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Business SA submission: Independent State Water Price Inquiry

November 2018

Business SA
Chamber of Commerce
and Industry South Australia

Executive Summary

- South Australian businesses relying on potable water as key inputs for production, particularly in the food and beverage manufacturing and agri-business sectors, have been significantly impacted by the tripling of SA Water's potable water price in less than a decade and have provided forthright feedback about the need to reduce these costs.

- Expert independent analysis prepared for Business SA by CEPA Economic Policy Associates (Attachment A) demonstrates that the value of SA Water's regulatory 'water asset' base, their water RAB, is approximately $1.5 billion higher than a conservative estimate of the value calculated through the best practice deprival value approach. CEPA also found SA Water's waste water assets to be over-valued by approximately $500 million, and when the two are combined, SA Water's total RAB is over-valued by $1.96 billion.

- For water related charges alone, the subsequent reduction in SA Water revenues should be approximately 13% (or an equivalent of 40 cents/kilolitre (KL) if applied to water usage charges only). However, when combined with waste water related charges, the over-valuation of SA Water's total RAB represents 12% of SA Water's revenues in the reference year, 2012/13, and when addressed, should result in an approximate 12% reduction to the average customer's total bill.

- Business SA has long argued for a fully independent inquiry into the value of SA Water's assets and we welcome the new State Government's willingness to tackle this key micro-economic reform to ensure that South Australian water consumers only pay an economically efficient price for water which is critical for the cost competitiveness of business, and to ensure households can better cope with high utility costs.

- CEPA's analysis finds there was no independence in the initial setting of SA Water's RAB which is completely at odds with best regulatory practice and has already cost South Australian water consumers hundreds of millions of dollars over the last decade in SA Water revenues recovered above efficient levels.

- Business SA accepts there may need to be some brief transition period for the reduction of SA Water's RAB but the main aim of this inquiry should be to determine a robust valuation of SA Water's assets, and any financial impacts on SA Water itself or the Government as its owner are best managed by those particular parties, particularly considering the new State Government has called for this inquiry due to their own belief that SA Water's assets are significantly overvalued.

- Business SA recognises the interest in this inquiry by a wide range of consumers and the high level of complexity in the issues related to how SA Water's RAB has been constructed over time. CEPA's report, while written for Business SA, is primarily focused on providing all South Australian water consumers a voice in this debate and does not advocate price decreases for businesses over residential consumers, rather a fair and equitable percentage price reduction across the board once SA Water's RAB is adjusted to its correct value.

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Introduction

Business SA, South Australia's Chamber of Commerce and Industry, was formed in 1839 and has approximately 3,200 members across a wide range of industry sectors, from micro businesses right through to listed companies. We are a not-for-profit business membership organisation which not only works on behalf of members, but for the broader business community and in pursuit of economic prosperity for both South Australia and the nation. Business SA is also a founding member of the Australian Chamber of Commerce and Industry (ACCI) and on national issues, we work through ACCI to advance the interests of businesses across the nation. Funded mainly by our products and services to thousands of local business and employer customers, alongside member subscription support, Business SA is entirely independent of the policy agenda of any government or political party.

Existing in the driest state on the driest continent, Business SA has long played an active role in water related issues on behalf of our members, particularly those in water intensive industries such as food and beverage manufacturing and agri-business. Part of that role has included long-standing representation on SA Water's Business Customer Reference Group and the Essential Services Commission of South Australia (ESCOSA)'s Customer Advisory Committee.

In 2014, Business SA made a submission to ESCOSA's Inquiry into Reform of SA Water's Drinking Water & Sewerage Prices where we outlined the impact that high costs of potable water and trade waste in particular were having on the business community, especially export orientated sectors. At the time we argued that if there were to be wholesale changes to the way water use and supply charges are levied in South Australia, that new charges must reflect the actual costs of supply, and not be predicated on an inflated value of SA Water's assets, the assessment of which was not part of that specific inquiry. We also raised the possibility for strategic use of Adelaide's de-salination plant, with appropriate cost-sharing mechanisms in place, to avoid some impacts from irrigators losing water allocations during the next drought.

In our recent pre-state election survey, approximately one third of members nominated water costs and supply, and/or environment and sustainability issues as important matters pressuring their business. While the cost of potable water in South Australia has levelled off in recent years and other utility costs have increased dramatically, the per unit price of potable water at $3.37 per kilo-litre (KL) remains approximately triple the rate of just over a decade ago, $1.16 in 2007/08, before major cost increases were imposed including through construction of the Adelaide Desalination Plant and associated pipeline infrastructure. Trade waste costs have also continued to rise as the only measure of moving towards cost-reflectivity adopted by SA Water from ESCOSA's 2014 Inquiry recommendations, the bulk of which were dismissed by the then State Government the same day the report was released. At present, SA Water trade-waste customers are half-way through a three-year implementation of 9.5 per cent per annum price increases.

Business SA acknowledges that through the economic building block form of regulation applied by ESCOSA to SA Water's revenues, and indirectly prices, the value of SA Water's regulatory asset base (RAB), is directly or indirectly related to approximately two-thirds of its allowable revenues. Furthermore, this value is set by the South Australian Treasury, not the independent regulator.

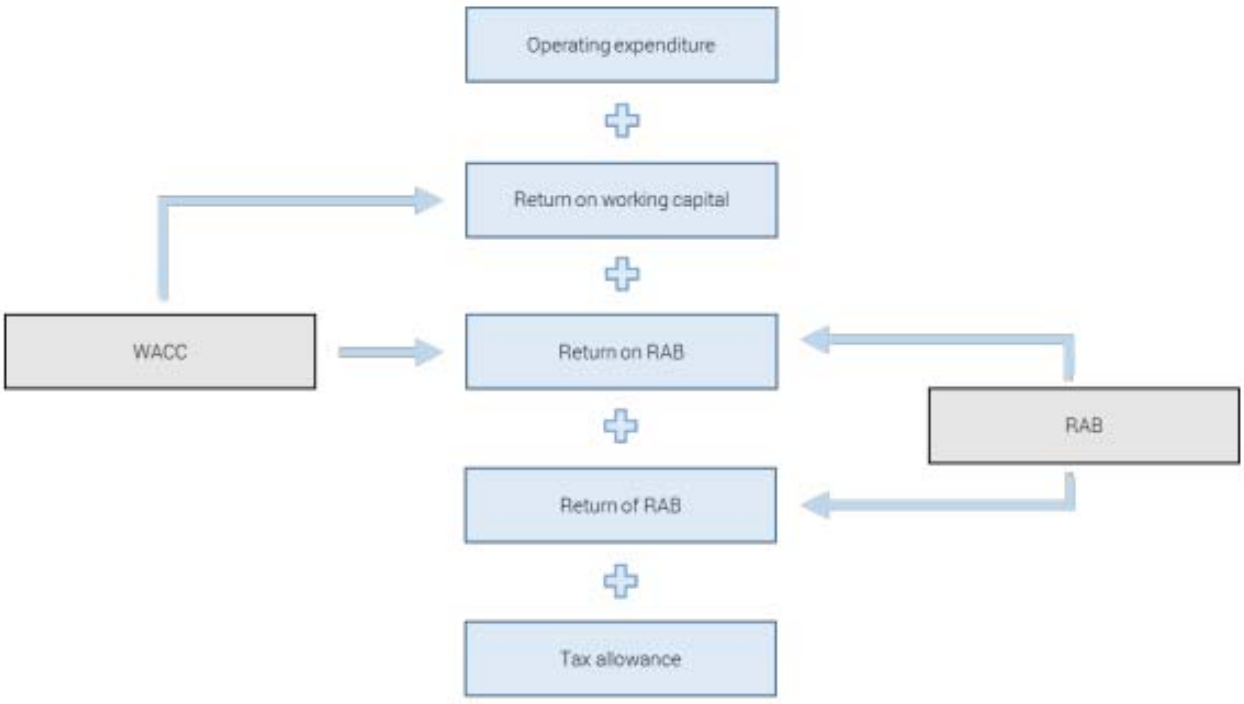

Figure C.1 shows how the total revenue cap is derived from these (primary) cost building blocks[1]

In Business SA's *2018 Charter for a More Prosperous South Australia* released in February 2018, we recommended the next State Government update ESCOSA's 2014 Inquiry to include an independent assessment of SA Water's RAB, and to review the full inclusion of the Adelaide De-salination Plant. Subsequently, we welcomed the new State Government's independent inquiry of water prices, following through on their pre-election policy entitled 'An End to Spiralling Water Prices'.

In conjunction with direct feedback solicited from South Australian businesses on the impacts of high water prices, Business SA successfully applied through the State Government's Consumer Advocacy and Research Fund to conduct expert analysis on the key drivers of growth in South Australia's water prices over the past decade, particularly water usage charges which are considerably higher than interstate. Business SA engaged Cambridge Economic Policy Associates' (CEPA), led by leading regulatory economist Eric Groom, to primarily review the basis for the determination of the RAB, and the efficiency testing of SA Water's capital expenditure; to ensure that 'all' consumers, and not just businesses, do not have to pay any more than necessary for water related charges due to either an inflated RAB, or inefficient CAPEX.

[1] ESCOSA, SA Water Regulatory Determination 2016, Page 60

The research report prepared by CEPA (Attachment A) forms the technical basis of Business SA's primary recommendations to the Independent State Water Price Inquiry, which we have supported with feedback from members on how those high prices impact them directly.

South Australian business and the cost of potable water

There are a broad range of uses for water across the economy and varying rates of usage amongst different industry sectors. There are also businesses which depend more on potable (drinking) water, while others which are typically involved in horticulture and agriculture are often, but not always, more dependent on River Murray water, or recycled water schemes, groundwater etc. In terms of businesses hardest hit by the significant increases in SA Water potable water prices over the past decade or so, while water intensive businesses such as large food processors tend to be more visible, there are also many less intensive water consuming businesses which may not necessarily spring to mind, such as health and aged care providers or caravan parks.

Business SA has received feedback for this submission from a range of businesses of varying sizes and levels of water consumption, and with many concerned about anonymity, the following case studies are mostly deidentified. The public provision of water cost information is of particular concern for large water users such as food processors where their industries are very cost competitive, and where there may only be a handful of large players. While the focus of the water price inquiry may be more aimed at the average residential customer's water bill, which is quite valid, some of our members that provided information are spending up to $3 million per annum on water related charges, and we are talking businesses employing hundreds of staff. Often for water intensive businesses, their water related costs also include trade-waste costs which can in of themselves run into hundreds of thousands per annum. For these types of businesses, any reductions in SA Water's potable price would bring very direct benefits to their market competitiveness, and their ability to employ more people.

A sample of case studies from information provided to Business SA is included below:

a) Regional Egg Producer

One regional egg producer member of Business SA is heavily reliant on potable water delivered by SA Water and uses just over 60,000 KL per annum, spending approximately $200,000 on water bills; excluding sewerage costs which are managed through an on-site dissolved air flotation (DAF) plant. This egg business uses water for a variety of purposes with the primary use being to water the livestock which accounts for approximately 70 percent of total use. In fact, after feed, electricity and labour costs, water is the fourth largest input cost in the business. Strict food and safety guidelines require all eggs to be washed in line, and water is also used to clean the machinery and wash the premises daily, all of which accounts for approximately 20 percent of water use. Hen welfare obligations are also very strict and the business must provide its free range hens with external shelter, with the remaining 10 percent of its water being used to irrigate growing trees within the range enclosures.

The egg industry is highly competitive and producers such as this business have little ability to pass these costs back to consumers. High water costs are another challenge which is even harder to manage during years of drought such as 2018 when stock feed prices have increased substantially. The business has also commented that the inquiry's limited terms of reference do not provide for a true and beneficial attempt at cost reductions for water intensive businesses.

b) Regional Caravan Park

While not typically coming to mind as a business impacted by water prices, a regional caravan park that last year spent nearly $6,000 per annum on water charges has been quite adversely impacted by the tripling of SA Water's potable water price over the past decade. Being in the service industry which is about meeting customers' needs, unfortunately this business has had to try and stop customers using water to clean their cars and vans. As much as they would like to, they have also been unable to supply passing travellers with free water given the cost to them is too high. In the words of the owner "the price of water is just one of so many rising prices that limit small businesses and their capacity to spend through employment and upgrades of facilities."

This is a typical small business having a go with both the husband and wife owners working in the business, and employing 2 full-time staff, 1 casual as well as contract cleaners.

c) South Australian Grape Growers

South Australia's wine industry is a significant contributor to the state's economy, and in 2016/17 alone generated more than $2.3 billion in revenue. 2017 also marked a record year for South Australian wine exports which reached $1.56 billion. With over 3,400 South Australian growers responsible for just under half of Australia's vineyards[2], access to water is a critical factor in securing the state's vintage. While the way in which grapes are grown across South Australia's 18 distinct wine regions varies, often dependent on access to water, the costs of water also forms a critical component of the costs of production. Business SA has been provided with analysis from the SA Wine Industry Association to demonstrate how the cost of water varies in key grape growing regions, particularly where those grape growers are more dependent on water provided through SA Water, such as in the Clare Valley. As the analysis shows, SA Water's revenues, and associated water prices can have a significant impact on the viability of grape production in certain regions.

Region	Clare	Barossa	Riverland	Langhorne Creek	McLaren Vale
Total irrigation water used by vineyards, estimated by ABS (ML)	7,106	6,139	102,700	12,200	10,044
Average water application rate on vineyard, estimated by ABS (ML/ha)	1.372	0.543	5.040	2.085	1.372
Cost of water ($/ML) – approx., estimated	$2,830	$800	$150	$190	$1,700
A = Production Cost of Water $/Tonne of grapes	$724	$66	$33	$39	$385
A as % of Avg Sale Price of Grapes	62%	3%	10%	5%	24%

[2] South Australian State Government, PIRSA, http://www.pir.sa.gov.au/food_and_wine/wine

d) Regional South Australian pork producer

Pork production is typically quite water intensive and for one member of Business SA, the high cost of potable water has been very difficult to absorb, particularly when the industry is otherwise going through such challenging circumstances, exacerbated by high feed costs. Water is vital for pork production and our member uses approximately 43,000 KL of potable water per annum, primarily for animal consumption as well as for cleaning of farrowing crates. All up across two farms, the business spends approximately $140,000 per annum on water, in addition to further costs related to treating sewerage. However, water is not the only utility cost adversely impacting this business, with high electricity and gas costs also making it very difficult to operate in an extremely price sensitive environment.

The business has advised that since the Adelaide Desalination Plant was built, their cost of water has increased substantially and is making pork production unviable. Our member has also raised concerns with bank fees, taxes and levies all adding additional cost pressures. For a small South Australian employer, any reduction in SA Water's potable water price through the inquiry would be very helpful to lower their cost of production.

e) Regional meat processor

One Business SA member involved in meat processing provided information related to one of its regional plants which uses nearly 300,000 KL of potable water per annum, resulting in water charges of approximately $1 million per annum. The water is mainly used for processing and cleaning but is also used to operate the plant's boilers. Employing approximately 400 staff, this key regional employer operates in a highly cost competitive environment and also faces issues with rising energy costs, particularly gas.

f) Bickford's (beverage manufacturer)

Bickford's is an iconic South Australian family owned business, tracing its roots back to 1839, and produces a range of beverages including cordials, sodas, juices, iced coffee and an array of water related products. It is also one of the few bottling companies in the world to have invested in sterile filtration technologies, meaning on commissioning Bickford's will be able to produce a number of products that are free of preservatives and do not need to be pasteurised. Water is a key input at Bickford's principal production facility based in Adelaide, being primarily used as an ingredient but also for cleaning, line sanitisation, as well as filtering and cooling.

Bickford's SA Water costs are approximately $200,000 per annum, including sewerage and trade waste costs. Potable water charges comprise the majority of this key input cost for the business, and its clear message is that the prices need to stop rising. Any reduction in SA Water's potable water price through this inquiry would help Bickford's reduce their production costs and in turn, help in providing more competitive prices to consumers as well providing savings to implement other water efficiency projects.

g) Adelaide based meat products processor

Using just over 150,000 KL per annum, one Adelaide based meat product processing business spends just shy of $500,000 per annum on water costs alone, in addition to nearly $200,000 on trade-waste costs. This business uses water for a range of uses, including cleaning and operating boilers and it is a significant input cost for our member, alongside electricity and gas. If the Inquiry results in lower potable water prices, the business has advised this cost saving could be allocated to employing more people and enabling the business to better compete both locally and internationally.

