easily realise the catch up and continuing efficiencies. These adjustments are:

Catch up efficiency = 1.5 per cent per annum

Continuing efficiency = 0.4 per cent per annum

These proposed efficiency adjustments are well within the scope of Icon Water’s ability to deliver and are comparable to the factors applied in other jurisdictions. For example:

IPART recently applied catch up efficiencies to Sydney Water ranging from 2.9 per cent to 8.6 per cent and continuing efficiencies ranging from 0.25 per cent to 1.00 per cent

The water businesses in Victoria have recently submitted pricing proposals which have included proposed capital efficiencies for ongoing programs of 14 per cent (Yarra Valley Water presentation to the ESC October 2017) and proposed reductions to total capital programs of 20 per cent on previous years (Barwon Water Price Submission September 2017). In addition, other businesses are factoring in efficiency savings of around 9 per cent on their total capital program (South East Water Price Submission September 2017)

The Economic Regulation Authority of WA recently applied efficiency targets on Water Corporation ranging from 1 per cent to 5 per cent

We also note that the previous regulatory pricing review applied efficiency targets significantly higher than we have proposed with catch up efficiency factors of between 2.5 per cent and 5.5 per cent. These efficiencies were delivered as part of the currently regulatory period expenditure.

Source: Calibre (2017).

Table 4.10 shows the adjusted capital expenditure for Icon Water, including project delivery efficiencies, catch-up efficiencies and ongoing efficiencies. The Calibre review found possible efficiencies totalling \$59.4m for the 2018–23 regulatory period. To further support the case for the catch up and ongoing efficiencies proposed in Box 3, it is noted that Calibre’s detailed project review for project delivery efficiencies was limited to half of the total forward capital expenditure program.

Table 4.10 Adjusted capital expenditure for Icon Water, including project delivery, catch-up and ongoing efficiencies recommended by Calibre, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water	37.27	42.41	40.98	35.16	26.55	182.37
Sewerage	62.91	35.27	35.08	28.62	31.09	192.97
Total capital expenditure	100.19	77.68	76.06	63.78	57.64	375.35
Difference from Icon Water's proposal (including adjustments in Table 4.9)	-5.92	-13.24	-13.34	-17.93	-8.92	-59.35

Source: Calibre (2017).

Calibre’s review identified systematic transparency issues in project cost accounting by Icon Water. Although Calibre did not recommend an adjustment to the proposed capital expenditure program as a result of this, it did recommend a review of project cost accounting practices by Icon Water. Particular practices of project job code splitting into sub-projects, delivery of works against new or different project codes and not reallocating resources to sub-projects or new codes should be reviewed by Icon Water to improve the transparency and traceability of expenditure.

4.2.3 The draft decision on capital expenditure for 2018–23

The Commission considered a range of information sources in developing a draft allowance for Icon Water’s capital expenditure for the forward regulatory period. Foremost, it considered Icon Water’s submission and Calibre’s review in great detail. It further gave careful consideration to the information provided in public submissions in response to the issues paper and the public consultation forum and information from previous Commission inquiries.

The project-specific issues raised in Calibre’s review of Icon Water’s capital plans were carefully considered. Calibre’s review demonstrated that capital planning requires judgement calls to be made about project triggers and timing, as well as the service delivered and consumer preferences. Icon Water’s consumer engagement provided additional information on consumer support for projects and programs; the Commission has been mindful of this in developing its draft decision.

Of course, Icon Water cannot forecast perfectly a capital expenditure program for the 2018–23 period. The Commission also further appreciates Icon Water’s engagement with it and with Calibre during this investigation. It considers Icon Water has proposed a capital works program that seeks to meet the ACT’s water and sewerage services requirements.

Although active participation from Icon Water has assisted in clarifying the capital expenditure program, some areas of uncertainty remain in the proposed forward capital

expenditure program. This uncertainty arises from many factors, among them the future pattern of the territory's residential and commercial development, the potential for cross-border agreements to respond to regional challenges, and the degree to which Icon Water's investment planning process has progressed with each project. Of particular importance was uncertainty about Icon Water's capacity to complete the proposed forward capital expenditure program within the forward regulatory period, given both the state of current planning and historical patterns of proposed and actual capital expenditure. Calibre examined these uncertainties carefully through independent review for prudence and efficiency, and the Commission scrutinised them at length before arriving at its draft decision.

The detailed examination of Icon Water's proposed capital expenditure program identified opportunities for prudent and efficient project delivery at lower cost. Calibre's review identified delivery efficiency opportunities in particular projects and catch-up and ongoing efficiencies across the portfolio.

The Commission's draft decision recognises that Icon Water should achieve greater efficiency in the proposed capital program. The Commission takes the view that the project delivery efficiencies recommended by Calibre are sufficiently justified, based on the information available, to be adopted for the Commission's draft decision.³² The Commission recognises that some of the project-specific uncertainties raised in the current investigation might be resolved and welcomes further engagement with Icon Water following release of the draft report.

The Commission notes the recent setting and achieving of catch-up and ongoing efficiencies by water utilities and regulators in other jurisdictions. Drawing on evidence elsewhere, Calibre has recommended catch-up and ongoing efficiencies of 1.5 per cent and 0.4 per cent per year to apply to Icon Water's capital expenditure program. The Commission notes further that the project delivery efficiencies Calibre recommended are substantially greater in impact on Icon Water's capital expenditure program than the catch-up and ongoing efficiencies. The Commission's draft decision is not to adopt Calibre's recommended catch-up and ongoing efficiencies on the basis of the information available at the time of the draft decision and the Commission's draft decision to adopt the project delivery efficiencies. However, it will consider this further before making its final determination. Nevertheless, at the next price investigation the Commission will review Icon Water's capital expenditure performance for the 2018–23 regulatory period to assess whether catch-up and ongoing efficiencies should be applied in the subsequent regulatory period.

The Commission's draft decision on capital expenditure provides for an allowance of \$382m (\$358m real) for 2018–23. The draft decision reflects the project delivery efficiencies and project delivery uncertainties Calibre identified. Table 4.11 shows the

³² The Commission notes the Industry Panel's decision to adopt a \$10m per year project delivery adjustment to the last regulatory period, based on the recommendations provided by its independent expert, Cardno.

draft decision on total approved capital expenditure for Icon Water over the forward regulatory period.

The Commission considered the capital expenditure in the current regulatory period when formulating its draft decision on the capital expenditure allowance for 2018–23. There is potential for confusion about ‘like for like’ comparison with the previous regulatory period owing to the inclusion of capital expenditure to be financed by the Capital Contribution Code in the forward regulatory period. The allowable capital expenditure, including expenditure financed by capital contributions, is \$397m (\$370m real) for the forward period. In real terms, the draft decision expenditure is slightly lower than Icon Water’s expenditure in 2013–18 (\$416m real). The reduced capital expenditure between periods (10.8 per cent) in real value terms reflects the project delivery efficiency gains expected of Icon Water during the forward period.

Table 4.11 The Commission’s draft decision on prudent and efficient capital expenditure for Icon Water in 2018–23, excluding expenditure financed by capital contributions (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water	37.99	43.23	41.77	35.84	27.06	185.89
Sewerage	64.13	35.95	35.76	29.17	31.69	196.70
Total capital expenditure	102.12	79.18	77.53	65.01	58.75	382.59

Source: Commission’s calculations.

The Commission notes that several projects Icon Water proposed for the forward period were partially funded through the Capital Contribution Code. These projects were reviewed by Calibre and found to be prudent targets for expenditure. The timing and development of some of these projects remains uncertain, however, and Calibre was unable to make a recommendation on efficiency.

Careful project-level matching was undertaken by Icon Water and the Commission to ensure that project funding is clearly allocated between Capital Contribution Code and water and sewerage services tariffs. By taking all due care and consideration, the Commission has ensured that consumers will not be double-charged for Capital Contribution Code projects undertaken by Icon Water.

The Commission is satisfied that the charge associated with the Capital Contribution Code remains appropriate. The appropriateness is a result of both the Calibre findings and the economic modelling underlying the Code. The Calibre findings hold the Code projects to be prudent, in that they are reasonably to be expected of a utility operating in the circumstances that apply. Calibre was unable to determine efficiency, in part because the projects were associated with an uncertain start date. The Code’s economic modelling, provided by Icon Water and supported by the Commission, used expected

inflation as a discount rate: this modelling implies that there is no variation to project value associated with a project's start date.

5 Regulatory Asset Base and depreciation allowance

The value of the RAB is an integral component of the building block methodology. It is used in the calculation of both the return on capital and the depreciation building blocks that provide a return of capital.

This chapter sets out the Commission’s draft decision and the matters the Commission considered in reaching its draft decision on the opening value and depreciation provisions for the water and sewerage RABs.

The Commission’s draft decision

Table 5.1 and Table 5.2 show the RABs, as proposed by Icon Water for water and sewerage, for each year of the forward regulatory period.

Table 5.1 Icon Water’s proposal: value of the water RAB, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23
Opening water RAB	1,508.97	1,554.48	1,603.11	1,648.57	1,686.62
Capital expenditure	38.38	43.76	42.48	36.82	28.28
Asset disposals	0.00	0.00	0.00	0.00	0.00
Forecast depreciation	31.09	34.53	37.63	40.44	41.78
Indexation	38.20	39.41	40.61	41.67	42.52
Closing water RAB	1,554.48	1,603.11	1,648.57	1,686.62	1,715.65

Source: Icon Water (2017).

Table 5.2 Icon Water’s proposal: value of the sewerage RAB, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23
Opening sewerage RAB	859.57	923.10	963.41	1,001.36	1,035.47
Forecast net capital expenditure	67.73	47.17	46.91	44.89	38.28
Asset disposals	0.00	0.00	0.00	0.00	0.00
Forecast depreciation	26.53	30.53	33.63	36.38	38.77
Indexation	22.34	23.67	24.67	25.60	26.37
Closing sewerage RAB	923.10	963.41	1,001.36	1,035.47	1,061.34

Source: Icon Water (2017).

The Commission's draft decision on the value of the water and sewerage RABs is set out in Table 5.3 and Table 5.4.

Table 5.3 Draft decision: value of the water RAB, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23
Opening water RAB	1,508.97	1,554.09	1,602.20	1,646.97	1,684.07
Capital expenditure	37.99	43.23	41.77	35.84	27.06
Asset disposals	0.00	0.00	0.00	0.00	0.00
Forecast depreciation	31.08	34.51	37.58	40.36	41.65
Indexation	38.20	39.39	40.58	41.62	42.44
Closing water RAB	1,554.09	1,602.20	1,646.97	1,684.07	1,711.93

Sources: Commission's calculations based on Icon Water (2017).

Table 5.4 Draft decision: value of the sewerage RAB, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23
Opening sewerage RAB	859.57	919.50	948.55	975.30	993.71
Capital expenditure	64.13	35.95	35.76	29.17	31.69
Asset disposals	0.00	0.00	0.00	0.00	0.00
Forecast depreciation	26.49	30.33	33.17	35.51	37.52
Indexation	22.29	23.44	24.16	24.75	25.24
Closing sewerage RAB	919.50	948.55	975.30	993.71	1,013.12

Sources: Commission's calculations based on Icon Water (2017).

The Commission's draft decision on the value of RABs is \$3.7m lower for water, in total nominal terms across the regulatory period, than Icon Water's proposal. For sewerage it is \$48.2m lower, in total nominal terms across the regulatory period, than Icon Water's proposal.

These differences broadly reflect the Commission's decision to decrease the water and sewerage capital expenditure forecasts by \$3.7m and \$48.2 m, respectively.

5.1 Methodology for rolling forward the RAB

As noted, the RAB is an important component of the building block methodology and is used in the calculation of the return on capital and the return of capital (depreciation). This requires an opening RAB for the start of the previous regulatory period and then an opening and closing RAB for each year of the next regulatory period.

The standard building block approach is to take the opening value of the RAB from the start of the previous regulatory period and roll it forward. This roll-forward is calculated for each year of the previous regulatory period by adding prudent and efficient actual capital expenditure, deducting forecast depreciation and actual asset disposals, and adding inflation indexation reflecting actual inflation. This establishes a RAB value at the end of the previous regulatory period, which then becomes the starting value for the next regulatory period. The RAB for each year of the next regulatory period (in this case 2018–23) can be calculated with the same formula but using forecast capital expenditure, forecast asset disposals, forecast depreciation, and forecast inflation for the indexation adjustment.

The building block methodology was used by the Industry Panel for 2013–18 and supported by Icon Water in its submission. The roll-forward calculation can be described thus:

$$\begin{aligned} \text{Opening RAB}_{t+1} = & \text{Opening RAB}_t + \\ & \text{Actual net capital expenditure}_t - \text{Actual asset disposals}_t - \text{Forecast depreciation}_t + \\ & \text{Actual inflation indexation}_t \end{aligned}$$

Net capital expenditure is capital expenditure after allowing for capital contributions from other parties – for example, contributions received under the Capital Contribution Code.

One methodological consideration is that actual values are used for capital expenditure, asset disposals and inflation, but depreciation is based on forecast depreciation to establish the RAB at the start of the regulatory period. As long as the sum of depreciation that is recovered does not exceed the value of the capital expenditure, it is not necessary to use actual depreciation. This condition can be satisfied by the roll-forward methodology and the calculation of depreciation in terms of the recovery of residual values. This approach is consistent with the approach used by the Industry Panel and the default position used by the AER for gas and electricity network businesses.

Inclusion of actual capital expenditure in the RAB depends on the expenditure being assessed as prudent and efficient. Capital expenditure is reviewed in Chapter 4, and the results of the review are included in the calculation of the RAB in this chapter.

5.2 The RAB value for 2013–18

It is necessary to calculate the RAB value for each year of the current regulatory period using the methodology described in Section 5.1. The current regulatory period spans the years 2013–14 to 2017–18.

5.2.1 Adjustment for 2012–13

The opening RAB value for 2013–14 corresponds to the closing RAB value for 2012–13. The value for 2012–13 must be adjusted to account for the differences between actual and forecast values at the time of the last price investigation (2012). These adjustments are shown in Table 5.5.

Table 5.5 Adjustments for differences between forecast and actual net capital expenditure, water and sewerage, 2012–13 (\$m, nominal)

Forecast	Water	Sewerage
Actual capital expenditure	111.25	24.48
Actual disposals	11.83	0.00
Actual net capital expenditure	99.42	24.48
Estimated capital expenditure	108.42	25.30
Estimated disposals	11.78	0.00
Estimated net capital expenditure (inflation adjusted)	96.43	25.24
Difference in net capital expenditure	2.99	-0.76
Return on difference	1.14	-0.29
Total adjustment	4.13	-1.05

Source: Icon Water (2017).

5.2.2 Capital expenditure, 2013–18

As detailed in the Chapter 4, the Commission organised an independent review of Icon Water’s submission on capital expenditure to assess it for prudence and efficiency. The Commission’s draft decision is to accept Icon Water’s capital expenditure in the current regulatory period as prudent and efficient. The capital expenditure in each year is added to the RAB as just described.

5.2.3 Asset disposals

Icon Water provided details of its asset disposals for the period 2013–18. Disposed assets are to be removed from the RAB. Asset disposals are shown in Table 5.6.

Table 5.6 Actual asset disposals, water and sewerage, 2013–14 to 2017–18 (\$m, nominal)

	2013–14	2014–15	2015–16	2016–17	2017–18	Total
Water	0.00	1.55	0.00	34.25	0.00	35.81
Sewerage	0.00	2.00	0.00	0.00	0.00	2.00
Total disposals	0.01	3.55	0.00	34.25	0.00	37.81

Source: Icon Water (2017).

5.2.4 Forecast depreciation

Depreciation is adjusted to take into account differences between actual and forecast inflation during the regulatory period. Table 5.7 shows forecast depreciation including an adjustment for the difference between actual and forecast inflation.

Table 5.7 Forecast depreciation including an adjustment for the difference between actual and forecast inflation, water and sewerage, 2013–14 to 2017–18 (\$m, nominal)

	2013–14	2014–15	2015–16	2016–17	2017–18	Total
Water	25.05	26.37	27.41	28.50	30.00	137.33
Sewerage	16.93	19.31	20.20	23.20	26.68	106.32
Total depreciation	41.98	45.68	47.61	51.69	56.68	243.65

Source: Icon Water (2017).

5.2.5 Indexation

The RAB is indexed to maintain its real value over time. When it is rolled forward from the start of the previous regulatory period, the convention is to use actual inflation. The Industry Panel approach calculated inflation on an annual basis as the sum of the four quarters all groups CPI for the current period divided by the sum of the four quarters all groups CPI for the previous period, as follows:

$$CPI_t = \frac{CPI_{June(t)} + CPI_{Sep(t)} + CPI_{Dec(t)} + CPI_{Mar(t)}}{CPI_{June(t-1)} + CPI_{Sep(t-1)} + CPI_{Dec(t-1)} + CPI_{Mar(t-1)}}$$

For 2017–18 the CPI will be set to the forecast CPI, and the roll-forward for the next regulatory period will make an adjustment for the difference between forecast and actual inflation for 2017–18.

The indexation amount for each year is calculated thus:

$$Indexation_t = CPI_t \times (Opening\ RAB_t + Net\ capital\ expenditure_t - Asset\ disposals_t)$$

Note that forecast depreciation is adjusted separately for the difference between actual and forecast inflation, as described.

The indexation amounts are shown in Table 5.8.

Table 5.8 Indexation of the RAB, water and sewerage, 2013–14 to 2017–18 (\$m, nominal)

	2013–14	2014–15	2015–16	2016–17	2017–18	Total
Water	37.64	24.48	20.07	24.30	36.95	143.43
Sewerage	18.07	11.78	9.87	12.62	20.57	72.92
Total indexation	55.71	36.26	29.94	36.91	57.52	216.35

Source: Icon Water (2017).

5.3 Opening RAB value for 2018–23

Using the methodology and inputs just described, the revised RABs for the regulatory period 2013–14 to 2017–18 are shown for water and sewerage in Table 5.9.

Table 5.9 Water and sewerage RAB roll-forward, 2013–14 to 2017–18 (\$m, nominal)

	2013–14	2014–15	2015–16	2016–17	2017–18
Water					
Opening water RAB	1,369.80	1,416.76	1,437.88	1,461.56	1,457.75
Net capital expenditure	34.37	24.57	31.02	34.65	40.15
Asset disposals	0.00	1.55	0.00	34.25	0.00
Forecast depreciation	25.05	26.37	27.41	28.50	30.00
Indexation	37.64	24.48	20.07	24.30	36.95
Adjustment for 2012–13					4.13
Closing water RAB	1,416.76	1,437.88	1,461.56	1,457.75	1,508.97
Sewerage					
Opening RAB	656.72	676.17	691.41	728.56	779.22
Net capital expenditure	18.32	24.76	47.48	61.23	87.50
Asset disposals	0.00	2.00	0.00	0.00	0.00
Forecast depreciation	16.93	19.31	20.20	23.20	26.68
Indexation	18.07	11.78	9.87	12.62	20.57
Adjustment for 2012–13					-1.05
Closing sewerage RAB	676.17	691.41	728.56	779.22	859.57

Source: Icon Water (2017).

The closing RABs for 2017–18 are the opening RABs for 2018–19.

5.4 Asset lives and depreciation

The RAB roll-forward does not require asset lives as an input, but remaining asset lives are needed to calculate depreciation for the next regulatory period. Remaining asset lives are calculated separately as part of the roll-forward calculation.

Forecast depreciation is calculated on a straight-line basis, which allows for an equal proportion of the asset's value to be calculated over each year of the asset's useful life. This is the same approach as used in the Industry Panel report and by other economic regulators in Australia.

The Industry Panel used 'economic lives' of assets to calculate depreciation, with a weighted average asset life used for existing water and sewerage assets and asset-specific lives used for water security assets and new capital expenditure.³³ Icon Water is proposing to use the same approach as the Industry Panel adopted.

The Commission notes the Industry Panel expressed concern with the weighted average asset life methodology in relation to transparency and recovery of some asset values that did not match their useful lives.³⁴ The panel expressed a preference for an approach that recognises depreciation based on different asset classes but accepted the weighted average approach because of time constraints.³⁵

The Commission notes that 'depreciation' in a regulatory context is defined to ensure the recovery or return of capital to the investor and to ensure that decisions about the profile of depreciation do not have to align with useful lives on an asset class basis. Provided there is a credible commitment to the recovery of the present value of an investment, the profile of depreciation can be adjusted in myriad ways to achieve other regulatory objectives that would mean a deviation from the straight-line convention used for calculating depreciation.

Provided the estimates of 'economic lives' are based on estimates of 'useful lives', the Commission accepts Icon Water's proposed approach to estimating depreciation (see Table 5.10 and Table 5.11).

³³ Industry Panel, 2015: 60, Industry Panel, 2014: 94.

³⁴ Industry Panel, 2014: 93.

³⁵ Industry Panel, 2014: 93.

Table 5.10 Economic asset lives for water, sewerage and water security assets (years)

Water asset classes	Range of economic asset lives
Efficiency	5–25
Growth	10–80
Regulation	10–50
Renewal	5–50
Sewerage asset classes	Range of economic asset lives
Efficiency	10–60
Growth	10–80
Regulation	10–50
Renewal	5–80
Water security assets	Range of economic asset lives
Dams and weirs	150
Water mains	100
Valves and pump sets	25–30
Meters	10–20

Source: Icon Water (2017).

Table 5.11 Weighted average asset lives for water security assets (years)

Water security assets	Asset lives	Remaining asset lives in		Weighted average of remaining economic asset lives				
		2013–14	2018–19	2018–19	2019–20	2020–21	2021–22	2022–23
Dams and weirs	150	149	144	144	143	142	141	140
Water mains (bulk and pump)	100	99	94	94	93	92	91	90
Valves (bulk and pump)	30	29–30	24–25	24–25	23–24	22–23	21–22	20–21
Pump sets	25	24	19	19	18	17	16	15
Flow meters and cathodic protection systems	20	19–20	14–15	14–15	13–14	12–13	11–12	10–11
Pressure sensors, transmitters and meters	10	10	5	5	4	3	2	1
Telemetry	10	9	4	4	3	2	1	0

Source: Icon Water (2017).

5.5 RAB values for 2018–23

The roll-forward calculation for each year of the 2018–23 regulatory period uses the following formula:

$$\text{Opening RAB}_{t+1} = \text{Opening RAB}_t + \text{Forecast net capital expenditure}_t - \text{Forecast asset disposals} - \text{Forecast depreciation} + \text{Forecast inflation indexation}$$

The opening RAB value for the 2018–23 regulatory period is the closing RAB value for the last year of the 2013–18 regulatory period, as described.

Chapter 4 provides details of the forecast capital expenditure program. Forecast depreciation is calculated as described in Section 5.4.

The RAB is indexed for each year of the forward regulatory period by forecast inflation. To avoid double-counting for inflation if a nominal rate of return is used, a separate adjustment is made to the return on capital to deduct forecast inflation. This approach in effect leads to a flatter profile of capital charges than if the asset base is not indexed, but it does not change the present value amount of capital charges.

The indexation amount for each year is calculated as follows:

$$\text{Indexation}_t = \text{Forecast CPI}_t \times (\text{Opening RAB}_t + \text{Net capital expenditure}_t - \text{Asset disposals}_t)$$

5.5.1 Icon Water’s submission

Forecast efficient net capital expenditure

Table 5.12 shows Icon Water’s proposed forecast net capital expenditure for water and sewerage for 2018–23.

Table 5.12 Icon Water’s proposed capital expenditure for water and sewerage, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water	38.38	43.76	42.48	36.82	28.28	189.72
Sewerage	67.73	47.17	46.91	44.89	38.28	244.99
Total capital expenditure	106.11	90.93	89.40	81.71	66.56	434.70

Source: Icon Water (2017).

Forecast asset disposals

There are no forecast asset disposals proposed for the 2018–23 period.

Forecast depreciation

Table 5.13 shows Icon Water's proposed forecast depreciation for water and sewerage assets for 2018–23.

Table 5.13 Icon Water's forecast depreciation for water and sewerage, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water	31.09	34.53	37.63	40.44	41.78	185.46
Sewerage	26.53	30.53	33.63	36.38	38.77	165.85
Total forecast depreciation	57.62	65.06	71.26	76.82	80.55	351.31

Source: Icon Water (2017).

Forecast indexation

Icon Water's proposed forecast indexation amounts for water and sewerage assets for the period 2018–23 are shown in Table 5.14.

Table 5.14 Forecast indexation for water and sewerage, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water	38.20	39.41	40.61	41.67	42.52	202.42
Sewerage	22.34	23.67	24.67	25.60	26.37	122.63
Total indexation	60.54	63.08	65.28	67.27	68.88	325.05

Source: Icon Water (2017).

RABs for 2018–23

The RABs proposed by Icon Water for water and sewerage for each year of the 2018–23 regulatory period are shown in Table 5.15.

Table 5.15 Icon Water's proposed RABs, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23
Water					
Opening water RAB	1,508.97	1,554.48	1,603.11	1,648.57	1,686.62
Capital expenditure	38.38	43.76	42.48	36.82	28.28
Asset disposals	0.00	0.00	0.00	0.00	0.00
Forecast depreciation	31.09	34.53	37.63	40.44	41.78
Indexation	38.20	39.41	40.61	41.67	42.52
Closing water RAB	1,554.48	1,603.11	1,648.57	1,686.62	1,715.65
Sewerage					
Opening sewerage RAB	859.57	923.10	963.41	1,001.36	1,035.47
Forecast net capital expenditure	67.73	47.17	46.91	44.89	38.28
Asset disposals	0.00	0.00	0.00	0.00	0.00
Forecast depreciation	26.53	30.53	33.63	36.38	38.77
Indexation	22.34	23.67	24.67	25.60	26.37
Closing sewerage RAB	923.10	963.41	1,001.36	1,035.47	1,061.34

Source: Icon Water (2017).

5.6 The Commission's draft decision

In making its draft decision on the value of the water and sewerage RABs, the Commission took account of independent consultant Calibre's expert advice on the prudence and efficiency of the Icon Water proposed forecast capital expenditure. On the basis of this, the Commission's draft decision on forecast efficient net capital expenditure is set out in Table 5.16. The resulting depreciation forecasts for the water and sewerage assets for the period 2018–23 are presented in Table 5.17.

Table 5.16 The Commission's draft decision on forecast efficient net capital expenditure for water and sewerage, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water	37.99	43.23	41.77	35.84	27.06	185.90
Sewerage	64.13	35.95	35.76	29.17	31.69	196.70
Total capital expenditure	102.12	79.18	77.53	65.01	58.75	382.60

Source: Commission's calculations.

Table 5.17 The Commission’s draft decision on forecast depreciation for water and sewerage, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water	31.08	34.51	37.58	40.36	41.65	185.17
Sewerage	26.49	30.33	33.17	35.51	37.52	163.02
Total depreciation	57.57	64.84	70.75	75.87	79.16	348.20

Source: Commission’s calculations.

There are no forecast asset disposals proposed for the 2018–23 period.

The Commission’s draft decision on the provision to be made for indexation in the forward regulatory period is set out in Table 5.18.

Table 5.18 The Commission’s draft decision on forecast indexation for water and sewerage, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water	38.20	39.39	40.58	41.62	42.44	202.23
Sewerage	22.29	23.44	24.16	24.75	25.24	119.87
Total indexation	60.49	62.83	64.74	66.37	67.68	322.11

Source: Commission’s calculations.

The Commission’s draft decision on the RAB roll-forward in the 2018–23 regulatory period for water and sewerage assets, using each of the input values discussed above, is shown in Table 5.19.

Table 5.19 The Commission’s draft decision water and sewerage RABs, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23
Water					
Opening water RAB	1,508.97	1,554.09	1,602.20	1,646.97	1,684.07
Capital expenditure	37.99	43.23	41.77	35.84	27.06
Asset disposals	0.00	0.00	0.00	0.00	0.00
Forecast depreciation	31.08	34.51	37.58	40.36	41.65
Indexation	38.20	39.39	40.58	41.62	42.44
Closing water RAB	1,554.09	1,602.20	1,646.97	1,684.07	1,711.93
Sewerage					
Opening sewerage RAB	859.57	919.50	948.55	975.30	993.71
Capital expenditure	64.13	35.95	35.76	29.17	31.69
Asset disposals	0.00	0.00	0.00	0.00	0.00
Forecast depreciation	26.49	30.33	33.17	35.51	37.52
Indexation	22.29	23.44	24.16	24.75	25.24
Closing sewerage RAB	919.50	948.55	975.30	993.71	1,013.12

Source: Commission’s calculations.

The Commission’s draft decision on the value of RABs is \$3.7m lower for water than Icon Water’s proposal and \$48.2m lower for sewerage over the regulatory period. These differences broadly reflect the Commission’s decision to decrease the water and sewerage capital expenditure forecasts by \$3.7m and \$48.2m respectively (see Chapter 4). The values also reflect appropriate adjustments in keeping with the Capital Contribution Code.