Appendix A – Independent analysis of SA Water's regulatory asset base (RAB) provide by CEPA Economic Policy Associates

Valuation of SA Water's Regulated Asset Base

8 November 2018

Business SA (Chamber of Commerce and Industry South Australia)

FINAL REPORT

IMPORTANT NOTICE

This report was prepared by Cambridge Economic Policy Associates Pty Ltd (CEPA) for the exclusive use of the client(s) named herein.

Information furnished by others, upon which all or portions of this report are based, is believed to be reliable but has not been independently verified, unless expressly indicated. Public information, industry and statistical data are from sources we deem to be reliable; however, we make no representation as to the accuracy or completeness of such information, unless expressly indicated. The findings enclosed in this report may contain predictions based on current data and historical trends. Any such predictions are subject to inherent risks and uncertainties.

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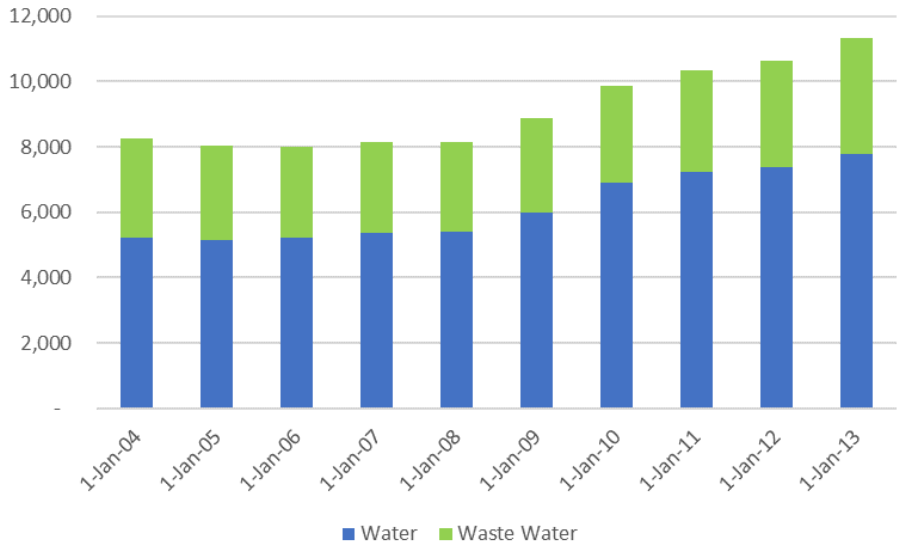
EXECUTIVE SUMMARY

Business SA (Chamber of Commerce and Industry South Australia) have engaged Cambridge Economic Policy Associates (CEPA) to provide advice in response to the South Australian Government's inquiry into water pricing in South Australia ('the Inquiry'). The Inquiry was initiated in August 2018 by the SA Treasurer and is being led by Mr Lewis Owens. The first report, 'Diving Deeper' was published in September 2018.[1]

The Inquiry's findings will assist the Government in considering the value of SA Water's regulated asset base (RAB) for the next regulatory determination by the Essential Services Commission of SA (ESCOSA), covering the period 2020-21 to 2023-34. The Inquiry takes place in the context of the significant historical increase in SA Water's RAB, as illustrated in the figure below.

Figure ES.1: Evolution of SA Water's total RAB (opening RAB, $m, December 2012 prices)



Source: CEPA analysis, Transparency Statements, Regulatory Statements and ESCOSA (2013).

In 2013-14, the return of and on capital accounted for around 70% of SA Water's revenue cap for both drinking water and sewerage services (67% and 72% respectively).[2] Therefore, the impact of the RAB on customer bills is significant. In 2013-14, the typical annual residential bill for SA Water was $1,320 , the fourth highest of the 13 major water utilities in Australia and around 7% and 10% above the average and median bill for the major water utilities, respectively.[3] In terms of how water intensive businesses have been impacted, in 2007-08 prior to any price impacts from Adelaide's Desalination Plant, the primary

[1] Owens (2018b).

[2] ESCOSA (2013).

[3] Typical annual bill for water and wastewater services. BOM (2018).

potable water price for business was $1.16/KL.[4] By 2012-13, this had increased to $3.45[5] and has only slightly moderated to $3.37/KL for 2018-19.[6] In real terms, this represents approximately a 160% increase over the 2007-08 to 2012-13 period.

Scope of this report

CEPA has been asked by Business SA to:

- review and comment on the basis for the determination of the RAB; and
- review and comment on the approach to rolling forward the RAB, particularly the approach to incorporating actual capex without an efficiency test.[7]

Our analysis is focussed on the period up to the Second Pricing Order of May 2013, which set the opening RAB for ESCOSA's first regulatory determination for SA Water in 2013-14. This is in line with the terms of reference for the Inquiry, which focus on the appropriateness of the opening RAB set by the SA Government at the start of independent economic regulation. Therefore, the subsequent evolution of the RAB resulting from ESCOSA's determinations is outside the scope of this report.

The terms of reference limit the Inquiry to consideration of the RAB for water assets only. Therefore, the bulk of our analysis has focussed on the process and methodology used to value these assets. However, we do comment on the implications of limiting the scope of the Inquiry in this way, and extend parts of our analysis to encompass SA Water's total RAB.

Our assessment of the original RAB valuation and roll-forward process has highlighted a number of concerns, which are summarised below.

Initial RAB

The accepted best practice in Australia has been to use the optimised deprival value approach to set the initial asset base on a particular date (often referred to as "drawing a line in the sand"). In its 1995 report to the Council of Australian Governments (COAG), the Expert Group advising COAG on asset valuation methods for the water sector set out its support for the deprival value approach.[8] This approach was subsequently adopted by the majority of Australian State regulators.

The deprival value approach, which reflects the value to the asset owners if they were 'deprived' of the future economic benefits of the asset, takes the minimum of the economic value approach (estimated net present value of the assets' future expected cash flows) or the depreciated optimised replacement cost

[4] 2007-08 Transparency Statement – Part A.

[5] 2012-13 Regulatory Statement.

[6] SA Water (2018).

[7] Throughout this report, we use 'efficiency' and 'inefficiency' to refer to both prudency (e.g., the need for and size of assets) and whether the capex has been incurred efficiently.

[8] COAG (1995).

(DORC).[9] The National Water Initiative (NWI) Pricing Principles allowed more flexibility for valuing legacy assets (beyond deprival value), but advocated for drawing a line in the sand in relation to legacy assets.

While DORC estimates were used to set the initial RAB in some jurisdictions, for others (NSW, WA and the ACT) the economic value method was the lower of the two branches of the deprival value approach.[10,11] The decisions of these states could be seen to reflect an implicit 'contract' with consumers that – prior to the start of independent economic regulation – services were not provided on a fully commercial basis. The NWI required a change to this contract, so that future efficient capex would be recovered on a fully commercial basis by allowing the service provider a commercial return on their investment in new and replacement assets. For existing assets however, an approach that preserves the 'implicit contract' would instead provide for recovery of existing returns, to the extent that these are below the commercial return.

The initial RAB was not set in line with the deprival value approach.

While it appears that a DORC approach was used to set SA Water's initial RAB, based on our analysis, this appears to be materially higher than the value that would have been established using the economic value branch of the deprival value methodology. Using an economic value approach, we have estimated an initial 1 July 2004 RAB value for the water assets of between $2.45 billion and $4.77 billion, with a mid-point estimate of $3.62 billion.[12] SA Water's 1 July 2004 DORC valuation was $4.15 billion, $0.53 billion above the economic value mid-point.

In some respects, the SA approach appeared to recognise the implicit contract referred to above by – from the 2008-09 Transparency Statement onwards – setting the minimum revenue bound on the basis of a lower rate of return (3.1%) for legacy assets compared to new assets (6%). However, no country assets appear to have been classified as legacy assets. The revenue targets adopted by the Government also fell above minimum level, approaching the upper revenue bound (URB) established by levying the commercial 6% rate of return on *all* assets.

In contrast, the 'line-in-the-sand' approach adopted by other states fixed legacy asset values consistent with pre-existing prices and expectations. This approach honoured the existing 'implicit contract', while gradually introducing a fully commercial basis for service provision as new investments were made. This type of approach provides greater certainty regarding the treatment of the legacy assets, and a more gradual path to the same end point as existing assets are replaced and start to earn a commercial rate of return.

Limited independent review and scrutiny of the initial RAB.

We have assessed the approach to setting the initial RAB against the following regulatory best practice criteria – communication, consultation, independence, flexibility, effectiveness and efficiency, accountability,

[9] See for example QCA (2000), page 33.

[10] We note, if the initial cash flows used for the economic value method have been set based on a DORC method, then both methods should give a similar value.

[11] In Victoria, the ESC also recommended an economic value approach. However, the Government ultimately determined starting RAB values for the different water companies using a mix of economic value and DORC approaches.

[12] The mid-point estimate is based on a six-year average of free cash flows (up to 2003-04), a real, post-tax WACC of 3.6%, and a period of 25 years. We have tested a range of 3.0%-4.1% for the WACC, and 15-35 years for the period of analysis.

and transparency. On balance, the process followed for initially setting and then rolling forward SA Water's RAB does not perform well against the assessment criteria.

The process to set SA Water's initial RAB cannot be considered fully independent, given that the owner of the business effectively decided the valuation. The underlying assumptions and methodology are not transparent. A degree of independent scrutiny was provided by ESCOSA's review of the Transparency Statements, and the publication of the Government's response to ESCOSA's findings. However, ESCOSA's reviews were focused on the compliance of the overall approach for setting the RAB with the NWI requirements and whether adequate supporting evidence was provided to inform the SA Government's pricing decisions, rather than a detailed assessment of the application of the approach or assumptions.

RAB roll-forward

After the line in the sand is drawn for legacy assets (whether through a DORC or economic value approach), the NWI Pricing Principles state that the RAB should be rolled forward by adding efficient capex and adjusting for inflation, depreciation, and disposals. This approach ensures that for new investments, financial capital maintenance (FCM) is achieved, which is currently standard regulatory practice in Australia (and the UK and New Zealand)

Our assessment of the RAB roll forwards also indicated a number of concerns:

- **Lack of independent efficiency reviews or incentives for SA Water's capex.** As the Inquiry has noted, the capex included in SA Water's RAB up to 2013 was not subject to the type review process that would be expected under a best-practice approach to independent economic regulation. This raises concerns that the RAB may include capex that would not meet an efficiency test. Further, without a capex efficiency incentive mechanism (which in other jurisdictions and sectors takes the form of *ex ante* sharing factors and/or *ex post* reviews), SA Water has not been incentivised to achieve efficiency gains after it has received approval for its capex plans.
- **Lack of transparency in relation to additions to the RAB.** Through its review of the Transparency Statements, ESCOSA repeatedly expressed concerns in relation to the level of information provided to justify levels of capex. For example, their review of the 2007-08 Transparency Statement highlighted that: "…*little or no information is provided to demonstrate that forecast capital costs are efficient. This is of particular concern given that the capital expenditure forecasts represent a substantial increase in expenditure compared to historic levels*"[13]. Further, *"[…] Transparency Statement – Part A provides no information to demonstrate that the projects themselves are necessary and 'least cost' solutions, or that appropriate capital planning processes are in place."*[14] A lack of transparency inhibits the ability of stakeholders to understand and challenge SA Water's capex proposals.
- **Indexation of RAB by forecast inflation without correction to actual inflation.** The RAB was rolled forward between reviews using forecast inflation but – based on the information contained in the Transparency Statements – there does not appear to have been a correction for the difference between forecast and actual inflation.

[13] ESCOSA (2007), page 26.

[14] Ibid., page 27.

Adelaide Desalination Plant

As the Inquiry notes, the inclusion of the full value of the ADP in SA Water's RAB is a key concern for stakeholders. High-level comparisons indicate that the ADP's capacity – resulting from the extension to 100GL – is larger than the investment in desalination capacity in other States, relative to their water demand. While SA was facing serious drought concerns at the time this investment was approved, this was also the case for the other jurisdictions. There is little evidence to suggest that a robust, comprehensive business case for the extension was developed. Without such evidence being presented, there is significant doubt that a best-practice regulatory review of prudence and efficiency would have approved inclusion of the capex for the extension in the RAB. In our view, the available evidence does not support the Inquiry's inclination to incorporate the full ADP capex in its RAB calculation.

The Inquiry's proposed approach and alternatives

The Inquiry proposes to:

- Adopt the 1 July 2004 RAB value (based on a DORC valuation) for the water assets set out in the 2005-06 Transparency Statement. This would set an opening RAB of $4.15 billion in July 2004 prices (excluding $94 million of post-corporatisation contributed assets) as a 'line-in-the-sand'.
- Roll the RAB forward from this starting point, with adjustments for actual capex, depreciation, and actual inflation to derive a June 2013 value. This value could then be compared against that set by the Treasurer's Second Pricing Order of May 2013.

The approach proposed by the Inquiry to recalculating the RAB addresses several significant concerns with the original approach used by the SA Government. It also provides a simpler and clearer basis for the establishment of a (water-only) RAB for SA Water as at 1 July 2013, compared to the examination of each individual RAB decision after the 2004-05 Transparency Statement.

While we support the Inquiry's proposed approach to revising the RAB, we consider that – in light of the concerns outlined above – it should be viewed as an upper bound estimate of a plausible range of RAB values, rather than directly adopted as the new RAB. We recommend sensitivity testing of this value to develop a more robust approach to the RAB valuation. In particular, consideration of an economic value approach can assist the Inquiry in establishing a range for the opening RAB that would be in line with the deprival value approach adopted by regulators in other States and consistent with preserving the 'implicit contract' with consumers. Sensitivity analysis can also assist the Inquiry in assessing the potential impact of regulatory capex challenges on the RAB.

We have developed an alternative approach to considering SA Water's RAB, which provides an example of this kind of sensitivity analysis.[15] In a sequence of adjustments, we have:

1. Estimated an economic value 'line in the sand' for the RAB as at 1 July 2004, based on the net present value of free cash flows. This is accompanied by sensitivity testing on the discount rate and period of analysis, highlighting the material impact of these assumptions on the results.

[15] We would be pleased to provide the Inquiry with the calculations referenced in this report, if required.

2. Rolled the opening 1 July 2004 RAB forward using projected rather than actual capex. Projected capex is 11% lower than actual capex for the period and this difference is applies as a proxy for the effect that efficiency testing of the capex program by an independent regulator may have had.
3. Deducted the cost (exclusive of the Commonwealth Government funding) of the expansion of the ADP's capacity from 50GL p.a. to 100GL p.a. from the capex program ($222 million). At this stage significant questions have been raised as to whether the increase in capacity was economically efficient.

Based on our mid-point estimate, if just the first change – an economic value for the opening water asset RAB – were made, the RAB for water assets in 2013 would be $6.77 billion, $1.00 billion below that in the Second Pricing Order of 2013. If all the changes were made (including removal of $222 million ADP expansion capex) the water asset RAB in 2013 would be $6.24 billion, $1.53 billion below that in the Second Pricing Order. If implemented, we estimate that this would have resulted in a reduction in SA Water's 2013/14 revenue cap (water only) of around -13%. This may be considered a proxy for the average water bill reduction across all consumers. These results are presented in the tables below.