6 Rate of return and tax liability allowance

The rate of return is used to calculate the ‘return on capital’ building block when using the building block methodology. In determining the rate of return for the 2018–23 regulatory period, the Commission must have regard to a number of factors, among them the requirements of the ICRC Act, consistency with the approaches used by the majority of Australian regulators, and consistency with the principles of competitive neutrality and allocative efficiency.

This chapter presents the matters the Commission considered in reaching its draft decision on the parameter values to be used to calculate the WACC and the net tax liabilities.

The Commission’s draft decision

The Commission’s draft decision on the parameters to be used to calculate the rate of return (the nominal vanilla WACC) and the net tax liabilities building block is set out in Table 6.1, which also provides a comparison of the WACC parameters in the Industry Panel’s decision and Icon Water’s proposal.

Table 6.1 Draft decision: rate of return and net tax liability parameter values

WACC parameter	Industry Panel final decision 2015	Icon Water proposal 2017	Commission draft decision 2017
Risk-free rate (per cent)	3.22	2.78	2.78
Debt margin (per cent)	3.13	2.08	2.08
Debt raising cost	0.13	0.13	0.13
Equity beta	0.70	0.70	0.70
Market risk premium (per cent)	7.23	7.03	6.50
Gearing (per cent)	60	60	60
Cost of debt (per cent)	6.48	4.99	4.99
Cost of equity (per cent)	8.28	7.71	7.33
Nominal post-tax vanilla WACC (per cent)	7.20	6.07	5.93
Net tax liabilities parameter	Industry Panel final decision 2015	Icon Water proposed 2017	Commission draft decision 2017
Tax rate (per cent)	30.00	30.00	30.00
Value of imputation credit (gamma) (per cent)	0.50	0.25	0.40

Sources: Commission’s calculations, Icon Water (2017) and Industry Panel (2015).

6.1 The rate of return

6.1.1 Introduction

The return on capital forms part of the allowed revenue for Icon Water. It is calculated as the allowed rate of return on assets multiplied by the RAB and is calculated on an annual basis using the same rate of return for each year of the regulatory period. In view of Icon Water's capital-intensive cost structure, the return on capital constitutes a substantial proportion of the overall allowed revenue.

Having regard to the terms of reference and the requirements of the Act, the Commission considers it is appropriate to retain the Industry Panel's cost of capital methodology. It is the standard methodology used for price regulation of utilities in Australia and is also supported in Icon Water's submission. The methodology is considered appropriate for ensuring that the allowed rate of return will provide incentives for efficient investment that is in the long-term interests of consumers, provided appropriate parameters are set in applying the methodology. But the Commission considers that there is a case for updating the values of several parameters adopted in the Industry Panel decision, as explained in this chapter.

6.1.2 Reference point for estimating the rate of return

The rate of return on assets is also known as the WACC. The 'weighting' refers to the cost of equity and the cost of debt being weighted by their respective shares in the overall asset value, or financing, of an entity.

Most regulators in Australia specify a WACC that is considered to reflect the efficient financing costs of a benchmark entity and is the same irrespective of whether the assets are privately or publicly owned. This entails specifying relationships and parameters for the equity and debt returns (and the shares of equity and debt financing) based on a benchmark private entity with risk characteristics similar to those of the regulated business.

The WACC can be expressed in pre-tax form or in various other forms, depending on how tax is recognised in the formula. The formulation adopted in the Industry Panel's model, and retained in the Commission's draft decision, is known as the 'nominal vanilla WACC'. 'Nominal' means that the return components are in nominal as opposed to real (or inflation-adjusted) terms, so that an inflation premium is already included in the components. 'Vanilla' refers to the simple form of the WACC, whereby explicit tax effects are not included in the formula but are treated separately in defining allowed revenue requirements.

The nominal vanilla WACC is defined as follows:

$$(1) \text{WACC}_{\text{nominalvanilla}} = E(R_d) \times \frac{D}{V} + E(R_e) \times \frac{E}{V}$$

where

$E(R_d)$ is the expected nominal pre-tax rate of return on debt

$E(R_e)$ is the expected nominal post-(company) tax rate of return on equity

$\frac{D}{V}$ is the proportion of debt in total financing

$\frac{E}{V}$ is the proportion of equity in total financing.

Note that the tax effects are not shown: they are treated separately, recognising the company tax rate, the tax deductibility of interest, and the value of tax credits to shareholders under the dividend imputation system.³⁶ The allowance for tax liabilities is explained in Section 6.3.

The cost of debt, $E(R_d)$, is established by determining the appropriate cost of debt for a private entity considered to have a relevant benchmark credit rating.

The rate of return on equity, $E(R_e)$, is established by applying the widely used capital asset pricing model, or CAPM. The CAPM requires only three parameters – a risk-free rate; a market risk premium that reflects the risk relating to the market for investments as a whole relative to the risk-free rate; and a beta parameter that reflects the sensitivity of the benchmark entity's returns relative to the return for the market as a whole.

The CAPM is defined thus:

$$(2) E(R_e) = E(R_f) + \beta_e [(E(R_m) - E(R_f))]$$

where

$E(R_f)$ is the expected risk-free rate

β_e is the equity beta, which is a measure of the amount of relevant risk of the investment (as measured by the sensitivity of the return on the specific asset to the return on the market as a whole)

$E(R_m) - E(R_f)$ is the expected market risk premium above the expected risk-free rate and can be interpreted as the price of relevant risk.

It is important to recognise that the CAPM model relies on a basic assumption: business-specific risk can be fully diversified by investors so that the only risk for the benchmark entity depends on the risk for the market as a whole (measured by the market risk premium) and the extent to which the benchmark business's return is related to returns for the market as a whole (measured by the equity beta). This means many business-specific risks that are not related to risks in the economy as a whole are not recognised (and consequently priced) in the CAPM.

The standard CAPM assumes investors are risk averse and concerned only about expected returns and the variability of those returns. This means that the CAPM in

³⁶ Officer, 1994:1–17, definition B. (iii).

effect assumes that the distribution of risks for the benchmark entity is symmetric: upside risk is balanced by downside risk. In applying the CAPM, regulators need to recognise that regulation caps upside potential (by regulating prices) but that it can also put a floor on many downside risks (depending on the nature of these risks and how they are treated) so the expected symmetry in returns may be retained. For example, there might be minimal relevant downside risk if there is considerable scope to pass through cost increases and good assurance that the value of the RAB will not be written down by the regulator and will be recovered.

It should also be recognised that, to the extent that regulation reduces the variability of returns relative to an unregulated benchmark, the reduced variability of returns should be reflected in the equity beta parameter.

The parameters for equations (1) WACC and (2) CAPM are discussed in the following sections.

6.1.3 The risk-free rate

The risk-free rate is a component of the cost of equity and the cost of debt. In calculating the cost of equity, a premium is added to the risk-free rate to take account of the market risk premium and the relevant specific risk (beta) for the regulated entity. For the cost of debt, until recently the standard approach (the on-the-day approach) was to add a debt margin to an on-the-day risk-free rate. This margin would reflect the credit rating of the relevant benchmark, and also an allowance for debt-raising costs. A number of different methodologies have since been developed to estimate a benchmark cost of debt. These approaches are discussed further in Section 6.1.4.

The Industry Panel adopted a standard approach in using a 10 year term to maturity for Commonwealth Government Securities, and a 40 day averaging period at the time when the risk free rate was estimated to start to apply. Icon Water proposes to adopt the approach used by the Industry Panel, resulting in a risk-free rate of 2.78 per cent as at 31 March 2017.

The Commission notes a potential issue in using a 10 year term to maturity when prices are reset at five year intervals: the reset makes use of the latest estimates of yield for a 10 year Commonwealth Government Security. The Queensland Competition Authority (QCA) and the Western Australian Economic Regulation Authority (ERA) use five year terms, reflecting concerns that resetting based on 10 years is not likely to be consistent with ensuring that the NPV = 0 condition³⁷ is satisfied over time.

³⁷ The NPV = 0 condition or principle is that expected revenues should be just sufficient to finance all expected costs, including appropriate allowances for the return on capital and the return of capital (depreciation).

The 40 day averaging period is used to smooth out day-to-day fluctuations around the time that the estimate is required. Typically there is not much difference in using a 20 day or 40 day averaging period.

The Industry Panel's approach has the advantage of being simple to apply and is considered to be appropriate when financing conditions are relatively stable. The Commission proposes to retain the panel's approach for setting the cost of debt at this stage.

For the purposes of this draft report, the Icon Water estimate of the risk-free rate of 2.78 per cent for the 40 day averaging period ending 31 March 2017 is adopted. This estimate will need to be updated to reflect the relevant estimate at a period as close as possible to the start of the 2018–23 regulatory period.

6.1.4 The cost of debt

The cost of debt comprises a risk-free rate, a margin to represent the impact of adopting a relevant credit rating for the benchmark cost of debt estimate, and a margin to reflect debt raising costs. Until recently most regulators used an 'on-the-day' approach which focused on estimating the cost of debt based on prevailing conditions near the start of the regulatory period.

This approach assumes that firms refinance all their debt at a single point in time and, recognising that the 'on-the-day' approach might deviate too much from standard practice, regulators have adopted various versions of a trailing average cost of debt with a rolling average applying for 10 years. The Icon Water submission³⁸ provides a useful summary of the various approaches to estimating the cost of debt that are being used by various regulators of utilities and monopoly infrastructure services in Australia.

In some cases the trailing average relates to the cost of debt as a whole and in other cases to the debt premium only, which is then added to an estimate of the risk-free rate. The New South Wales Independent Pricing and Regulatory Tribunal (IPART) and the Tasmanian Economic Regulator use an average of the 'on-the-day' approach and a 10 year trailing average.

When financial conditions are relatively stable the 'on-the-day' approach is likely to be reasonable, but if financial conditions were to change substantially over the regulatory period and substantial refinancing had to occur when this happened there could be financial gains and losses that might need to be addressed – including with a separate price reset during the regulatory period. This concern could be met by providing for a price reset if debt conditions changed beyond a specific materiality threshold.

The Industry Panel adopted an 'on-the-day' approach and at this stage Icon Water is proposing to retain such an approach but noted it will monitor how the Australian

³⁸ Icon Water, 2017 (Attachment 9): 15–16.

Energy Regulator remakes its decision in relation to a gradual transition to a trailing average approach as a result of the Australian Competition Tribunal's recent ruling on the matter.³⁹

The Industry Panel's 'on-the-day' approach calculated a 40 day average of the credit spreads for 10 year BBB Australian corporate bonds using Reserve Bank of Australia data and the same risk-free rate for the cost of debt as for the cost of equity. This meant a margin of 3.13 per cent was added to the risk-free rate. An additional margin of 0.125 per cent was added for debt raising costs. Using the same approach, Icon Water has calculated the debt margin as of 31 March 2017 as 2.08 per cent.⁴⁰ With a risk-free rate of 2.78 per cent and a debt raising cost margin of 0.125 per cent, Icon Water's proposed cost of debt at this stage is 4.99 per cent.

Icon Water's submission notes that using the prevailing cost of debt and the 'on-the-day' approach gives the lowest estimate of a debt margin compared with other approaches used by Australian regulators.⁴¹ But there is difficulty with determining the appropriate credit rating: many regulators use at least a BBB+ credit rating, whereas the Reserve Bank estimates are an average of BBB+, BBB and BBB- credit ratings.

The Commission proposes to retain the Industry Panel's 'on-the-day' approach, noting that the use of a credit margin based on BBB rating is likely to provide a reasonable buffer if credit conditions were to worsen and additional debt financing were required during the regulatory period. The on-the-day approach also has the advantage of being simple to apply. If credit conditions changed dramatically, having materially adverse impacts on its cash flows, Icon Water could apply for a special price reset.

For the purpose of this draft report, the Commission proposes to retain the Industry Panel's methodology for estimating the cost of debt and Icon Water's proposed estimate of 4.99 per cent. This estimate will need to be updated to reflect the relevant estimate at a period as close as possible to the start of the 2018–23 period.

6.1.5 The cost of equity

The cost of equity comprises a risk-free rate and a margin representing the product of an equity beta and a market risk premium. The equity beta is a firm-specific or investment-specific parameter that represents the amount of relevant (non-diversifiable) risk, relative to the risk-free rate. The market risk premium is the price of the risk and is calculated as the difference between the expected return to the market as a whole and the risk-free rate. The Commission's consideration of these parameters is presented in the following sections.

³⁹ Icon Water, 2017 (Attachment 9): 15.

⁴⁰ Icon Water, 2017 (Attachment 9): 15.

⁴¹ Icon Water, 2017 (Attachment 9): 16.

6.1.6 The equity beta

The equity beta measures the relationship between expected equity returns for a specific investment and returns for the market as a whole. An asset beta relates to the value of an asset as a whole and is in effect a weighted average of an equity and debt beta. Asset betas are preferred as benchmarks because they are formally not sensitive to changes in gearing (being the proportion of debt funding for assets). Once a benchmark asset beta is established, the equity beta can be derived given an assumption about gearing.

An equity beta of 1 for a specific investment means that the investment has the same risk as the market as a whole. An equity beta of less than (or more than) 1 means the investment has a lower (or higher) risk than for the investment market as a whole. An equity beta of 0 means the investment has the same expected return as a risk-free investment (in this case a 10 year Commonwealth Government Security).

The Industry Panel adopted an equity beta parameter of 0.7 assuming a gearing ratio of 60 per cent. This estimate was based on consideration of a number of sources of information, including 16 international water utility companies in the United Kingdom and the United States (0.53 to 0.77, with gearing of 60 per cent), equity beta values adopted by other regulators (0.55 to 0.80), and the recognition of estimation bias, which suggests the need to set a point estimate for the equity beta at the top of the range when equity beta estimates are substantially less than 1.

Icon Water is proposing retention of an equity beta of 0.7 assuming a gearing ratio of 60 per cent. It presents the equity beta estimates of other recent Australian regulators, showing ranges from 0.65 to 0.7, and refers to the estimates in a consultant's report it commissioned, with a range of 0.6 to 1.0 (for gearing of 60 per cent).⁴² Given the Commission proposes to continue with the current hybrid price and revenue cap form of control, consistent with the Industry Panel's decision, the Commission's draft decision is to adopt Icon Water's proposed equity beta of 0.7 for a gearing ratio of 60 per cent.

It is noted that Icon Water's proposed unders and overs mechanism would transfer nearly all demand risk from Icon Water to consumers. If the Commission were persuaded to adopt this form of regulation it would be expected that there should also be a lower beta to reflect the substantial reduction in demand and revenue risk.

6.1.7 The market risk premium

The market risk premium is a general market parameter that does not vary with different investments or specific firms. It is a measure of the extent to which the expected return on the market portfolio as whole exceeds the risk-free rate. It is defined thus:

⁴² Icon Water, 2017 (Attachment 9): 8–9.

$$(3) \text{ Market risk premium} = (E(R_m) - E(R_f))$$

Icon Water is proposing a market risk premium of 7.03 per cent, estimated using a 40 day average of Bloomberg's daily implied market risk premium.

A forward-looking perspective

The market risk premium is defined on an ex ante (expected) basis and so is forward looking. A time horizon of 10 years is typically used by Australian regulators, although this can be questioned if prices are reset in a shorter period.

Regardless of which time period is chosen, the risk-free rate and the market risk premium should be the best estimates of the corresponding forward-looking parameters. If the specified time horizon is 10 years the aim should be to obtain a 10 year forward-looking cost of capital, with a 10 year forward-looking return on equity, 10 year forward-looking risk fee rate, 10 year forward-looking market risk premium and 10 year forward-looking cost of debt.⁴³

For the cost of equity, estimates based on long term averages and forward-looking methodologies are both relevant to the extent that they contribute to the best estimate of the forward-looking market risk premium over the relevant time frame. There is often confusion about this point and claims that using historical information or on-the-day information together are inconsistent, but this is not the case if the objective is the best estimate of the forward-looking market risk premium.⁴⁴ This is because there is considerable imprecision in the estimates derived from both historic and forward-looking methodologies and considering a range of approaches can reduce the margin of error in choosing a particular point estimate.

The Industry Panel's estimate

The market risk parameter that was preferred in the Industry Panel's report was based on a single methodology, whereas regulators tend to use a range of approaches in order to determine an appropriate market risk premium. Using a range of approaches also helps reduce the margin for error in a particular approach.

As discussed shortly, some experts and other regulators consider that the methodology adopted by the Industry Panel contains an upward bias. The panel's estimate of 7.23 per cent is similar to that adopted in a recent Independent Pricing and Regulatory Tribunal (IPART) decision for Sydney Water⁴⁵ although it is higher than the estimates adopted by several other regulators in recent decisions and reviews.

⁴³ AER, 2013b: 108.

⁴⁴ AER, 2013b: 108–9.

⁴⁵ IPART, 2016: 125.

The Industry Panel noted in its draft report that it preferred market based parameters using prevailing rates. The choice of an implied market risk premium (based on a dividend discount growth model) was consistent with this preference.⁴⁶

In estimating important regulatory parameters, consideration of a range of methods is likely to provide a more robust estimate. The objective is to obtain the best estimate to apply over the relevant five year regulatory period. To rely solely on recent information can give too much weight to passing circumstances.

The Commission therefore considered in some detail how to best arrive at a suitable estimate of the market risk premium as explained in the rest of this section. The following sub-section explains the methodology, known as a dividend growth model.

Dividend growth models and the market risk premium

Dividend growth models estimate an implied market risk premium. They do so by solving for the expected rate of return that will ensure that the present value of expected dividends (over a long time horizon) will equal the current market price of the market portfolio and then deducting the relevant risk-free rate.

The simplest formulation for a dividend growth model is to assume a constant growth rate of expected dividends per share on a perpetuity basis and solve for the expected return on equity that will equate the present value of expected dividends to the current market value of the market portfolio.

Thus, using the perpetuity assumption:

$$(4) P_m = D_0(1 + E(g))/(E(R_m) - E(g))$$

where

P_m is the current value of the market portfolio

D_0 is the current level of dividends per share

$E(g)$ is the expected growth rate of dividends

$E(R_m)$ is the expected total return on the market portfolio.

and

$$(4) E(R_m) = D_0(1 + E(g))/P_m + E(g)$$

The implied market risk premium can then be calculated by deducting an appropriate measure of the risk-free rate, $E(R_f)$, from the expected return for the market as a whole, $E(R_m)$.

⁴⁶ Industry Panel, 2014: 175.

The key unobservable parameters are the expected dividend growth rate, $E(g)$, and the expected risk-free rate, $E(R_f)$, that should apply.

There are significant difficulties in estimating the expected growth of dividends on a perpetuity basis (that is, effectively over an infinite time horizon). Typically, analysts' forecasts are used, but many experts consider these have an upward bias. As discussed by Cornell (2009), analysts' forecasts of dividend growth rates tend to be higher than reasonable estimates of the long term growth rate of GDP. This is not credible over a long time horizon because eventually the absolute value of dividends would exceed GDP.⁴⁷

The Industry Panel's estimate of the market risk premium

The market risk parameter specified in the Industry Panel's report was 7.23 per cent.

The panel estimated the implied market risk premium as a 40 day average of Bloomberg's daily implied market risk premiums as estimated by their dividend growth models.⁴⁸ This approach assumes that the current equity market is correctly priced and solves for the required rate of return that equates the present value of expected dividends over a long time horizon with the current price of the market portfolio.⁴⁹ The Industry Panel's final and draft reports did not provide a discussion of why the Bloomberg estimates were preferred over other dividend growth model approaches.

In its issues paper for the investigation into water and sewerage services prices for 2018–23, the Commission noted its concern about reliance on the Bloomberg methodology as the sole method for estimating a preferred market risk premium. It noted that the Bloomberg methodology appears to be relatively sensitive to short-term fluctuations in share prices and that the objective is to obtain the best estimate of the market risk premium that is likely to be relevant for a five year regulatory period.⁵⁰

In this regard, SFG Consulting advice to IPART on methodologies for estimating the market risk premium is worthy of noting:⁵¹

Over the time period for which data is available, it is clear that the Bloomberg estimates of the market cost of equity are both higher than our estimates, and more variable over time. We cannot say with certainty which series exhibited the 'correct' level of variation over time because both series are estimates of the cost of capital. The Bloomberg series could be more volatile over time because the true cost of equity

⁴⁷ Cornell, 1999.

⁴⁸ Industry Panel, 2015: 71.

⁴⁹ Industry Panel, 2015: 78.

⁵⁰ ICRC, 2017: 27.

⁵¹ SFG Consulting, 2013: 12.68.

varied considerably over this time period; or the Bloomberg series could be more volatile because of noise.

The Bloomberg series is more sensitive to short-term price fluctuations because analysts do not instantaneously adjust their earnings forecasts every time the share price moves. When there is a large change in the share price, this reflects news about expected cash flows, or news about the risk of those cash flows, or both. If analysts instantaneously adjusted their earnings forecasts every time the share price moved, the news about expected cash flows would be reflected in the share price and the analyst's earnings forecast. But if the share price changes and analysts do not immediately adjust their earnings forecasts, the movement in the implied cost of capital will be overstated.

Other regulators' use of dividend growth models

To address the problem of forecasting the market risk premium using dividend growth models, the models are modified by defining two or more growth stages. This is a complicated modification and requires further assumptions that should also be examined.

The AER's primary concern with using dividend growth models to estimate the market risk premium relates to the sensitivity of the estimates to assumptions about the long term growth rate.⁵² The AER further noted that it did not consider any particular set of assumptions to be superior or more reliable.⁵³

The AER recognises that these models are more likely to reflect prevailing market conditions than other approaches but, given concerns about the reliability of the estimates, uses them (in addition to other evidence) to inform its view of the market risk premium. The AER's approach establishes a 'foundation model' based on the standard CAPM as a starting point and uses a range of evidence to arrive at a point estimate of the allowed expected return on equity for certain regulatory purposes.⁵⁴

To develop more reliable information based on dividend growth models, the AER uses two-stage and three-stage models to produce a range of estimates to inform its view of the market risk premium rather than to set a benchmark for incorporation in its foundation model. Single-stage dividend growth models use a constant rate of growth for dividends, while multiple-stage dividend growth models adopt different assumptions about the rate of growth for dividends.

The approach adopted in the Industry Panel report is one of the six methodologies that have been used by IPART to help form a preferred estimate of the market risk premium based on current market data.⁵⁵ This is used with averages based on historic estimates to obtain an overall preferred estimate of the market risk premium.

⁵² AER, 2013b: 15, 84–5.

⁵³ AER, 2013b: 84–5.

⁵⁴ AER, 2013a: 50.

⁵⁵ IPART, 2013: 33.

Five of the six current market data estimates IPART refers to are based on dividend growth models. The sixth current market data model is based on a calculation by the consultant SFG and informed by the distributions of influencing variables. This technique is not based on a formal statistical analysis and does not appear to be referred to in the academic literature or other regulators' reports.

The QCA adopts a similar approach to the AER in using a range of information to form a view about a preferred point estimate for the market risk premium and also uses a multi-stage dividend growth model, with a range of assumptions. In its market parameters paper, the QCA obtained an estimated range for the market risk premium using the dividend growth model of 5.5–8.0 per cent, with a median estimate of 6.9 per cent.⁵⁶ The QCA further noted, 'The QCA considers that results from dividend growth models should be treated with some caution due to the sensitivities of the results to the assumptions and inputs'.⁵⁷

In its recent decision on the access price for Dalrymple Bay Coal Terminal, the QCA expressed its view about the reliability of dividend growth models as follows:

For the reasons outlined in our market parameters decision, we consider DGM methods to be worthy of consideration because of their forward-looking nature, but relatively unreliable due to their sensitivity to underlying assumptions and inputs. In this respect, we note that the DGM estimates have declined significantly in May 2016 from their level in October 2015 (from a level of 7.3%–9.0%, with a median of 8.2%, to a level of 6.0%–8.0%, with a median of 7.0%). We therefore consider that relatively less emphasis should be placed on DGM methods than on methods that rely on historical data (such as Siegel and Ibbotson) because of the objectivity and reliability of these latter approaches.⁵⁸

The QCA summarised its overall view on the market risk premium and the role of historic and recent data as follows⁵⁹:

As mentioned above, although historical-based methods may not be sensitive to short-term changes in the MRP (and therefore may not reflect the current 'true' MRP), they are nevertheless better estimators of the long-term average MRP, the latter of which is the preferred measure for our purposes.

As pointed out by Lally (2013), even though placing significant weight on the Ibbotson and Siegel estimators may imply that the MRP estimate may not react quickly to changes in the 'true' MRP, this approach is nevertheless desirable because:

In a statistical context, the 'best' estimate of the MRP at the present time is usually understood to mean an estimate that minimises mean squared error (MSE), and this is

⁵⁶ QCA, 2014: 72.

⁵⁷ QCA, 2014: 73.

⁵⁸ QCA, 2016: 79.

⁶⁰ Wright, 2012.

more likely to occur by placing significant weight on the Ibbotson and Siegel estimators.

It is important for a regulator to provide appropriate compensation over the life of the regulated assets, and therefore it is important to obtain a good estimate of the long-run average MRP rather than that prevailing at the current time. Consequently, even if use of the Ibbotson and Siegel approaches tends to underestimate the MRP at the present time, they are likely to contribute to better estimates of the long-run average MRP.

We emphasise that our methodology is not founded solely on historical-based methods but also has regard to forward-looking methods such as the DGM approach, surveys, and general market conditions. Moreover, investors' current expectations are likely to be informed by history. In this way, historical measures could be seen as informing estimates of the forward-looking MRP.⁶⁰

The reference to mean square error relates to the formula for the mean square estimate where the mean square estimate is the sum of any bias in the estimate squared and the estimated variance. Furthermore, if historical and forward-based estimates are averaged the mean square can be reduced.

The inverse relationship between the market risk premium and the risk-free rate

An issue in selecting a preferred estimate of the market risk premium, is whether the forward-looking market risk premium is likely to be fixed irrespective of changes in the risk-free rate. This issue is also related to the extent to which weight should be given to recent market conditions when specifying a preferred market risk premium for regulatory purposes.

Until recently Australian regulators had not explicitly recognised the scope for a relationship between the market risk premium and the risk-free rate. The two factors were typically estimated separately, assuming there was no relationship. Estimates of the market risk premium tended to be relatively stable, while estimates of the risk-free rate were based on current financial conditions at the start of the regulatory period.

With this approach, the overall estimated market rate of return varied in lock-step with the risk-free rate: as the risk-free rate declines the return on the market as whole declines. Regulators in Australia have tended to adopt a relatively stable market risk premium, although both the AER and the QCA increased the market risk premium from a longstanding preference for 6 to 6.5 in recent years.

In contrast, Wright reports on practice in the United Kingdom, where the Office of Gas and Electricity Markets and the UK appeals body, the Competition Commission, assume that the real cost of equity for the market as a whole is relatively stable over time, so that if the risk-free rate declines materially the market risk premium increases materially.⁶⁰

⁶⁰ Wright, 2012.

The two approaches are in effect extremes: one assumes there is no relationship between the risk-free rate and the market risk premium; the other assumes they are perfectly negatively correlated.

In developing its rate of return guidelines, the AER discussed a wide range of evidence and views on the relationship between the market risk premium and the risk-free rate. They concluded there was no consensus in the academic literature on the direction, magnitude and stability of the relationship.⁶¹ Two important reports highlight the different views.

The AER noted that Wright's principal argument was that the risk-free rate is procyclical (lowest in depressed economic conditions and highest in favourable economic conditions), while the MRP is counter-cyclical (highest in depressed economic conditions and lowest in favourable economic conditions).⁶² These aspects are not features of the standard CAPM, which in effect abstracts from macroeconomic considerations in terms of its underlying theory.

In his report for the AER, Lally noted that the crucial question is not whether the correlation is negative but whether it is sufficiently negative. A negative correlation is not a sufficient condition for the real market return on equity to be more stable than the MRP. Using the Australian data, Lally found the correlation coefficient between the risk-free rate and the MRP needs to be at least -0.76 for the real market return on equity to exhibit greater stability than the MRP. The actual correlation between the two in Australia was only -0.12. He also noted that other indirect evidence presented by Wright similarly does not reveal the extent of the correlation. It is therefore not sufficient to support the argument that the real market return on equity is more stable over time than the MRP.⁶³

The AER used the Wright approach to estimate the market risk premium as one of its measures to inform its final view. Using an arithmetic average (the preferred approach), the AER estimated a real return on the market as a whole of 7.2 to 10.0 per cent, depending on the period (from 1883 to 2011). With expected inflation of 2.5 per cent, the range for the long term average nominal return to the market was estimated to be 9.9 to 12.7 per cent.⁶⁴

The AER also used the Wright approach as one of the sources of information it had regard to in arriving at its preferred estimate of a market risk premium of 6.5 per cent. The AER noted that the amount of emphasis it would place on the Wright method would be considered at the time of a determination. It also noted that it considered

⁶¹ AER, 2013b: 26.

⁶² AER, 2013b: 107.

⁶³ Lally, 2013: 15.

⁶⁴ AER, 2013b: 27–8.

dividend growth models as relevant and that they also calculate market risk premiums that are sensitive to interest rates.⁶⁵

In its recent appeal decision the Australian Competition Tribunal endorsed the AER's consideration of the Wright approach and its overall methodology.⁶⁶

The Queensland Competition Authority⁶⁷ and the Economic Regulation Authority⁶⁸ have also both noted the contradictory evidence and lack of consensus about the relationship between the market risk premium and the risk-free rate.