Table ES.1: Comparison of Water RAB from Second Pricing Order with Alternatives ($ billion, December 2012 prices)

Option	Value ($b)	Difference from Pricing Order ($b and % change)
RAB Value Second Pricing Order May 2013 to apply from 1 July 2013	7.77	
Re-calculated RAB using "Roll-forward"	7.32	-0.45 (-6%)
LIS RAB at 2004-05 Rolled Forward using Actual Capex	6.77	-1.00 (-13%)
LIS RAB at 2004-05 Rolled Forward using Projected Capex	6.47	-1.30 (-17%)
LIS RAB at 2004-05 Rolled Forward using Projected Capex less Second Stage ADP	6.24	-1.53 (-20%)

Source: Second Pricing Order of 2013, CEPA

Table ES.2: Impact on 2013/14 revenue cap - Change from Second Pricing Order Water RAB (December 2012 prices)

Option	Total revenue cap ($m / % change)	Revenue/ customer ($ / % change)	Revenue/ML ($ / % change)	Return on equity ($m / % change)
Re-calculated RAB using "Roll-forward"	-29 / -4%	-38 / -4%	-129 / -4%	-10 / -6%
LIS RAB at 2004-05 Rolled Forward using Actual Capex	-65 / -9%	-86 / -9%	-291 / -9%	-22 / -13%
LIS RAB at 2004-05 Rolled Forward using Projected Capex	-84 / -11%	-112 / -11%	-378 / -11%	-29 / -16%
LIS RAB at 2004-05 Rolled Forward using Projected Capex less Second Stage ADP	- 99 / -13%	-131 / -13%	-444 / -13%	-34 / -19%

Source: CEPA

Note: The return on equity impact represents a maximum impact on dividends, as it assumes a 100% pay-out.

Economic valuations are sensitive to the assumptions applied. The table below illustrates the impact of varying the WACC and period assumptions on the 2004 opening RAB value. While this implies a potentially

wide range of values, we have undertaken a simple cross check by calculating a 'rule of thumb' RAB estimate based on: *RAB = return on capital x book value / WACC*. This results in an approximate estimate of $3.63 billion (July 2004 prices), which is close to the mid-point estimate of the range below.

Table ES.3: Economic value RAB 1 July 2004 – Water Assets – Sensitivity Testing ($ billion, July 2004 prices)

Period (years)	Real Post-Tax WACC		
	3.0%	3.6%	4.1%
15	$2.65	$2.54	$2.45
20	$3.30	$3.13	$2.99
25	$3.87	***$3.62***	$3.43
30	$4.35	$4.03	$3.79
35	$4.77	$4.38	$4.09

Source: CEPA. Green indicates values below the 1 July 2004 RAB value proposed to be adopted by the Inquiry.

Extension to wastewater assets

The terms of reference limit the Inquiry to consideration of the RAB for water assets. We consider that it would be preferable to consider the water and wastewater RAB's concurrently - customers are concerned about the total bill, and it would be logical to approach the valuation of the water and wastewater RABs on the basis of a consistent framework. Depending on the valuation approach adopted, there may be interdependencies between the value of the water and waste water assets – this is particularly the case for an economic value approach.

We have therefore replicated the analysis outlined above for SA Water's combined water and wastewater RAB. If just the first change – an economic value for the opening RAB – were made the total RAB in 2013 would be $9.90 billion, $1.45 billion below that in the Second Pricing Order.[16] If all the changes were made the total RAB in 2013 would be $9.39 billion, $1.96 billion below that in the Second Pricing Order. If implemented, we estimate that this would have resulted in a reduction in SA Water's 2013-14 total revenue cap (or average savings to customers across water and wastewater services) of around -12%.

[16] These estimates are based our mid-point values for the WACC and the period of analysis used to establish the 2004 initial RAB value. As noted above, these assumptions may materially impact the valuation.

Table ES.4: Comparison of Total SA Water RAB from Second Pricing Order with Alternatives ($ billion, December 2012 prices)

Option	Value ($b)	Difference from Pricing Order ($b and % change)
RAB Value Second Pricing Order May 2013 to apply from 1 July 2013	11.35	
Re-calculated RAB using "Roll-forward"	10.78	-0.57 (-5%)
LIS RAB at 2004-05 Rolled Forward using Actual Capex	9.90	-1.45 (-13%)
LIS RAB at 2004-05 Rolled Forward using Projected Capex	9.62	-1.73 (-15%)
LIS RAB at 2004-05 Rolled Forward using Projected Capex less Second Stage ADP	9.39	-1.96 (-17%)

Source: Second Pricing Order of 2013, CEPA analysis.

Table ES.5: Impact on 2013/14 revenue cap - Change from Second Pricing Order Total RAB (December 2012 prices)

Option	Revenue cap ($m / % change)	Revenue/ customer ($ / % change)	Revenue/ML ($ / % change)	Return on equity ($m / % change)
Re-calculated RAB using "Roll-forward"	-38 / -3%	-50 / -3%	-169 / -3%	-13 / 5%
LIS RAB at 2004-05 Rolled Forward using Actual Capex	-96 / -9%	-127 / -9%	-431 / -9%	-32 / 13%
LIS RAB at 2004-05 Rolled Forward using Projected Capex	-114 / -10%	-152 / -10%	-513 / -10%	-38 / -15%
LIS RAB at 2004-05 Rolled Forward using Projected Capex less Second Stage ADP	-129 / -12%	-171 / -12%	-580 / -12%	-43 / -17%

Source: CEPA. Note: The return on equity impact represents a maximum impact on dividends, as it assumes a 100% pay-out.

Transitional issues

Consideration of transition paths and implementation issues is important in ensuring the effectiveness of the Inquiry. We think that it would be appropriate for the Inquiry to consider issues in relation to SA Water's gearing if the RAB is written down. However, not all issues raised by stakeholders are necessarily managed most appropriately through the Inquiry.

The Diving Deeper paper highlights a range of other transitional issues raised by stakeholders, including a possible reduction in the WACC and potential introduction of retail competition. While the Inquiry can consider and advise on the timetable and transition paths for the adoption of a new RAB, the implementation of this – and the financeability impact of a concurrent reduction in the RAB and the WACC – is best done through the ESCOSA review of prices.

We also note that while the decision on the RAB will impact on the SA Government as the owner of SA Water, this does not support a regulator giving different weight to the consideration of those impacts because the owner is the SA Government. The competitive neutrality principles underpinning the National Competition Policy (NCP) require that government-owned utilities operate within a commercial framework and are regulated on the same basis as privately-owned utilities. This means that who the dividends flow to and how they are used should not be relevant to the Inquiry's decision.

1. INTRODUCTION

Business SA (Chamber of Commerce and Industry South Australia) have engaged Cambridge Economic Policy Associates (CEPA) to provide advice in response to the South Australian Government's inquiry into water pricing in South Australia ('the Inquiry'). The Inquiry was initiated in August 2018 by the SA Treasurer and is being led by Mr Lewis Owens. The first report, 'Diving Deeper' was published in September 2018. The scope of the Inquiry is set out in the following section.

CEPA has been asked by Business SA to:

- review and comment on the basis for the determination of the RAB; and
- review and comment on the approach to rolling forward the RAB, particularly the approach to incorporating actual capex without an efficiency test.

We have approached this task by:

- reviewing regulatory precedent and best practice principles in setting and rolling-forward the initial RAB;
- assessing the original approach taken to determining SA Water's RAB, including the treatment of the Adelaide Desalination Plant (ADP);
- assessing the proposed approach of the Inquiry to calculating SA Water's RAB; and
- proposing alternative approaches and sensitivity analysis that could be considered by the Inquiry.

Business SA acknowledges this report was funded through the Department of Human Services (DHS) 'Consumer Advocacy and Research Fund (CARF)', a fund established within the *Water Industry Act 2012* to support amongst other things, projects that advance the interests of consumers from an advocacy perspective.

1.1. SCOPE OF THE INQUIRY

The terms of reference require the Inquiry to examine:

1. the reasonableness of the opening value of SA Water's RAB established in 2013;
2. whether that value should be changed;
3. if so, the implementation strategy and timetable for a change in the RAB; and
4. issues in the setting of the RAB, including inflation adjustments, to ensure a reasonable balance between the interests of consumers and the Government (as owner of SA Water).

Significantly, the terms of reference limit the Inquiry to consideration of the regulation of SA Water's drinking water services and RAB for drinking water assets. The Inquiry's paper, Diving Deeper, acknowledges that stakeholders have expressed concerns about the limitation of the Inquiry to drinking water services only. We consider that this concern is justified, for the reasons outlined below.

Customers are concerned about the total bill, as it is this that impacts on the household's available budget or business competitiveness. In 2013-14 the typical annual bill for SA Water was $1,320, the fourth highest of the 13 major water utilities in Australia and around 7% and 10% above the average and median bill for

the major water utilities, respectively.[17] For many businesses, the potable water price is more relevant to their total water costs. In 2007-08 prior to any price impacts from Adelaide's Desalination Plant, the primary potable water price for business was $1.16/KL.[18] By 2012-13, this had increased to $3.45[19] and has only slightly moderated to $3.37/KL for 2018-19.[20] In real terms, this represents approximately a 160% increase over the 2007-08 to 2012-13 period. For a smaller cohort of businesses, trade waste charges are also a particularly important component of their bill. These costs have also risen significantly in recent years, including 9.5% per annum rises from 2017-18 to 2019-20 as part of SA Water's transition to cost-reflective pricing.[21]

Furthermore, depending on the approach taken to the valuation of the RAB, the value ascribed to the drinking water assets may not be independent of the value of the wastewater assets. If the assets are revalued to their depreciated operating replacement cost (DORC) the value of the water and wastewater assets are separable, subject to the allocation of shared assets such as IT systems and head office costs. But if a financial valuation method is adopted – as is most common practice (see below) – the valuation of the water and wastewater assets are not independent of each other. The financial valuation approach values the assets for the business as a whole on the basis of current or expected cash flows. There are a range of options as to how this value is allocated between the water and wastewater businesses. One option would be to use an equal percentage write-down from DORC estimates, but another would be to allocate asset values based on relative cash flows or rates of return. Given this interdependence, the value of the water assets cannot be considered entirely separately from the value of the wastewater assets.

1.2. STRUCTURE OF THIS REPORT

The remainder of this report has been structured in the following way:

- Section 2 set out the general approaches to setting initial RAB values and rolling these forward. We then discuss the line-in-the-sand approach adopted by a number of regulators, before setting out the NWI requirements and a range of precedents for RAB valuations.
- Section 3 provides our assessment of the original RAB valuation approach for water and sewerage assets in South Australia.
- Section 4 assesses the approach proposed by the Inquiry to establish a revised RAB valuation for the South Australian water and sewerage assets. This section also considers an alternative option.
- Section 5 provides a discussion of the transitional issues that would need to be considered.

Additional information is contained in the appendices:

- Appendix A provides more detail on the different approaches to RAB valuations.

[17] BOM (2018).

[18] 2007-08 Transparency Statement – Part A.

[19] 2012-13 Regulatory Statement.

[20] SA Water (2018).

[21] These rate increases were provided to CEPA by Business SA, and are sourced from information provided to the Business Customer Reference Group by SA Water.

- Appendix B provides additional information on the approaches taken by other regulators to setting initial RAB values.
- Appendix C sets out the assessment criteria that we have used to evaluate the different RAB valuation approaches in Sections 3 and 4.

2. BASIS FOR RAB VALUATIONS

In this section, we briefly set out alternative approaches to setting an initial RAB value and rolling this forward. We then discuss the line-in-the-sand approach adopted by a number of regulators, before setting out the NWI requirements and a range of precedents for RAB valuations.

2.1. APPROACHES TO RAB VALUATIONS

There are a range of different broad options for setting the **initial value,** including depreciation, of the regulatory asset base (RAB). In summary, these are:

- **Cost-based (or book-based):** Use accounting information or an assessment, such as the initial asset purchase price, or the cost of replacing the asset. There are a number of variations to this approach:
    - historic cost;
    - index historic cost;
    - like-for-like replacement;
    - modern equivalent asset value (MEA); and
    - optimised replacement cost (ORC).
- **Market-based:** Use market information, if available, to value the assets.
- **Financial/ economic value based:** Forecast the discounted present value of future cash flows.
- **Hybrid (deprival value) approach:** This uses a combination of the cost-based and economic-based techniques to quantify the loss to the owner if they were to be 'deprived' of the asset is also an option.

The different approaches to RAB valuation are well defined in a number of regulator's reports[22] and we do not think that we need to go into a detailed explanation of these approaches for the purposes of this report. We provide a summary of the approaches in Appendix A.

We think that it is worthwhile re-iterating the Council of Australian Governments' (COAG') Expert Group recommended approach to asset valuation; the deprival value method.[23] This approach has been the most commonly used by the State regulators.

As defined by the NWI:

> *"The deprival value is the value of future economic benefits that would be foregone if the entity is deprived of an asset. If the asset to be lost is to be replaced, it can be valued at its market value, replacement cost or reproduction cost, depending on the circumstances. If the asset is not to be*

[22] See for example: COAG (1995) and QCA (2000).

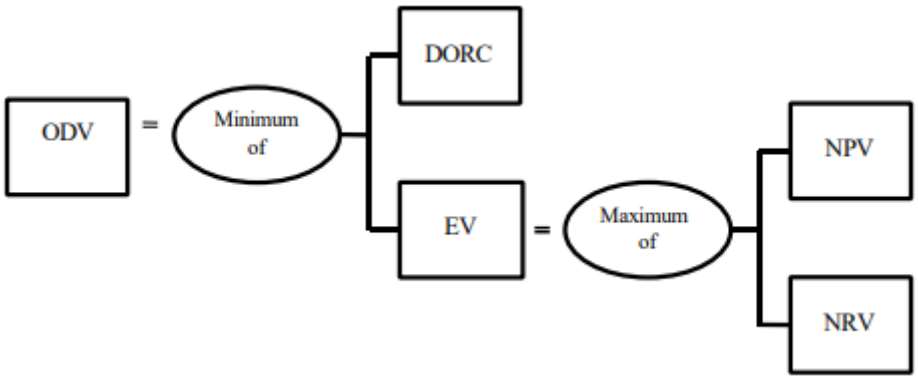
[23] See for example, COAG (1995).

replaced, then it should be valued at its economic value, which is the greater of either the net present value of the income expected to be earned from the asset, or the fair market value. The optimised deprival value [ODV] is the lesser of the DORC [depreciated optimised replacement cost] and the economic value of the asset."[24]

The QCA sets this out diagrammatically. Where:

- **Depreciated optimised replacement cost** (DORC), represents the optimal / most efficient replacement asset, e.g. 50ML per day wastewater treatment plant based on the most efficient technology available. This results in an estimate of the ORC, and once depreciated, this approach becomes the DORC.
- **Economic value** (EV), means the economic or financial value of discounted future cashflow (the net present value (NPV)). This involves the calculation of discounted expected future profit streams for the company, rather than that just accruing to shareholders as given by the market value of equity. The net realisable value (NRV) can be used instead of the NPV to determine the minimum EV estimate.

Figure 2.1: ODV



Source: QCA (2000).

The **DORC** method reflects the cost today of replacing the services provided by the assets and so sends strong signals about consumption. It also provides the basis for more accurate price signal for new entry, something that can be important in a sector that is still developing and regulated without license requirements about areas of service etc.

However, DORC approaches require significant assumptions and judgement, often requiring independent engineering and/or economic advice, on the unit costs of the assets, land values, and the optimised approach. The DORC values are very dependent on assumptions, especially when considering modern equivalent asset forms of replacement cost.

The **economic value** approach reflects the earning potential of the assets and so provides a clear valuation of future profit streams.

However, like DORC it is dependent on assumptions and may include a degree of circularity (in relation to the discount rate used and how prices were determined in the 'base' year). Most examples of this approach

[24] NWI (2004), page 7, footnote 7.

are focused on pre-privatisation estimates, or where existing assets may have been installed for non-commercial reasons.

2.2. "LINE IN THE SAND"

The "line-in-the-sand" approach, often referred to by Australian regulators in discussions of RAB valuation, is not a valuation method, but rather it is the practice of separating the process of valuing legacy assets and valuing new assets. NWI defined it as:

> *"It is common practice for some jurisdictions to draw a 'line-in-the-sand' to differentiate between past (legacy) investment decisions and new investment decisions. Where a line in the sand is drawn, an opening RAB value is set (which essentially locks in the past rate of return on previous investments). The RAB is then updated (or rolled forward) each year to reflect prudent capital additions, disposals and depreciation)."*[25]

We do not necessarily agree that the approach "*locks in the past rate of return on previous investments*", as a broad range of approaches could be used to value the opening RAB under a line-in-the-sand approach, which NWI go on to state. However, this does not affect the NWI's definition that the line in the sand means an approach to establishing the initial RAB and a (potentially) different approach to rolling it forward.