Recent regulatory developments

Table 6.2 summarises the methodologies and estimates recently used by other Australian economic regulators.

Table 6.2 Regulatory methodologies and estimates of the market risk premium

Regulator (sector)	Methodology	Time	Estimate
ACCC (Australia Post)	Historical evidence and other regulatory decisions, AER rate of return guidelines	December 2015	6.0
ACCC (NBN)	Current one-year MRP of 10.5 per cent, transitioning to long-term average of 7 per cent over 10 years. Estimated by applying constant premium per unit of risk (implied volatility) of 7/14 for 1-year options on ASX 200 index. Supported by historical data adjusted for franking tax credits.	December 2013	7.0
ACCC (Telecommunications fixed-line services)	Most weight on historical estimates, various periods 1883–2014. Supported by evidence from 7 surveys over the period 2013–2015, conditioning variables (dividend yields, credit spreads and implied volatility, regulatory decisions). No weight to dividend growth models. No clear consensus on relationship between market risk premium and risk-free rate.	October 2015	6.0
ACCC (Hunter Rail Coal Network)	Most weight on historical returns, various periods 1883–2015 and 8 surveys over the period 2013–2015. Previous regulatory decisions for ARTC, NSW bulk water, fixed-line telecommunications services.	April 2017	6.0
ACCC (Bulk water in the Murray–Darling Basin)	Historical returns, 13 surveys 2005–2013.	June 2014	6.5
AER (Energy network businesses guidelines)	Estimate a range based on various sources including historical returns as primary sources, with consideration given to dividend growth models, survey evidence, conditioning variables (dividend yields, credit spreads and implied volatility). Point estimate gives greatest consideration to historical averages, significant	December 2013	6.5

⁶⁵ AER, 2013b: 12, 215.

⁶⁶ ACT, 2016: 221.

⁶⁷ QCA, 2014: 19–22, QCA, 2016: 79.

⁶⁸ ERA, 2013: 145–7.

Regulator (sector)	Methodology	Time	Estimate
	consideration to dividend growth estimates, some consideration to survey estimates and limited consideration to conditioning variables and other regulators' estimates.		
AER (Electricity networks in various jurisdictions)	As above	October 2015	6.5
ESC (Water)	Not specified	June 2016	6.0
ESCOSA (Water)	Historical approach	June 2016	6.0
ERA (Gas distribution)	Broad range of material, standard CAPM and dividend growth models; historical and forward-looking models used to establish a range from 5.4 to 8.8 per cent.	June 2016	7.4
ERA (Rate of return guidelines)	As above, with a range of 5.0 to 7.5 per cent using historical averages and dividend growth model. Contradictory evidence of relationship between risk-free rate and MRP.		5.0 to 7.5
IPART (Water)	Average of long-term and current market data estimates, providing a range of 5.5 per cent to 9.8 per cent	June 2016	7.35
QCA (Dalrymple Bay Coal Terminal)	Historic returns as primary sources, with consideration given to survey evidence, Wright method, dividend growth model, volatility measures, corporate debt premiums, liquidity premiums, consideration of relationship between MRP and risk-free rate. MRP more stable than return on equity. Changing relationship between MRP and risk-free rate.	November 2016	6.5
QCA (Gladstone Area Water Board)	Same factors as above.	May 2015	6.5
QCA (Market parameters decision)	Same factors as above.	August 2014	6.5

Sources: ACCC 2017: 143–9, ACCC 2015a: 30, ACCC 2015b: 68–77, 88–9, ACCC 2013: 98, AER 2013a: 90–7, ESC 2016: 53, ESC 2015: 28, ESCOSA 2016: 124, ERA, 2016: 126, ERA, 2013: 136–60, IPART 2016: 125, QCA 2016: 75–80, QCA, 2015: QCA, 2014: 15–23.

Some regulators use a range of methodologies to arrive at a preferred estimate of the market risk premium. The Australian Energy Regulator (AER), the Economic Regulation Authority (ERA), Independent Pricing and Regulatory Tribunal (IPART) and the Queensland Competition Authority (QCA) have completed major reviews of their WACC methodologies in recent years and used a range of information to establish a preferred market risk premium.⁶⁹ This perspective recognises that there is no firm consensus on how the market risk premium should be estimated for regulatory applications and that the various estimation methods have advantages and disadvantages.

⁶⁹ AER, 2013, ERA 2013, IPART, 2013, QCA, 2014.

The AER's current approach to estimating the market risk premium uses a range of theoretical and empirical evidence, including historical excess returns, the dividend growth model, survey evidence, financial market volatility measures, credit spreads, regulatory precedents, and regulatory judgement.⁷⁰ The AER's preferred estimate of the market risk premium has been 6.5 per cent for several years now, but before that it was set at 6.0 per cent. The AER has also noted its concerns about the reliability of estimates based on dividend growth models and their tendency to lead to estimates with an upward bias.⁷¹

The Australian Competition Tribunal also noted the AER's concerns about the reliability of dividend growth models when considering the merits review appeal by various electricity distribution and transmission companies about various AER decisions, including in relation to the return on equity.⁷² The Tribunal upheld the AER approach to estimating the return on equity.⁷³

IPART uses several methodologies to help form a preferred estimate of the market risk premium.⁷⁴ IPART uses both long term averages and current market data (with six methodologies for current market data, including the Bloomberg approach) to establish a range for the market risk premium, the mid-point of the range being the default estimate.⁷⁵ The default estimate may be adjusted along with other parameters in the WACC if an uncertainty index measure exceeds one standard deviation of the long-term average. IPART's most recent decision for setting the price for water services for Sydney Water Corporation estimated the market risk premium as the average of the mid-points for a long-term average of 6 per cent and an implied short-term value of 8.7 per cent to obtain a preferred average estimate, across the various approaches, of 7.35 per cent.⁷⁶

The ERA also uses a range of methodologies. It establishes a range based on the lower and upper points of various historical and dividend growth model estimates and then exercises its judgement to determine a point estimate that is consistent with prevailing conditions at the time of its final decision.⁷⁷

The QCA uses a similar approach to the AER, comprising two types of historical averaging methods, a dividend growth model, survey evidence, information about the volatility of returns, and debt premiums and regulatory judgement to also arrive at a

⁷⁰ AER, 2013.

⁷¹ AER 2016a: 3–180 to 3–181.

⁷² ACT, 2016: 190.

⁷³ AER 2016b: 2.

⁷⁴ IPART, 2013: 33.

⁷⁵ IPART, 2013: 2–4.

⁷⁶ IPART, 2016: 125.

⁷⁷ ERA, 2017: 126. ERA 2013: 159–60.

preferred market risk premium of 6.5 per cent.⁷⁸ Before the review conducted in 2014 the QCA's preferred market risk premium was also six per cent, as was the case for several other regulatory decisions. In its most recent decision, in relation to the Dalrymple Bay Coal Terminal, the QCA continued to prefer a market risk premium of 6.5 per cent.⁷⁹

The AER and the QCA have recognised that there may be some need to adjust the market risk premium in the light of unusual financial conditions and very low risk-free rates, but the adjustments to the market risk premium have been much smaller – that is, from 6 per cent to 6.5 per cent for both the AER and the QCA.

The AER reports also discuss the estimates of other regulators.⁸⁰ In its recent draft decision for AusNet Services (transmission) the AER noted that for some 20 regulatory decisions, covering rail, gas pipelines, water utilities, telecommunications and Australia Post between August 2015 and March 2016, the estimates of the market risk premium ranged from 6 per cent to 7.6 per cent. The AER noted that its estimate of 6.5 per cent was consistent with the range of estimates from other regulators over time.⁸¹

The AER's approach and preferred estimate have involved extensive research and consultation. Development of its Rate of Return Guidelines entailed consideration of a wide range of models and information and was subject itself to an extensive consultation process.⁸² It was challenged by many service providers in the process and in its application to various electricity distribution and transmission network services business, including in the recent merits review appeal to the Australian Competition Tribunal, which upheld its approach.⁸³

The approach of the AER and the QCA are considered to give less weight to dividend growth models and recent market conditions than the ERA, the IPART and the Industry Panel decision.

The Commission considers that the AER and QCA approach should be given the greatest weight given the range of evidence used and the greater weight applied to historical estimates. Historical estimates are considered more reliable, given the lower standard errors of the estimates, which in turn are considered to contribute to a lower mean squared error (the sum of the bias squared and the variance of the estimate).

Furthermore, there is conflicting evidence of the relationship between the market risk premium and the risk-free rate where a negative relationship is required to justify an

⁷⁸ QCA, 2014: 23.

⁷⁹ QCA, 2016: 123.

⁸⁰ AER, 2013b: 100–2, AER 2016: 3-224 to 3–226.

⁸¹ AER, 2016: 3-225 to 3–226.

⁸² AER, 2013.

⁸³ ACT, 2015.

increase in the market risk premium when the risk-free rate declines. It is also noted that there appears little prospect of a material change in the risk-free rate over the regulatory period that is the subject of the Commission's investigation.

Higher estimates of the market risk premium also rely on greater weight being given to dividend growth models, but, as noted, these are considered to incorporate an upward bias. In this respect it is clear that reliance on a dividend growth model, as in the Industry Panel report, is not reasonable. The practice of using a range of methods and models, provided they have credibility, is more appropriate when there is uncertainty about a parameter, as recognised by the Australian Competition Tribunal in endorsing the AER approach.⁸⁴

Considering all the above factors, the Commission's draft decision is to adopt a market risk premium of 6.5 per cent.

6.1.8 Gearing

The cost of equity and the cost of debt are weighted by the shares of equity and debt capital in the total asset value of the benchmark entity. The gearing ratio is simply the ratio of debt to the value of debt plus equity. The Industry Panel adopted a 60 per cent gearing ratio, which was consistent with the gearing ratio adopted by other regulators at the time.

Icon Water is proposing to retain a gearing ratio of 60 per cent, noting the consistency with what other regulators continue to use.

The Commission notes that a gearing ratio of 60 per cent is likely to be relatively low for an entity with a credit rating higher than a B rating but is proposing to retain the ratio because of its consistency with the decisions of other regulators and the Industry Panel's decision.

6.1.9 Nominal post-tax vanilla WACC

Table 6.3 provides a comparison of the WACC parameters in the Industry Panel's decision, Icon Water's proposal and the Commission's draft decision.

⁸⁴ ACT, 2015: 86.

Table 6.3 WACC parameters: a comparison

WACC parameter	Industry Panel (31 May 2013)	Icon Water (31 May 2013)	Commission (31 May 2017)
Risk-free rate (per cent)	3.22	2.78	2.78
Debt margin (per cent)	3.13	2.08	2.08
Debt-raising cost (per cent)	0.125	0.125	0.125
Equity beta	0.70	0.70	0.70
Market risk premium (per cent)	7.23	7.03	6.5
Gearing (per cent)	60	60	60
Cost of debt (per cent)	6.48	4.99	4.99
Cost of equity (per cent)	8.28	7.71	7.33
Nominal post-tax vanilla WACC (per cent)	7.20	6.07	5.93

Source: Icon Water (2017).

The Commission’s draft decision is for a nominal post-tax ‘vanilla’ WACC of 5.93 per cent, calibrated assuming a risk-free rate as of 31 March 2017. This will change to reflect the prevailing risk-free interest rate at the time the Commission’s final decision is set to apply.

This estimate is very close to Icon Water’s proposed WACC of 6.07 per cent. It is markedly lower than the Industry Panel’s WACC of 7.20 per cent, reflecting a lower risk-free rate, a lower cost of debt margin and a lower market risk premium.

6.2 The return on capital

The return on capital is calculated by multiplying the allowed rate of return (nominal post-tax vanilla WACC) by the starting value of the RAB plus half of forecast capital expenditure in each year of the regulatory period and deducting the indexation adjustment that is applied to the RAB.

Since the rate of return is specified in nominal terms and the asset base is indexed for forecast inflation, there is a need to deduct the indexation adjustment from the return on capital to avoid double-counting of inflation. This approach leads to a flatter revenue stream than if the asset base is not indexed and no adjustment is made to the nominal return on capital. It is the approach used by the Industry Panel and most other economic regulators applying the building block model in Australia.

Forecast capital expenditure is assumed to occur mid-year, so a rate of return is applied to only half the value of the capital expenditure in a year.

The calculation of the return on capital is as follows:

$$\text{Return on capital} = (\text{Opening RAB}_t + \text{Forecast capex}_t \times 0.5) \times \text{nominal}$$

post-tax WACC – Inflation adjustment_t

Calculation of the rate of return is discussed in Section 6.1. Calculation of the RAB is explained in Chapter 5.

Table 6.4 shows the estimates of the return on capital for water and sewerage services for the period 2018–23.

Table 6.4 Return on capital for water and sewerage, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23
Water					
Value of RAB	1,527.97	1,575.70	1,623.09	1,664.89	1,697.61
Return on capital excluding indexation adjustment	90.54	93.37	96.17	98.65	100.59
Inflation adjustment	38.20	39.39	40.58	41.62	42.44
Return on capital including indexation adjustment	52.34	53.97	55.59	57.03	58.15
Sewerage					
Value of RAB	891.63	937.47	966.43	989.89	1,009.55
Return on capital excluding indexation adjustment	52.83	55.55	57.27	58.65	59.82
Inflation adjustment	22.29	23.44	24.16	24.75	25.24
Return on capital including indexation adjustment	30.54	32.11	33.10	33.91	34.58

Source: Commission's calculations.

6.3 Tax expenses

The use of the nominal post-tax vanilla WACC requires a separate allowance for tax expenses. Icon Water's submission provides a useful summary of how tax expenses are calculated for inclusion as an allowed cost.⁸⁵ The approach is the same as in the Industry Panel report. The Commission proposes to continue applying this approach, which involves the estimation of a tax asset base, the calculation of taxable profit, and the deduction of value of imputation credits.

6.3.1 The tax asset base

To calculate tax expenses a separate Tax Asset Base (TAB) is calculated. The TAB methodology mirrors the RAB methodology with the following exceptions:

⁸⁵ Icon Water (2017), Price Proposal, 2018–23 Water and Sewerage Price Proposal, Attachment 10: Corporate Income Tax.

- The opening values in the roll-forward calculation reflect TAB values, not RAB values
- Depreciation in the roll-forward calculation for the TAB is based on actual depreciation, not forecast depreciation
- Tax asset lives, not economic asset lives, are used to calculate depreciation
- The TAB is not indexed for inflation; rather, it is maintained in historic terms

6.3.2 The TAB roll forward

The TAB is rolled forward from 2013–14 to 2017–18 to establish an opening value for 2018–19. The opening value for 2013–14 must be adjusted for the difference between forecast and actual depreciation for the last year of the previous regulatory period (2012–13) since actual depreciation was not known at the time. Then the TAB is rolled forward, adding actual net capital expenditure and deducting asset disposals and actual depreciation for each year of the roll forward period. The estimates of the TAB for water and sewerage for the period 2013–18 are shown in Table 6.5.

Table 6.5 Water and sewerage TAB roll forward, 2013–18 (\$m, nominal)

	2013–14	2014–15	2015–16	2016–17	2017–18
Water					
Opening water TAB	1,086.83	1,089.62	1,080.27	1,078.14	1,044.39
Net capital expenditure	34.37	24.57	31.02	34.65	40.15
Asset disposals	0.00	1.55	0.00	34.25	0.00
Depreciation	31.58	32.37	33.15	34.15	36.23
Closing water TAB	1,089.62	1,080.27	1,078.14	1,044.39	1,048.31
Sewerage					
Opening TAB	392.23	394.40	400.23	429.29	469.11
Net capital expenditure	18.32	24.76	47.48	61.23	87.50
Asset disposals	0.00	2.00	0.00	0.00	0.00
Depreciation	16.15	16.93	18.42	21.41	25.98
Closing TAB	394.40	400.23	429.29	469.11	530.63

Source: Icon Water (2017).

6.3.3 The TAB for 2018–19 to 2022–23

The closing value for the TAB for 2017–18 from the roll forward calculation just described is the opening value for the TAB for 2018–19. This opening value is adjusted for forecast net capital expenditure, forecast asset disposals and forecast depreciation for that year. The calculation is repeated for each subsequent year of the regulatory period.

The Commission's estimates of the TAB for water and sewerage for the period 2018–23 are shown in Table 6.6.

Table 6.6 Water and sewerage TAB roll forward, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23
Water					
Opening TAB	1,048.31	1,051.44	1,057.21	1,059.37	1,053.80
Net capital expenditure	37.99	43.23	41.77	35.84	27.06
Asset disposals	0.00	0.00	0.00	0.00	0.00
Depreciation	34.87	37.46	39.61	41.41	43.04
Closing TAB	1,051.44	1,057.21	1,059.37	1,053.80	1,037.82
Sewerage					
Opening TAB	530.63	570.87	579.84	586.58	585.25
Net capital expenditure	64.13	35.95	35.76	29.17	31.69
Asset disposals	0.00	0.00	0.00	0.00	0.00
Depreciation	23.89	26.98	29.02	30.50	31.62
Closing TAB	570.87	579.84	586.58	585.25	585.32

Source: Commission's calculation.

6.3.4 Total tax expenses

Total tax expenses are calculated by multiplying taxable profit by the corporate tax rate. Consistent with the Industry Panel report, the corporate tax rate is set at 30 per cent. Adoption of a corporate tax rate of 30 per cent is also consistent with the rate expected to be applicable in the 2018–23 period to the benchmark efficient entity that is applied in estimating the WACC and net tax expenses.

Taxable profit is calculated following the methodology used in the 2015 Industry Panel decision, as follows:

$$\text{Taxable profit} = \text{Forecast tariff revenue} + \text{Other income} - \text{Tax depreciation} - \text{Interest expenses} - \text{Operating expenses} - \text{Previous year losses}$$

The components of taxable profit are described in various parts of this report:

- Forecast tariff revenue and other income – Chapter 7
- Tax depreciation – as described
- Interest expenses – calculated by multiplying the RAB by the share of debt and the cost of debt
- Operating expenses – Chapter 3
- Previous year losses are the accumulated tax losses from previous years

The taxable profit and total tax expenses for water and sewerage for the period 2018–19 to 2022–23 are shown in Table 6.7 and Table 6.8.

Table 6.7 Taxable profit and total tax expenses, water, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23
Forecast tariff revenue	166.30	171.11	177.14	183.94	190.86
plus other income	14.77	15.06	15.44	15.84	16.24
less tax depreciation	34.87	37.46	39.61	41.41	43.04
less interest	45.72	47.15	48.56	49.81	50.79
less operating & maintenance	96.49	98.77	101.48	105.22	108.88
less previous year losses	0.00	0.00	0.00	0.00	0.00
Taxable profit	4.00	2.80	2.93	3.33	4.38
Total tax expenses	1.20	0.84	0.88	1.00	1.31

Source: Commission's calculations.

Table 6.8 Taxable profit and total tax expenses, for sewerage, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23
Forecast tariff revenue	129.46	131.53	133.64	135.78	137.95
plus other income	13.46	13.86	14.19	14.53	14.87
less tax depreciation	23.89	26.98	29.02	30.50	31.62
less interest	26.68	28.05	28.92	29.62	30.21
less operating & maintenance	78.17	79.48	81.14	83.86	86.51
less previous year losses	0.00	0.00	0.00	0.00	0.00
Taxable profit	14.19	10.88	8.76	6.33	4.49
Total tax expenses	4.26	3.26	2.63	1.90	1.35

Source: Commission's calculations.

6.3.5 Imputation credits

In establishing an appropriate allowance for tax expenses for a regulated entity in Australia, it is necessary to calculate a value for imputation credits. This is then deducted from tax expenses to obtain an estimate of net tax expenses.

Under Australia's imputation tax system, introduced in 1987, company tax is integrated with the personal tax system for Australian taxpayers. Under the system, tax is first collected as 'company tax' and then when shareholders receive (franked) dividends they are credited with these 'company tax' payments, called imputation

credits, for use against their personal tax liabilities on the grossed-up (for tax credits) dividends.⁸⁶

In a seminal paper that still forms the basis for how to interpret the impact of dividend imputation on the cost of capital or allow for it in the cash flows for regulated businesses, Officer derived various formulae for the cost of capital recognising the impact of imputation credits.⁸⁷

The formula for the cost of capital differed depending on how the cash flows were defined to recognise the treatment of tax. In the case of the formula for the nominal post-tax vanilla WACC, all the tax adjustments are incorporated in the cash flows, rather than by the inclusion of terms in the WACC.

In his analysis Officer used the variable name 'gamma' to represent the value of imputation credits. He defined gamma as follows:

Thus [gamma] is the proportion collected from the company which gives rise to the tax credit associated with a franked dividend. This franking credit can be utilized as tax credit against the personal tax liabilities of the shareholder. [Gamma] can be interpreted as the value of a dollar of tax credit to the shareholder.⁸⁸

In the Officer framework it is clear that the value of gamma depends on the proportion of company tax paid that is distributed as imputation credits attached to franked dividends and the proportion of distributed imputation credits that can be utilised by resident taxpayers to obtain a rebate on their tax.⁸⁹ Many overseas investors in Australian companies would not be able to use the imputation credit to obtain a rebate for the company tax paid in Australia.

Thus gamma is the product of two elements:

- 1) The distribution rate – the ratio of imputation credits to company tax paid.
- 2) The utilisation rate – the rate at which investors (in aggregate) utilise the distributed imputation credits to obtain a tax rebate.

Or

$$(3) \text{ gamma } (\gamma) = \text{ distribution rate } \times \text{ utilisation rate}$$

In order to estimate an appropriate allowance for imputation credits it is necessary to estimate the distribution rate and the utilisation rate and form their product.

The value of gamma can vary between 0 and 1. If all franked dividends are distributed and can be fully utilised then gamma = 1. But gamma must be less than 1 because not

⁸⁶ Officer, 2011: 4–5.

⁸⁷ Officer, 1994.

⁸⁸ Officer, 1994: 4.

⁸⁹ Officer, 2011: 4–5.

all franked dividends are distributed and some shareholders (particularly foreign shareholders) cannot utilise imputation credits.

The Industry Panel preferred gamma estimate of 0.5. It noted that several regulators had lowered their estimates of gamma following a decision by the Australian Competition Tribunal but that a value of 0.5 had greater regulatory precedent in the water and sewerage services industry than a 0.25 value.⁹⁰

Central to the disagreement about an appropriate value for gamma is the definition of gamma and its interpretation. The disagreement concerns whether it should be interpreted as a ‘value of a dollar of tax credit to the shareholder’, as defined by Officer, or a ‘market value’ (that can be estimated by dividend drop-off studies).

The AER interprets the utilisation rate as the rate at which investors in the aggregate can utilise the imputation credits to obtain a tax rate and not as the market value of the imputation credits.⁹¹ In its 2013 review the AER considered various approaches to estimating the distribution rate (or payout ratio) and the utilisation rate. It preferred a distribution rate of 0.7 (based primarily on taxation statistics) and a utilisation rate of 0.7 (based on consideration of the share of equity owned by domestic residents, tax statistics, implied market values, conceptual boundaries and other supporting evidence). This leads to a preferred estimate of gamma of 0.5.⁹²

In its 2013 review the AER noted previous reviews, studies and estimates of gamma, including an Australian Competition Tribunal 2011 decision that set a payout ratio of 0.7 and a utilisation rate of 0.35 based on a single dividend drop-off study.⁹³ This leads to a gamma estimate of 0.25. The AER noted that the Tribunal indicated it would be assisted by further information about the rationale for the gamma component and how it relates to the building block components and that issues relating to the foundations for an appropriate value of gamma may be taken up in a further decision.⁹⁴

The AER used a gamma value of 0.25 after 2011 until it completed its 2013 review. It took the opportunity in its 2013 review to discuss conceptual factors and a wider range of evidence in relation to an appropriate determination for gamma and recommended an estimate of 0.5 for gamma.⁹⁵ In subsequent decisions it has adopted a gamma value of 0.4 (from a possible range of 0.3 to 0.5).⁹⁶

⁹⁰ Industry Panel, 2015: 79–81.

⁹¹ AER, 2013b: 139.

⁹² AER, 2013b: 159.

⁹³ AER, 2013a: 162, 2013b: 144, ACT, 2010, paras 149–50.

⁹⁴ AER, 2013b: 144.

⁹⁵ *Ibid*, 146–50.

⁹⁶ ACT, 2016: para 131.

The Icon Water submission provides a useful summary of recent legal decisions in relation to the value of gamma.⁹⁷

In May 2015 four electricity distribution networks and one gas network business applied to the Australian Competition Tribunal for review of decisions made by the AER in relation to a number of matters, including gamma. The main issues in dispute in relation to gamma were the appropriate interpretation of the distribution rate and the utilisation rate and appropriate methods, information and estimates of the components of gamma. In February 2016 the Tribunal released its decision and reasoning.⁹⁸ The Tribunal considered that, ‘of the various methodologies for estimating gamma employed by the AER, market value studies are best placed to capture the considerations that investors make in determining the worth of imputation credits to them’.⁹⁹

The Tribunal also concluded that tax statistics and the equity ownership methodologies provide an upper bound on estimates of the utilisation.¹⁰⁰ It put forward a provisional view that the best estimate of the utilisation rate was 0.35.¹⁰¹

The AER applied to the Federal Court for judicial review of the Tribunal’s decision on gamma and in particular on the meaning of ‘value’ in the expression of ‘value of imputation credits’. The Full Federal Court’s decision was handed down on 24 May 2017. The court upheld the AER’s appeal as the meaning of ‘value’ and found that the Tribunal’s interpretation of value as based on market studies was incorrect and that the AER did not make an error of construction in focusing on utilisation rather than market values.¹⁰² The court accepted the AER’s submission that the rules require consistency in the way the relevant building blocks interact – that is, on a post-company tax and pre-personal tax and personal costs basis.¹⁰³

The Federal Court found that the Tribunal erred in concluding that the value of gamma is (only) the value claimed or utilised as demonstrated by the behaviour of the shareholder recipients of the imputation credits:

The present context relates to a statutory model rather than the value of something which exists. In our opinion the Tribunal was distracted by the apparent simplicity of the concept of market studies and data into mistaking what was to be estimated as real in a market rather than as estimates within a model.

⁹⁷ Icon Water (2017), Price Proposal, 2018-23 Water and Sewerage Price Proposal, Attachment 10: Corporate Income Tax: 9-11.

⁹⁸ ACT, 2016: 269–94.

⁹⁹ ACT, 2016: para 1096.

¹⁰⁰ ACT, 2016: para 1095.

¹⁰¹ ACT, 2016: para 1103.

¹⁰² Federal Court of Australia, 2017: 215–16.

¹⁰³ AER, 2017: 22–3.

This is what led the Tribunal into error at [1081]-[1082] in concluding that the value of gamma is (only) what is claimed or utilised as demonstrated by the behaviour of the shareholder recipients of the imputation credits.¹⁰⁴

The most recent AER decision after the Federal Court decision noted that the Full Federal Court's decision on this point was consistent with the approach it has taken in all regulatory decisions released since November 2014 (which is for a gamma of 0.4).¹⁰⁵

The AER decision also noted that a further Tribunal decision in relation to SA Power Networks in October 2016 upheld the AER's decision to value gamma at 0.4 and found there was no error in the AER's approach or conclusion.¹⁰⁶ SA Power Networks subsequently sought review of the Tribunal's decision in the Full Federal Court, and the matter was heard in May 2017. The Full Federal Court's decision is at present pending.

The AER recently summarised the range of evidence it uses to estimate gamma and in particular the utilisation rate.¹⁰⁷ The key points are as follows:

- The approach set out in the Rate of Return Guideline has been broadly maintained but re-examination of the relevant evidence and estimates leads to a departure from the 0.5 value of imputation credits in the guideline
- A value of imputation credits of 0.4 from within a range of 0.3 to 0.5 is preferred
- A range of relevant evidence is used to estimate the utilisation rate:
 - The equity (domestic) ownership rate is considered to provide the best estimate of the utilisation rate. Estimates of the utilisation rate vary from 0.56 to 0.68 for all companies and from 0.38 to 0.55 for listed companies. With respective preferred distribution rates of 0.7 and 0.75 the ranges for gamma are 0.40 to 0.47 for all companies and 0.28 to 0.41 for listed companies.¹⁰⁸ An estimate well below the top of the range for all equity is used
 - Taxation statistics are considered to provide a separate point estimate of the utilisation rate that is not inconsistent with the evidence from the equity ownership approach but is considered to be of questionable reliability and not an upper bound estimate
 - Implied market value studies are another source of evidence, but they are affected by factors such as differential personal taxation and other personal costs and so they do not provide an estimate of the utilisation value to

¹⁰⁴ Federal Court of Australia, 2017: paras 753–4, 216.

¹⁰⁵ AER, 2017: 23.

¹⁰⁶ AER, 2017: 23.

¹⁰⁷ AER, 2017a: 22–3 and AER 2017b: 25–6.