A number of regulators appear to use line in the sand to refer to the economic value approach: i.e., estimate that value of the asset based on the net present value of future income streams. However, as the assets may have been valued using different approaches before the line in the sand is drawn, this is an incorrect interpretation of the NWI's definition.

After reviewing Australian regulators' statements (discussed the rest of this Chapter), we consider that the most consistent definition of line in the sand in the water sector, is that it is an approach to:

- draws a line in the sand where the regulators/ governments determine that customers should pay an established price level for existing assets (i.e., assets could not be revalued again after this point); and
- future capital expenditure should be treated as incurred, but with adjustments for efficiency/ incentives.

This can also be thought of as regulators/ governments agreeing an implicit contract with customers that they will continue to pay the 'same' price for existing assets going forward, and a different contract for new assets (which is based on the efficient capex). ACCC/ AER (2012) working paper explains this as "*long-term under-recovery of costs might be justified if … there is an implicit or explicit agreement that any common costs will be shared in a particular way.*"[26]

An example set out in the ACCC/AER paper was bulk water prices in NSW and IPART's approach to setting the initial RAB for these. See Box 2 below.

[25] NWI (2004), page 5.

[26] ACCC/AER (2012), page 10.

Box 1: Bulk water prices

"As part of its 1998/99 determination, the Tribunal refined its treatment of the RAB. This determination explicitly stated that existing assets should be treated as sunk costs with the charges limited to the costs of maintaining service capacity. Consequently, the Tribunal decided to draw a 'line-in-the-sand' and determine that all water assets put in place prior to 1 July 1997 should not be included in the asset base for pricing purposes. This resulted in the existing asset base being valued at $0 for regulatory purposes. The key implication of this valuation was that a rate of return would not be charged on those assets in place prior to 1 July 1997. This was consistent with the view that much of the irrigation infrastructure was constructed with non-commercial objectives in mind, and so a commercial return on this historical expenditure was not justified. The Tribunal decided that only capital expenditure after 1 July 1997 should earn a rate of return."[27]

Source: IPART (2004)

The ACCC/AER working paper noted that:

> *"Past implicit or explicit promises to investors should be respected. IPART has explicitly recognised the importance of respecting past promises and assurances by not passing on to users charges which they were not expected to pay (and did not expect to have to pay) in the past:*
>
> *'The Tribunal expressed its view in 1996 that it believed that many of the rural water infrastructure assets were put in place in the late nineteenth and early twentieth century because it was a government priority at the time to expand agriculture and rural development. Water prices had until recently contained substantial subsidies and there was never any stated intention by governments across Australia to fully recover these charges."*[28]

2.3. NWI REQUIREMENTS

The NWI pricing principles, under the 'Principles for the recovery of capital expenditure" provide considerable flexibility on the valuation approach that can be taken for setting the initial RAB. Principle 3:

> *"Legacy assets*[i] *that are to be retained should be valued at Depreciated Replacement Cost (DRC); Depreciated Optimised Replacement Cost (DORC); Optimised Replacement Cost (ORC), indexed actual cost, Optimised Deprival Value (ODV)*[ii] *or using another recognised valuation method.*
>
> *Notes:*
>
> *i. Legacy assets are those which existed as at the legacy date (see iii for a definition of the legacy date).*
>
> *ii. This is consistent with the findings of the expert group on asset valuation methods which stated that the deprival value approach to asset valuation should be adopted.*
>
> *iii. The legacy date equates to the date where a line in the sand has been drawn. Where jurisdictions have not drawn a line in the sand, the legacy date will be no later than 1 January 2007 and may be in accordance with earlier dates as determined by governments or economic regulators."*[29]

[27] IPART (2004), 12.

[28] ACCC/AER (2012), page 14.

[29] NWI (2004), page 7.

New capex, covered by Principle 2, and rolling forward the RAB, Principle 5, place a focus on the efficiency going forward and ensuring the prices reflect future efficient capex (and operating expenditure (opex)).
Principle 2:

> *"New and replacement assets[i] should be initially valued at efficient actual cost[ii]*
>
> *Notes:*
>
> *i. A new asset refers to any investment (be it on a new asset or a replacement asset) that occurs after the legacy date.*
>
> *ii. To avoid circularity in price setting the amount included in the RAB should not be based on the net present value of cash flows."*

Principle 5:

> *"The RAB comprising prudent new investments and legacy investments should be rolled forward each year in accordance with the following formula, which can be expressed in nominal or real terms[i]:*
>
> *RAB t = (RABt-1 + Prudent Capital Expenditure t – Depreciation t – Disposal t (discarded assets)). (Where t = the year under consideration).*
>
> *Where assets are optimised[ii], they should not be subject to further optimisation unless there are relevant changes in market circumstances.*
>
> *Where DRC or DORC is used as a basis for asset values, the RAB comprising new investments and legacy investments should be re-valued through an independent appraisal on a rolling basis in accordance with Accounting Policy Standards.*
>
> *Where a renewals annuity is used, asset values should not be depreciated.*
>
> *Notes:*
>
> *i. When applicable, CPI or other relevant indexation factor may be used.*
>
> *ii. The RAB should be adjusted for 'unplanned' excess capacity through optimisation (that is, delivery of an equivalent service that reflects least cost planning reflecting prudent engineering and technological advancements), where 'unplanned' excess capacity is capacity which is not the result of a planned level of utilisation."*

We refer to the 'roll forward' approach above, with the addition that capex is also efficient, as the 'standard roll forward approach' in subsequent sections.

Box 2: Financial capital maintenance

We note that regulatory approaches in Australia and internationally have moved to be consistent with the FCM approach. The key implications of adopting an FCM approach are that:

- Financial valuations preferred (based on recovery of funds invested or value of future revenue streams)
- If replacement cost revaluations are used, capital gains should be treated as income.

What this means in practice, is that the regulators have tended not to revalue assets once the initial asset based has been established. This leads to the standard roll-forward approach.

The QCA provides a concise summary of capital maintenance:

"*Capital maintenance is a longstanding financial accounting concept that can be related to economic notions of the recovery of capital. Financial capital refers to the value of business assets as measured by the value of equity and debt, while physical capital is the productive or operating capacity of the assets.*

Financial capital maintenance (FCM) is the maintenance of the initial value of a business as measured by the value of assets at the time of investment. Under the accounting definition of FCM, a profit is earned only if the financial value of net assets at the end of the period exceeds the financial value of net assets at the beginning of the period, after excluding any distributions to, and contributions from owners during the period. In the regulatory context, FCM is applied in an ex ante

sense, meaning that investors of a regulated firm can expect to recover the opportunity cost of their capital and the nominal value of their initial investment over time. This is referred to as the FCM principle. As long as the present value (PV) of future regulated returns, calculated on the basis of an appropriate opportunity cost discount rate, is equal to the value of the regulatory asset base (RAB), the FCM principle is achieved. The FCM principle in an exact sense is often referred to as the NPV=0 principle.

In contrast, physical or operating capital maintenance (OCM) focuses on maintaining the productive capacity of physical assets over time, rather than the financial value of assets. In the accounting context, this means that profit is only recognised after the operating capacity of assets has been maintained or when the operating capacity of the enterprise at the end of the period exceeds the operating capacity at the beginning of the period, after excluding any changes to capacity associated with additions or disposals of assets during the period. OCM determines asset prices and depreciation charges based on the cost of replacing assets in order to maintain operational capability at a defined level.

For a defined level of operational capability, FCM differs from OCM in an accounting sense by recognising capital gains and losses associated with holding the assets as well as the standard OCM charge."[30]

Source: QCA (2014)

2.4. PRECEDENTS FOR RAB VALUATIONS

2.4.1. Water (Australia)

In the table below, we summarise the approaches adopted for initial RAB valuations and roll-forward adopted by other States and Territories in Australia. Further detail on selected states is provided in Appendix A.

Table 2.1: Summary of regulatory approaches

State/Territory	Approach
NSW – Sydney Water	Deprival value. Economic-based approach branch of the ODV was used (i.e., NPV of cash flows). Economic-based approach was used as it maintained the price levels and was materially lower than DORC. [31] A line in the sand (on revaluations) appears to have been drawn in 1998/99 year and a standard roll forward (efficient prudent capex, plus inflation, less disposals and depreciation) has been used since.
Victoria – Urban and Rural Water and Wastewater[32]	Economic-based approach proposed by ESC. The Minister determined the starting RAB values, which were based on a mixture of economic value (using either expected returns for a single year or businesses' proposed returns) or businesses' proposed prices and revenues unadjusted. A line in the sand was drawn at this point, 2004 valuation, and a standard roll forward has been used since.
Queensland – Gladstone Area Water	DORC valuations for1 July 2005 were used as the starting point for the RAB. QCA has treated this as a line in the sand, however it does note that it can 'optimise' (re-

[30] QCA (2014), pages 1-2.

[31] IPART (2000), Medium-term price path from 1 October 2000.

[32] See ESC (2005a) and ESC (2005b).

State/Territory	Approach
	value) if it "*had previously been misled, there are actual bypass options available or there are issues in relation to customers' capacity to pay.*"[33] QCA rolls forward the RAB in the standard way
Western Australia - Urban Water and Wastewater Pricing[34]	Deprival value. DORC estimate considered to be significantly higher than economic value method, so economic value method adopted. A line in the sand was made based on the 2004 values and a standard roll forward is used (regulatory asset value is updated by adjusting for efficient new capex, depreciation, asset disposals and inflation).
Tasmania – Water and sewerage	The regulated companies independently audited DORC values as of 1 July 2009 were rolled forward in the standard way to set the RAB for the first price determination (1 July 2012 to 30 June 2015). The regulator (Office of the Tasmanian Economic Regulator (OTTER)) noted that in a standard price control determination OTTER "would source independent analyses of asset values and capital expenditure. Due to time constraints, for the purpose of the current Price Determination investigation, the Economic Regulator will use the asset data provided by the regulated entities to determine each regulated entity's RAB."[35] It appears that OTTER has continued to roll forward the 2009 DORC valuations using the standard roll forward approach.[36]
ACT - Actew[37]	Deprival value. After estimating the DORC and economic value for the water assets in 1998, the Commission determined that the economic value as being the lower of the two and set Actew's opening RAB on this basis. A line in the sand was made on the opening RAB, and a standard roll-forward approach has been applied since (the Commission declined requests from Actew to revalue assets).
South Australia – SA Water	DORC valuations of the opening RAB appear to have been undertaken in the 2004-05, 2005-06 and 2006-07 Transparency Statements, which set out the basis for the SA Government's pricing decisions. From 2007-08 to 2011-12, it is unclear whether subsequent DORC revaluations were undertaken, or whether the RAB was rolled forward based on adjustments for capex, depreciation and inflation. In the May 2013 Second Pricing Order, the Treasurer effectively adopted an economic value approach to set the 1 July 2013 opening RAB to be applied by ESCOSA in its first regulatory determination for SA Water, based on expected future cash flows at that time.

Source: CEPA analysis of regulatory reports

2.4.2. Energy (Australia)

In the table below, we provide a summary of the methods used by State and Territory regulators to set the initial RAB for electricity networks. We note that all regulators, after setting the initial RABs, have generally

[33] QCA (2010), pages 74-76.

[34] ERA (2004).

[35] OTTER (2012), page 51.

[36] OTTER's wording in its 2015 Determination is slightly unclear: "*The opening $RAB_{EXISTING}$ and RAB_{NEW} are DORC asset values as at 1 July 2015 which have been rolled forward from 1 July 2009.*" However, the formula provided indicates that it is a standard roll forward approach. OTTER (2015), page 31.

[37] (IPARC, 1999).

adopted a standard roll-forward approach (i.e., no revaluations). Further details for selected States are provided in Appendix A.

Table 2.2: Summary of regulatory approaches

State/Territory	Initial RAB valuation
NSW	DORC.
Victoria	DORC, however values adjusted so that prices across rural and urban networks were approximately equal.
Queensland	DORC.
Western Australia	Deprival value. There was little difference between ODV and DORC, and the initial asset base was set on a mix of the methods.
Tasmania	DORC.
ACT	DORC.
South Australia	Deprival basis. The assets appear to have been valued using the DORC method.

Source: CEPA, Abbott and Kantor (2014), ESCOSA (2005b), ESTAS Utilities (2005).

2.4.3. International (UK)

For the privatised UK network infrastructure industries, the RAB (which was established later) was a lot lower than the net book value (under current cost accounting). This is because at privatization in the 1980s, the assets were sold at a substantial discount to net book value, and the RAB was set with reference to market value. The UK Government also provided a one-off injection of public capital and wrote-off of significant government debt and provided capital tax allowances.

The England and Wales water and sewerage industry was privatised in 1989. This involved the transfer of assets and personnel of the 10 water authorities into limited companies, which were then publicly listed on the London Stock Exchange. The companies were privatised with a price cap, RPI+K, in place. At the time of privatisation, it was forecast that significant capital investment was required and therefore rather than price decreases (in an RPI-X regime) annual price increase were allowed.

A similar process was followed in the energy sector, and as with water the RABs were set some years after privatisation however the electricity distribution RABs were based upon the share price at the end of the first day's trading. The electricity networks were initially set an RPI-X path between 0 and -2.5% (i.e., a positive price increase).

Therefore, for both water and electricity distribution, the RAB was established *ex post* on the basis of market valuations. This approached created a line in the sand for existing assets, after which capex was added to the RAB at actual cost adjusted for any efficiency/ incentive decisions. There was little visibility over the process of estimating the initial cash flows, and there was also limited visibility of the regulated networks' RABs until the early 2000s.

2.5. SUMMARY

A broad range of approaches can be taken to estimate the initial and forward values of the RAB. The RAB value can vary significantly across the different approaches.

In Australia, the most common approach has been the ODV approach with the minimum value being chosen between DORC and economic-value. For the water sector, the minimum value has typically been

estimated using the EV method, while in the energy sector the DORC method has typically led to lower RAB estimates.

For the water sector, as far as we are aware, once an initial RAB value is chosen it has only been rolled-forward using efficient prudent capex, depreciation, disposals, and inflation, and we are not aware of the assets being revalued. This approach effectively maintains the starting price level and (the establishment of an initial RAB) has been referred to as the line-in-the-sand approach. As we outline in the following section, a line-in-the-sand value was not initially adopted for SA Water. While DORC valuations were initially undertaken as part of the SA Government's price setting process, the opening RAB set for ESCOSA's first regulatory determination through the May 2013 Second Pricing Order was revalued based on an economic value approach.

3. ASSESSMENT OF ASSET VALUATION APPROACH ADOPTED BY THE SA GOVERNMENT

This section evaluates the process to both establish the initial RAB as at 1 July 2004 and roll this forward up to the start of independent economic regulation by ESCOSA in 2013. The approach taken is assessed against a number of criteria for best-practice regulatory approaches, as set out in Appendix C. The shortfalls highlighted provide the basis for both our assessment of the new approach proposed in the Inquiry's discussion paper and the alternative we have considered.

3.1. SUMMARY OF ASSET VALUATION APPROACH

3.1.1. Process

During the period 2004-05 to 2012-13, responsibility for determining SA Water's regulatory asset base (RAB) for the purposes of setting water prices rested with the SA Government. The Government had committed to setting prices in compliance with the 1994 COAG pricing principles and the principles contained in the NWI.

The decision-making process of the Cabinet, along with Cabinet documents and submissions, is confidential. However, the basis for determining SA Water's RAB was set out in the Transparency Statements (2004-05 to 2010-11) and Regulatory Statements (2011-12 to 2012-13) prepared by the Department of Treasury and Finance (DTF). These documents set out the process and matters considered by the Cabinet in setting water prices, although it appears that not all information available to the Cabinet was published.

The Transparency Statements were reviewed by ESCOSA, to assess compliance with the NWI requirements and the overall adequacy of the information considered by Cabinet in making its pricing decision. The Regulatory Statements published in 2011-12 and 2012-13 were not reviewed by ESCOSA, although it appears that they provided advice on certain topics.[38]

3.1.2. Valuation methodology

The methodology for setting SA Water's RAB was set out in the Transparency Statements and Regulatory Statements. Our understanding of the approach taken is summarised in the table below.

Table 3.1: Valuation methodology

Valuation	Approach
2004-05 Transparency Statement	Adopts the 30 June 2003 closing asset valuation from SA Water's 2003 Annual Report as its opening RAB as at 1 July 2003. The Transparency Statement variously describes the methodology to calculate the June 2003 valuation as optimised deprival value and optimised fair value.[39] A more detailed description is set out in the 2003 Report of the Auditor-General, which clarifies that in practice, the valuation was based on *"written-down current cost"*, for which *"[t]he cost of replacing or reproducing excess capacity or over-engineering of the asset is excluded"*.[40] **We can therefore characterise this starting point as a DORC approach.**

[38] Owens (2018a), page 5.

[39] 2004/05 Transparency Statement – Part A, page 19.

[40] AG (2003), pages 68-69.

Valuation	Approach
	The Transparency Statement describes how the 1 July 2003 starting point was then rolled forward to the 30 June 2005 closing RAB, through adjustments for capex (including contributed assets and capitalised interest), depreciation and inflation.
2005-06 Transparency Statement	Rather than continuing to roll forward from the 1 July 2003 RAB, the 2005-06 Transparency Statement adopted a new opening RAB as of 1 July 2004. This was taken from the 30 June 2004 closing asset value included in SA Water's 2004 Annual Report. The Annual Report describes a similar DORC valuation approach to that set out above. However, unlike the 2004-05 Transparency Statement, the 1 July 2004 opening RAB excluded the estimated value of contributed assets from corporatisation in 1995 onwards ($94 million), although pre-corporatisation contributed assets remained in the RAB.[41] The value of water allocations purchased by SA Water ($14 million) were also included in the RAB.
2006-07 Transparency Statement	States that *"[t]he Government continues to use the fair value method in the 2006-07 pricing decisions"*.[42] While not explicitly stated, this suggests that a revaluation of SA Water's assets was undertaken for this pricing decision, continuing the DORC approach described above. Pre-1995 contributed assets also continued to be included in the asset base.
2007-08 to 2009-10 Transparency Statements	The Transparency Statements over this period continue to reference the DORC approach described above. However, it becomes less clear that a revaluation of SA Water's assets was actually undertaken. For example, the 2008-09 Transparency Statement notes that *"SA Water's RAB in respect of the 2008-09 decision is established by rolling forward the asset values as at 30 June 2006. The RAB is rolled forward in nominal terms including new capital expenditure and deducting depreciation and asset disposals."*[43] These statements suggest that the RAB was rolled forward from the 30 June 2006 closing value. However, it is unclear whether this was based on an updated DORC estimate for each pricing decision, or if the value from the 2006-07 Transparency Statement was maintained. As far as we are aware, the approach taken in the water sector has been to roll forward the initial RAB using efficient prudent capex, depreciation, disposals, and inflation; we are not aware of cases were the initial RAB has been revalued.
2010-2011 Transparency Statement	States that: *"All new and replacement assets are included in SA Water's regulated asset base after 30 June 2006 at their efficient actual cost"* and *"SA Water's legacy assets [i.e., before 30 June 2006] are currently valued at depreciated replacement cost as at the legacy date"*.[44] This suggests that additions post 30 June 2006 have *not* been subject to a DORC valuation. It is unclear however whether the valuation of the legacy assets is based on an updated DORC estimated, or rather carries forward the valuation from the 2006-07 Transparency Statement.
2011-12 and 2012-13 Regulatory Statements	States that *"the regulatory model estimates … are consistent with the information provided in recent Transparency Statements"*.[45] No further details on the valuation approach are provided.
2013 Pricing Order	In May 2013, the Treasurer issued a Second Pricing order, setting the initial RAB to be applied by ESCOSA in its regulatory determinations. Evidence provided to the Legislative Council Budget and Finance Committee Inquiry makes clear that rather than continuing the previous DORC valuation methodology, a 'line-in-the-sand' valuation was adopted by applying what appears to have been an economic value approach – i.e., to preserve the future revenue stream expected at the time.

[41] The value of these assets is not known, although commentary by ESCOSA staff indicates that they may be significant. See LCBFC (2014).

[42] 2006/07 Transparency Statement – Part A, page 22.

[43] 2008/09 Transparency Statement – Part A, page 19.

[44] 2010/11 Transparency Statement – Part A, page 38.

[45] 2011/12 Regulatory Statement, page 10.

3.2. ASSESSMENT

This section provides an overall assessment of both the *process* for setting SA Water's RAB and the *substance* of the RAB decisions. The assessment reflects the criteria set out in Appendix C. A more detailed discussion on the application of the methodology for setting the RAB is then provided in Section 3.3.

3.2.1. Process

On balance, the process followed for initially setting and then rolling forward SA Water's RAB does not perform well against the assessment criteria.

Table 3.2: Assessment of the process for determining the RAB

Principle	Assessment
Communication	Information was provided to stakeholders through the Transparency and Regulatory Statement process. The Statements – along with ESCOSA's review and the Government's response to this – were published online. However, it appears that communication of the proposed RAB determination were communicated retrospectively, after the Government's position had been developed,
Consultation	Stakeholders appeared to have had limited ability to comment on the development of the proposed RAB. ESCOSA's review invited submissions, however this was a retrospective process and the level of engagement was low.
Independence	The process to set the RAB cannot be considered fully independent, given that the valuation was effectively decided by the owner of the business. A degree of independent scrutiny was provided by ESCOSA's review; however, this was focused on compliance with the NWI requirements.
Flexibility	The process and NWI allowed the SA Government considerable flexibility in determining the RAB, allowing for responses to changes in market conditions.
Effectiveness and Efficiency	Limited information is available to assess the effectiveness and efficiency of the Transparency/Regulatory Statement process.
Accountability	The objectives, powers and process obligations of the SA Government in making its pricing determination are set out in the Transparency Statements. Accountability mechanisms included ESCOSA's review and the biennial reviews conducted by the National Water Commission (NWC). However, the nature and scope of these reviews arguably provide limited accountability in relation to the specifics of SA Water's RAB valuation.
Transparency	The level of transparency brought to the process by the ESCOSA reviews was limited by their scope. The process to determine the initial RAB and roll this forward lacked a robust and transparent basis for stakeholders to assess and contest the valuation.

Source: CEPA

The process to set SA Water's RAB cannot be considered fully **independent**, given that the valuation was effectively decided by the owner of the business. A degree of independent scrutiny was provided by ESCOSA's review of the Transparency Statements, and the publication of the Government's response to ESCOSA's findings. However, ESCOSA's reviews were focused on the compliance of the overall approach for setting the RAB with the NWI requirements and whether adequate supporting evidence was provided to inform the SA Government's pricing decisions, rather than a detailed assessment of the application of the approach or the underlying assumptions:

> *"It was the task of the Commission only to examine the **process** used to prepare advice to Cabinet with respect to the adequacy of the application of the COAG pricing principles and whether information relevant to the COAG principles was made available to Cabinet when a decision on the level and structure of SA*

> *Water's 2004-05 urban water prices was made. The Commission is not inquiring into the **price** which was set by Cabinet."*[46]

From the perspective of **transparency**, it does not appear that stakeholders were able to comment during the development of the Government's pricing decisions. The review process conducted by ESCOSA did request stakeholder input and comment, through a Public Notice of Inquiry placed in the Advertiser. In the initial reviews, stakeholders were provided with 14 days to comment; this increased to 28 days from the 2007-08 Transparency Statement onwards. The number of submissions was low, with only one or no submissions received in most years. In its review of the 2009-10 Transparency Statement, ESCOSA noted that:

> *"The low level of stakeholder engagement in this Inquiry is consistent with the Commission's experience in earlier water inquiries. The Commission continues to hold the view that the current form of inquiry, being a retrospective inquiry into processes for establishing prices, is not conducive to meaningful public consultation."*[47]

Overall, the level of transparency provided by the ESCOSA reviews was limited by their scope. Details of the basis and assumptions for the RAB valuation were not examined and publicly reported on, and alternative expert views on the underlying methodology and inputs were not sought. Therefore, the process to determine the RAB lacked a robust and transparent basis for contesting the valuation.

In terms of **accountability**, the objectives, powers and process obligations of the SA Government in making its pricing determination are set out in the Transparency Statements. The annual reviews conducted by ESCOSA provide a means of assessing the SA Government's compliance with this framework. An additional accountability mechanism was provided by the biennial reviews conducted by the National Water Commission (NWC), which reported on the implementation of the 1994 COAG Water Reform Framework and compliance with the NWI obligations and pricing principles. However, the nature and scope of these reviews arguably provide limited accountability in relation to the specifics of SA Water's RAB valuation.

As noted above, there does not appear to have been substantial consultation with stakeholders during the development of the Cabinet's pricing decisions. While interested parties had the opportunity to provide a submission to the annual reviews conducted by ESCOSA, stakeholder engagement through this process was minimal. In its review of the 2007-08 Transparency Statement, ESCOSA noted that:

> *"The low level of [stakeholder] interest also does not reflect regulatory experience elsewhere. For example, the Victorian Essential Services Commission and the NSW Independent Pricing and Regulatory Tribunal (IPART) receive numerous submissions and representations in relation to their various water pricing reviews."*[48]

Therefore, **stakeholder awareness** of the process for setting SA Water's RAB was limited and appears to have been below the level that could have been achieved through an alternative process.

The above assessment is particularly pertinent in the context of applying a DORC valuation to set SA Water's opening RAB. As noted in Section 2.4, and discussed further below, DORC values require a number of assumptions and considerable judgement. Experience has shown that there can be a wide range

[46] ESCOSA (2005a), page 11 (original emphasis).

[47] ESCOSA (2009), page 5.

[48] ESCOSA (2007), page 5

in DORC values. Therefore, there should be a high degree of transparency in the process, with the regulator and stakeholders having the chance to critically review and challenge the estimates.

3.2.2. Setting the RAB – Initial decision (2004) and subsequent roll-forward

The substance of the RAB decisions reflect mixed performance against the assessment criteria.

Table 3.3: Assessment of the approach to setting the RAB

Principle	Features
Efficiency	A robust DORC valuation can be used to determine an initial value for the RAB, which may be consistent with the efficient costs of a new entrant. However, establishing a sound DORC estimate requires substantial judgement, and a range of plausible values may result. The roll forward of the RAB appeared to lack a robust process to review the prudence and efficiency of new investments, either at the planning stage or prior to inclusion in the RAB.
Commercial Sustainability	The valuation approach maximised revenues and commercial outcomes (within the constraints imposed by the NWI and efficiency), and can therefore be considered to achieve the principle of commercial sustainability.
Social Sustainability and Equity	Evidence of these considerations appears primarily in relation to decisions on the overall revenue target. The Transparency Statements do not reveal consideration of the broader impacts on consumers and their long-term interest in relation to the initial valuation of the RAB itself. In relation to the roll forward, customers should not pay for inefficient capex; however, there was an apparent lack of a rigorous review process to ensure this did not occur.
Consistency with Government's sector policy and reform	The approach adopted to set the initial RAB for SA Water appears to be broadly consistent with the NWI principles – although there are concerns regarding the inclusion of pre-corporatisation contributed assets. However, alternative NWI-compatible options were also available to the SA Government, that may have been more in line with the deprival value approach adopted in most other States.
Transparency	The Transparency Statements set out the basis of the RAB valuation decisions. However, the lack of detail on the assumptions and methodology underpinning the initial valuation does not appear sufficiently transparent to allow stakeholders to replicate the analysis and decision.
Certainty and Predictability	The NWI principles provided significant flexibility – and therefore a degree of uncertainty – in the RAB valuation methodology.
Consistency	The DORC approach appears to have been maintained over time (although there is some uncertainty around the extent to which revaluations were undertaken). There appears to have been a substantial shift in the 2013 Second Pricing Order, which adopted a financial valuation approach. Modifications to the approach require careful consideration and justification.

Source: CEPA

In relation to **economic efficiency**, a robust DORC valuation can be used to inform a judgement on the range of values for the initial RAB. However, establishing a sound DORC estimate requires substantial judgement, and a range of plausible values may result. As we set on in Sections 3.3 and 3.4 below3.3, issues around the application of the DORC methodology may have resulted in an estimate that exceeds a reasonable upper bound. As the valuation approach maximises revenues and commercial outcomes (within the constraints imposed by the NWI and efficiency), it can be considered to achieve the principle of **commercial sustainability**. Nonetheless, alternative economically feasible approaches could also meet this test.

The Transparency Statements set out that the Government's pricing decisions aimed to balance *"economic efficiency matters against community benefit, equity, social justice, and environmental and regional matters, within the COAG framework."*[49] However, evidence of these considerations appears primarily in relation to decisions on where the revenue target fell between the minimum and maximum outcome determined through the price setting methodology. The Transparency Statements do not reveal consideration of the broader impacts on consumers and their long-term interest in relation to the valuation of the RAB itself – which was ultimately carried forward into ESCOSA's regulatory determinations. For example, we note that the long-term interest of consumers is not highlighted in the discussion on whether to exclude an estimate of pre-1995 contributed asset values from the RAB. The Transparency Statements appear to place more weight on the difficulties of establishing a robust estimate; the impact on consumers of being charged twice for these assets does not appear to have been considered. In relation to the RAB itself (rather than previous pricing decisions more broadly), the **equity and social sustainability** criterion does not appear to be fulfilled.

The basis for the Government's decision on the 01 July 2004 initial RAB value is set out in the 2004-05 and 2005-06 Transparency Statements. However, the Transparency Statements do not provide the key assumptions underpinning the DORC valuation (for example, unit rates, asset lives); nor are these assumptions set out in SA Water's Annual Report. A peer review of SA Water's asset valuation approach was conducted by the Hunter Water Corporation in May 2002. However, as this review does not appear to be publicly available, it is hard to conclude that it improved the transparency of the decision on the initial RAB. Overall, the lack of detail on the assumptions and methodology underpinning the initial valuation **does not appear sufficiently transparent** to allow stakeholders to replicate the analysis and decision. As we outline in Section 3.4.4, there are also transparency concerns in relation to the inclusion of capex in the RAB.

As set out in ESCOSA's reviews of the Transparency Statements, the DORC approach adopted to set the initial RAB for SA Water appears to be **broadly consistent with the NWI principles**. However, in a number of its reviews, ESCOSA expressed misgivings in relation to the Government's decision to include pre-corporatisation (1995) contributed assets in SA Water's initial RAB. For example, ESCOSA noted that while *"the Government's approach has some support under Principle 6 of the NWIC which implies that contributed assets in respect of legacy assets should only be excluded from the RAB where adequate information is available to identify them"*, *"[a]s indicated in previous inquiry reports, the Commission believes that there are some potential ways in which historical contributions could be estimated."*[50] We support the Inquiry's continued investigation of the rationale for why an appropriate estimate of pre-1995 contributions cannot be made.[51]. Further, as alternative NWI-compatible options were also available to the SA Government, that may have been more in line with the deprival value approach (i.e., the lower of a DORC and economic value estimate) adopted in most other states.

[49] 2004-05 Transparency Statement – Part A, page 5.

[50] ESCOSA (2009), page 31.

[51] Owens (2018b), page 15.

3.3. CHOICE OF METHODOLOGY

Although a DORC methodology is one option for setting the initial RAB, our sensitivity analysis (Section 4.3) indicates that it likely represents an upper bound value for SA Water's assets and is not the only available option that complies with the NWI principles.

Accepted best practice in Australia has been to use the optimised deprival value approach to set the initial asset base on a particular date (often referred to as "drawing a line in the sand"). In its 1995 report to the Council of Australian Governments (COAG), the Expert Group advising COAG on asset valuation methods for water and water services set out its support for the deprival value approach.[52] This approach was subsequently adopted by the majority of Australian State regulators.

The deprival value approach, which reflects the value of the assets to the owners if they were 'deprived' of the future economic benefits of the asset, takes the minimum of the economic value approach (an estimate of the net present value of the assets' future expected cash flows) or the depreciated optimised replacement cost (DORC).[53] The National Water Initiative (NWI) Pricing Principles allowed more flexibility for valuing legacy assets than just the deprival value approach, but advocated for drawing a line in the sand in relation to legacy assets.