¹⁰⁸ AER 2017a: 29.

investors in the market per dollar of imputation credits distributed on a post-tax (pre-personal tax and costs basis)

- The estimate of 0.4 is within the range supported by the opinion of several experts in the field
- The preferred estimate is consistent with providing regulatory certainty since it is consistent with the value used for all AER regulatory decisions released in 2015 and 2016
- Adopting a value of imputation credits that is rounded to one decimal place appropriately reflects the uncertainty and imprecision associated with this parameter

The Commission also notes that in a recent decision on the cost of capital for the Dalrymple Bay Coal Terminal the Queensland Competition Authority reviewed recent information on gamma, including the Tribunal decision, and confirmed its interpretation of gamma as being consistent with the AER interpretation.¹⁰⁹ The QCA confirmed that its preferred method for estimating the utilisation rate was to consider the relative importance of several estimation methods and that it did not accept the market-value definition.¹¹⁰ After reviewing the evidence, the QCA required the use of a gamma of 0.47¹¹¹, the value preferred in its market parameters paper of 2014.¹¹²

The Commission agrees with the AER and the QCA interpretations of the definition of gamma and considers that both organisations have considered a wide range of relevant and recent evidence in a thorough manner. The Commission also recognises the importance of the Federal Court decision that upheld the AER approach when it appealed the Tribunal decision.

Icon Water is proposing a gamma of 0.25 based on its view that implied market value is the appropriate definition of the utilisation rate, rather than the dollar value to a taxpayer of an imputation credit and a single dividend drop-off study.

In the light of all this, including the information presented in the Icon Water submission, the Commission prefers the interpretations of the AER and the QCA and their supporting research and over the results of a single dividend-drop off study.

The Commission considers that a gamma of 0.4 should be used, primarily on the basis of the AER work that has been completed and tested by legal processes, and finds this estimate is conservative in terms of ensuring there is an adequate allowance for tax expenses.

¹⁰⁹ QCA, 2016.

¹¹⁰ QCA, 2016: 119.

¹¹¹ QCA, 2016: 121.

¹¹² QCA, 2014, 101.

6.3.6 Net tax expenses

Net tax expenses are calculated thus:

$$\text{Net tax expenses} = \text{Tax expenses} \times (1 - \gamma)$$

Icon Water's proposed net tax expenses based on a value of gamma of 0.25 are shown in Table 6.9.

Table 6.9 Net tax expenses, water and sewerage, 2018–23: Icon Water (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23
Water	1.82	1.57	1.48	1.25	1.53
Sewerage services	3.46	2.93	2.64	2.02	1.99
Total	5.28	4.50	4.12	3.27	3.52

Source: Icon Water (2017).

As explained in the preceding section, the Commission's draft decision adopts a gamma value of 0.4.

The resulting net tax expenses used in the calculation of maximum allowable revenue are shown below in Table 6.10.

Table 6.10 Draft decision: net tax expenses, water and sewerage, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23
Water	0.72	0.50	0.53	0.60	0.79
Sewerage services	2.55	1.96	1.58	1.14	0.81
Total	3.27	2.46	2.10	1.74	1.60

Sources: Commission's calculations and Icon Water (2017).

6.4 The Commission's draft decision

As explained in Section 6.1, the Commission agrees with all Icon Water's proposed parameters for the nominal post-tax vanilla WACC – with the exception of the market risk premium and the value of imputation credits used to calculate net tax expenses.

The Commission also agrees with the approach used by Icon Water to calculate the return on capital by applying the allowed rate of return to the RAB and half of the capital expenditure in a year and deducting the inflation adjustment that is applied to the RAB.

6.4.1 Equity beta

Icon Water's proposed equity beta is 0.7, the same as adopted in the Industry Panel's decision. Icon Water is proposing a form of regulation that greatly reduces volume risk

during the regulatory period compared with that applied by the Industry Panel for the 2013–18 regulatory period.

One aspect that needs to be considered therefore concerns the extent to which Icon Water’s proposed change to the form of regulation – which virtually eliminates volume risk for Icon Water and transfers it to consumers – should be reflected in an adjustment to the equity beta. This follows because the estimate of 0.7 was considered appropriate by the Industry Panel when its hybrid methodology entailed considerably greater volume risk for Icon Water.

The Commission’s draft decision is to retain an equity beta of 0.7, consistent with the Industry Panel’s final decision and Icon Water’s submission, and to retain the existing hybrid price and revenue cap mechanism.

6.4.2 The market risk premium

Icon Water is proposing a market risk premium of 7.03 per cent, noting:

Based on relevant regulatory precedent and Frontier Economics’ expert opinion that the preferred estimate for the MRP is 7.5 per cent, Icon Water considers that the MRP of 7.03 per cent based on the 2015 Industry Panel methodology is a conservative estimate of the MRP.¹¹³

The Frontier Economics¹¹⁴ report gives 50 per cent weight to historical estimates and 50 per cent weight to forward-looking estimates. The forward-looking estimates give 50 per cent weight to dividend growth estimates, 25 per cent weight to independent expert reports, and 25 per cent weight to market indicator reports.

Four independent expert reports were referred to. All four set returns materially above what would apply using the prevailing risk-free rate and a market risk premium of six per cent.¹¹⁵ The Frontier Economics report notes that this was done by adjusting either the market risk premium or the risk-free rate or an overall ad hoc adjustment. In each case the adjustments were reported to be based on judgement and not other supporting evidence.

The market indicators were the risk-free rate, term spread on 10 and 2 year government bonds, corporate debt spread for 10 year BBB rated corporate bonds and government bonds, and implied volatility of the ASX 200.¹¹⁶

The Commission considers that this gives too much weight to estimates based on current market conditions. The estimate of 7.03 per cent is based on the Industry Panel’s methodology, which uses a recent 40 day average of Bloomberg’s implied

¹¹³ 13. Icon Water, 2017 (Attachment 9): 13.

¹¹⁴ Frontier Economics, 2017: 41–2.

¹¹⁵ Frontier Economics, 2017: 37–8.

¹¹⁶ Frontier Economics, 2017: 39–40.

market risk premium, calculated using a dividend growth model. As explained, dividend growth models are considered to obtain an upward bias; the bias for the Bloomberg estimates was highlighted in the discussion. The Commission also considers that the consultant's report gives too much weight to current market conditions and dividend growth models and that the independent expert reports contain adjustments where there is no supporting evidence.

The Commission considers that the recent decisions by the AER and the QCA cover a wider range of material and give appropriate weight to relevant methodologies. Its draft decision is therefore for a market risk premium of 6.5 per cent.

6.4.3 Imputation credits

Icon Water is proposing a gamma of 0.25 based on a distribution rate of 0.7 and a utilisation rate of 0.35 for imputation credits.¹¹⁷ The utility maintains that the value of imputation credits should be a market value concept, rather than being based on investors' eligibility to redeem imputation credits.

Icon Water's estimate of the distribution rate is consistent with estimates preferred by the AER. Its estimate of the utilisation rate is based on a single dividend drop-off study¹¹⁸ the Australian Competition Tribunal relied on in its decision in favour of the businesses in their appeal against the AER.¹¹⁹ The AER and the QCA have, however, pointed to problems with the reliability and relevance of dividend drop-off studies. There are other factors that can affect share prices at the time, and the implied values based on trading are affected by factors such as differential personal taxation and other personal costs. Implied values are based on a market value in a particular trading context and are considered not to reflect the value of imputation credits to all shareholders who can make use of them; that is, they do not provide an estimate of the utilisation value to investors in the market per dollar of imputation credits distributed on a post-tax (pre-personal tax and costs) basis.

The Commission also notes that the Federal Court accepted the AER's interpretation of the value of imputation credits and not the market value concept endorsed by the Tribunal.

The Commission agrees that the definition of the utilisation rate should be based on the eligibility of investors to redeem the imputation credits and that it is better to consider a range of information to provide guidance on the best estimate of the utilisation rate. It

¹¹⁷ Icon Water, 2017 (Attachment 10): 11.

¹¹⁸ A dividend drop-off study estimates the value of imputation credits by the difference between the value of shares with dividend and without dividend, with the information being reflected in the change in the value of the shares the day the dividend is paid.

¹¹⁹ ACT, 2016.

also considers that the greatest weight should be given to the equity ownership methodology, as used by the AER and the QCA.

As noted, the AER's equity ownership methodology provides estimates of the utilisation rate that vary from 0.56 to 0.68 for all companies and from 0.38 to 0.55 for listed companies. With respective preferred distribution rates of 0.7 and 0.75, the ranges for gamma are 0.40 to 0.47 for all companies and 0.28 to 0.41 for listed companies.¹²⁰ The AER prefers a gamma estimate of 0.4. The QCA prefers a gamma estimate of 0.47.

The Commission considers that a gamma estimate of 0.4 is most appropriate and notes that this is lower than the Industry Panel's estimate of 0.5.

¹²⁰ AER 2017a: 29.

7 Total revenue allowance

Icon Water incurs costs in providing water and sewerage services. These costs need to be matched by allowed revenue to ensure that Icon Water remains financially viable.

This chapter identifies the 2018–23 revenue requirement, based on the efficient costs incurred by Icon Water in providing regulated water and sewerage services in each year of that regulatory period. It then sets out the Commission’s draft decision on Icon Water’s total and net revenue requirements.

The Commission’s draft decision

Table 7.1 shows Icon Water’s proposed net revenue requirement for water and sewerage services for the 2018–23 regulatory period.

Table 7.1 Icon Water’s proposal: net revenue requirement for water and sewerage services, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water						
Return on capital	54.62	56.34	58.06	59.58	60.79	289.39
Depreciation	31.09	34.53	37.63	40.44	41.78	185.46
Operating expenditure (controllable)	61.75	62.61	63.84	66.82	68.03	323.05
Water Abstraction Charge	29.07	30.15	31.25	32.50	33.77	156.74
Utility Network Facilities Tax	5.67	6.02	6.39	6.78	7.19	32.04
Net tax liabilities	1.82	1.57	1.48	1.25	1.53	7.65
Total revenue requirement	184.01	191.22	198.65	207.36	213.08	994.32
Less adjustments	16.52	16.80	17.21	17.61	18.03	86.17
Net revenue requirement	167.49	174.41	181.44	189.75	195.05	908.15
Sewerage						
Return on capital	31.93	33.84	35.27	36.59	37.69	175.33
Depreciation	26.53	30.53	33.63	36.38	38.77	165.85
Operating expenditure (controllable)	73.52	74.54	75.90	79.28	80.73	383.96
Utility Network Facilities Tax	4.65	4.94	5.24	5.56	5.90	26.30
Net tax liabilities	3.46	2.93	2.64	2.02	1.99	13.04
Total revenue requirement	140.10	146.78	152.68	159.83	165.08	764.48
Less adjustments	14.10	14.52	14.86	15.22	15.57	74.27
Net revenue requirement	126.00	132.26	137.82	144.61	149.51	690.21

Source: Icon Water (2017).

Table 7.2 shows the Commission’s draft decision on Icon Water’s net revenue requirement for water and sewerage services in 2018–23.

Table 7.2 Draft decision: net revenue requirement for water and sewerage services, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water						
Return on capital	52.34	53.97	55.60	57.03	58.15	277.09
Depreciation	31.08	34.51	37.58	40.36	41.65	185.17
Operating expenditure (controllable)	61.75	62.61	63.84	65.95	67.92	322.07
Water Abstraction Charge	29.07	30.15	31.25	32.50	33.77	156.74
Utility Network Facilities Tax	5.67	6.02	6.39	6.78	7.19	32.04
Net tax liabilities	0.72	0.50	0.53	0.60	0.79	3.14
Total revenue requirement	180.63	187.76	195.18	203.21	209.47	976.25
Less adjustments	16.57	16.87	17.27	17.67	18.08	86.46
Net revenue requirement	164.06	170.89	177.92	185.54	191.38	889.78
Sewerage services						
Return on capital	30.54	32.11	33.10	33.91	34.58	164.25
Depreciation	26.49	30.33	33.17	35.51	37.52	163.02
Operating expenditure (controllable)	73.52	74.54	75.90	78.30	80.61	382.86
Utility Network Facilities Tax	4.65	4.94	5.24	5.56	5.90	26.30
Net tax liabilities	2.55	1.96	1.58	1.14	0.81	8.04
Total revenue requirement	137.76	143.88	148.99	154.42	159.42	744.46
Less adjustments	14.13	14.55	14.89	15.25	15.61	74.43
Net revenue requirement	123.63	129.33	134.10	139.17	143.81	670.03

Sources: Commission’s calculations based on Icon Water (2017).

The Commission’s draft decision on Icon Water’s net revenue requirement for the forward regulatory period is:

- \$18.36m (2.02 per cent) lower for water than Icon Water’s proposal
- \$20.18m (2.92 per cent) lower for sewerage services than Icon Water’s proposal.

These differences reflect the Commission’s decision to:

- Decrease the market risk premium from Icon Water’s proposed 7.03 per cent to 6.5 per cent in the calculation of the rate of return.

- Increase gamma from Icon Water’s proposed 0.25 to 0.4 in the calculation of net tax liabilities.
- Decrease Icon Water’s proposed operating expenditure (by \$2.1m) and capital expenditure (\$52.1m) based on the prudence and efficiency analysis performed by the Commission’s independent consultant.

7.1 Calculating the revenue requirement

The building block methodology is a widely used means of collating a utility’s costs to estimate its revenue requirement. Under the methodology, the total revenue requirement is calculated as the sum of the different building blocks (or revenue components) for each year of the next regulatory period. To calculate Icon Water’s total revenue requirement, the Commission determined, for each year of the next regulatory period, an allowance for the following:

- *Operating expenditure.* This represents the prudent and efficient level of forecast operating costs, including a range of controllable expenditure items and non-controllable costs (see full discussion in Chapter 3).
- *Regulatory depreciation (the return of capital).* This reflects the cost of investing in and maintaining the RAB and is calculated on a straight-line basis (see the discussion in Chapter 5).
- *The return on capital.* This is calculated by multiplying the allowed rate of return (nominal post-tax vanilla WACC) by the starting value of the RAB plus half of forecast capital expenditure in each year of the regulatory period and deducting the indexation adjustment that is applied to the RAB (see the discussion in Chapter 6).
- *Net tax expenses.* These are calculated by deducting a value for imputation credits from tax expenses (see the discussion in Chapter 6).

The sum of these allowances represents the total revenue requirement. Once the total revenue requirement for the forward regulatory period is estimated, the net (or ‘target’) revenue requirement can be estimated. The target revenue is the total amount less revenue received from sources other than water and sewerage services tariffs. Other revenue sources include Community Service Obligation (CSO) payments and bulk water sales to Queanbeyan–Palerang Regional Council.

7.2 Icon Water’s submission

Table 7.3 shows Icon Water’s proposed total revenue requirements for water and sewerage services for the forward regulatory period. Icon Water determined its total revenue requirement using the same methodology as applied in the Industry Panel’s

report, being the sum of each of the building blocks of operating expenditure, depreciation, return on capital and net tax liabilities.¹²¹

Table 7.3 Icon Water's proposed total revenue requirement for water and sewerage services, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water						
Return on capital	54.62	56.34	58.06	59.58	60.79	289.39
Depreciation	31.09	34.53	37.63	40.44	41.78	185.46
Operating expenditure	96.49	98.77	101.48	106.09	108.99	511.83
Net tax liabilities	1.82	1.57	1.48	1.25	1.53	7.65
Total water revenue requirement	184.01	191.22	198.65	207.36	213.08	994.32
Sewerage						
Return on capital	31.93	33.84	35.27	36.59	37.69	175.33
Depreciation	26.53	30.53	33.63	36.38	38.77	165.85
Operating expenditure	78.17	79.48	81.14	84.84	86.63	410.26
Net tax liabilities	3.46	2.93	2.64	2.02	1.99	13.04
Total sewerage revenue requirement	140.10	146.78	152.68	159.83	165.08	764.48

Source: Icon Water (2017).

For the purposes of calculating the net revenue requirement, Icon Water proposed to deduct income received from other sources, these being charges for bulk water provided to Queanbeyan–Palerang Regional Council, subvention payments by the Commonwealth, miscellaneous charges and income from other sources, and other adjustments made for notional Community Service Obligation (CSO) payments.¹²² Each of these revenue adjustments and resulting net revenue requirements for regulated water and sewerage services is shown in Table 7.4.

¹²¹ Icon Water, 2017 (Attachment 11): 4.

¹²² Icon Water, 2017 (Attachment 11): 4.

Table 7.4 Icon Water’s proposed revenue adjustments and net revenue requirement for water and sewerage services, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water						
Total water revenue requirement	184.01	191.22	198.65	207.36	213.08	994.32
Sales to QPRC and other income	13.65	13.91	14.27	14.63	15.01	71.47
Subvention	1.12	1.14	1.17	1.20	1.23	5.86
CSO payments	1.75	1.76	1.77	1.78	1.79	8.85
Net water revenue requirement	167.49	174.41	181.44	189.75	195.05	908.15
Sewerage						
Total sewerage revenue requirement	140.10	146.78	152.68	159.83	165.08	764.48
Subvention	11.16	11.44	11.73	12.02	12.32	58.67
Other income	2.30	2.42	2.46	2.51	2.55	12.24
CSO payments	0.64	0.66	0.67	0.69	0.70	3.36
Net sewerage revenue requirement	126.00	132.26	137.82	144.61	149.51	690.21

Source: Icon Water 2017.

7.3 The Commission’s consideration and draft decision

7.3.1 The total revenue requirement

On the basis of its draft decisions on operating expenditure, the return of capital, the return on capital and net tax expenses building blocks (as discussed in Chapters 3, 5 and 6), the Commission has decided to set Icon Water’s total revenue requirement in the manner shown in Table 7.5.

Table 7.5 Draft decision: total revenue requirement water and sewerage services, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water						
Return on capital	52.34	53.97	55.60	57.03	58.15	277.09
Depreciation	31.08	34.51	37.58	40.36	41.65	185.17
Operating expenditure	96.49	98.77	101.48	105.22	108.88	510.85
Net tax liabilities	0.72	0.50	0.53	0.60	0.79	3.14
Total water revenue requirement	180.63	187.76	195.18	203.21	209.47	976.25
Sewerage						
Return on capital	30.54	32.11	33.10	33.91	34.58	164.25
Depreciation	26.49	30.33	33.17	35.51	37.52	163.02
Operating expenditure	78.17	79.48	81.14	83.86	86.51	409.16
Net tax liabilities	2.55	1.96	1.58	1.14	0.81	8.04
Total sewerage revenue requirement	137.76	143.88	148.99	154.42	159.42	744.46

Source: Commission's calculations based on Icon Water (2017).

The Commission's draft decision on Icon Water's total revenue requirement for the next regulatory period is \$976.25m for water services and \$744.46m for sewerage services. The decision is approximately 1.82 per cent and 2.62 per cent lower than Icon Water's proposed total revenue requirements for water and sewerage services respectively. The difference between the Commission's draft decision and Icon Water's proposal reflects the Commission's decision to:

- Decrease Icon Water's proposed operating expenditure (by \$2.1m) and capital expenditure (by \$52.1m) in view of the prudence and efficiency analysis undertaken by the Commission's independent consultant, Calibre. These adjustments are discussed in Chapters 3 and 4 respectively.
- Decrease the market risk premium from Icon Water's proposed 7.03 per cent to 6.5 per cent in the calculation of the rate of return, as discussed in Chapter 6.
- Increase gamma from Icon Water's proposed 0.25 to 0.4 in the calculation of net tax liabilities, as discussed in Chapter 6.

7.3.2 Revenue adjustments

Icon Water derives revenue from a number of sources, among them sources unrelated to its provision of regulated water and sewerage services. In order to ensure that Icon Water is not compensated for costs not incurred in the provision of regulated services, these revenue items must be deducted from Icon Water's total revenue requirement to determine the net revenue requirement for the forward regulatory period. These adjustments include the following:

- Charges for bulk water provided to Queanbeyan–Palerang Regional Council
- Subvention payments by the Commonwealth
- Miscellaneous charges and income from other sources

Revenue from CSO payments should also be deducted from Icon Water's total revenue requirement to determine the net revenue requirement. Among these CSOs are Icon Water's payments associated with:

- The Cotter Dam Discovery Trail
- Greenhouse gas abatement activities associated with water security projects
- Uriarra Village sewerage, beyond what would be recovered from local residents though the standard sewerage services charges

The Commission's draft decision is to accept Icon Water's proposed revenue adjustments, deducting the amounts shown in Table 7.6 from the total revenue requirement.

7.3.3 The net revenue requirement

The net revenue requirement is calculated by removing other sources of revenue from the total revenue requirement. This provides the maximum revenue Icon Water can receive from regulated water and sewerage service tariffs in the 2018–23 regulatory period.

Table 7.6 shows the Commission's draft decision on Icon Water's net revenue requirement for water and sewerage services to be recovered from regulated prices.

Table 7.6 Draft decision: Revenue adjustments and net revenue requirement for water and sewerage services, 2018–23 (\$m, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Water						
Total water revenue requirement	180.63	187.76	195.18	203.21	209.47	976.25
Sales to QPRC and other income	13.65	13.91	14.27	14.63	15.01	71.48
Subvention	1.12	1.14	1.17	1.20	1.23	5.87
CSO payments	1.80	1.81	1.82	1.83	1.85	9.12
Net water revenue requirement	164.06	170.89	177.92	185.54	191.38	889.78
Sewerage						
Total sewerage revenue requirement	137.76	143.88	148.99	154.42	159.42	744.46
Subvention	11.16	11.44	11.73	12.02	12.32	58.67
Other income	2.30	2.42	2.46	2.51	2.55	12.24
CSO payments	0.67	0.69	0.70	0.72	0.74	3.52
Net sewerage revenue requirement	123.63	129.33	134.10	139.17	143.81	670.03

Source: Commission's calculations.

In nominal values, the Commission's draft decision on Icon Water's net revenue requirement for the forward regulatory period is as follows:

- Net water revenue requirement of \$889.8m is \$18.36m (2.02 per cent) lower than Icon Water's proposal
- Net sewerage services revenue requirement of \$670.0m is \$20.18m (2.92 per cent) lower than Icon Water's proposal
- Net total revenue requirement of \$1559.8m is \$38.54m (2.47 per cent) lower than Icon Water's proposal

8 Forecast sales and installations

In order to price Icon Water’s water and sewerage services for the 2018–23 period, the Commission must decide on Icon Water’s forecast water sales and the numbers of consumer installations. Five important sets of figures need to be forecast: total water releases, billed water sales at Tier 1 and Tier 2, the number of water supply consumers, the number of sewerage service consumers, and the number of billable sewerage fixtures.

This chapter discusses observed data from the current regulatory period and the forecasting methods proposed by Icon Water. It then presents the Commission’s draft decision on forecasting methodology together with draft forecast numbers.

The Commission’s draft decision

The Commission reviewed the forecasting methodology used to establish previous price directions, as suggested by Icon Water in its submission.

Table 8.1 shows the Commission’s draft position. The forecasts for water demand, water installations, sewerage installations, and billable fixtures are those proposed by Icon Water. The forecast Tier 1 and 2 consumption differs slightly from those in Icon Water’s proposal due to the Commission’s adjustment to forecasting method.

Table 8.1 Water service demand forecasts used in the Commission’s draft decision

Year	Total water releases (GL)	Total billed water sales at Tier 1 (GL)	Total billed water sales at Tier 2 (GL)	No. of water consumers	No. of sewerage services consumers	No. of billable fixtures
2018–19	41.32	25.29	16.03	178,795	178,344	64,380
2019–20	41.62	25.65	15.97	182,083	181,609	65,377
2020–21	41.88	25.99	15.89	185,432	184,933	66,389
2021–22	42.28	26.37	15.91	188,842	188,318	67,417
2022–23	42.66	26.75	15.92	192,315	191,765	68,461

Sources: Commission’s calculations and Icon Water (2017).

8.1 Forecast components

To price Icon Water’s water and sewerage services for the 2018–23 period, the Commission must decide on Icon Water’s water sales and numbers of consumers and fixtures. The essential demand forecast components and their uses are shown in Table 8.2.

Table 8.2 Essential demand forecast components for developing pricing for the forward regulatory period

Forecast	Role in pricing water and sewerage services
Total water releases	Under the <i>Water Resources Act 2007 (ACT)</i> , an annual Water Abstraction Charge (WAC) is charged at a rate of \$0.578 per kilolitre (2017–18) for urban water usage. The total WAC paid is estimated using total water releases in each year and the charge rate in each year.
Total billed water sales at Tier 1	The forecast volume of water sold at Tier 1 prices is used to estimate total revenue from water sales in each year.
Total billed water sales at Tier 2	The forecast volume of water sold at Tier 2 prices is used to estimate total revenue from water sales in each year.
Total water supply consumers	The forecast number of water supply consumers is used to estimate total revenue from water supply charges in each year.
Total sewerage supply consumers	The forecast number of sewerage supply consumers is used to estimate total revenue from sewerage supply charges in each year.
Additional billable fixtures	The forecast number of additional billable fixtures is used to estimate total revenue from sewerage supply charges in each year.

Source: Commission.

As part of this review the Commission re-evaluated the forecasting methods for each demand component to ensure that the forecasts delivered are accurate, consistent with established best practice and cost-effective.

With the notable exception of the forecast of water demand, Icon Water’s submission supported continued use of the forecasting methods the Industry Panel used for forecasting each demand component. The water demand model that was used by the Industry Panel was developed by the engineering consulting firm Cardno. Retrospective comparison of forecast accuracy with observed sales data shows that the Industry Panel model forecast on average seven per cent higher demand than average observed sales between 2014–15 and 2017–18. The impact of this overestimation was to lower prices and revenue received by Icon Water. Icon Water estimated a revenue shortfall of approximately \$56m nominal for the 2013–18 regulatory period as a result of the forecast inaccuracy.

8.2 Icon Water’s submission

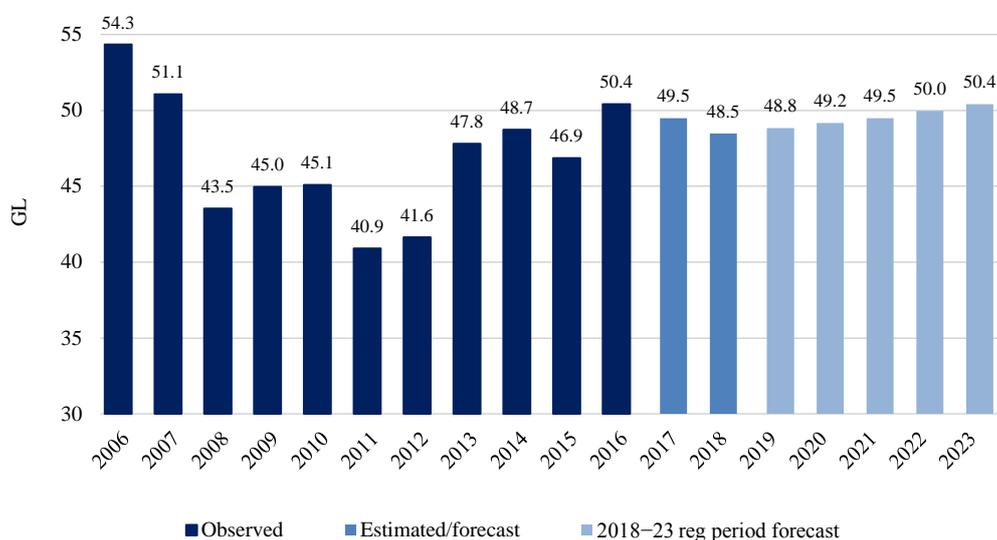
8.2.1 Water demand

In its submission to the Commission Icon Water proposed the adoption of an ARIMA forecasting model for the 2018–23 regulatory period. The ARIMA model is a variant

of a model previously proposed by the Commission for the 2013–18 regulatory period. The model uses daily dam release data together with up to 12 days of weather data and seasonal variation information to forecast daily demand. Daily dam releases under alternative climate scenarios (driest, dry, medium and wet) were estimated, and a simple average across the scenarios was used to forecast the total annual releases over the forward regulatory period.

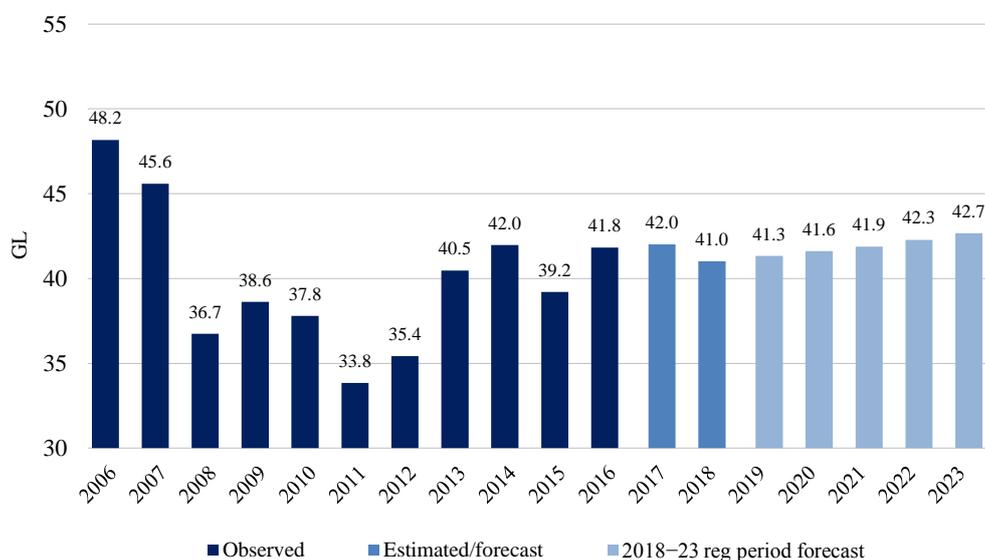
The forecast annual water releases for 2018–23 are shown in Figure 8.1. Forecast demand data are provided in Figure 8.2, noting that these demand figures are obtained by applying the average of the historical ratio of billed consumption water sales to water releases of 84.6 per cent.

Figure 8.1 Observed and forecast water releases, 2006–23



Source: Commission's calculations.

Figure 8.2 Observed and forecast billed water sales, 2006–23



Source: Commission's calculations.

Icon Water's submission presented the underlying theory, model selection process and test statistics associated with the ARIMA model. It provided evidence that the model is appropriately established, implemented and provides reliable results and that Icon Water's proposed ARIMA model delivers greater forecast accuracy for the 2013–18 period than the Cardno model or the Commission's 2013 ARIMA model. Technical data on these demonstrations are provided in Appendix 4 of this report.

8.2.2 Tier 1 and Tier 2 sales

Icon Water's submission proposed the adoption of the Commission's earlier method for forecasting Tier 1 and Tier 2 sales proportions. The method uses the observed relationship between annual average per capita water consumption and the allocation of sales between Tier 1 and 2. Using forecast per capita water consumption, the method allows estimation of water sales in each tier over the forward period.

8.2.3 Consumer numbers and fixtures

Icon Water's preferred method uses data from 2008–09 to 2015–16 to estimate a model for the Tier 1 proportion. The algebraic details of the methodology are provided in Appendix 4. Applying the methodology to Icon Water's forecast of water demand provides a forecast for Tier 1 and 2 water consumption proportions for the 2018–23 regulatory period, as shown in Icon Water's submission used the Industry Panel's method to forecast water and sewerage installations and billable fixtures. This method extends the observed annual growth rate over 2013–14 to 2017–18 (being 1.84 per cent for water installations, 1.83 per cent for sewerage installations, and 1.55 per cent for

billable fixtures) to the forward regulatory period. Table 8.3 shows Icon Water’s forecast for water and sewerage installations and billable fixtures.

Table 8.3 Icon Water’s proposed forecast water sales, 2018–23

Year	Total water releases (GL)	Total Tier 1 sales (GL)	Total Tier 2 sales (GL)	Water supply consumers	Sewerage supply consumers	Billable fixtures
2018–19	41.32	25.32	16.00	178,795	178,344	64,380
2019–20	41.62	25.61	16.01	182,083	181,609	65,377
2020–21	41.88	25.88	16.00	185,432	184,933	66,389
2021–22	42.28	26.20	16.08	188,842	188,318	67,417
2022–23	42.66	26.51	16.16	192,315	191,765	68,461

Source: Icon Water (2017).

8.2.4 Consumer numbers and fixtures

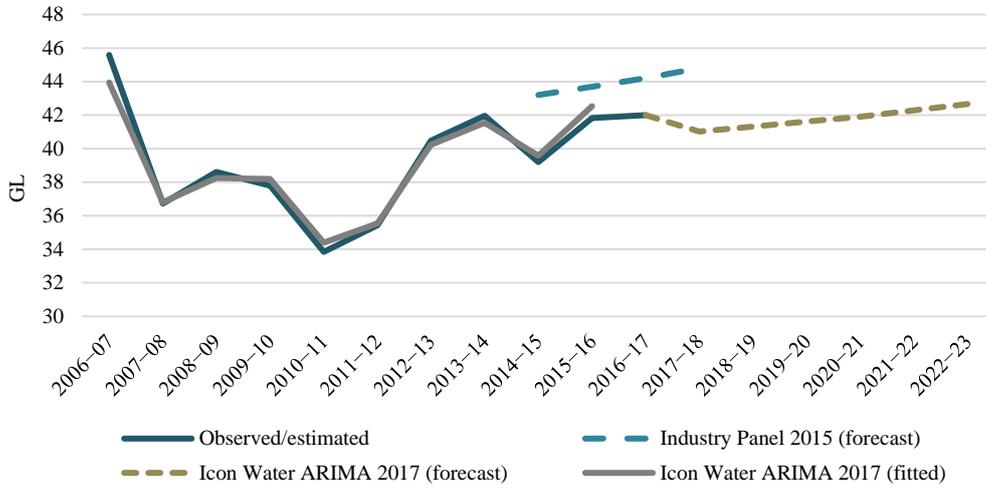
Icon Water’s submission used the Industry Panel’s method to forecast water and sewerage installations and billable fixtures. This method extends the observed annual growth rate over 2013–14 to 2017–18 (being 1.84 per cent for water installations, 1.83 per cent for sewerage installations, and 1.55 per cent for billable fixtures) to the forward regulatory period. Table 8.3 shows Icon Water’s forecast for water and sewerage installations and billable fixtures.

8.3 The Commission’s consideration and draft decision

8.3.1 Water releases and water demand

The Commission considers that Icon Water’s proposed ARIMA approach delivers greater forecast accuracy than the Industry Panel model. The Commission replicated Icon Water’s data-focused review of the performance of the proposed ARIMA model and the Industry Panel’s model. The available evidence suggests that Icon Water’s proposed ARIMA model provides a more accurate model for fitted and forecast values (see Figure 8.3 and Appendix 4).

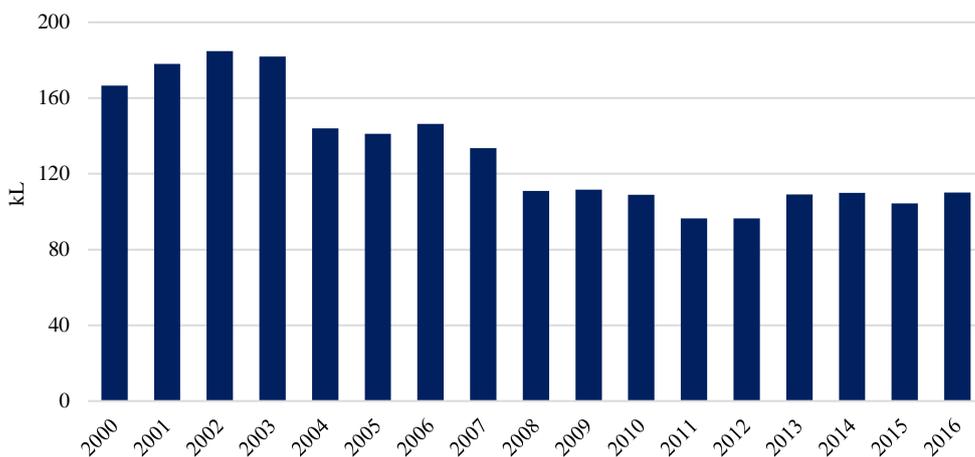
Figure 8.3 Comparison of water sales performance by Icon Water's and the Industry Panel's models



Source: Data from Icon Water (2017).

The Industry Panel consistently forecast higher water sales than were observed in the current regulatory period. This discrepancy might have arisen following an apparently lasting change to territory consumers' water consumption patterns (see Figure 8.4). The change was not incorporated in the Industry Panel's model,¹²³ but is a change to which the ARIMA model specification is robust.

Figure 8.4 ACT dam releases per person, 2000-16



Source: Data from Icon Water (2017).

¹²³ Icon Water, 2017 (Attachment 4): 18.

In making its draft decision the Commission considers Icon Water’s proposed approach to be reasonable and intends to accept the submitted method and forecast numbers for water releases and water demand. The draft decision forecast water sales and consumer numbers are provided in Table 8.4.

Table 8.4 Water service demand forecasts used in the Commission’s draft decision, 2018–23

Year	Total releases (GL)	Total Tier 1 sales (GL)	Total Tier 2 sales (GL)	No. of water consumers	No. of sewerage consumers	Billable fixtures
2018–19	41.32	25.29	16.03	178,795	178,344	64,380
2019–20	41.62	25.65	15.97	182,083	181,609	65,377
2020–21	41.88	25.99	15.89	185,432	184,933	66,389
2021–22	42.28	26.37	15.91	188,842	188,318	67,417
2022–23	42.66	26.75	15.92	192,315	191,765	68,461

Sources: Commission’s calculations and Icon Water (2017).

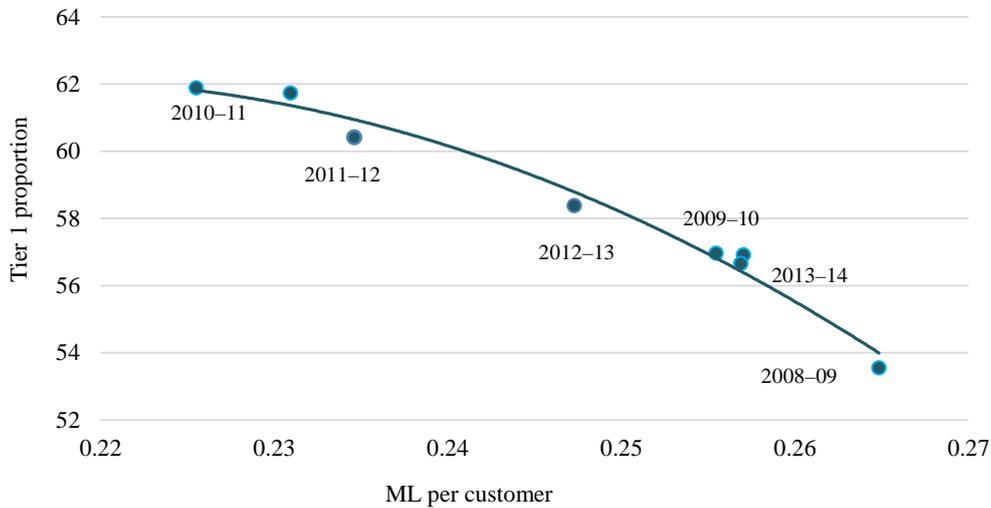
One matter not raised by Icon Water in its submission concerns the potential to materially update the forecasting model with the aim of making any demand forecast more flexible in response to climatic, policy and demographic variations. For the purposes of this draft determination, however, the Commission uses the ARIMA model as proposed by Icon Water.

Given the potential for change in the environmental, economic and policy environments in the 2018–23 regulatory period, the Commission intends to re-evaluate the method for forecasting water demand. This re-evaluation will occur during the 2018–23 regulatory period.

8.3.2 The Tier 1 proportion

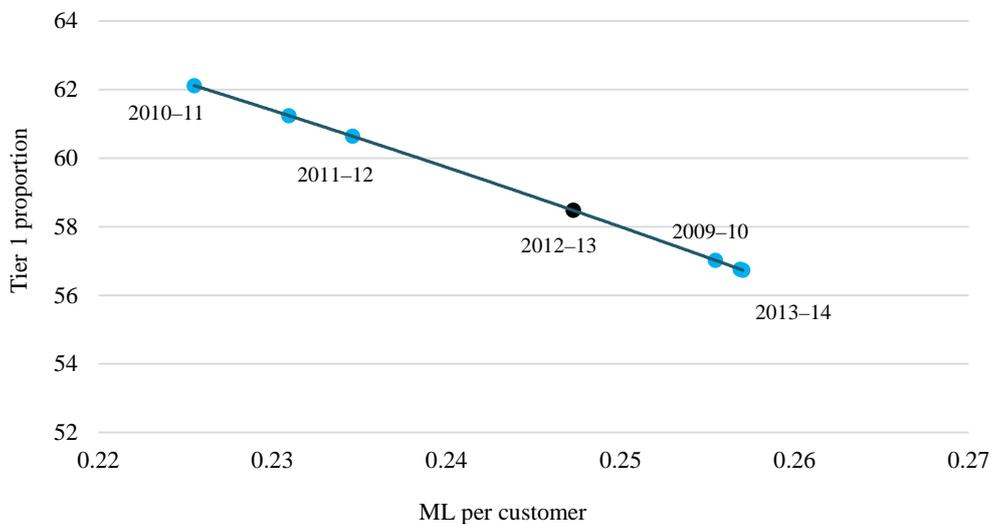
The Commission considers Icon Water’s proposed approach for estimating Tier 1 sales to be reasonable, using a methodology previous endorsed by the Commission. But close examination reveals an irregular data point used in the estimation of the model. When the irregular 2008–09 data point is removed, the resulting model is simplified from a complex, exponential arrangement to a tractable linear model, as demonstrated in Figure 8.5 and Figure 8.6.

Figure 8.5 Icon Water's estimation of the relationship between consumption per consumer and Tier 1 water sales, 2008–09



Source: Commission's calculations.

Figure 8.6 The Commission's estimation of the relationship between consumption per consumer and Tier 1 water sales, 2008–09



Source: Commission's calculations.

Analysis of the models (see Appendix 4) shows that the previous implementation, as proposed by Icon Water, demonstrates a sub-optimal fit to the data in comparison with the updated model. The Commission's draft decision is to apply the same estimation method but exclude the irregular data point. The calculated Tier 1 proportion for the 2018–2023 regulatory period is shown in Table 8.4. Note that Tier 2 sales are a residual of total sales, following the extraction of Tier 1 sales.

8.3.3 Consumer numbers and fixtures

The Commission considers Icon Water’s proposed approach reasonable, and intends to accept the submitted method and forecast numbers for consumer numbers and fixtures. The draft decision for consumer numbers and fixtures is shown in Table 8.4.

9 Prices for water and sewerage services

The Commission has followed the Terms of Reference and legislative framework as set out by the ICRC Act in conducting its investigation into water and sewerage service prices in the ACT. The outcome of the investigation process is the Commission's draft decision on water and sewerage services prices for the 2018–23 period.

This chapter presents the prices and price paths that have resulted from the price investigation.

The Commission's draft decision

Icon Water's proposed prices for water and sewerage services in the 2018–23 regulatory period are shown in Table 9.1 and Table 9.2 respectively.

Table 9.1 Icon Water's proposal: water prices for 2018–23 (\$, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23
Supply charge (\$/pa)	120.00	140.00	160.00	180.00	200.00
Tier 1 price (\$/kL)	2.73	2.76	2.79	2.81	2.84
Tier 2 price (\$/kL)	4.95	4.95	4.95	4.95	4.95

Note: Actual charges payable from 2019–20 to 2022–23 could differ from the indicative charges in this table if actual inflation differs from forecast inflation or if the cost pass-through mechanism is triggered.

Source: Icon Water (2017).

Table 9.2 Icon Water's proposal: sewerage services prices for 2018–23 (\$, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23
Sewerage services charge (\$/pa)	541.84	546.39	550.97	555.59	560.24
Sewerage fixtures (\$/pa)	529.92	534.36	538.84	543.35	547.91

Note: Actual charges payable from 2019–20 to 2022–23 could differ from the indicative charges in this table if actual inflation differs from forecast inflation or if the cost pass-through mechanism is triggered.

Source: Icon Water (2017).

The Commission's draft decision on water and sewerage service prices for the forward regulatory period are set out in Table 9.3 and Table 9.4.

Table 9.3 The Commission's draft decision on water prices for 2018–23 (\$, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23
Supply charge	120.00	140.00	160.00	180.00	200.00
Tier 1 price	2.55	2.57	2.60	2.62	2.65
Tier 2 price	4.95	5.00	5.04	5.09	5.14

Note: Actual charges payable from 2019–20 to 2022–23 could differ from the indicative charges in this table if actual inflation differs from forecast inflation or if the cost pass-through mechanism is triggered.

Source: Commission's calculations.

Table 9.4 The Commission's draft decision on sewerage services prices for 2018–23 (\$, nominal)

Sewerage services prices	2018–19	2019–20	2020–21	2021–22	2022–23
Sewerage services charge	536.51	535.68	534.85	534.02	533.20
Sewerage fixtures	524.70	523.88	523.07	522.26	521.46

Note: Actual charges payable from 2019–20 to 2022–23 could differ from the indicative charges in this table if actual inflation differs from forecast inflation or if the cost pass through mechanism is triggered.

Source: Commission's calculations.

The Commission's draft decision reflects the following:

- The regulatory objectives, as detailed in Chapter 1
- the form of regulation, as detailed in Chapter 2
- operating and capital expenditure, as detailed in Chapters 3 and 4
- the RAB and depreciation allowances, as detailed in Chapter 5
- the rate of return and tax liability allowance, as detailed in Chapter 6
- the total revenue allowance, as detailed in Chapter 7
- forecast sales and installations, as detailed in Chapter 8

9.1 Draft decision on water and sewerage services tariffs 2018–23

9.1.1 Draft water price path and tariff structure

The Commission's draft decision details a price path for water services in Table 9.5. For the water tariff the Commission's draft decision is:

- Accept Icon Water's proposal to retain the existing water tariff structure with a fixed supply charge and a two-tier inclining block usage charge for the next regulatory period

- Accept Icon Water’s proposal to increase the fixed supply charge in a gradual manner by \$20 a year to \$200 by 2022–23
- Accept Icon Water’s proposal to adjust the Tier 1 usage price for changes in the CPI and any pass-through amounts approved as part of the annual price reset mechanism during the next regulatory period
- Accept Icon Water’s proposal to decrease the current Tier 2 usage price (\$5.38 per kL) to \$4.95 per kL in 2018–19, but contrary to Icon Water’s proposal, adjust Tier 2 prices for changes in the CPI and any pass-through amounts approved as part of the annual price reset mechanism

In determining its proposed price path for each component of the water tariff structure from 2018–19 to 2022–23, the Commission, following Icon Water’s proposal, included an X factor in the price setting formula. This factor acts to smooth price changes for consumers during the regulatory period and is set to negative 1.52 per cent.

Table 9.5 The Commission’s draft decision on standard water tariffs, 2018–23 (\$)

	2018–19	2019–20	2020–21	2021–22	2022–23
Icon Water proposed					
Supply charge (\$/pa)	120.00	140.00	160.00	180.00	200.00
Tier 1 price (\$/kL)	2.73	2.76	2.79	2.81	2.84
Tier 2 price (\$/kL)	4.95	4.95	4.95	4.95	4.95
Commission draft decision					
Supply charge (\$/pa)	120.00	140.00	160.00	180.00	200.00
Tier 1 price (\$/kL)	2.55	2.57	2.60	2.62	2.65
Tier 2 price (\$/kL)	4.95	5.00	5.04	5.09	5.14

Note: Actual charges payable from 2019–20 to 2022–23 could differ from the indicative charges in this table if actual inflation differs from forecast inflation or if the cost pass-through mechanism is triggered.

Sources: Commission’s calculations and Icon Water (2017).

The Commission’s draft decision on water prices differs from Icon Water’s proposal in two respects:

- A lower Tier 1 price
- Adjusting Tier 2 prices by the CPI

The Commission’s draft decision accepts Icon Water’s proposal to increase the fixed charge in the first and later years. The decision for a lower usage charge in 2018–19 reflects the methodology and calculation described in this report.

The current water prices, the Icon Water submission and the Commission’s draft decision for the first year of the forward regulatory period are shown in Table 9.6. The current water prices were the outcome of the 2015 Industry Panel substituted price direction and expire in June 2018. Icon Water has proposed tariffs and charges for the

2018–23 period. The impact on consumers of the tariff changes are described and analysed in greater detail in Chapter 10.

Table 9.6 Comparison of current water prices, Icon Water’s proposed price for 2018–19 and the Commission’s draft decision for 2018–19 (nominal)

Water prices	Current prices, 2017–18	Icon Water proposed 2018–19	Commission’s draft decision 2018–19
Supply charge (\$/pa)	104.21	120.00	120.00
Tier 1 price (\$/kL)	2.68	2.73	2.55
Tier 2 price (\$/kL)	5.38	4.95	4.95

Notes: Actual charges payable from 2019–20 to 2022–23 could differ from the indicative charges in this table if actual inflation differs from forecast inflation or if the cost pass-through mechanism is triggered.

Sources: Commission’s calculations and Icon Water (2017).

9.1.2 Draft sewerage services price path and tariff structure

The draft decision retains the existing sewerage services tariff structure, comprising a fixed supply charge for residential premises and the same fixed supply charge plus an additional annual charge for flushing fixtures in excess of two for non-residential consumers.

In determining its proposed price path for each component of the sewerage services tariff structure from 2018–19 to 2022–23, the Commission, following Icon Water’s proposal, included an X factor in the price setting formula. The factor has a mathematical function in smoothing price changes for consumers during the regulatory period and is set to negative 2.59 per cent.

The 2018–19 sewerage services charge and the sewerage fixtures charge are set at \$536.51 and \$524.70 respectively. Sewerage services charges from 2019–20 to 2022–23 are to increase by the CPI and any pass-through amounts allowed in each year of the forward regulatory period.

Table 9.7 The Commission’s draft decision on sewerage services tariffs, 2018–23

	2018–19	2019–20	2020–21	2021–22	2022–23
Icon Water proposed					
Sewerage services charge (\$/pa)	541.84	546.39	550.97	555.59	560.24
Sewerage fixtures (\$/pa)	529.92	534.36	538.84	543.35	547.91
Commission draft decision					
Sewerage services charge (\$/pa)	536.51	535.68	534.85	534.02	533.20
Sewerage fixtures (\$/pa)	524.70	523.88	523.07	522.26	521.46

Note: Actual charges payable from 2019–20 to 2022–23 could differ from the indicative charges in this table if actual inflation differs from forecast inflation or if the cost pass-through mechanism is triggered.

Sources: Commission’s calculations and Icon Water (2017).

The Commission's draft decision has lower prices than were proposed by Icon Water (Table 9.7). The difference reflects the Commission's draft decision on Icon Water's total revenue requirement, as detailed in Chapters 3 to 7.

The current sewerage services prices, Icon Water's proposed prices 2018–19 and the Commission's draft decision for 2018–19 prices are shown in Table 9.8.

Table 9.8 Comparison of current sewerage services prices, Icon Water's proposed 2018–19 price and the Commission's draft decision for 2018–19 (nominal)

	Current prices, 2017–18	Icon Water proposed, 2018–19	Commission's draft decision 2018–19
Sewerage services charge (\$/pa)	537.34	541.84	536.51
Sewerage fixtures (\$/pa)	525.51	529.92	524.70

Sources: Commission's calculations and Icon Water (2017).

The immediate impact of the Commission's draft decision on water and sewerage services prices will be a slight reduction in the total annual bill of a typical household. A typical household consuming 200kL of water per year will see its total bill decrease by 1.2 per cent (approximately \$14) between 2017–18 and 2018–19. The impacts of changes in water and sewerage services tariffs over the entire forward period and on other consumers are described and analysed in Chapter 10.

10 Effects on consumers, inflation and Icon Water's financial viability

This chapter presents the estimated impacts of the Commission's draft decision on residential and non-residential consumers' annual bills, general price inflation and Icon Water's financial viability.

The Commission's draft decision

The Commission's draft decision on regulated water and sewerage services prices for 2018–23 is likely to have a modest impact on ACT consumers. This assumes broad inflation of 2.5 per cent a year and no material changes in Icon Water's non-controllable costs.

- *Indicative effects on residential consumers.* Under the Commission's draft decision, a typical household consuming 200kL a year will see a decrease in its annual combined water and sewerage services bill of 1.2 per cent (approximately \$14) in 2018–19. This typical household will pay \$1,283 for its annual combined bill in 2022–23, an increase of \$83 from 2018–19. This is \$63 lower than under Icon Water's proposed prices; Icon Water proposed a nominal increase of \$146 for the same period.
- *Indicative effects on non-residential consumers.* The draft decision is expected to alter combined water and sewerage services bills by between –0.1 per cent and 3.6 per cent during 2018–23, depending on usage. Icon Water proposed combined bill changes ranging from 0.4 per cent to 3.3 per cent for the period.

In Chapter 4 the Commission proposes a number of changes to existing water and sewerage services tariffs. As part of finalising its draft decision, the Commission assessed the proposal's indicative impacts on ACT consumers, general price inflation and Icon Water's financial sustainability.

10.1 Impacts on consumers

10.1.1 Residential consumers

To assess the indicative effects of its draft decision on residential consumers, the Commission examined the average annual bills payable by residential consumers with varying consumption levels.

Table 10.1 presents the resulting combined water and sewerage services bills for residential consumers at different consumption levels. The estimated effects assume a CPI of 2.5 per cent a year and no material changes in Icon Water's non-controllable costs that would trigger a pass-through during the next regulatory period.

Table 10.1 Indicative impacts on residential water and sewerage services bills (\$, nominal)

Water consumption (kL/year)		2017–18	2018–19	2019–20	2020–21	2021–22	2022–23
50	\$/year	776	784	804	825	845	865
	Percentage change		1.1	2.6	2.5	2.5	2.4
100	\$/year	910	911	933	954	976	998
	Percentage change		0.2	2.4	2.3	2.3	2.2
150	\$/year	1,044	1,039	1,061	1,084	1,107	1,130
	Percentage change		-0.5	2.2	2.1	2.1	2.1
200	\$/year	1,200	1,186	1,210	1,234	1,259	1,283
	Percentage change		-1.2	2.0	2.0	2.0	1.9
250	\$/year	1,447	1,414	1,440	1,466	1,493	1,519
	Percentage change		-2.3	1.9	1.8	1.8	1.8
300	\$/year	1,716	1,661	1,690	1,718	1,747	1,776
	Percentage change		-3.2	1.7	1.7	1.7	1.7
400	\$/year	2,254	2,156	2,189	2,223	2,256	2,290
	Percentage change		-4.3	1.5	1.5	1.5	1.5
500	\$/year	2,792	2,651	2,689	2,727	2,765	2,804
	Percentage change		-5.0	1.4	1.4	1.4	1.4
750	\$/year	4,137	3,889	3,938	3,988	4,038	4,089
	Percentage change		-6.0	1.3	1.3	1.3	1.3

Source: Commission's calculations.

A typical household consuming 200kL a year will see a decrease in its annual bill of 1.2 per cent (approximately \$14) in 2018–19 compared with 2017–18. In 2022–23 a typical household will pay \$1,283 for its annual combined bill, an increase of \$83 over the regulatory period. This is \$63 lower than under Icon Water's proposed prices; Icon Water proposed a nominal increase of \$146 over the same period.

Under the Commission’s draft decision, the annual average increase of the combined water and sewerage services bill for a household consuming 200kL a year during the regulatory period is 1.35 per cent. This rate of increase is below the expected rate of inflation (2.50 per cent) and thus the cost of water and sewerage services is expected to decline in real terms at an annual average change of –1.12 per cent.

10.1.2 Comparison with bills payable in other jurisdictions

Should the prices in the Commission’s draft decision be adopted, the combined water and sewerage services bills payable by residential consumers in the ACT will be lower than the average of comparable jurisdictions. Table 10.2 provides a comparison of annual water and sewerage services bills for a residential consumer consuming 200kL of water a year for a number of urban utilities in Australia.

Table 10.2 Major utility annual water and sewerage services bills for residential consumers using 200kL a year (\$, nominal)

	Actual 2017–18	Forecast Estimates 2018–19
Queensland Urban Utilities	1,091	1,118 ^a
SA Water (Adelaide)	1,149	1,177 ^a
TasWater	1,166	1,220
Barwon Water	1,177	1,206 ^a
Icon Water	1,200	1,186
Hunter Water	1,226	1,251
Sydney Water	1,279	1,279
Average	1,328	1,234
City West Water	1,377	1,411 ^a
South East Water	1,439	1,475 ^a
Yarra Valley Water	1,492	1,529 ^a
Unitywater – Moreton Bay	2,016	2,067 ^a

Note: ^a Indexed assuming inflation of 2.5 per cent from 2017–18.

Sources: Utility websites, Commission’s calculations.

A simple comparison of prices across jurisdictions should be read with caution as the underlying costs of providing water and sewerage services may vary between water service providers.

10.1.3 Non-residential consumers

Table 10.3 shows the estimated changes in the combined annual water and sewerage services bills for non-residential consumers by water usage and number of billable sewerage fixtures. Indicative bill increases for non-residential consumers over the period 2018–23 range from –0.1 per cent to 3.6 per cent, depending on water usage and

the number of billable fixtures. Icon Water's estimated bill changes range from 0.4 per cent to 3.3 per cent for 2018–23.¹²⁴

Table 10.3 Indicative impacts on non-residential water and sewerage services bills (\$, nominal)

Annual water usage (kL)	No. of billable fixtures	2018–19	2019–20	2020–21	2021–22	2022–23	Change between 2017–18 and 2018–19 (per cent)	Change between 2018–19 and 2022–23 (per cent)
1,000	10	10,373	10,426	10,480	10,534	10,588	-3.4	2.1
	50	31,361	31,382	31,403	31,424	31,446	-1.2	0.3
	100	57,596	57,576	57,556	57,538	57,519	-0.8	-0.1
2,500	10	17,798	17,921	18,045	18,171	18,297	-5.4	2.8
	50	38,786	38,877	38,968	39,061	39,155	-2.6	1.0
	100	65,021	65,071	65,122	65,174	65,228	-1.6	0.3
7,000	10	40,073	40,406	40,742	41,081	41,423	-6.8	3.4
	50	61,061	61,361	61,665	61,972	62,281	-4.6	2.0
	100	87,296	87,556	87,819	88,085	88,354	-3.3	1.2
15,000	10	79,673	80,379	81,092	81,811	82,536	-7.4	3.6
	50	100,661	101,334	102,014	102,701	103,395	-6.0	2.7
	100	126,896	127,529	128,168	128,814	129,468	-4.8	2.0

Source: Commission's calculations.