While DORC estimates were used to set the initial RAB in some jurisdictions, for others (NSW, WA and the ACT) the economic value method was the lower of the two branches of the deprival value approach.[54] The decisions of these states could be seen to reflect an implicit 'contract' with consumers that – prior to the start of independent economic regulation – services were not provided on a fully commercial basis. The NWI required a change to this contract, so that future efficient capex would be recovered on a fully commercial basis by allowing the service provider a commercial return on their investment in new and replacement assets.

In some respects, the SA approach appeared to recognise the implicit contract referred to above by – from the 2008-09 Transparency Statement onwards – setting the minimum revenue bound on the basis of a lower rate of return (3.1%) for legacy assets compared to new assets (6%). However, no country assets appear to have been classified as legacy assets. Further, the revenue targets adopted by the Government fell above minimum level, approaching the upper revenue bound (URB) established by levying the commercial 6% rate of return on *all* assets.

In contrast, the 'line-in-the-sand' approach adopted by other states fixed legacy asset values consistent with pre-existing prices and expectations. This approach honoured the existing 'implicit contract', while gradually introducing a fully commercial basis for service provision as new investments were made. This type of approach provides greater certainty regarding the treatment of the legacy assets, and a more gradual path to the same end point as existing assets are replaced and start to earn a commercial rate of return.

[52] COAG (1995).

[53] See for example QCA (2000), page 33.

[54] We note, if the initial cash flows used for the economic value method have been set based on a DORC method, then both methods should give a similar value.

3.4. METHODOLOGY APPLICATION ISSUES

In support of the assessment outlined above, this section provides a more detailed discussion on the application of the DORC methodology in setting and rolling forward the RAB. There are several reasons why this process may not have led to a robust estimate for both SA Water's initial RAB, and the subsequent revisions of this value up to 2013. In particular:

- DORC estimates require substantial judgement. To ensure a robust estimate is developed, independent scrutiny and evaluation of the underlying assumptions is required. The available information on the decision-making process suggests that this did not occur.
- The treatment of assets contributed pre-1995 suggests that the RAB is likely to be overstated.
- It is unclear whether the treatment of SA Water's Community Service Obligation (CSO) has made appropriate adjustments to deal with any cross subsidy between urban and rural consumers.
- There are a range of issues around the roll-forward of the RAB from 2004 onwards, including the appropriateness of adopting updated DORC estimates and an apparent lack of critical independent review and challenge of SA Water's capex.

These factors suggest that both the initial 2004 RAB estimate and the subsequent revaluations (including the Treasurer's 2013 Second Pricing Order) are likely to be at the upper end of a reasonable range. This emphasises our view that the Inquiry should not adopt the 2004 initial RAB value uncritically and highlights the importance of establishing a range of RAB estimates.

3.4.1. Basis and reasonableness of DORC valuation

A DORC valuation approach attempts to estimate the cost of the most efficient (optimised) means of providing the same level of service, adjusted for accumulated depreciation. This therefore requires an assessment of the optimisation of the assets (i.e., a least-cost solution based on modern engineering equivalent components), the current replacement cost, and the value of accumulated depreciation. Establishing a DORC estimate necessarily requires judgements that may substantially change the resulting valuation. We highlight several such issues below, in relation to the approach taken for SA Water:

- **Assumptions relating to unit rates, assumed asset lives and asset condition.** In the case of SA Water's RAB, it is unclear whether and how the reasonableness of these assumptions was tested. As noted above, there was no clear process for critical review and challenge of these assumptions by an independent party, and external stakeholders apparently lacked visibility of the assumptions that were applied.
- **Greenfield or brownfield basis for valuation.** Existing assets were often put in place under 'greenfield' conditions. However, as infrastructure in urban areas has since developed (roads, footpaths, driveways etc), future replication of the network by a hypothetical new entrant service provider would expect to involve higher costs. The question is whether the objective of the valuation is to determine the replacement costs under the initial investment conditions, or instead attempt to estimate the theoretical future costs of replacing the assets. We have not found any evidence of the approach adopted for SA Water's RAB.
- **Replacement or refurbishment**. It may be more cost effective for certain assets to be maintained and renewed *in situ*, rather than fully replaced. It is unclear what distinction was made between asset refurbishment or replacement in the estimate of SA Water's RAB.

- **Valuation of easement**. The treatment of easements has been a controversial issue in DORC valuations for energy networks, due in particular to their magnitude. The key methodological issue is whether it is most appropriate to adopt a current market valuation, or historic costs. Depending on the level of compensation paid to acquire easements (if indeed compensation was paid), market values may significantly exceed historic costs. Other regulators have observed that if - once acquired - easements will remain in perpetuity and continue to be required, there is no apparent efficiency gain from valuing these assets at market prices, as the service provider will not be required to incur future additional costs to replace them. For example, this was the rationale put forward by IPART, in deciding to include actual easement costs in setting the RAB for the NSW electricity networks.[55] In this decision, IPART noted that including the easements of the two distributors at market value would have increased the DORC valuation by about 73 percent. Again, it is unclear what approach was taken for SA Water.

Decisions on these (and other) assumptions may result in widely divergent RAB estimates. The magnitude of the potential impact of assumption choices is illustrated by the 1999 Ewbank Preece review of the DORC for AGLGN, commissioned by IPART. [56] This review concluded that the effect of uncertainty in various aspects of the valuation could result in an indicative range for DORC of between $1.9 billion to $3.3 billion.[57] Depending on the assumptions applied, the 2004 valuation of SA Water's RAB could have potentially resulted in a wide range of DORC estimates. In our view, this emphasises the importance of the Inquiry considering alternative RABs rather than accepting the 2004 valuation at face value.

3.4.2. Capital Contributions pre- and post-corporatisation

In the Diving Deeper paper, the Inquiry expresses an intention to pursue the reasons why a reasonable estimate of these contributed assets could not be developed – although this paper also notes that if the 2004 opening RAB is treated as a 'line in the sand', *"there is no dispute"*.[58]

We consider that further investigation of this issue would be appropriate. In line with accepted regulatory practice, either capital contributions should not be included in the RAB or the contributions should be treated as income when they are received. In the case of the pre-corporatisation contributed assets, it appears that neither approach was adopted. As a result, the RAB and/or revenue requirements are likely to be overstated – while noting the lack of information available, evidence provided to the 2014-15 Legislative Council Budget and Finance Committee suggests that this could be considerable.[59] We note that ESCOSA's Transparency Statement reviews proposed several options for estimating the value of the pre-corporatisation contributed assets, which could be considered by the Inquiry.

3.4.3. Community Service Obligations

SA Water's primary community service obligation (CSO) is the supply of services to rural areas at the standard tariff (i.e., Statewide pricing). The Transparency Statements note that the Government fully funds

[55] IPART (1999), page 59-60.

[56] Ewbank Preece (1999).

[57] Ewbank Preece (1999), page 7.

[58] Owens (2018b), page 15.

[59] LCBFC (2014).

the CSO, in order to meet the gap between the cost of providing the CSO and revenues recovered from rural customers. In principle, this should have ensured that there was no cross subsidy between urban and rural consumers.

However, avoiding a cross subsidy depends on the adequacy of the CSO payment made by the Government, and how it relates to the assets included in SA Water's RAB. If CSO payments do not fully cover the residual cost of service provision (including the target return on rural assets included in the RAB), the adjustment to the company's target revenue will not be sufficient to eliminate the cross subsidy between urban and rural consumers.

We note that while the Transparency Statements assert that CSO's were adequate, ESCOSA's reviews repeatedly highlight a lack of transparent analysis. At the time the initial RAB was established, the value of the CSOs was relatively small – the Statewide pricing CSO is reported as $65 million in 2004-05[60] compared to approximately $130 million by 2010-11[61]. The 2004-05 Transparency Statement notes that the Statewide pricing CSO was *"based on a 1999 review in which all SA Water's existing non-metropolitan pre-1999 assets were valued according to 1997-98 values and a return on assets approach was used to calculate the CSO payments."*[62] This could indicate that CSO payments at the time the initial RAB was estimated did not fully bridge the rural cost recovery gap in relation to assets added between 1999 and 2004. To the extent that a cross subsidy existed between rural and urban customers, one option to address this would have been to write down the value of the assets serving rural areas. This approach was adopted in Victoria for the rural electricity networks.[63]

For the purposes of estimating an appropriate RAB for SA Water, the Inquiry may wish to consider whether the interaction with SA Water's CSOs and the potential for cross subsidisation is appropriately addressed.

3.4.4. Roll-forward of the RAB

Revaluations based on up-dated DORC estimates

As noted in Section 3.1.2, there is some uncertainty around whether the RAB *was* actually based on updated DORC estimates from the 2006-07 Transparency Statement onwards. If revaluations *were* undertaken, this would appear inconsistent with practice in other states and sectors (see Section 2.4).[64] We identify several issues related to an ongoing revaluation approach (if this was adopted):

- The revaluation estimates are subject to same criticisms of process and application of DORC methodology as the original estimates, as set out in Section 3.4.1.

[60] 2004-05 Transparency Statement - Part A, page 47. Reported in nominal 2004-05 prices.

[61] 2010-11 Transparency Statement - Part A, page 62-63. Reported in real 2007-08 prices.

[62] 2004-05 Transparency Statement - Part A, page 40.

[63] Abbott and Kantor (2014), page 69.

[64] For example, see ICRC (2008), page 82 onwards.

- Revaluation to updated DORC values is not necessary for economic efficiency or required by the NWI principles. SA Water's RAB relates to investment decisions that have already been made; including the cost of prudent and efficient new investments in the RAB would then accommodate appropriate future capex decisions by SA Water, allowing customer requirements to be met independent of the opening RAB value.[65]
- Further, a revaluation approach introduces a number of disadvantages, including:
    - **Reduced transparency** compared to a more standard regulatory roll-forward approach, given the high-degree of judgement and discretion involved in establishing an updated valuation.
    - **Reduced predictability and certainty.** Revisiting the value of past investments – the major determinant of prices – at each determination creates uncertainty and the risk of potential price shocks for customers, investors and the regulated business.
    - **Increases costs of regulation**, relative to an approach where the starting RAB is simply maintained.
    - If the revaluation results in real increases in the RAB, this creates a **windfall gain** for the owner at the expense of customers.
- To elaborate on the latter point, a higher RAB resulting from revaluation increases future income that is not matched by any additional outlays by the utility. That is, the return on the actual financial investment will exceed the allowed return determined by the regulator independent of any action by the utility. Such windfall gains could be avoided by treating the real capital gain as income. This would be consistent with the concept of financial capital maintenance.
- We note there may be incentive properties to a revaluation approach, in terms of signals for investment / disposal – this would need to be weighed up against the other factors outlined above.

To the extent that periodic revaluations of the RAB *were* undertaken up to the 2013 transfer of regulatory responsibility to ESCOSA, the Transparency and Regulatory Statements do not indicate that the issues raised above were taken into consideration.

Change in methodology

As noted in Section 3.1.2, the RAB set through the Treasurer's Second Pricing Order of May 2013 appears to have been based on an economic value approach, rather than the previous DORC methodology. While there is limited transparency around the details of the valuation, we note that statements by DTF staff to the Legislative Council's 2014 to 2015 inquiry highlight that the change in the basis for valuation took advantage of the reduction in interest rates to lock in a higher RAB. While this decision could be described as consistent with an economic value approach, the timing of the revaluation also optimised future revenues for the asset owner.

> *"The initial regulatory asset base was to be set by a subsequent second pricing order after ESCOSA's draft determination in order to avoid price and revenue shocks. […] The reality was that there was an*

[65] As discussed further below, it is not apparent that there *was* a robust independent process to assess the prudency and efficiency of SA Water's expenditure.

> *extraordinary drop in interest rates over the period between when ESCOSA provided the initial advice to the government on the WACC in February 2012 and a final determination in May 2013. This had the potential to significantly impact on price and revenue outcomes.*
>
> *The government had a difficult decision to make in relation to the regulatory asset base; that is, how best to balance the interests of SA Water consumers in terms of price and South Australian taxpayers in terms of revenues and dividends."*[66]

This is confirmed by the evidence provided by ESCOSA's Chair:

> *"The government was seeking to reflect the outcomes—price, revenue—in terms of price revenue paths that it had foreshadowed in the 2012-13 regulatory statement that it issued at the time, it set prices for that year"*[67]

Statements by ESCOSA staff also indicate that – as the Treasurer was to set the opening RAB value – at the time ESCOSA did not undertake its own evaluation of the opening RAB: *"It is important to emphasise that the commission has not done a technical valuation and we are not aware of anyone having done that work on the RAB itself."*[68] Evidence presented to the Legislative Council indicates that ESCOSA did undertake some preliminary, internal analysis of the RAB value. While described by ESCOSA's Chair as a "back of the envelope" calculation, this analysis suggested a number of reasons why the RAB could be considered overvalued, including: the inclusion of contributed assets; inflation of the RAB above CPI; and the potential inclusion of capex that may not have met a rigorous prudency and efficiency test, given the historical lack of scrutiny.[69]

Inclusion of capex

In contrast with other regulatory regimes, it does not appear that the capex used to roll forward the RAB was subject to an independent efficiency review. Several Transparency Statements reference SA Water and Government review processes for capex additions. The 2010-11 Transparency Statement concludes that *"SA Water is subject to extensive scrutiny to ensure that capital investment decisions are prudent and efficient"*.[70] However, aside from parliamentary scrutiny of SA Water's major projects – which could not be considered equivalent to an expert technical review – these processes were not independent from SA Water or the Government as owner. As a result, there is no assurance that capex was not above an efficient level.

Indeed, similar concerns were raised by ESCOSA in its review of the Transparency Statements. In its review of the 2007-08 Transparency Statement, ESCOSA highlighted that:

[66] LCBFC (2015b), page 823.

[67] LCBFC (2015a), page 689.

[68] LCBFC (2015a), page 691.

[69] Ibid,, page 699 and attachment.

[70] 2010-11 Transparency Statement – Part A, page 15.

> *"…little or no information is provided to demonstrate that forecast capital costs are efficient. This is of particular concern given that the capital expenditure forecasts represent a substantial increase in expenditure compared to historic levels"*[71]

> *"[…] Transparency Statement – Part A provides no information to demonstrate that the projects themselves are necessary and 'least cost' solutions, or that appropriate capital planning processes are in place."*[72]

These comments were an enduring theme in the ESCOSA reviews. While additional information was made available to the Cabinet over time, by the final 2010-11 Transparency Statement room for improvement remained:

> *"The Commission acknowledges the Cabinet documents do provide additional information on capital expenditure, particularly concerning updates to the capital expenditure program in 2010-11. However, these details are extremely limited, with the result that little clarity is added to the issue of the prudence and efficiency of the capital expenditure program."*[73]

ESCOSA provided a number of recommendations on the type of information that would be required to assess prudence and efficiency. However, it does not appear that these recommendations were taken on board for the 2011-12 and 2012-13 Regulatory Statements (which ESCOSA did not review).

In contrast, in other regulatory regimes planned and actual capex is subject to efficiency reviews prior to inclusion. These reviews may encompass not only a review of the regulated utility's proposed capex, but also a review of actual capex incurred before it is allowed to enter the RAB. In undertaking these reviews, the regulator may engage independent experts to review the capex program and benchmark the proposed capex against the spending of peers and past spending. In 2010 PWC undertook a review of capex efficiency testing for IPART. It found that ex-ante and ex-testing of the efficiency of capex spending is a key component in incentive-based regulation. While the reductions in proposed capex imposed by IPART had been in the range of 0-12%, the examples cited for water and energy in the UK ranged from 9-18%.[74] Recent draft decisions by the AER for the NSW energy network proposed reductions in forecast capex of 1-25%.[75] As an illustration of the potential magnitude of efficiency challenges, we set out below previous reductions imposed in past decisions of IPART (water), the ESC (water) and the AER (electricity distribution).

[71] ESCOSA (2007), page 26.

[72] Ibid., page 27.

[73] ESCOSA (2010), page 37.

[74] PWC (2010).

[75] AER (2018).