10.2 Impacts on inflation

Under Section 20(2)(j) of the ICRC Act, the Commission is required to consider the effects of changes in water and sewerage services bills on general price inflation. The Commission assessed general inflationary effects by replicating the methodology adopted by the Industry Panel.¹²⁵

As reported by the Australian Bureau of Statistics, water and sewerage services costs in Canberra contribute 0.03 per cent towards the weighted average of the general CPI (all groups, eight capital cities) in Australia.¹²⁶ Using this percentage and the Commission's draft decision of an approximately -1.12 per cent annual average increase (in real terms) for a typical consumer consuming 200kL of water a year, the

¹²⁴ Icon Water, 2017 (Attachment 11): 12.

¹²⁵ It has also been the approach adopted by IPART in similar assessments (IPART, 2016: 193).

¹²⁶ Australian Bureau of Statistics, 2017.

Commission estimated that the approximate annual impact of its draft decision on general price inflation in Australia is -0.0003 per cent.¹²⁷

The Commission considers an annual -0.0003 per cent contribution by water and sewerage services prices in Canberra to have no material effect on general price inflation in Australia.

10.3 Impacts on Icon Water's financial viability

In arriving at its draft decision the Commission had regard to matters set out in the ICRC Act. Section 20(2) of the Act requires the Commission to ensure the ongoing financial viability of Icon Water. The Terms of Reference also require the Commission to consider appropriate mechanisms for ensuring the recovery of the prudent and efficient costs of Icon Water during the regulatory period.

The Commission determined regulated water and sewerage services prices for the 2018–23 regulatory period by using the building block methodology, which is designed to ensure that allowed revenues are sufficient to meet regulated utility businesses' prudent and efficient costs.

Nevertheless, a general risk could exist in that the allowed revenue might not be sufficient to cover the utility's costs, particularly in the short run. This could occur should material differences between allowed and actual costs eventuate, thereby affecting the regulated business's short-term viability.

Recognising the importance of ensuring the financial viability of Icon Water, the Commission estimated the impact of its draft decision on Icon Water's financial position during the 2018–23 regulatory period. A financial viability test was conducted by calculating a selection of financial ratios for Icon Water from 2018–19 to 2022–23. These selected financial ratios are those used by the Industry Panel in assessing Icon Water's financial viability for the current regulatory period and are similar to those used by authorities such as the Essential Services Commission (ESC) and IPART in their recent decisions¹²⁸:

- Funds from operations (FFO) interest cover ratio, which provides an indication of Icon Water's ability to make interest payments
- Net debt gearing ratio, which measures the proportion of Icon Water's overall regulatory capital structure that is made up by debt, and provides an indication of its ability to repay its debt (or increase borrowings in the short term if required)
- FFO to net debt ratio, which provides an indication of whether Icon Water's debt servicing ability is improving, remaining stable or declining

¹²⁷ 0.03 per cent \times -1.12 per cent = -0.0003 per cent.

¹²⁸ Industry Panel, 2015: 120.

- Retained cash flow to capital expenditure ratio, which provides an indication of Icon Water’s ability to finance a prudent portion of capital expenditure after paying dividends

Although regulated water service providers are typically financed through a mixture of debt and equity, in practice regulators have primarily focused on debt-related financial viability assessments. This is a reasonable approach considering that debt is typically sourced from external markets, must be periodically refinanced, and must be provided on the basis of the maintenance of a specified credit rating.¹²⁹

Table 10.4 shows the financial ratios used by the ESC, IPART and NERA Economic Consulting in their most recent decisions. The Industry Panel adopted the target levels recommended by NERA as a reference for assessing Icon Water’s financial viability.

Table 10.4 Target level of financial ratios

	ESC	IPART	NERA
Target credit rating	Not Stated	Baa2	Ba
FFO interest cover	>1.5	1.7 to 2.5	1.8 to 2.5
Net debt gearing ratio (per cent)	<70	60 to 91	70 to 85
FFO to net debt (per cent)	>10	6 to 10	6 to 10
Retained cash flow to capital expenditure	>0.35	Not stated	0.5 to 1.0

Source: Industry Panel (2015) data.

For this price review, the Commission’s draft decision is to adopt the target levels as recommended by the Industry Panel. Table 10.5 presents estimated financial ratios for Icon Water together with the Industry Panels recommended targets.

Table 10.5 Estimated financial ratios for Icon Water

	Industry Panel target	2018–19	2019–20	2020–21	2021–22	2022–23
FFO interest cover	>1.8	2.3	2.4	2.5	2.5	2.5
Net debt gearing ratio (per cent)	<85	53.1	50.1	49.9	50.0	50.9
FFO to net debt (per cent)	>6.0	6.3	6.8	7.0	7.0	7.0
Retained cash flow to capital expenditure	>0.5	0.5	0.7	0.7	0.9	1.0

Sources: Commission’s calculations and Industry Panel (2015).

The impacts of the Commission’s draft decision on Icon Water satisfy the target minimums for the FFO interest cover ratio, the net debt gearing ratio and the FFO to net debt ratio for the entire forward regulatory period.

In considering the impact of its proposed prices on its financial viability, Icon Water presented financial ratios similar to those estimated by the Commission for its draft

¹²⁹ NERA, 2013: 5.

decision, with the estimated retained cash flow to capital expenditure ratio marginally below the target minimum ratio.

Different regulators and credit rating agencies have given differing weights to the aforementioned financial ratios in their analyses.¹³⁰ For instance, IPART considers the FFO interest cover and the net debt to RAB ratios as more significant than others.¹³¹ According to the ESC, the FFO interest cover is the most important indicator.¹³² Moody's prefers FFO interest cover and net debt to RAB over other ratios.¹³³ In the ESC's view, utility businesses are not expected to achieve all financial ratio benchmarks in every year of the regulatory period.

On the basis of the foregoing best practice, the Commission's draft decision is that exceeding all financial ratio targets in every year of the regulatory period is not a necessary determinant of Icon Water's ongoing financial viability. This decision is made in view of the Commission's estimate that Icon Water will exceed all other important financial health indicators, as recommended by other regulators and credit rating agencies, during the forward period.

The Commission is satisfied that its draft decision on water and sewerage services prices and the proposed price path for the 2018–23 regulatory period are consistent with Icon Water's continued financial viability.

¹³⁰ Industry Panel, 2015: 121.

¹³¹ IPART, 2013: 11.

¹³² ESC, 2013: 34.

¹³³ Industry Panel, 2015: 121; Moody's (2009).

11 Incentive mechanisms

This chapter discusses the potential to introduce incentive schemes for Icon Water during the 2018–23 regulatory period. It identifies key issues that need to be addressed if appropriate and effective incentive schemes are to be developed and implemented for Icon Water.

The Commission’s draft decision

Icon Water’s main submission did not support the introduction of any incentive schemes relating to service standards, capital expenditure or operating expenditure.

The Commission proposes to further review the potential for implementing such schemes for Icon Water’s operating expenditure, capital expenditure and service levels during 2018–23. This review will be given effect through a future reset principle specified in the draft price direction.

11.1 Context

The Terms of Reference require the Commission to consider whether there is potential for the future implementation of incentive schemes for the service levels, operating expenditure or capital expenditure of Icon Water. The Industry Panel report also suggested the Commission consider altering the regulatory framework to allow for such schemes.

The Commission’s framework for the effective regulation of a natural monopoly entity, such as Icon Water, requires the setting of prices that reflect efficient costs incurred. The framework therefore requires the identification of costs as being prudent and efficient and that these costs are incurred in meeting specified service standards. Auditing and benchmarking of costs and services standards constitute an approach widely used by Australian regulators in similar positions, but audits are typically expensive and time-consuming and remain a process that can look into a utility only from the outside. It cannot duplicate ‘standing in the shoes’ of the utility. Further, due to likely procedural difficulties in obtaining and analysing relevant information from the utility, the process can be intrusive and costly.

The essential problem is one of asymmetric information: the managers of a utility will always understand their operational options, constraints and mandates better than even the most expert regulator. After all, the utility’s management team engages with its business on every level every day, whereas the regulator only engages with the utility when regulatory decisions need to be made, which may be years apart. This problem,

asymmetric information, means that regulators – even after obtaining expert advice – cannot duplicate all the possible investment decisions that a utility might make or know whether expenses incurred by the utility represent the most efficient expenditure decision available. Nor can they know the counterfactual of all of the decisions the utility could have made but did not.

Although regulation is directed at reducing information asymmetry (with the regulator acting on behalf of the consuming community), it is not clear that by increasing the degree of oversight – for instance, having more detailed and more frequent audits – the degree of confidence in utility decision-making will be improved. Crucially, increasing oversight will certainly increase the associated costs of regulation – potentially to uneconomic levels.

11.2 Options

A range of alternative and supplementary regulation frameworks have been explored to partially overcome the problem of asymmetric information, and the consequent natural constraints of auditing. One supplementary approach is to develop and implement incentive schemes that identify financial rewards and penalties linked to cost efficiency and service performance. Regulators of water, energy and other infrastructure-based businesses in other jurisdictions in Australia have implemented various schemes to help provide incentives consistent with achieving various aspects of economic efficiency, including service delivery.

Two key Australian examples of implementing incentive schemes are the approaches adopted by IPART in NSW for urban metropolitan water businesses and by the AER for electricity transmission and distribution network service providers (NSPs).

11.2.1 IPART's incentive scheme for Sydney Water

Service performance incentive measures

IPART has responsibility for regulating the performance of urban water utilities in NSW according to standards (output measures) specified in their operating licenses.¹³⁴ In the most recent price regulation determination for Sydney Water, IPART revised the performance measures to reflect the nature of Sydney Water's capital program. A list of output measures for the current determination period is provided in Appendix G of the IPART final decision.¹³⁵ The output measures largely relate to various targets for asset renewal.

IPART's guidelines for water agency submissions to a pricing review specify that regulated agencies should report on their performance over the current determination

¹³⁴ See IPART, 2015a; 2016a, b.

¹³⁵ IPART, 2016a: 282.

period, including various measures of service levels, complaints, revenue, connections, operating expenditure and capital expenditure.¹³⁶

At this stage the output measures for service standards are not linked directly to financial rewards or penalties, but rather provide information for assessing the efficiency of expenditure.

Operating expenditure efficiency benefit sharing scheme

In recognition of the disincentives to pursue operating cost efficiencies under the previous regulatory arrangements, IPART approved an efficiency benefit sharing scheme for Sydney Water.¹³⁷ The main reason for introducing the scheme was IPART's concern about the periodicity of the incentives problem – that is, the incentive to delay cost savings from the end of one regulatory period to the beginning of the next.¹³⁸

The following are features of the efficiency benefit sharing scheme that applies to Sydney Water¹³⁹:

- The scheme applies to controllable operating expenditure (defined as total operating expenditure less bulk water costs covering 70 per cent of total operating expenditure for regulated services)
- The scheme is asymmetric in that it equalises incentives as to the timing of permanent efficiency savings over time but does not allow automatic sharing of permanent cost increases, as this is considered to be in the long-term interests of consumers. There are separate cost pass-through mechanisms that apply to defined non-controllable costs
- Temporary over- and under-spends within budget are treated symmetrically and not passed on to consumers
- The scheme does not apply to capital expenditure, reflecting concerns about limited coverage, the risk of incentives to over-forecast and inefficiently defer capital expenditure, limited opportunities for efficient trade-offs between operating and capital expenditure, and complexity
- The scheme is designed to apply to the four years preceding its application (three years for the first application). This means that the value of a permanent efficiency gain is allowed to be retained for four years regardless of when it is realised¹⁴⁰

¹³⁶ IPART, 2015a: 5–7.

¹³⁷ IPART, 2016a: 53–60.

¹³⁸ IPART, 2016a: 53–55.

¹³⁹ IPART, 2016a: 53–62.

¹⁴⁰ This gain can be measured in terms of the share of the permanent present value gain that is realised, which depends on the gain and a discount rate. The share of the gain increases as the discount rate

11.2.2 AER incentive schemes

Service target performance incentive scheme

The AER applies a service target performance incentive scheme to network service providers. This scheme aims to encourage NSPs to improve or maintain the performance of their electricity distribution and transmission networks. This is achieved by linking service providers' allowed revenues to their performance against defined service-level measures. Different measurements of performance and service standards apply to distribution and transmission businesses.

When the AER first introduced the scheme in 2007, it was based on the service standards guidelines developed by the Australian Competition and Consumer Commission (ACCC). Those guidelines were designed to address the incentives provided to transmission NSPs under a revenue cap to reduce operating expenditure at the expense of service quality, by linking transmission service providers' allowed revenues to their performance against defined service-level measures.

The scheme has since undergone three major rounds of amendments. The latest version of the scheme for transmission NSPs has three main components:

- A service component, with performance measures covering the frequency of unplanned outages and the duration of these events. This can lead to a maximum reward or penalty worth 1.25 per cent of the maximum allowable revenue
- A market-impact component, which provides an incentive to reduce the impact of planned and unplanned outages on wholesale market outcomes. This has a maximum reward of one per cent of the maximum allowable revenue
- A network-capability component, which encourages NSPs to undertake low-cost projects that deliver improvements in network capability, availability or reliability. This has a maximum reward of 1.5 per cent of the maximum allowable revenue, and there are penalties if improvement targets are not met (up to a maximum of 3.5 per cent of the MAR)¹⁴¹

The rewards and penalties are based on estimates of consumers' willingness to pay for service and reliability improvements.

Efficiency benefit sharing schemes

The AER implemented operating expenditure and capital expenditure efficiency incentive schemes for both transmission and distribution NSPs. Both the operating and capital expenditure schemes still apply to transmission NSPs and the capital expenditure scheme still applies to distribution NSPs. The operating expenditure

increases since future gains are worth less relative to gains for the first four years. For a four-year holding period and a 5.3 per cent discount rate, the share of the present value of a permanent efficiency gain is approximately 18 per cent (IPART, 2015b: 86).

¹⁴¹ AER, 2015a.

scheme for distribution NSPs was recently replaced by a more comprehensive use of benchmarking.¹⁴²

The efficiency benefit sharing scheme, or EBSS, for operating expenditure was designed to provide continuous incentives for NSPs to pursue efficiency and to share efficiency gains and losses between NSPs and consumers.

Similar to IPART's scheme for Sydney Water, the AER's EBSS has an incremental rolling mechanism whereby NSPs retain a share of 'incremental' efficiency gains and losses for a fixed period (known as the carryover period and typically equal to the length of the regulatory period of five years). The unused carryover amounts are added into the NSP's allowed revenue for the next regulatory period.

This mechanism ensures that NSPs retain a fixed percentage of any efficiency gains in net present value terms, regardless of the nature of the operating expenditure reduction (that is, one-off or recurrent) and the time when the efficiency gain occurs. Thus, NSPs are provided with continuous incentives to pursue efficiency in operating expenditure. The EBSS operates on a symmetric basis in the sense that both over- and under-performance are shared between NSPs and their consumers.

The EBSS is linked to the AER's approach for setting the operating expenditure allowance, which is usually the revealed-cost approach. With the revealed-cost approach, the AER uses actual operating expenditure in a base year (either the penultimate or the final year of the previous regulatory period) as a starting point for forecasting operating expenditure. This actual operating expenditure is then adjusted downwards for any past inefficient costs (if identified) and scaled to reflect forecast changes in input costs, productivity and output growth in order to establish a cost benchmark.

The AER argues¹⁴³ that actual operating expenditure from the previous period would be an appropriate efficient benchmark if the regulated firm had operated under an effective incentive framework (such as the EBSS) and had behaved in a profit-maximising manner. If adjustments are made to actual operating expenditure, this implies that the incentive framework was not fully effective (for example, there are distortions affecting the company's decision-making). Note also that the effectiveness of the incentive framework should encompass the extent to which the firm behaves in a profit-maximising manner.

The efficiency incentives are designed to recognise that the NSPs can underspend their operating expenditure allowances (hence earning additional profits) and to ensure they face no clawback of the allowed additional profits in the future.

¹⁴² AER, 2015b: 47.

¹⁴³ AER, 2015a: 15.

Even so, the fundamental problem of asymmetric information in the true efficient costs of a firm still exists under the AER's regime, to the extent that forecast costs are not efficient. This problem is partially redressed by the AER's revealed-cost approach, but it underlines the importance of continuing to use benchmarking or auditing as a complementary mechanism to help identify efficient costs.

The capital expenditure sharing scheme

The EBSS for operating expenditure was first introduced by the AER in 2007, but there was no similar scheme for capital expenditure. This provided incentives for NSPs to favour capital expenditure solutions and to misclassify operating expenditure as capital expenditure, since they would gain from the scheme for operating expenditure but receive a return on and a return of capital for capital expenditure provided it was allowed. NSPs also faced the periodicity problem for capital expenditure. In addition, while an NSP would incur additional financing costs if it overspent the capital expenditure allowance, actual capital expenditure would automatically be rolled into the RAB at the end of the regulatory period without being subjected to any ex post assessments.¹⁴⁴

In 2012 the AEMC made a number of changes to the National Electricity Rules in response to these issues.¹⁴⁵ The changes gave the AER the following responsibilities:

- Develop a capital expenditure sharing scheme (CESS) to provide incentives to incur efficient capital expenditure; and
- Undertake ex post efficiency reviews of actual capital expenditure, including the ability to preclude inefficient capital expenditure from being rolled into the RAB.

The AER has since developed guidelines on the scheme and a new ex post test that will apply to an NSP's actual capital expenditure.¹⁴⁶ These measures were introduced to apply to all NSPs in 2016.

Similar to the AER's EBSS, the capital expenditure sharing scheme is an application of an efficiency carryover scheme. Under the EBSS, NSPs retain any incremental efficiency gains or losses for a fixed period via carryover payments. But the exact share of the present value of permanent benefits retained by NSPs under an EBSS will depend on the value of the discount rate (WACC) used to calculate the present value as well as the carryover period.

In contrast, the capital expenditure sharing scheme operates on a fixed-sharing basis. At the end of each regulatory period a sharing ratio of 30 per cent is applied to the value of the cumulative capital expenditure underspend or overspend to determine the NSP's share that can be retained or paid for by the NSP (the scheme is symmetric). A capital expenditure sharing scheme payment is calculated; it can be positive or

¹⁴⁴ AER, 2013d.

¹⁴⁵ AEMC, 2012: v.

¹⁴⁶ AER, 2013c, d.

negative depending on whether there is underspending or overspending. The payment also takes account of the net benefit the NSP has already earned, or net cost already incurred, in the regulatory period. This amount is added to or deducted from the next period's allowed revenue.

Consumers are better off where the RAB is lower from underspending a capital allowance (hence a lower return on and return of capital in the future). As both the capital expenditure sharing scheme and EBSS have approximately the same sharing ratio of 30 per cent (given a six per cent real WACC), there are limited incentives for the NSP to prefer one type of expenditure to the other.

The AER scheme also makes adjustments to remove the incentive to inefficiently defer capital expenditure. Without such an adjustment, a business can advantage from the financing benefit (return on and return of capital) associated with the difference between forecast capital expenditure and lower actual expenditure in the current regulatory period while still being compensated when the deferred capital expenditure actually occurs.

To calculate the capital expenditure sharing scheme payment, the AER estimates the present value of the underspend in the current regulatory period; the present value of any material increase in forecast capital expenditure in the next regulatory period, as a result of a material deferral; and the present value of the financing benefits during the regulatory control period. It then calculates the CESS payments to be made to or paid by the regulated NSP as follows:

$$\text{CESS payments} = 30 \text{ per cent} \times (\text{NPV of underspend in period } n - \text{NPV of forecast marginal increase in capex in period } n+1 \text{ from capex deferred in period } n) - \text{financing benefits received in period } n.^{147}$$

This approach means that the NSP will still retain 30 per cent of the estimated present value of the short-term deferral.¹⁴⁸

The calculation of the payment when there is no deferral is simply 30 per cent of the NPV of an underspend, after deducting the NPV of the financing benefit the entity has already received from the underspend. If there is overspending the NSP will be faced with a deduction from its allowed revenue in the next regulatory period.

It is also relevant to recognise that a deferral of a fixed nominal amount of capital expenditure entails a benefit in present value terms because the expenditure is delayed by a year and there will be a financing benefit to both the regulated firm and its consumers from such a delay. But the deferral could mean that capital costs increase materially for the same project, which would reduce or more than offset the financing

¹⁴⁷ AER, 2013b: 32.

¹⁴⁸ The AER (2013b) explanatory statement shows that the NSP would receive 30 per cent of the estimated benefit of an inter-period deferral after an adjustment to the CESS payments (Attachment D).

benefits from the delay. The benefits and risks of a delay can be shared between the regulated business and its consumers, and these considerations should be recognised when specifying how the financing benefits or costs of a deferral should be treated.

11.2.3 Submissions on the issues paper

In its issues paper released in March 2017, the Commission raised a number of matters in relation to introducing incentive schemes for Icon Water. Apart from Icon Water's main submission, the Commission received no submissions from other interested parties and stakeholders.

Icon Water did not support the introduction of a service standard incentive scheme, a CAPEX incentive scheme or an OPEX incentive scheme, and did not respond to the issues raised in the issues paper, citing inter alia complexity and administrative cost.

Icon Water noted in its submission:

Icon Water believes that [its] opex proposal will provide a better outcome for consumers than would be achieved through the introduction of an opex incentive scheme in the 2018–23 regulatory period ... Icon Water's rigorous asset management planning system, underpinned by best-practice governance arrangements provides a sound basis for developing and implementing a prudent and efficient capex programme, which mitigates the need for a capex incentive scheme.¹⁴⁹

11.2.4 Commission's consideration and draft decision

There are merits in implementing incentive schemes. Nonetheless, they also imply a series of challenges that need to be addressed if appropriate incentive schemes are to be established.

Regulating service standards

A focus on the regulation of price can mean that service standards are overlooked. In addition, the introduction of efficiency incentive schemes for operating and capital expenditure may result in lower expenditure and potentially therefore lower service standards.

Many price cap regimes incorporate explicit incentives to counter any potential adverse impact of the price regulatory regime on quality. In order to regulate quality, the regulator needs to define and monitor the relevant quality performance measures. Some quality measures might be technical in nature (such as water quality, leakage and supply interruptions), while others might be based on consumer surveys of service performance.¹⁵⁰ Effective incentives schemes should be aligned with consumer time-preferences and willingness to pay for essential services.

¹⁴⁹ Icon Water, 2017: 36–9.

¹⁵⁰ The UK Office of Water Services has used consumer surveys to determine how satisfied consumers were with services and with the handling of complaints (Ofwat, 2010).

The periodicity of incentives problem

Incentives to reduce costs depend on the extent to which the regulated firm is allowed to retain part of the cost savings that it is able to achieve. For example, Icon Water is seeking to retain the difference between actual and forecast operating expenditure and the return on capital and depreciation allowed for the difference between actual and forecast capital expenditure for the current regulatory period.

These arrangements have the potential to create a distortion with respect to the timing of efficiency initiatives. There might be an incentive to reduce operating or capital expenditure below allowed expenditure in the early part of a regulatory period and defer potential savings near the end of a regulatory period to the next regulatory period. This is known as the ‘periodicity of incentives problem’.

In light of these issues, regulators have implemented efficiency carryover mechanisms to provide continuous incentives for efficiency in capital and operating expenditure. A carryover scheme allows the firm to retain a fixed percentage of any cost savings, irrespective of when the efficiency gain is initiated. This is done by adding a carryover component as one of the building blocks when establishing the efficient cost base for the next period. This carryover amount reflects the additional income the firm would have retained had the cost allowance not been reset at the end of the regulatory period.

Balancing operating and capital expenditure incentives

Efficiency-sharing schemes also need to ensure that incentives to pursue operating and capital expenditure savings are balanced. Such balance will seek to ensure that, for example, an incentive scheme for operating expenditure does not create a distortion whereby the operating expenditure saving is reflected in higher capital expenditure. This means that there is a need to consider either incentive schemes for both operating expenditure and capital expenditure or complementary mechanisms to avoid distorted outcomes.

The symmetry of incentives for underspending and overspending

Another issue is the extent to which rewards for reducing costs should be balanced by penalties if expenditure is higher than forecast. In the context of economic regulation, it is typical to allow a wide range of cost pass-through events so that consumers bear all of the costs of specified non-controllable events. But ex post reviews can disallow overspending of operating and capital expenditure and, in particular, not allow some capital expenditure to be rolled into the RAB in the next regulatory period.

As a result, when implementing a capital expenditure efficiency scheme it is necessary to determine the extent to which there is a penalty for overspending of controllable capital expenditure.

Incentives to bias forecasts

When efficiency incentive schemes are introduced there can be stronger incentives to exaggerate forecasts of expenditure to the extent that this increases the profits of the regulated entity. This can be addressed by improving the review process for forecasts and by ex post adjustments where there are material differences between actual and forecast expenditure.

In the case of capital expenditure deferrals, adjustments can be made to remove or reduce the financing benefit (return on and return of the difference between actual and forecast capital expenditure) if the capital expenditure difference is largely attributable to a pure deferral of the expenditure rather than a permanent efficiency benefit.

It should also be recognised that an efficiency sharing scheme can be effective in revealing a business's efficient cost, thereby reducing the need for more intrusive expenditure reviews.

11.2.5 Potential incentive schemes for Icon Water

Service performance incentives measures

Many price cap regimes incorporate explicit incentives to counter any potential adverse impacts that price cap regimes may have on the quality of services.

At present Icon Water is not subject to a services performance incentive scheme. Nevertheless, it does operate within a regulatory framework governed by the ACT and the Commonwealth governments. Among its regulatory obligations are compliance with the Utility Services License under the *Utilities Act 2000* and with the Drinking Water Utility License, the Consumer Protection Code July 2012, and technical codes under the *Utilities (Technical Regulation) Act 2014* and legislative instruments under the *Environment Protection Act 1997*. Icon Water reports to the Commission, the Utilities Technical Regulator, the Bureau of Meteorology and the Australian Bureau of Statistics on specific service-level measures such as consumer complaints and unplanned interruptions to water supply and sewerage services.

In order to achieve specific service standards for Icon Water, relevant performance measures can be defined and monitored. The target output measures can be selected from the already specified measures under Icon Water's current obligations to the ACT and Commonwealth governments, such as water quality, leakages, consumer complaints and supply interruptions. The proposed service standards can be linked to financial rewards or penalties in an effort to achieve improved outcomes.

An efficiency benefit sharing scheme

In its main submission Icon Water states that it will receive a financial benefit associated with underspending of capital to the extent of \$56.4m during the current regulatory period. The Commission takes the view that this underspend is likely the result both of an increase in the efficiency of Icon Water's capital program and of ACT consumers having previously paid excessive charges.

The Commission's method of regulatory control currently makes no standard allowance for improvements in operational or capital expenditure efficiency to be retained by the regulated entity as income. Similarly, Icon Water's preference for retaining the financing benefits might be viewed as being consistent with the Industry Panel's establishment of an end-of-period demand volatility adjustment mechanism. In this instance, the Commission acknowledges the social value in incentivising a decrease in capital expenditure, provided that this decrease is not associated with lower service levels (arising from, for example, neglected infrastructure investment), increased operational expenditure costs (arising from, for example, maintenance costs associated with non-replaced assets) increased future capital costs (where the necessary expenditure is moved to later regulated periods, requiring additional funding) or exaggeration of forecast capital expenditure.

Such considerations might suggest to the Commission that sharing these financing benefits between consumers and Icon Water could provide a better balance between incentivising efficient capital expenditure and returning overpayments to consumers.

In order to guide an appropriate level of benefit sharing between consumers and Icon Water, an efficiency benefit sharing scheme can be introduced and established. In determining the nature of the EBSS, the Commission would have to make a decision on the precise elements of a preferred scheme. One example could be allowing Icon Water to retain the underspent amounts or other cost reductions for the length of the regulatory period and then pass a certain percentage on to consumers through lower prices at the end of the regulatory period.

If the Commission does choose to introduce an EBSS, there would be a need to determine whether the scheme is symmetric for underspending and overspending and to what extent the rewards should be balanced by penalties and whether the scheme should apply to both capital and operating expenditure.

Deadbands

One common form of risk, benefit and cost sharing used by Australian regulators is a price cap that can be adjusted for any under- or over-recovery of revenue above a certain threshold (deadband). Deadbands allow for the regulated service provider to bear the demand risk up to the threshold, while consumers bear the risk beyond this threshold.

This form of benefit sharing is administratively simple in that minor variations in demand do not require a costly administrative response. As a result, it provides a degree of regulatory certainty in relation to pricing without overly sacrificing consumer interests. Note that the arrangements are typically symmetrical, so that if demand exceeds the threshold the benefits accrue to the firm up to the threshold and to customers beyond the threshold.

The Commission has a longstanding record of using deadbands as an efficiency sharing mechanism.

Community social and environmental benefit sharing

The current tariff structure for water in the ACT is a two-part inclining-block tariff that features relatively low supply charges in comparison with apparently high usage charges. This is in contrast with the utility's cost structure, where costs are approximately 80 per cent fixed and 20 per cent variable. (The economic benefits of inclining and variable-weighted tariff structures are discussed in Chapter 2.)

The Commission sought to investigate the community's reaction to a tariff structure that more closely reflected the utility's cost structure in that it featured high fixed costs and low variable costs. There was significant community opposition to altering the tariff structure in this fashion.

Consumers who contacted the Commission perceived that the move towards a cost structure that reflected utility costs would be environmentally sub-optimal, would potentially diminish the value of household sunk water investments, had the appearance of being contrary to government messaging about reducing water usage, and raised social equity and distributional concerns.

It might well be that the community's enthusiasm for the current tariff structure represents a form of benefit sharing, in that it places a higher financial risk on the regulated entity (in terms of the mismatch between the utility's fixed costs and the tariff structure) in return for serving the community interest in maintaining the existing tariff structure and reducing mains-supplied water usage.

11.3 The Commission's draft decision

The analysis in this chapter reveals a number of factors that warrant further investigation and consideration should an incentive scheme be introduced – in addition to or to replace the current regulatory arrangements. The Commission's draft decision is to further examine the potential for implementing incentive schemes for Icon Water's operating expenditure, capital expenditure and service levels during the 2018–23 regulatory period. This review will be given effect through a future reset principle specified in the draft price direction.

Appendix 1 Terms of Reference

Following are the Commission's Terms of Reference, as issued by the ACT Treasurer on 13 December 2016.

Australian Capital Territory

Independent Competition and Regulatory Commission (Regulated Water and Sewerage Services) Terms of Reference Determination 2016

Disallowable instrument DI2016-297

made under the

Independent Competition and Regulatory Commission Act 1997 ('the Act'),
Section 15 (Nature of industry references) and Section 16 (Terms of industry references).

Reference for investigation under s. 15

Pursuant to subsection 15(1)(a) of the Act, I refer to the Independent Competition and Regulatory Commission (the 'Commission') the matter of an investigation into, and the making of a price direction for regulated water and sewerage services provided by Icon Water Limited.

The price direction will be for the period of 1 July 2018 to 30 June 2023.

Terms of Reference for investigation under s. 16

1. The Commission must consider:
 - a. the objectives of the Commission outlined within section 7 of the Act;
 - b. the objective related to price directions outlined in section 19L of the Act;
 - c. the legislative requirements outlined in section 20(2) of the Act;
 - d. the policies of the ACT Government as they relate to the supply and use of water and sewerage services, including the *ACT Water Strategy – Striking the Balance 2014–2044*;
 - e. the National Water Initiative, Murray–Darling Basin Plan commitments and associated policies and agreements; and
 - f. any other matters considered to be directly relevant to the pricing investigation.
2. The Commission should consider:

- a. continuing to use the current regulatory model, and, where identified, implement improvements to particular aspects of the methodology;
 - b. appropriate mechanisms to ensure the recovery of the prudent and efficient costs of Icon Water Limited during the regulatory period, while minimising the potential for significant price fluctuations; and
 - c. whether there is potential for the implementation of incentive schemes for service levels, operating expenditure or capital expenditure for Icon Water Limited in the future.
3. As part of its investigation, the Commission should outline its intended approach to achieving its various regulatory objectives within its decision making process.
4. The Commission should identify, in the draft and final reports of the investigation, the incremental impact on prices associated with:
 - a. any changes to the total allowed revenue for Icon Water Limited;
 - b. any changes to the water demand forecasts used in the regulatory model; and
 - c. the implementation of any reforms to the tariff structure arising from the Commission's review of Icon Water Limited's regulated water and sewerage services tariffs.
5. In accordance with subsection 16(2)(d) of the Act, the Commission must make available a draft report for public inspection within the period of 1 September 2017 to 12 December 2017.
6. In accordance with subsection 16(2)(a) of the Act, the Commission must submit its final report to the referring authority within the period of 1 March 2018 to 1 May 2018.

Andrew Barr MLA
Treasurer
13 December 2016

Appendix 2 Compliance with Terms of Reference and the ICRC Act

This appendix first sets out how the Commission’s investigation complies with the Terms of Reference. Second, it considers how the proposed price direction, should it be adopted, would comply with the provisions of the *Independent Competition and Regulatory Commission Act 1997*, and particularly section 20(2).¹⁵¹

A2.1 Compliance with the Terms of Reference

Table A2.1 Compliance with the Terms of Reference

Clause	Requirement	Chapter	Comments
Section 15 of the Act	The price direction will be for the period of 1 July 2018 to 30 June 2023.	2	The proposed price direction applies for the five year period from 1 July 2018 to 30 June 2023.
1.a	The Commission must consider the objectives of the Commission outlined within section 7 of the Act.		See Table A2.2
1.b	The Commission must consider the objective related to price directions outlined in section 19L of the Act.		See Table A2.3
1.c	The Commission must consider the legislative requirements outlined in section 20(2) of the Act.		See Table A2.4
1.d	The Commission must consider the policies of the ACT Government as they relate to the supply and use of water and sewerage services, including the <i>ACT Water Strategy - Striking the Balance 2014-2044</i> .	1,2	As part of the Commission's tariff structure review leading to this investigation, the Commission established key price setting principles in order to clarify how it intended to take account of relevant ACT government policies. In making its draft decision based on the aforementioned pricing principles, the Commission took into account various water conservation actions, policies and initiatives, including the <i>ACT Water Strategy – Striking the Balance 2014–2044</i> .

¹⁵¹ For avoidance of doubt, it is the price direction that the Commission makes at the conclusion of the price investigation, and not the proposed price direction, that is subject to the provisions set out in section 20(2) of the ICRC Act.

Clause	Requirement	Chapter	Comments
1.e	The Commission must consider the National Water Initiative, Murray-Darling Basin Plan commitments and associated policies and agreements.	1, 2	In making its draft decision, based on the aforementioned key pricing principles, the Commission considered various government policies and national agreements.
1.f	The Commission must consider any other matters considered to be directly relevant to the pricing investigation.	1, 2	In making its draft decision, the Commission regarded a number of matters it is required to consider under the ICRC Act and the key price setting principles it established as part of the tariff structure review in 2016–17.
2.a	The Commission should consider continuing to use the current regulatory model and, where identified, implement improvements to particular aspects of the methodology.	2, 5, 6, 7, 8	For the purposes of the draft decision, the Commission continued to use the Industry Panel's regulatory model with improvements to the parameters and demand forecasting methodology.
2.b	The Commission should consider appropriate mechanisms to ensure the recovery of the prudent and efficient costs of Icon Water Limited during the regulatory period, while minimising the potential for significant price fluctuations.	2, 3, 4, 5, 6, 7, 8	The Commission's proposed form of regulation and 'building block' methodology have been designed to recover the efficient costs of providing water and sewerage services in the ACT.
2.c	The Commission should consider whether there is potential for the implementation of incentive schemes for service levels, operating expenditure or capital expenditure for Icon Water Limited in the future.	2, 11	The Commission proposes to further examine the potential for implementing incentive schemes for Icon Water's operating expenditure, capital expenditure and service levels during the 2018–23 regulatory period. This review will be given effect through a future reset principle.
3.	As part of its investigation, the Commission should outline its intended approach to achieving its various regulatory objectives within its decision-making process.	1, 2	In making its draft decision, the Commission regarded key pricing principles that took account of both legislative and government policy objectives as well as generally accepted economic and regulatory principles. These principles provided the basis for the assessment framework the Commission used to develop its draft recommendations for prices for water and sewerage services.
4.a	The Commission should identify, in the draft and final reports of the investigation, the incremental impact on prices associated with any changes to the total allowed revenue for Icon Water Limited.	7, 9	The Commission's proposed net revenue requirement, in conjunction with its draft decision on demand forecasts, is used to calculate the prices to be charged for water and sewerage services. The revisions are outlined and the associated impacts identified.

Clause	Requirement	Chapter	Comments
4.b	The Commission should identify, in the draft and final reports of the investigation, the incremental impact on prices associated with any changes to the water demand forecasts used in the regulatory model.	8, 9	As part of the investigation, the Commission made some revisions to the current model in the direction of improving the demand forecasting methodology. The revisions are outlined and the associated impacts have been identified.
4.c	The Commission should identify, in the draft and final reports of the investigation, the incremental impact on prices associated with the implementation of any reforms to the tariff structure arising from the Commission's review of Icon Water Limited's regulated water and sewerage services tariffs.	2, 9	The Commission's 2016–17 tariff structure review provided the basis for implementation of the proposed prices. The Commission proposes to retain the existing water tariff structure while introducing a measured and gradual approach to changing the fixed supply charge. No changes have been proposed for the existing sewerage services tariff structure.
5.	In accordance with subsection 16(2)(d) of the Act, the Commission must make available a draft report for public inspection within the period of 1 September 2017 to 12 December 2017.	n.a.	The draft decision will be made available to the public by 12 December 2017, in accordance with the Terms of Reference.
6.	In accordance with subsection 16(2)(a) of the Act, the Commission must submit its final report to the referring authority within the period 1 March 2018 to 1 May 2018.	n.a.	This clause relates to the final decision.

A2.2 Compliance with the ICRC Act

A2.2.1 Objectives

Table A2.2 Compliance with section 7 of the ICRC Act

Section 7	Requirement	Chapter	Comments
(a)	to promote effective competition in the interests of consumers	n.a.	n.a.
(b)	to facilitate an appropriate balance between efficiency and environmental and social considerations	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	The pricing principles developed as part of the Commission's tariff structure review in 2016–17 provided the basis for how the Commission considered an appropriate balance between efficiency and environmental and social considerations in forming its draft decision. The Commission's proposed form of regulation and the pricing methodology have been designed to recover the efficient costs of providing regulated water and sewerage services in the ACT. Social considerations have been taken into account by ensuring that the regulated prices are based on efficient costs. The Commission also considered the impacts of proposed price changes on customers' annual water bills.
(c)	to ensure non-discriminatory access to monopoly and near monopoly infrastructure	n.a.	n.a.

A2.2.2 Section 19(L)

Table A2.3 Compliance with section 19(L) of the ICRC Act

Section 19L	Requirement	Chapter	Comments
	The Objective of the Commission, when making a price direction in a regulated industry, is to promote the efficient investment in, and efficient operation and use of regulated services for the long term interests of consumers in relation to the price, quality, safety, reliability and security of the service.	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	The Commission's proposed form of regulation and the pricing methodology have been designed to recover the efficient costs of providing regulated water and sewerage services in the ACT. This includes the costs of meeting quality, reliability and safety standards. The long-term interests of consumers have been taken into account by ensuring that the regulated prices are based on efficient costs to meet the required standards. The Commission also considered the impacts of proposed price changes on customers' annual water bills.

A2.2.3 Section 20(2)

Table A2.4 Compliance with section 20(2) of the ICRC Act

Section 20(2)	Requirement	Chapter	Comments
(a)	The protection of consumers from abuses of monopoly power in terms of prices, pricing policies (including policies relating to the level or structure of prices for services) and standard of regulated services	1, 2, 3, 4, 5, 6, 7, 8	The Commission's proposed pricing methodology recovers the efficient costs of providing regulated water and sewerage services in the ACT. Consumers are protected from abuses of monopoly power by the Commission ensuring that the regulated prices are based on efficient costs to meet the required standards.
(b)	Standards of quality, reliability and safety of the regulated services	2, 3, 11	The Commission's proposed form of regulation and the pricing methodology have been designed to recover the efficient costs of providing regulated water and sewerage services in the ACT. This includes the costs of meeting quality, reliability and safety standards. Various Territory and national water conservation actions, policies and initiatives, including the ACT Water Strategy – Striking the Balance 2014–2044, have been considered. The Commission proposes to further examine the potential for implementing incentive schemes for Icon Water's service levels during the 2018–23 regulatory period.

Section 20(2)	Requirement	Chapter	Comments
(c)	The need for greater efficiency in the provision of regulated services to reduce costs to consumers and taxpayers	2, 3, 4, 5, 6, 7, 8	The Commission's proposed price setting model is based on the prudent and efficient costs of providing regulated water and sewerage services in the ACT, reviewed by an independent expert.
(d)	An appropriate rate of return on any investment in the regulated industry	6	The Commission determined an appropriate rate of the return by considering a number of factors, including the requirements of the ICRC Act, consistency with the approaches used by the majority of Australian regulators and consistency with the competitive neutrality and allocative efficiency principles. The Commission is confident that it provides, in the current circumstances, an appropriate rate of return on investment in the regulated industry.
(e)	The cost of providing the regulated services	2,3,4,5,6,7,8	The Commission's proposed form of regulation and the pricing methodology have been designed to recover the efficient costs of providing regulated water and sewerage services in the ACT. The Commission considers that the allowed revenue represents a reasonable balance between cost recovery and efficient operation.
(f)	The principles of ecologically sustainable development	1, 2	The pricing principles developed as part of the Commission's tariff structure review in 2016–17 provided the basis for how the Commission considered an appropriate balance between efficiency and environmental and social considerations in forming its draft decision. These principles took account of a number of government policies and national agreements associated with ecologically sustainable development, including the National Water Initiative, the Murray–Darling Basin Plan and ACT government policies including the ACT Water Strategy – Striking the Balance 2014–2044.
(g)	The social impacts of the decision	1, 2, 3, 4, 10	The pricing principles developed as part of the Commission's tariff structure review in 2016–17 provided the basis for how the Commission considered an appropriate balance between efficiency and environmental and social considerations in forming its draft decision. Social considerations have been taken into account by ensuring that the regulated prices are based on efficient costs. With regard to the water tariff structure, the existing tariff structure has been retained while introducing a measured and gradual approach to changing the fixed supply charge. The Commission considered the impacts of proposed price changes on customers' annual combined bills. In adjusting for changes in prices between and during regulatory periods the Commission has applied a price smoothing factor for water and sewerage prices.

Section 20(2)	Requirement	Chapter	Comments
(h)	Considerations of demand management and least-cost planning	2, 3, 4, 8, 11	<p>The Commission's proposed price setting model is based on prudent and efficient costs of providing regulated water and sewerage services in the ACT, reviewed by an independent expert.</p> <p>The Commission proposes to further examine the potential for implementing incentive schemes for Icon Water's operating expenditure, capital expenditure and service levels during the 2018–23 regulatory period.</p> <p>The Commission has made some revisions to the current model in the direction of improving the demand forecasting methodology.</p>
(i)	The borrowing, capital and cash flow requirements of people providing regulated services and the need to renew or increase relevant assets in the regulated industry	3, 4, 5, 6, 8, 9, 10	<p>The Commission's proposed water and sewerage services pricing provides for the efficient costs of providing these services in the ACT. This includes an appropriate rate of return. In making its draft decision, the Commission also considered the estimated impacts on Icon Water's financial viability. The Commission is confident that its draft decision is consistent with Icon Water remaining financially viable and provides sufficient room to meet the borrowing capital, cash flow and investment requirements.</p>
(j)	The effect on general price inflation over the medium term	10	<p>The Commission identified the estimated impacts of its draft decision on general price inflation. The Commission's assessment is that the proposed prices are expected to have no material effect on general inflation.</p>
(k)	Any arrangements that a person providing regulated services has entered into for the exercise of its functions by some other person	3	<p>The Commission reviewed Icon Water's arrangements with other parties for the provision of regulated water and sewerage services. The Commission has found these arrangements sufficiently documented to allow due consideration for the purposes of the price investigation.</p>

Appendix 3 Submissions to the issues paper

A3.1 Written submissions

Date received	Submitter	Key issues raised/information provided
30 June 2017	Icon Water	<p>Icon Water's comprehensive submission addressed the following:</p> <ul style="list-style-type: none"> • The form of regulation, in which Icon Water proposed to maintain the five-year regulatory period, to retain the pass-through events for government fees and charges but to add a pass-through event for the Best for Region project and create a new 'unders and overs' mechanism for differences between target and actual revenue. • Operating expenditure over the current and forward regulatory period, in which Icon Water proposed 2016–17 as the base year and additional regulation costs. • Capital expenditure over the current and forward regulatory period, in which Icon Water proposed total capital expenditure of \$437m over the forward regulatory period. • RAB and depreciation, in which Icon Water proposed to retain the roll-forward methodology and the asset lives used previously. • Rate of return and tax liability allowance, in which Icon Water proposed a vanilla post-tax nominal WACC rate of 6.07 per cent. • Total net revenue allowance across water and sewerage services businesses of \$294m in 2018–19 rising to \$345m in 2022–23. • Forecast water sales volume of 41.3GL in 2018–19. • Prices and tariff structure, in which Icon Water proposed to retain the current tariff structure for water and sewerage services but increase the fixed supply charge from \$120 to \$200 over the regulatory period and fix Tier 2 prices in nominal terms at \$4.95/kL throughout the regulatory period.

A3.2 Submissions at the public consultation

Date received	Submitter	Key issues raised/information provided
28 September 2017	Ian Falconer	The submission was supportive of Icon Water's proposal, particularly the retention of the tiered pricing structure for water, which assists low use customers. The submission highlighted areas for further evaluation: the high return on capital delivered by Icon Water and the 'uneconomic bypass' contracts that might transfer a cost burden to other consumers.
28 September 2017	Kevin Cox	The submission proposed the removal of fixed charges for water and sewerage services entirely. All water and sewerage services costs would be recouped through a single variable water charge. Assistance to particular customer groups would occur through rebates and other transfer systems, rather than tiered pricing. Higher variable water prices would provide an incentive for water recycling.

Appendix 4 Demand modelling methodology

Demand forecasts are used to convert the net revenue requirement into fixed and variable water and sewerage services prices. This involves forecasting water sales, water and sewerage services customer numbers and billable fixtures. Forecast water sales are used to determine the variable component of the water and sewerage services prices. Forecast customer numbers and billable fixtures are used to determine fixed supply charges.¹⁵²

This appendix provides a summary of the demand modelling methodologies used to forecast Icon Water's total water sales and the proportion of water sales that are Tier 1. First, it discusses observed patterns of water demand in the ACT that could have implications for forecasting water sales. It then describes water sales forecasting models considered or used in previous price investigations and the Commission's proposed approach for the forward regulatory period, 2018–23.

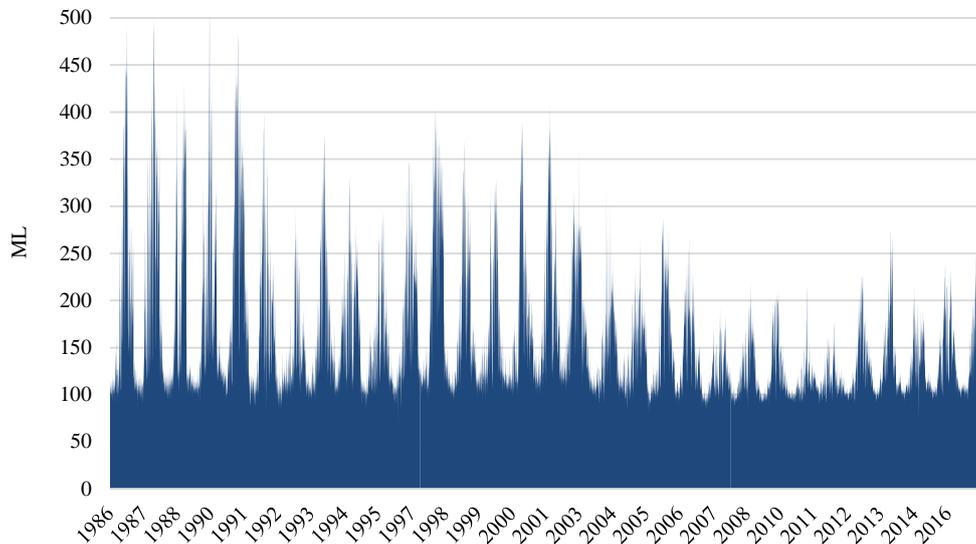
A4.1 Observed water demand in the ACT

Water demand in the ACT, as measured by dam releases and monthly billed consumption, has decreased in recent decades. Icon Water's dam releases decreased from 60GL in 1999 to 45GL in 2009. In 2015–16 (ending 30 June), Icon Water's dam releases were 50GL. The trend in dam releases between 1986 and 2016 is shown in Figure A4.1.

The reductions in water releases, and linearly associated billed consumption, over time are not reflected in changes in environmental conditions or the ACT's population. Seasonal temperature, rainfall and evaporation have not changed to an extent that explains the reduced consumption. The ACT's population has increased from 300,000 in 1994 to close to 400,000 in 2017.

¹⁵² Forecast billable fixtures are used to determine additional sewerage services supply charges for non-residential consumers.

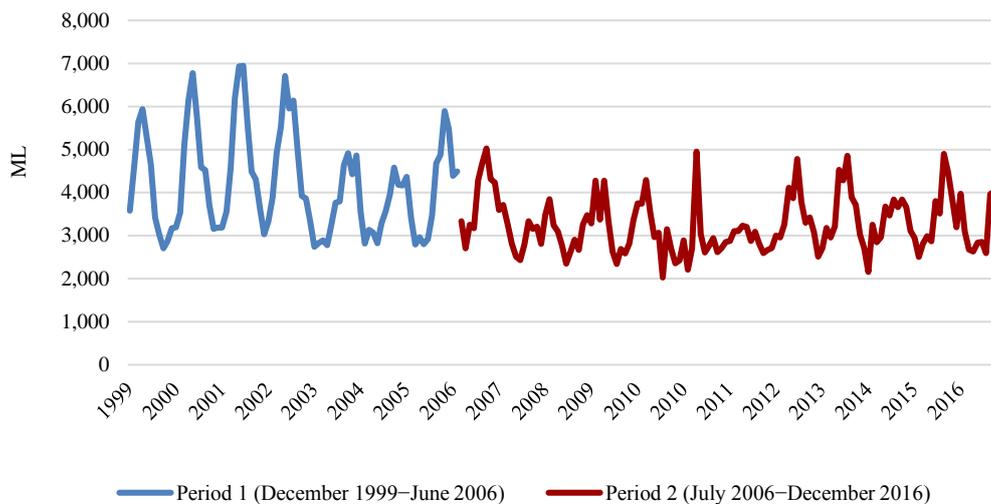
Figure A4.1 Icon Water daily dam releases, 1986–2016



Source: Icon Water (2017).

There appears to have been a permanent change in water consumption in the ACT following the Millennium Drought. This drought, which spanned the period 1996 to 2009, brought about significant changes to water-using behaviours, technology and prices. In the years following the end of the Millennium Drought per capita consumption has not returned to pre-drought levels in the ACT or in other Australian capital cities (Figure A4.2).

Figure A4.2 Structural change in water demand from July 2006



A4.2 Models for forecasting water sales

Water sales forecasting models considered or used in previous price investigations by the Commission and the Industry Panel are outlined in Table A4.1. The model origins, variables and formation are described further in the following sections.

Table A4.1 Demand models used in recent price determinations

Model	First year of development	Key input variables	Application
Breusch-Ward	2012	Evaporation, rainfall, permanent water conservation measures (PWCM), water restrictions at stage 2, stage 3 or greater, summer season.	2013 Commission price determination 2015 Commission biennial recalibration
Cardno	2014	Projected numbers for four customer types (freestanding houses, units, government/commercial, and 'all other' properties), per customer water consumption for each type, weather and restrictions.	2015 Industry Panel substituted price determination
ARIMA	2015	Daily and cumulative variables for rainfall, maximum temperature and evaporation, customer numbers (total) and seasonality term.	2017 Commission price determination (proposed)

A4.2.1 The Breusch-Ward model

Icon Water proposed the Breusch-Ward model in its main submission to the Commission's 2013 water price investigation.¹⁵³ An adapted version of the model was proposed by Icon Water in its response to the Industry Panel's draft report.¹⁵⁴

The Breusch-Ward model is a variant of the standard Ordinary Least Squares (OLS). This regression model includes variables expected to explain most of the variation in water consumption, including regular seasonality and irregular weather conditions such as rainfall and evaporation, as well as policy factors such as water restrictions.

Time-series predictors can be inserted in the main OLS model. The simplest method involves including autoregressive (AR) or moving average (MA) elements in the OLS regression equation. The Breusch-Ward model applied an AR process in the error term as the structure of data was found to be suitable with this method. The extension of the OLS model with AR property in the error term is

¹⁵³ Icon Water, 2017 (Attachment 4): 3.

¹⁵⁴ Industry Panel, 2014: 119.

$$y_t = \beta' x_t + \phi_1 \epsilon_t + v_t \quad (3)$$

$$y_t = \beta' x_t + \phi_1 (y_{t-1} - \beta' x_t) + v_t \quad (4)$$

The model uses three types of water data: daily water releases over 25 years (1986–2011), total billed consumption on a monthly basis (1998–2011), and a sample of billed consumption data (2001–2011).

To allow for seasonal variations in the consumption pattern, six predictors were utilised in the model estimation:

- i. A cumulative evaporation index.
- ii. A cumulative rainfall index.
- iii. Being under water restrictions (stages 0 and 1).
- iv. Being under water restriction of stage 2 or greater.
- v. During water restriction, a seasonal index of ‘summer’ applied, reflecting reduced seasonal water use under restrictions.
- vi. During stage 3 or greater restrictions, a multiplicative interaction between the summer index and the cumulative rainfall index, reflecting reduced sensitivity of summer consumption to rainfall during severe restrictions.

A4.2.2 Cardno model

The Industry Panel adopted the forecasts developed by its independent expert Cardno. The specifications for the Cardno model are not available to the Commission, but a description of the model was provided with the Industry Panel’s price investigation.

The Cardno model applied a sector-based approach by separating annual water demand into four customer segments. The data include a set of weather and water restrictions variables (2001–2014) without adjusting for any structural breaks in billed consumption. In the main submission for the 2018–23 regulatory period, Icon Water summarised the Cardno Model for the Panel’s final decision. The steps are as follows:

- Calculate water consumption for four dwelling types: freestanding houses, units, government/commercial, and ‘all other’ properties. The actual consumption data for these four customer segments are from 2001–2002 to 2013–2014
- Adopt the model adopted Breusch-Ward approach on weather and restrictions data to explain changes per property consumption and total volumes by four customer types
- Undertake detailed analysis of 4.5m records of meter-reading data (2006–2014) to look for changes in water consumption. The analysis was based on existing and new freestanding houses and units. The outcome indicated that newer houses and units consume less water than older housing stock

- Following the meter-reading analysis, apply an adjustment for predicted water consumption per property in order to take account of housing stock, in particular the impacts of new houses
- Use the model to estimate the growth in customer numbers by examining historical trends in customer growth and taking account of population projections from the Australian Bureau of Statistics. The projection was based on four types of customers and assumed to increase at five-year average annual growth rate
- Analyse the variance distribution from climate variables in the Breusch-Ward model
- The proportions of Tier 1 and Tier 2 consumers were set using the average historical split observed by Icon Water.

A4.2.3 ARIMA model

The Commission developed the ARIMA model in 2015 to forecast water sales. The Industry Panel’s investigation and substitute determination did not use the Commission’s ARIMA approach but adopted the Cardno model instead. Subsequently, Icon Water further developed the ARIMA model and has used this model in its submission to the 2017 price investigation. The Commission has compared model performance and the Commission’s draft decisions supports adoption of the revised ARIMA model, as proposed by Icon Water.

Consistent with statistical practice, the ARIMA model comprises several properties:

First, the *Auto-Regressive*, or AR, model:

$$Y_t = B_0 + B_1Y_{t-1} + B_2Y_{t-2} + \dots + B_pY_{t-p} + u_t \quad (1)$$

where u_t is the white-noise error term. The model determines the value of p (and in consequence the lags of the dependent variable Y_t) using a formal comparison criterion such as the Akaike Information Criterion or *Schwarz–Bayesian* Criterion.

Second, the *Moving-Average*, or MA, model:

$$Y_t = C_0 + C_1u_t + C_2u_{t-1} + \dots + C_qu_{t-q} \quad (2)$$

Y_t is described by the weighted or moving the average, and part white-noise error-term. The value of q (the number of periods over which data are averaged) is determined empirically.