Table 3.4: Illustrative impact of regulatory scrutiny of capex proposals

Regulator - Determination	Capex challenge (%)
AER – most recent electricity distribution network determinations	0% to 28% reduction
ESC – Melbourne Water 2013 decision	2% reduction
ESC – other 2013 decisions (regional, rural and greater metropolitan water companies)	0% to 15% reduction
ESC – Melbourne Water 2016 decision	8% reduction
ESC – 2018 decisions (regional, rural and greater metropolitan water companies)	0% to 10% reduction
IPART – Hunter Valley Water Corporation 2016 decision	6% reduction
IPART – Hunter Valley Water Corporation 2013 decision	0% reduction
IPART – Sydney Water 2016 decision	11% reduction
IPART – Sydney Water 2012 decision	15% reduction
ESCOSA – SA Water 2013 determination	14% reduction
ESCOSA – SA Water 2016 determination	6% reduction

Sources: IPART, ESC, AER, ESCOSA determinations.

Notes: The capex challenge is calculated as the difference between the utility's first proposal and the regulator's final determination for forecast capital expenditure over the regulatory period. Within certain limits, the regulators may also apply a prudence and efficiency test to actual capex before it enters the RAB.

Adelaide Desalination Plant

As noted by the Inquiry, the justification for the full inclusion of the Adelaide Desalination Plant (ADP) is a key issue of stakeholder concern. We note the Inquiry's current intention to accept the full ADP expenditure into the RAB, but we consider that the ADP expenditure warrants further scrutiny.

The decision to construct the ADP was a response to the millennium drought in South East Australia. These were concerns were common across all the mainland states of Australia. The strength and length of the millennium drought led policy makers and water planners in all these states to review water resource management and supply capacity to ensure security of supply. As the table below indicates each state made significant investment in desalination plants as an 'insurance policy' for water security. As Professor Porter argues in some states (such as WA), the strategies were the result of a consistent long-term planning approach, while in other states (such as Victoria), he argues that decisions reflected more rushed reactions with a stronger political influence.[76] What distinguishes the ADP investment is the decision to double the capacity of the plant from 50GL to 100GL, resulting in a much larger capacity relative to the annual demand for water.

[76] Porter (2013).

Table 3.5: Investment in desalination

Location (project)	Initial investment ($m)	Capacity (GL p.a.)	Maximum expandable capacity (GL p.a.)	Initial (and expandable) capacity as a % water supplied in 2009-10	Completion date
Sydney (Kurnell)	1,890	90	180	18 (36)	2010
Melbourne (Wonthaggi)	3,500	150	Up to 200	43 (57)	2012
SE Queensland (Tugun)	1,200	49		25	2009
Adelaide (Port Stanvac)	1,830	100		80	2012
Perth (Kwinana)	387	45		18	2006
Perth (Binningup)	1,400	100		40	2012

Source: Porter (2013), page 11.

Notes: Initial investment costs were incurred in different years, therefore are not directly comparable.

The two key issues that stand out from the table above in regard to the Adelaide desalination plant (ADP) are that:

- The capacity of the ADP represents a larger proportion of annual supply.
- Whereas Perth, Sydney and Melbourne have taken a staged approach to providing desalination capacity, SA invested in a comparatively larger plant up-front.

In this context it is quite reasonable to ask whether the level of capacity provided was optimal, recognising that the additional security of supply benefits likely diminish as the capacity provided increases, and whether a staged approach could have reduced costs for customers.

Prices should send a signal that promotes efficient use of resources and the importance of this was highlighted during the millennium drought and the heightened concerns about water security. However, this does not create a case for higher valuations of the sunk assets of the system (i.e. a higher initial RAB) nor did other jurisdictions use concerns about water security to argue for a higher opening RAB.

Efficient water pricing requires the usage charge for water to be set at the marginal cost of water. Due to the substantial economies of scale in water supply the marginal cost will be less than the average cost so the fixed charge is set to make up the difference between the revenues from usage charges and the total revenue requirement of the water utilities. As water security reduces and investment is required in more expensive additional supply – such as desalination plants – the usage charge will increase and fixed charges reduce. But even in Sydney, where the RAB was set at less than 43% of the DORC valuation of the assets,

the fixed charge remained positive even as the need to invest in the desalination plant or other additional capacity become more urgent.[77]

The Commonwealth Auditor General's review of the decision to award Australian Government funding for the additional 50GL ADP capacity raises a number of questions in relation to the business case for the enlarged plant. The Auditor General's key findings in relation to the business case were:

- In 2008, Infrastructure Australia reviewed the 100GL plant for inclusion on the first Infrastructure Priority List (IPL). They concluded *"that the proposal had a [benefit cost ratio (BCR)] estimated at between 0.8 and 1.0, raising questions about whether it had economic merit; and concluded that the state's BCR analysis could not be relied upon due to a methodological shortcoming"*.[78]
- Separately, *"[in] the context of the global financial crisis, a series of [Strategic Priorities and Budget Committee of Cabinet] meetings were held in April 2009 to consider funding for infrastructure projects […]. […] advice specific to the ADP's expansion was provided by central agencies on two occasions, with particular input from the Department of Finance and Deregulation (Finance) and the Department of the Prime Minister and Cabinet (PM&C). This advice indicated that the proposal was not supported by a full business case, the quality of the costings was low and the Commonwealth's exposure to project risk was high."*[79]

The SA Legislative Council Budget and Finance Committee inquiry between November 2014 and late 2015 also received evidence in relation to the business case for the ADP. Information provided by DTF staff to the Committee stated that *"[t]here was a comprehensive business case prepared by SA Water, in accordance with Treasurer's Instruction 17. SA Water made a submission to the Public Works Committee (PWC), which included economic and financial analysis of options."*[80] The PWC submission in question presents the results of an economic evaluation, which considered three options, including 50GL and 100GL scenarios.[81]

The assessment of the benefits of the different options appears to capture avoided cost of water restrictions. The results of the economic evaluation for the 50GL and 100GL options are reproduced in the table below (the results for third option are not included in the SA Water submission).

[77] See IPART (2000), page 21. Note, Sydney Water valued its assets at a written down replacement cost which is comparable to DORC and we have used this value as the DORC comparison point. The line-in-the-sand value set by IPART was $5.4b against the written down replacement cost of $12.6b.

[78] AG (2013), page 67.

[79] Ibid., page 71.

[80] LCBFC (2015b) – Attachment – Page 1.

[81] SA Water (2009).

Table 3.6: PWC submission - Economic evaluation of the ADP options

	50GL/a ADP		Additional works	
	$ million/NPV	BCR	$ million/NPV	BCR
Net Present Cost of Works				
4 per cent discount	1,882		1,855	
7 per cent discount	1,655		1,586	
10 per cent discount	1,498		1,387	
Net Present Benefits of Works				
Costs of restrictions (low welfare cost scenario)				
4 per cent discount	3,930	2.09	3,930	2.12
7 per cent discount	2,983	1.80	2,983	1.88
10 per cent discount	2,336	1.56	2,336	1.68

Source: SA Water (2009)

A number of questions arise from these results, that are not explained in the SA Water submission. For example, the net present cost of the works is lower in the additional works (100GL) case. The submission explains that *"the Commonwealth funding component is not included as it is deemed a transfer item"*, suggesting that this is not the reason for the cost difference.

The Inquiry highlights that the marginal cost of the additional 50GL supply was substantially lower than for the first 50GL.[82] However, the marginal *benefit* of the additional supply is not considered. Given that the expanded plant would be mitigating against supply shortages further along a distribution of probable outcomes, it is likely that the marginal benefits would also diminish. It notable that – based on the analysis presented above – the net present benefits of the 50GL and 100GL options are reported as equivalent. Taken at face value, this would appear to suggest that the estimated marginal benefits of the 100GL option were negligible.

The underlying assumptions and methodology for the economic assessment are not set out in the submission and we have been unable to find these elsewhere; therefore, it is not possible to comment further on the robustness of the analysis. We would not consider the 2009 submission to be a "comprehensive business case" in itself, given the limited explanation of the analysis.

Overall, this information raises significant questions in relation to the decision to expand the capacity of the ADP, and whether it should be considered prudent and efficient. In our view, this does not support the Inquiry's intention to include the full costs of the expansion in the RAB without further investigation.

Indexation of the RAB

Based on the Transparency Statements, it appears that the SA Government approach indexation of the RAB by the use of forecast inflation, without an apparent correction for the difference between actual and forecast inflation. In generating a forward-looking price control, regulators forecast future increases in costs, including the RAB in real and nominal terms. For example, the AER's Post-Tax Revenue Model

[82] Owens (2018b), page 15.

(PTRM) indexes the RAB by forecast inflation. But when the RAB is rolled forward to the start of the next regulatory period, the actual inflation rate is used. This automatically corrects for variations between the actual and forecast inflation rate. As the AER's recent review of forecast inflation demonstrates this approach has the desirable outcome that the real rate of return for the utility is not affected by differences between the forecast and actual inflation rate. The approach (apparently) taken SA Government means that the utility may earn a real capital gain or loss, in addition to the allowed real WACC built into the price path, equivalent to the difference between forecast and actual inflation. As the forecast inflation has consistently exceeded actual inflation for the period 2004 to 2013, in this case it would appear that the SA Government has benefited from a real capital gain.

3.4.5. Outcomes

Increase in RAB

The table below summarises the evolution of the RAB from the 2005-06 Transparency Statement (the Inquiry's proposed starting point for a revised 'line-in-the-sand' valuation) up to the 2013 Second Pricing Order.

Table 3.7: SA Water opening RAB (last reported value)

Opening date	Nominal, $m		Real December 2012 prices, $m		Source
	Water	Water + Wastewater	Water	Water + Wastewater	
01 July 2004	4,149	6,540	5,227	8,240	2005-06 TS
01 July 2005	4,189	6,547	5,150	8,050	2006-07 TS
01 July 2006	4,411	6,754	5,223	7,997	2009-10 TS
01 July 2007	4,596	7,000	5,349	8,147	2009-10 TS
01 July 2008	4,836	7,312	5,395	8,157	2010-11 TS
01 July 2009	5,437	8,059	5,987	8,874	2010-11 TS
01 July 2010	6,444	9,237	6,896	9,884	2011-12 RS
01 July 2011	7,009	10,036	7,228	10,350	2012-13 RS
01 July 2012	7,266	10,452	7,396	10,639	2012-13 RS
01 July 2013	7,805	11,403	7,767	11,347	2013 determination

Source: CEPA analysis, Transparency Statements, Regulatory Statements, ESCOSA (2013).

Benchmarks

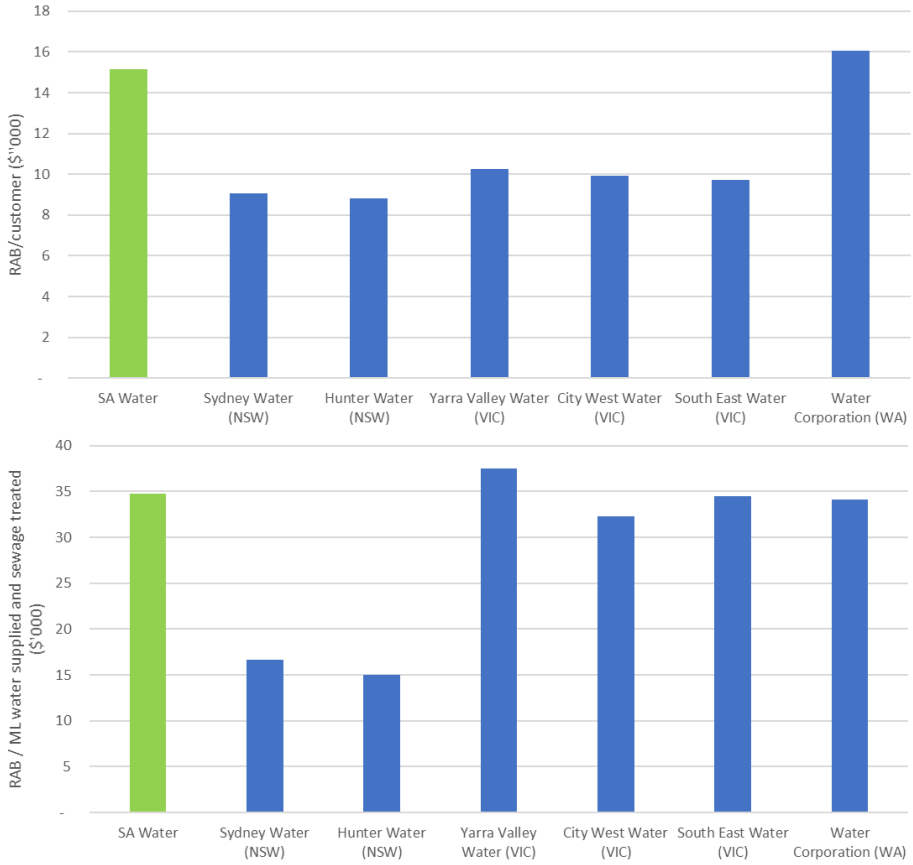
There are several factors that complicate direct comparisons of RAB values across water companies, including:

- Differences in the scope of the water business. For example, some companies may be vertically integrated and include bulk water.
- Differences in the operating environment. Factors such as the source of bulk water (dams, desalination plants), terrain, receiving waters and required treatment standards may also result in different costs of service provision.

- Different approaches to asset valuation. For example, economic valuation approaches value assets in aggregate, based on forecast revenues. This frustrates comparisons between individual asset classes.

These factors suggest that the most robust approach would be to consider benchmarks for unit cost assumptions, where DORC valuation approaches are used. Such analysis is not possible for this paper, as the underlying unit cost assumptions for SA Water's DORC estimates are not available. However, in order to highlight the impact of the water companies' RABs on consumers, the RABs may be benchmarked on the basis of RAB/customer supplied or RAB/ML of water supplied/sewage treated. These indicative comparisons are presented in Figure 3.1 below, for a range of water companies of a similar size to SA Water. This simplistic analysis indicates that for the 2013/14 financial year (the first year of independent price regulation by ESCOSA) SA Water's RAB per customer and per volume of water supplied/sewage treated appeared to be at the upper end of this range. This is less the case for the RAB/ML metric, which illustrates the limitations of a simplified benchmarking approach in explaining the variations in average bills (Figure 3.3). For example, as illustrated in Figure 3.2, the Victorian water companies appear to have far lower water consumption per connection, which may indicate that they are not the most relevant comparators for SA Water. The NSW companies and the WA Water Corporation appear more comparable in terms of consumption volumes. However, the operating environment in WA is likely to be different to SA, for example in terms of population density. Further analysis would be required to understand the reasons for the differences observed.

Figure 3.1: 2013-14 RAB per customer and RAB per ML water supplied and sewage treated (December 2012 prices)



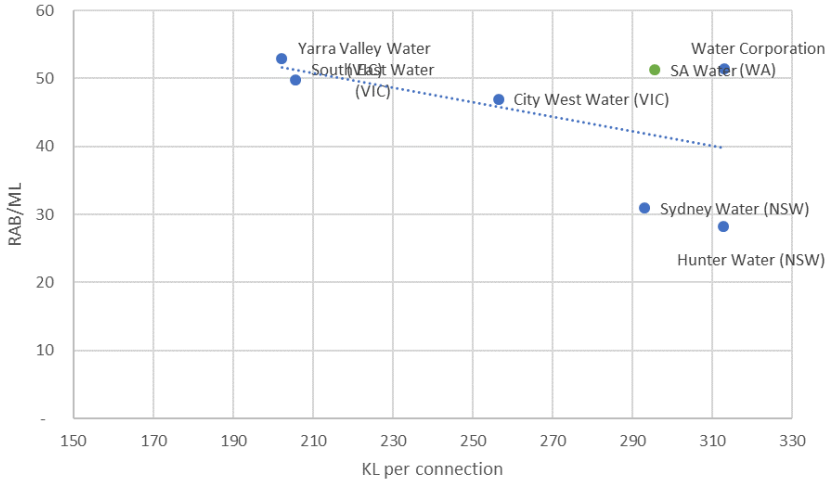
Source: BOM (2018) and regulatory determination data, CEPA analysis.