Third, differencing to meet the white-noise condition:

$$Y_t - Y_{t-1} = u_t \quad (3)$$

Leaving a standard ARIMA model specification as:

$$Y_t = c + \varphi_1Y_{t-1} + \dots + \varphi_pY_{t-p} + \theta_1u_{t-1} + \dots + \theta_qu_{t-q} + \varepsilon_t \quad (4)$$

A seasonally-adjusted specification of the ARIMA model is shown below:

$$ARIMA(p, d, q) * (P, D, Q)S$$

where the lower case is for non-seasonal AR (p), difference (d), and MA (q), while the upper case is for seasonal AR (P), difference (D), and MA (Q). S is the seasonal time-span. Thus, the equation can be formed as:

$$Seasonal AR(P^S) * AR(p) = Seasonal MA(Q^S) * MA(q)$$

For this water demand forecasting application, the model components are implemented as:

- *Order (2, 0, 1) for the non-seasonal*: The order means that the ARIMA estimation applies 2nd order of AR and 1st order of MA without any differencing in daily dam releases data.
- *Order (2, 0, 1)[7] for the seasonal*: The order means that the ARIMA estimation applies 2nd order of AR and 1st order of MA without any differencing in the seven-day time-span of the daily dam releases data.

The explanatory variables and their lags are mostly climate variables:

- Rainfall data*. Rainfall lag (0, 1), rainfall square root (0, 1, 3, 6, 7, 8)
- Evaporation data*. Evaporation lag (0, 1, 2, 3, 4), evaporation squared lag (0, 1, 5)
- Cumulative temperature*. Cumulative of seven days temperature
- Cumulative rain*. Cumulative of seven days of rain
- Cumulative X*. Cumulative of seven days of Rain*Evaporation as a proxy of net rainfall effect
- Days dummy*. Dummy from Sunday until Friday. Saturday is excluded
- Monthly dummy*. Dummy for December as the highest effect of months in water releases
- Season dummy*. Dummy for summer (December–February) in water releases
- Water installation number*. Reflected in the number of customers
- Fourier seasonal term*. The control includes a Fourier term to capture the seasonality of 365 days. The Fourier term was applied for circulating yearly data. Hyndman (2014) states that the Fourier term is useful in handling time-series data with multiple seasonal periods because it provides an additional covariate.¹⁵⁵

As implemented, the ARIMA model considers climate scenarios over the forward period using four climate scenarios developed through the South Eastern Australian Climate Initiative (SEACI). The scenarios adjust rainfall and evaporation based on a 1-

¹⁵⁵ Hyndman, 2014, as cited in Icon Water, 2017 (Attachment 4): 30.

degree change in global warming in four climatic situations. The average value from all climate scenarios is used to forecast water releases.

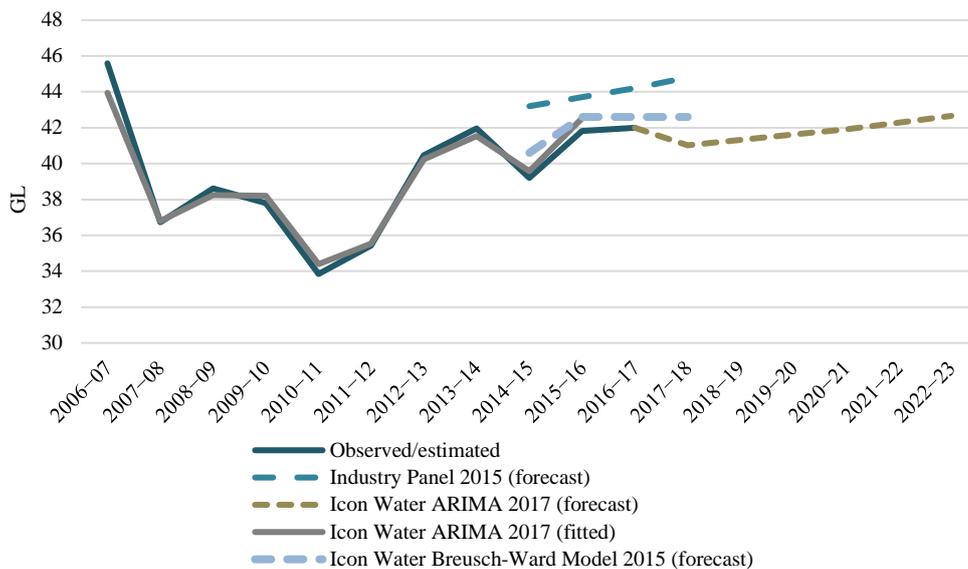
Forecast water sales

In determining the water demand forecast, Icon’s ARIMA model replicated the Commission’s approach in 2015 by measuring the average proportion of the annual water sales to water releases (1999 to 2016). The observed and forecast daily water releases are aggregated in a monthly basis in order to correspond with monthly billed consumption data. A regression was applied to estimate the historical proportion between billed consumption and water releases. The regression result found that the billed consumptions forecasts represent 84.7 per cent of the water release forecasts.

A4.3 Total water sales model performance and selection

The comparative performance of the three models is shown in Figure A4.3. Icon Water’s proposed ARIMA approach delivers greater forecast accuracy than the Industry Panel’s or Breusch-Ward model.

Figure A4.3 Comparative performance of water demand models



Sources: Commission’s calculations and data from Icon Water (2017).

A4.3.1 Icon Water’s analysis

Icon Water’s assessment of the Cardno model found a large variance between forecast and actual water sales. The average forecast water demand in the period between 2014–15 and 2017–18 was 44GL, or 7.3 per cent above the average observed water sales (41GL).

The Cardno Model's substantial variance from both the other models appears to be derived from the inclusion of population data. The Cardno model included population data and population projections, arguing that the parameters are available and reasonably robust. The Breusch-Ward model excluded population data on the basis that the plot between water demand and population is not statistically significant. The ARIMA model retains customer numbers but not population as a variable.

In Icon Water's view, the Breusch-Ward model, which was applied in the initial submission for 2013–18 regulatory period and in the biennial recalibration review in 2015, reflects robust model selection criteria. The configuration of the model has followed a standard forecasting procedure, selecting variables on the basis of information criteria and with data-driven identification of trend and seasonality.

In its submission Icon Water outlined the basis of its preference for the Commission's ARIMA model over the Breusch–Ward model. First, the Breusch–Ward model is challenged by data availability. The original data source for net evaporation came from the weather station at Canberra airport, but this data source is no longer available. Second, the ARIMA approach is a common method for modelling high-frequency time-series data. Icon Water considers the daily dam releases data to fit with the ARIMA approach. Third, the procedure in the ARIMA model is less complex to implement and has the capacity to cover demand forecasts for the five-year regulatory period. The Breusch-Ward model's requirement for annual updates is avoided by adopting the ARIMA model.

Icon Water's estimation of its proposed ARIMA model over the available data range is given in Table A4.2, with 43 out of 45 parameters estimated as being statistically significant.

Table A4.2 ARIMA estimated model parameter values

Variable	Coefficient	p-value	Variable	Coefficient	p-value
AR1	1.28	0.00	Evap0	1.16	0.00
AR2	-0.33	0.00	Evap1	1.04	0.00
MA1	-0.75	0.00	Evap2	1.16	0.00
Seas AR1	0.92	0.00	Evap3	0.88	0.00
<i>Seas AR2</i>	<i>-0.03</i>	<i>0.15</i>	Evap4	0.45	0.00
Seas MA1	-0.72	0.00	Evap0sq	0.10	0.00
<i>intercept</i>	<i>25.19</i>	<i>0.37</i>	Evap1sq	0.07	0.02
Temp0	-0.64	0.00	Evap5sq	0.05	0.00
Temp1	-7.11	0.00	CumX	-0.02	0.00
Temp12	-0.47	0.00	CumTemp	-0.08	0.00
Temp0sq	0.03	0.00	CumRain	0.14	0.00
Temp1sq	0.11	0.00	dumDM1	6.28	0.00
Temp5sq	0.01	0.00	dumDM2	12.34	0.00
Temp12sq	0.01	0.00	dumDM3	6.77	0.00
Temp1sqrt	32.40	0.00	dumDM4	5.63	0.00
Rain0	0.50	0.00	dumDM5	4.72	0.00
Rain1	0.52	0.00	dumDM6	4.84	0.00
Rain0sqrt	-3.48	0.00	dumDec	4.16	0.01
Rain1sqrt	-3.96	0.00	<i>dumSum</i>	<i>-2.53</i>	<i>0.11</i>
Rain3sqrt	-0.48	0.00	Cust	0.00	0.00
Rain6sqrt	0.26	0.03	<i>S1-365</i>	<i>-1.87</i>	<i>0.32</i>
Rain7sqrt	-0.50	0.00	<i>C1-365</i>	<i>-5.20</i>	<i>0.03</i>
Rain8sqrt	-0.38	0.00	AIC	27513	

Note: Italic forms show variables that are not statistically significant at the 0.05 per cent level.

Source: Icon Water (2017).

A4.3.2 Post-estimation tests of the ARIMA model

Two post-estimation procedures were used by Icon Water to assess the results of seasonal ARIMA to ensure the forecast estimation is robust. The first procedure is testing for stationarity; the second procedure is assessing forecasting accuracy.

Stationarity

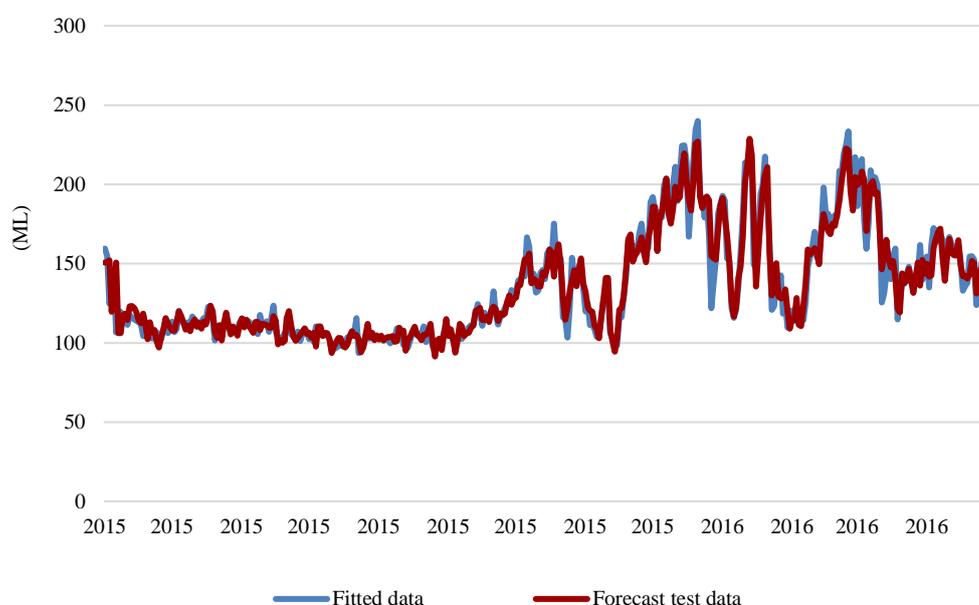
The first post-estimation procedure conducts diagnostic checking of the outcome residuals to confirm satisfaction of the white-noise condition: that there is no serial-correlation in the model's error term.

Icon Water performed two statistical tests to validate the white-noise condition: Box-Ljung¹⁵⁶ and Kwiatkowski-Phillips-Schmidt-Shin¹⁵⁷. The results of both tests supported the white-noise condition and consequent model specification at the 1 per cent level.

Forecast accuracy

Icon Water assessed dynamic forecast accuracy, as suggested by Hyndman (2014), with a visual inspection. It requires a portion of the sample fitted-data as test data, while the rest of the sample fitted-data are a portion to estimate the forecast. In this test, Icon’s ARIMA model applied fitted-data from July 2006 to March 2015 as the parameter to the forecast 12 months from April 2015. The plotted data (see Figure A4.4) indicate a reliable forecast.

Figure A4.4 Fitted and forecast data for April 2015 to April 2016



Source: Icon Water (2017).

The following are other measures of forecast accuracy:

- i. *Mean error (ME)*: the average difference between observed and forecast data, with positive and negative errors summed.
- ii. *Root mean squared error (RSME)*: the average difference between observed and forecast data, with absolute values of positive and negative errors summed.
- iii. *Mean absolute percentage error (MAPE)*: the average of the ratio between mean absolute errors and observed data.

¹⁵⁶ Ljung and Box (1978).

¹⁵⁷ Kwiatowski, Phillips, Schmidt and Shin (1992).

- iv. *Theil's U1 statistics*: the ratio between root mean squared error and the absolute error from a naïve previous-period forecast.

Icon's model compared performance of the current and the earlier version of the ARIMA model developed by the Commission in 2015 using the four forecast accuracy tests just noted. As shown in Table A4.3, Icon's forecast model performs better than the Commission's 2015 model.

Table A4.3 Forecast accuracy measures of daily dam releases

Forecast accuracy measures	Icon Water ARIMA model	Commission ARIMA model 2015
Mean error	-2.87	-5.96
Root mean squared error	13.65	15.81
Mean absolute percentage error	6.64	7.91
Theil's U1 statistics	0.05	0.06

Source: Icon Water (2017).

A4.4 Tier 1 and Tier 2 water sales

A further step in the water demand modelling involves the estimation of sales volume and, within water sales volume, the proportion of water sales at Tier 1 prices.

A4.4.1 Total water sales

When the ARIMA model is used the water sales volumes are estimated as a proportion of total dam releases. Icon Water used a regression to estimate the historical proportion between water releases and billed consumption. The regression result indicates that the billed consumption forecasts represent 84.7 per cent of the water release forecasts. This parameter is utilised to produce the forecasts over the forward period.

A4.4.2 Proportion of water sales at Tier 1 prices

Icon Water has proposed to retain the existing method of estimating Tier 1 sales. The existing method was developed in 2015 to complement the ARIMA model. The method follows the two-step process of:

1. Estimating the relationship between proportion of sales at Tier 1 prices (per cent) and per customer consumption (ML per customer per year).
2. Using the estimated relationship to project forwards the proportion of sales at Tier 1 prices.

When undertaking step 1, estimating the relationship, the equation form and data selection are critical. Earlier work by the Commission selected an exponential equation form on the basis of the significance of parameters and providing sensible values across billed consumption data. The model follows below equation:

$$y = c + a \cdot e^{bx}$$

where:

y = the Tier 1 proportion of total water sales as a proportion of 100 units

x = the average installation consumption per annum (in ML)

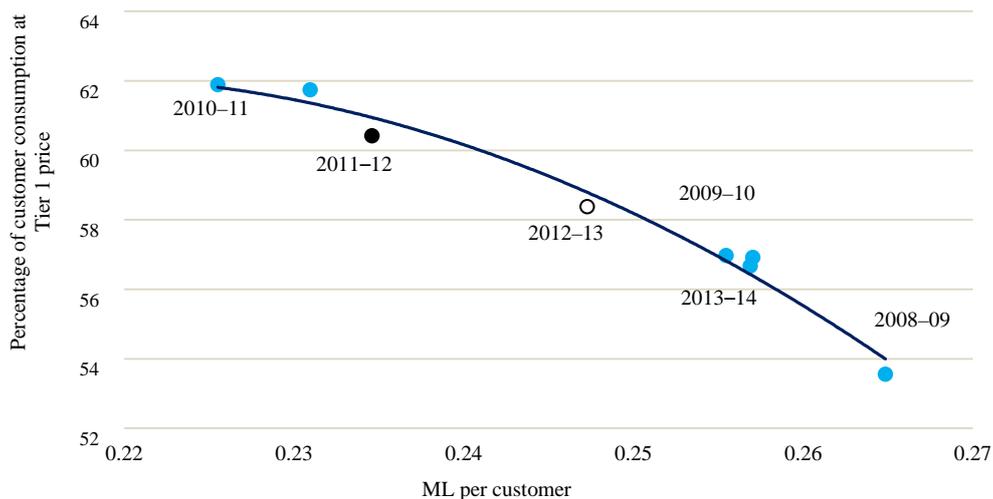
a , b , and c are the coefficients.

Icon Water use observed data for the period 2008–09 to 2015–16 to fit the parameter values as follows:

$$y = 64.14 - 0.00043 \cdot e^{38.08x}$$

Using the equation form and data proposed by Icon Water, the relationship proposed by Icon Water is plotted in Figure A4.

Figure A4.5 Relationship between per customer consumption and proportion of sales at Tier 1 price (including the 2008–09 observation)



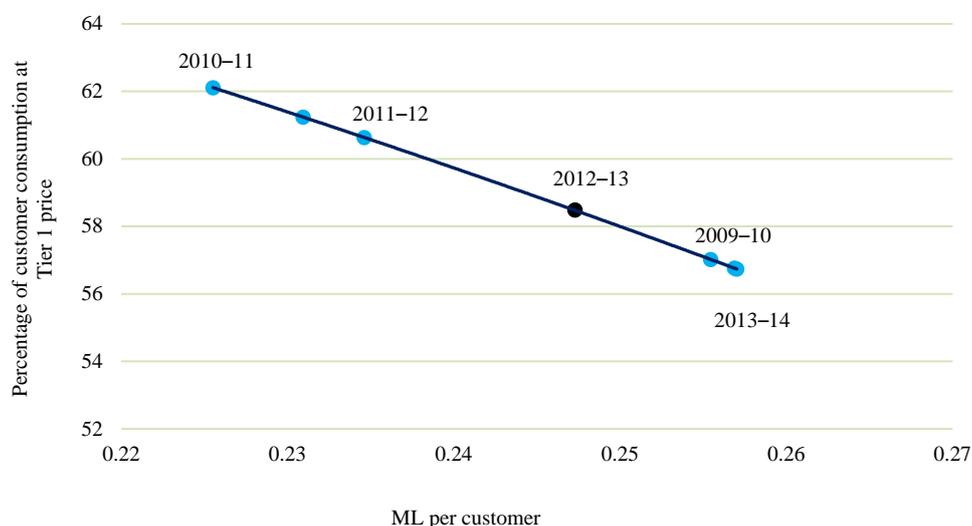
Source: Commission's (2017).

Subsequent analysis undertaken by the Commission indicated that the existence of an outlier observation in 2008–09 that has biased the parameter values estimation. The year 2008–09 was the last year of the Millennium Drought and in that year per capita water consumption was very low.

Subsequent to the finding of the outlier observation, the Commission estimated the equation between per customer water consumption and the Tier 1 proportion. The results are plotted in Figure A4.6 and the equation form is as follows:

$$y = 98.41 - 13.50 \cdot e^{4.38x}$$

Figure A4.6 Relationship between per customer consumption and the proportion of sales at Tier 1 price (excluding the 2008–09 observation)



Source: Commission's calculations.

The Commission's estimation, which excludes the 2008–09 observation, provides a more accurate forecast than Icon Water's estimation, which includes the 2008–09 observation. The forecasts are compared with observations in Table A4.4.

Table A4.4 Comparison of observed and estimated Tier 1 water sales for 2010–2016 (per cent)

Year	Observed	Icon Water estimation	Commission estimation	Closest estimation
2010	56.9	56.5	56.7	Commission
2011	61.9	61.8	62.1	Icon Water
2012	61.7	61.3	61.2	Icon Water
2013	57.0	56.9	57.0	Commission
2014	56.7	56.5	56.8	Commission
2015	60.4	60.9	60.6	Commission
2016	58.4	58.8	58.5	Commission

Sources: Commission's calculations and Icon Water (2017).

A4.5 Areas of interest in demand forecasting

Total water demand forecasts and forecast sales at different pricing tiers are essential to the Commission's investigation into water and sewerage services prices. More accurate forecasts enable the Commission and Icon Water to better manage demand risks and water prices for ACT consumers. Overly pessimistic demand forecasts increase the prices paid by ACT consumers.

The demand modelling work conducted by Icon Water and the Commission for this price investigation suggests that demand modelling techniques and abilities have progressed and improved between price determinations. Further efforts in water demand forecasting should be made to improve forecasting techniques and accuracy for the Commission's next price review. Recent advances in computing power, algorithm development and machine learning, building and appliance stock models, as well as weather and climate forecasts, provide enabling conditions for improved water demand forecasting.

The estimation of water sales at Tier 1 and Tier 2 prices has developed in the course of this price investigation. The Commission seeks further improvement in the modelling of the disaggregated components of total water demand (dam releases) – water sales volumes at Tier 1 prices, water sales volumes at Tier 2 prices, and non-revenue water.

As tariff structures reweight fixed charges over the course of the forward regulatory period, the unexpected variation in customer numbers provides a greater source of revenue risk to Icon Water. The simple linear increase approach proposed by Icon Water to forecast customer numbers has been adopted by the Commission in the current price investigation. Future forecasts for customer numbers could integrate more closely with ACT government forecasts for planning and development.

Glossary

Annual price reset process	A process undertaken by the Commission and Icon Water before the 1 July regulatory year start date to adjust water and sewerage services prices to incorporate inflation and any approved pass-through events.
Asset lives	The period of time (or total amount of activity) for which an asset will be economically feasible for use in a business.
Benchmark approach	An approach that sets the rate of return in line with the efficient debt and equity costs in the industry.
Building block model	A model used in public utility regulation to calculate the required revenue of the regulated entity. The building block model builds up the required revenue by calculating the Regulated Asset Base, the rate of return upon the asset base, and the consequential revenue return including tax effects.
Calibre	Calibre Consulting (ACT) Pty Ltd, an independent expert consultancy hired by the Commission to review Icon Water's operating expenditure and capital expenditure.
Capital expenditure	Expenditure that adds to the value of an existing fixed asset with a useful life extending beyond the taxable year.
Commission	The Independent Competition and Regulatory Commission.
Consultation period	The period of time available to the public for comments on the Commission's draft report.
Current regulatory period	The current regulatory period 2013–14 to 2017–18. The forward regulatory period 2018–19 to 2022–23.
Deadband	The range around water sales revenue beyond which adjustments are made to the revenue requirement in the subsequent regulatory period to compensate the water authority (or its customers) for under- or over-recovery of revenue where water sales are lower or higher than forecast.
Demand	The quantity of any goods buyers will take at a particular price.
Depreciation	The loss in value of an asset over its life.
Draft decision	The result of the Commission's price investigation into Icon Water's regulated water and sewerage services.
Draft report	The document produced by the Commission to outline the results of its investigation into regulated water and sewerage services.
Economic efficiency	The situation in which it is impossible to generate a larger welfare total from the available resources.

Efficient expenditure	Whether the project, program or activity is delivered or proposed to be delivered with the best value for money. Evidence considered for efficiency would include, but not be limited to, the substantiation of alternative service delivery options, assessment of lowest cost over the lifecycle, and the deliverability of the proposed project, program or activity.
Environmental considerations	Overserving minimum environmental flows of water and various permanent and temporary water conservation measures or restrictions.
Financial viability	The ability to generate sufficient income to meet operating payments and debt commitments and, where applicable, to allow for growth while maintaining service levels.
Fixed charge or fixed supply charge	A charge for a given product or service that is not linked to the amount used.
Forecast components	The components used by the Commission in its water and sewerage services model to forecast Icon Water's water sales, number of customers and fixtures.
Form of regulation	The manner in which regulation applies to a regulated party, such as prices or revenue regulation.
Forward regulatory period	The period 1 July 2018 to 30 June 2023, for which the Commission's final price direction will apply.
Gamma	The parameter that reflects the impact on dividend imputation. The value of gamma depends on the extent to which imputation credits for tax paid are distributed to shareholders and the extent to which shareholders can use imputation credits to in effect obtain a tax rebate.
Government policy context	The circumstances of government policies and how decisions made by the Commission relate to them.
Icon Water	Icon Water Limited, an unlisted public company that owns and operates the water and sewerage services assets and business in the ACT. It is the regulated water and sewerage services entity at the centre of this price investigation.
Incentive mechanism	A tool used to encourage the regulated entity to increase service levels and find efficiencies in operating and capital expenditure.
Inclining block tariff	The provision of two or more prices for water used, whereby each price applies to a customer's use within a defined tier. Prices rise with each successive tier.
Indexation	An adjustment to take into account the effect of inflation on the regulated asset base.
Industry Panel report	The report of the Industry Panel appointed in April 2014 to review the June 2013 price direction made by the Commission in relation to Icon Water's prices for the 1 June 2013 to 30 June 2019 period.

Inflation	The general increase in prices and fall in the purchasing value of money.
Market Risk Premium	A measure of the extent to which the expected return on the market portfolio as whole exceeds the risk-free rate.
Net present value	The dollar value that remains after any additions or deductions, as expressed in terms that adjust for the Weighted Average Cost of Capital (WACC).
Nominal value	The dollar value expressed as it would be in the day it was received.
Nominal vanilla weighted average cost of capital	The weighted average cost of capital that is not adjusted for inflation or tax effects.
Operating expenditure	The non-capital costs of operating and maintaining a product or service.
Pass-through	A mechanism for adjusting prices in the regulatory period for unexpected and uncontrollable costs.
Present value	The dollar value expressed in terms that adjust for the weighted average cost of capital.
Price direction	The legal instrument issued by the Commission that, under section 20(1) of the ICRC Act, follows the conclusion of the investigation and directs the regulated entity in relation to the service prices for the period specified.
Pricing principles	A set of principles that take account of both legislative and government policy objectives, as well as generally accepted economic and regulatory principles.
Prudent expenditure	Whether the project, program or activity would reasonably be expected of a utility operating in those circumstances. Evidence considered for prudence would include the substantiation of benefits of and the need for the project, program or activity.
Real value	The monetary value expressed in 2017–18 terms after adjusting for inflation.
Regulatory model	The ‘building block’ methodology approach used in conjunction with a hybrid form of price and revenue control.
Regulatory objectives	Under the ICRC Act the Commission must adhere to the objectives of promoting effective competition in the interests of consumers, facilitate an appropriate balance between efficiency and environmental and social considerations, and ensure non-discriminatory access to monopoly and near-monopoly infrastructure.
Residential customers	Customers of Icon Water, excluding businesses and other large water users.

Return on capital	A profitability ratio that measures the return an investment generates for capital contributors.
Revenue requirement	The amount of revenue required to meet Icon Water's efficient costs.
Social impacts	The effects an organisation's actions have on the wellbeing of the community.
Tariff	The price per unit of service.
Tariff structure	A combination of tariffs for a package of services, which can provide different incentives and signals to customers – for example, a two-part tariff (a fixed service charge and an inclining block tariff variable charge).
Tax expenses	A liability owing to the federal, state or local government.
Terms of Reference	The scope and limitations issued by the ACT Government to the Commission for the investigation into regulated water and sewerage services.
Trade waste	Non-domestic sewage that requires more effort to treat than average.
Rate of return	A gain or loss on an investment over a specified time period, expressed as a percentage of the investment's cost or value.
Total revenue allowance	The amount of revenue required to meet Icon Water's efficient costs minus its taxation liabilities.
Uneconomic bypass	Bypass that reduces costs to one customer but increases overall average network costs, thus creating costs for other customers.
Variable charge	A charge for a product or service which is based on the amount of quantity used. Also known as a usage or volumetric charge.

Abbreviations and acronyms

ACCC	Australian Competition and Consumer Commission
ACT	Australian Capital Territory
ACTEW	Australian Capital Territory Electricity and Water Corporation
ACT Government	The unicameral legislature of the ACT, including the Executive
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
ARIMA	autoregressive integrated moving average model
ARTC	Australian Rail Track Corporation
ASX	Australian Stock Exchange
BTP	Business Transformation Program
CAPEX	capital expenditure
CAPM	capital asset pricing model
CESS	capital expenditure spending scheme
Commission	Independent Competition and Regulatory Commission
CPI	consumer price index
CSA	Corporate Services Agreement
CSO	community service obligation
DGM	dividend growth model
EBSS	efficiency benefit sharing scheme
ERA	Economic Regulation Authority (Western Australia)
ESC	Essential Services Commission (Victoria)
ESCOSA	Essential Services Commission of South Australia
FFO	funds from operation
GDP	gross domestic product
GL	gigalitre
NPR	National Performance Reporting, undertaken by the Bureau of Meteorology
IBT	inclining block tariff
ICRC	Independent Competition and Regulatory Commission

ICRC Act	<i>Independent Competition and Regulatory Commission 1997 (ACT)</i>
ICT	information and communication technology
IPART	Independent Pricing and Regulatory Tribunal (NSW)
kL	kilolitre
km	kilometre
LMWQCC	Lower Molonglo Water Quality Control Centre
m	million
MAR	maximum allowable revenue
MRP	market risk premium
MSE	mean squared error
n.a.	not applicable
NBN	National Broadband Network
NER	National Electricity Rules
NPR	National Performance Reporting
NPV	net present value
NSP	network service provider
NSW	New South Wales
NWI	National Water Initiative
OPEX	operating expenditure
pa	per annum
QCA	Queensland Competition Authority
RAB	regulatory asset base
SOFC	statement of facts and contentions
STP	sewage treatment plant
STPIS	Service Target Performance Incentive Scheme
TAB	tax asset base
Tier 1 price	The usage price charged by Icon Water to its residential and non-residential customers for up to 200kL of water per annum.
Tier 2 price	The usage price charged by Icon Water to its residential and non-residential customers for 200kL-plus of water per annum.
UK	United Kingdom

UNFT	Utilities (Network Facilities) Tax
US	United States of America
UTR	Utilities Technical Regulator
WAC	water abstraction charge
WACC	weighted average cost of capital
WTP	water treatment plant

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