[1] RAB values are the average for water and wastewater assets over the period. Water-only RABs are not available for all comparators. Values have been converted to December 2012 prices.

[2] BOM dataset: 'Customers supplied' is 'Total connected properties – water supply'. 'ML water supplied' is 'Total urban water supplied'. 'ML sewage treated' is the sum of sewage treated to the primary, secondary and tertiary level.

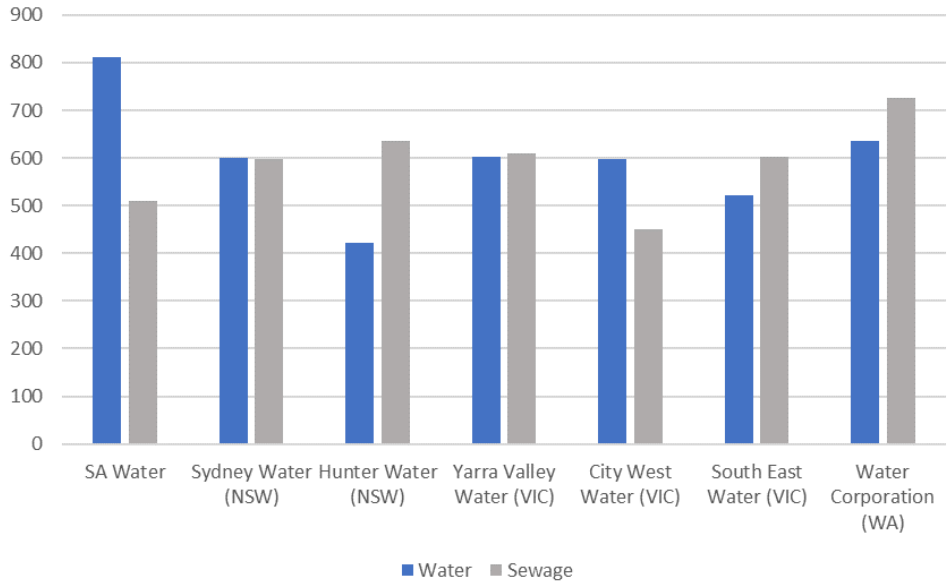
[3] Metrics for Sydney Water have been adjusted to reflect the costs of the Sydney Desalination Plant and the supply of bulk water by WaterNSW (Greater Sydney). Metrics for the Victorian retail water companies have been adjusted to reflect the costs of the Victorian Desalination Plant and the supply of bulk water by Melbourne Water.

Figure 3.2: Comparison of water consumption per connection (2013-14)



Source: BOM (2018), CEPA analysis.

Figure 3.3: Typical residential water & sewage bills - 2013/14 ($ p.a.)



Source: BOM (2018).

Consumer Impacts

SA Water's RAB increased substantially between the 2005-06 Transparency Statement and the Treasurer's May 2013 Second Pricing Order that established the opening RAB for ESCOSA's first revenue determination. The implications for ESCOSA's regulated revenue cap are significant. We estimate that of the first $759 million revenue cap set by ESCOSA for 2013-14, approximately 30% (~$170 million) can be attributed to net additions to the RAB between the 2005-06 Transparency Statement and the 2013 Second Pricing Order.[83] This equates to approximately $220/customer supplied or $750/ML water supplied.[84] As outlined above, it appears that RAB additions during this period were not subject to independent review and challenge. This means that we cannot be confident that the indicative customer impacts above reflect prudent and efficient investments.

[83] Values are in December 2012 prices, as applied in the 2013 determination.

[84] Again, values are in December 2012 prices. Impacts are based on 2013-14 customer numbers and ML supplied, sourced from BOM (2018).

4. ALTERNATIVE APPROACHES TO RAB VALUATION

4.1. INQUIRY PROPOSAL – ROLL-FORWARD OF THE 2004 RAB

The Inquiry has proposed an alternative approach that would set the RAB based on the DORC value as at 1 July 2004, adjusted to exclude post-corporatisation capital contributions, mechanically rolled-forward in accordance with common regulatory practice. The Inquiry carried out a "back of the envelope" calculation to estimate that under its approach the value of the RAB for 1 July 2013 for the water assets would be $300 million to $500 million lower than the value set by the SA government of $7.77 billion (December 2012 prices).[85] The key elements in the calculations are:

1. The opening RAB. This is $4.15 billion (July 2004 prices), which is the DORC estimate in the 2005-06 Transparency Statement less $94 million in post-1995 capital contributions.
2. In each year the RAB is rolled forward by:
    a. Adding capex as spent to the opening RAB.[86]
    b. Deducting depreciation from the opening RAB using the standard asset lives at the asset class level.
    c. Indexing the RAB by the actual inflation rate as measured by the change in the all groups CPI for Australia for the March quarter compared to the previous March quarter.

4.2. ASSESSMENT OF THE INQUIRY'S APPROACH

The approach proposed by the Inquiry addresses several significant concerns with approach used by the SA Government for the establishment and roll-forward of the RAB. It also provides a simpler and clearer basis for the establishment of a RAB for SA Water as at 1 July 2013 than the examination of each individual RAB decision after the first 2004-05 Transparency Statement.

The proposed approach provides a satisfactory starting point for the Inquiry's investigation of the RAB. It is consistent with the approach adopted to rolling forward the RAB from an initial valuation the water sector in NSW, Victoria, and WA and the energy sector nationally. It is also consistent with the approach adopted in the UK after the establishment of the initial RAB.

However, as the Inquiry concludes in Diving Deeper, the value for the RAB derived *"is likely to be on the high side … but we can then possibly undertake some sensitivity analysis of what further impact the presence of regulator challenge might have added."*[87] In the alternative approach set out below we provide sensitivity analysis of this kind.

In accordance with the best practice principles of regulation we have assessed the Inquiry's proposal in terms of the process for its development and the substance of the determination (i.e., the RAB value proposed).

[85] Owens (2018b), page 11.

[86] It is assumed that capex is spent evenly through the year so that the inflation indexation and depreciation are applied to half the capex spent in the year.

[87] Owens (2018b), page 9.

4.2.1. Improvement in the process for the determination of the RAB

As summarised in the table below, the Inquiry's proposed determination process for the RAB is a substantial improvement on the process for the original and subsequent determinations of the RAB.

Two key areas of improvement are in the independence and transparency of the process for determining the RAB.

The establishment of a public independent Inquiry with clear, public terms of reference to provide recommendations to the Government on the RAB separates the evaluation and recommendation of the RAB from the ownership interest of the Government as well as from non-transparent policy considerations. This creates an independent process that was absent from the previous establishment of the initial and subsequent RABs.

The Inquiry has also embarked on its review of water prices and the RAB with a high degree of transparency. The Exploratory Essay provides an initial statement of the issues for the review as well as a summary of the setting of the initial and subsequent RABs. The issues raised were discussed with various stakeholders and the feedback received was reflected in Diving Deeper which set out the issues in more detail and proposed an approach to the establishment of an initial RAB and its roll-forward.

However, there are aspects of the original decision that cannot be rectified through the Inquiry. The element in this regard is the absence of transparent information on the basis for the initial DORC value in the 2005-06 Transparency Statement and the absence of an opportunity for stakeholders and experts to properly review and challenge the DORC estimate.

Table 4.1: Assessment of the process for determining the RAB

Principle	Assessment
Communication	Open, public communications with stakeholders through issues paper (*Exploratory Essay*) and discussion paper including draft proposal (*Digging Deeper*).
Consultation	Stakeholders engaged in the process from eth outset with multiple opportunities to put forward views in discussions with the Commissioner and through submissions to the Inquiry.
Independence	Creation of public Inquiry creates and independent process for recommendation of RAB to the Government
Flexibility	Separating the recommendation on the RAB from the ownership interest of Government enhances flexibility in considering options and balancing the interest of all stakeholders.
Effectiveness and Efficiency	Non-legalistic, streamlined Inquiry is an effective and efficient process.
Accountability	Published ToR and independent, public process helps ensure objective and fair decision making and strengthens the accountability of the Inquiry in making its recommendations and the Government in making its decision on the recommendations.
Transparency	Process is open to stakeholders to participate effectively. Process to date has created realistic expectations that views will be considered and reflected in the recommendations.

Source: CEPA

4.2.2. The Inquiry's proposed approach to setting the RAB

As summarised in the table below the Inquiry's proposed approach to setting the RAB through this Inquiry is a significant improvement and will result in RABs and prices that better balance the respective interests of stakeholders than the RABs set in the period 2004 to 2013.

The proposed approach provides a better balance between the interests of consumers and the asset owners (i.e. the SA Government). The approach addresses a number of issues raised in Section 3:

- Avoids the real capital gains for the owners that arose from the use of forecast rather than actual inflation in the roll forward of the RAB.
- Avoids the revaluation of the RAB in 2013.
- Recognises post-corporatisation capital contributions in the initial RAB.

The approach also more closely aligns the roll-forward of the RAB with the methodology used in other jurisdictions/sectors and makes the calculation of the RAB more transparent and predictable by removing elements of discretion such as:

- the potential/actual future revaluation of the RAB;
- switching of assets between legacy and new assets with different rates of return; and
- increases over time in the rate of return sought on legacy assets.

Table 4.2: Assessment of the proposed approach to setting the RAB

Principle	Assessment
Efficiency	The proposed approach does not change the incentives for productive and dynamic efficiency. But given the review is a backward-looking review of the RABs determined by the SA Government it was never possible for the review to alter efficiency incentives. Nor will it affect the allocative efficiency of prices in signalling future costs. Economic efficiency requires that usage charges reflect forward-looking marginal costs, which are not affected by the valuation of the initial RAB and its roll-forward. The value of the RAB will affect the fixed component of prices. This will affect the total bills paid by customers but not the allocative efficiency of prices.
Commercial Sustainability	As long as financing and dividend decisions of Government (as owners) reflect the RAB established, the commercial sustainability of the business would not be affected by decision on the RAB. The capacity to finance new investment is assured by the commitment to roll efficient new investment into the RAB and the reasonableness of the rate of return provided, not the size of the opening RAB.
Social Sustainability and Equity	The proposed approach better balances the interests of all stakeholders by: • Avoiding real capital gains for the owners that arose from the use of forecast rather than actual inflation in the roll forward of the RAB • Avoiding the revaluation of the RAB in 2013 • Recognising post-corporatisation capital contributions in the initial RAB. However, it does not recognize the implicit contract with consumers in regard to pre-existing assets or the 'double-dipping' on pre-corporatisation capital contributions.
Consistency with Government's sector policy and reform	The proposed approach is consistent with the NWI and regulatory practice in eth energy sector in the Australia. However, an alternative line-in-the-sand value of the RAB based on an economic evaluation would also be consistent with the NWI.
Transparency	The roll-forward of the RAB is transparent, as is the source of the initial DORC value for the RAB in 2004-05. The analysis and assumptions underpinning the initial DORC value are not transparent, but the fault lies with the initial RAB valuation process, not the Inquiry. This means that the initial RAB cannot be replicated or evaluated.
Certainty and Predictability	The proposed approach avoids the uncertainty and unpredictability created under the RAB and pricing approach previously adopted through: • The potential/actual future revaluation of the RAB.

Principle	Assessment
	• Switching of assets between legacy and new assets with different rates of return. • Increases over time in the rate of return sought on legacy assets. Subject to the concerns expressed above in regard to the initial DORC valuation, the rules/models for the roll-forward of the RAB are complete, well-specified, and use publicly available data. This allows stakeholders to predict outcomes with reasonable certainty.
Consistency	The roll-forward of the RAB has been applied consistently over the 2004 to 2013 period and is consistent with the approaches adopted in other jurisdictions and sectors.

Source: CEPA

4.2.3. Extension to wastewater and total RAB

If this approach is adopted for the water assets, it should also be extended to the wastewater and total RAB to provide a consistent overall regulatory framework.

We have estimated that under this approach the value of the RAB at 30 June 2013 for the **wastewater** assets would be $3.46 billion, which is $124 million less than the value set by the SA government of $3.58 billion (all values in December 2012 prices).[88] The **total** RAB at 30 June 2013 for SA Water would be $10.78 billion (December 2012 prices) which is $569 million below the RAB set by the SA Government in the Second Pricing Order. As noted above this would have reduced SA Water's 2013-14 revenue cap (or average water and wastewater bills across all consumers) by around 3%.

In constructing this estimate, we pro-rated the depreciation provision in the Transparency Statements for the difference between the opening RAB in the Transparency Statements for each year and the opening RAB under the Inquiry's approach. This is an approximation but should closely approximate the result from calculating depreciation by asset class. We have also not been able to adjust the opening RAB for wastewater contributed assets due to insufficient information in the Transparency Statements. This may have a potentially significant impact and if the Inquiry were able to adjust for this it would result in a lower wastewater RAB and total RAB.

4.2.4. Why it is a maximum value?

While the proposed approach is a significant improvement on the SA Government's approach to setting the RAB, it still represents the upper end of the spectrum due to:

- Concerns about the initial 2004 DORC value (see Section 3).
- Absence of adjustment for pre-corporatisation capital contributions (see Section 3).
- Absence of review/question of the efficiency of the capex programs (see Section 3).
- Consideration of alternative approaches for establishing the initial valuation.

In relation to the latter point, the DORC value is likely the maximum value for the RAB consistent with the principles of economic efficiency and NWI (where other approaches exclude non-commercial investments). Alternatives – such as economic/financial valuations based on current and/or forecast cash flows – can

[88] We would be pleased to provide the Inquiry with the workings behind these calculations (and those for the alternative approach set out below), if required.

provide an opening RAB that is more consistent with the implicit prior contract between customers and the Government as the owner of the assets. Such estimates better balance the interest of the consumers and the owner of the assets. It recognises the policy framework – or contract with customers – changed with NCP and the NWI so that there was an expectation that the full costs of future investments ***including a commercial rate of return*** would be recovered through water prices. But this was not part of the previous policy framework – or implicit contract. The NWI recognised that it was not a necessary requirement for economic efficiency that the contract be changed retrospectively to recover the full cost of sunk (pre-existing) assets.

4.3. ALTERNATIVE PROPOSAL

The Inquiry recognised that the approach it has proposed above likely falls towards the upper end of a reasonable range of values for SA Water's RAB. This section sets out an alternative approach, that considers a RAB based on an economic valuation, with indicative adjustments for efficiency adjustments that may have occurred had SA Water been subject to independent economic scrutiny over the period in question. We suggest this alternative approach will assist the Inquiry in establishing a range for the initial RAB value that is more consistent with the deprival value approach adopted in other States, which allowed for consideration of the 'implicit contract' with consumers. In a sequence of adjustments, we have:

1. Estimated an initial economic value 'line in the sand' for the 1 July 2004 RAB based on the net present value of free cash flows. This is accompanied by sensitivity testing on the discount rate and period of analysis.
2. Rolled the opening RAB forward using projected rather than actual capex. Projected capex is 11% lower than actual capex for the period and this difference is a proxy for the effect that efficiency testing of the capex program may have had.
3. Deducted the cost (exclusive of the Commonwealth Government funding) of the expansion of the capacity of the ADP from 50GL p.a. to 100GL p.a. from the capex program. At this stage significant questions have been raised as to whether the increase in capacity was economically efficient.

The table below summarises the results of this analysis based on the mid-points of the WACC (3.6% real, post-tax) and analysis period (25 years) ranges we have considered.[89] If just the first change – an economic value for the opening RAB – was made the water RAB in 2013 would be $6.77 billion, $1.00 billion below that in the Second Pricing Order of 2013. If all the changes were made the water RAB in 2013 would be $6.24 billion, $1.53 billion below that in the Second Pricing Order of 2013.

[89] Results for alternative values for these assumptions are presented later in this chapter.

Table 4.3: Comparison of Water RAB from Second Pricing Order May 2013 with Alternatives ($ billion, December 2012 prices)

Option	Value ($b)	Difference from Pricing Order ($b)
RAB Value Second Pricing Order May 2013 to apply from 1 July 2013	7.77	
Re-calculated RAB using "Roll-forward"	7.32	0.45
LIS RAB at 2004-05 Rolled Forward using Actual Capex	6.77	-1.00
LIS RAB at 2004-05 Rolled Forward using Projected Capex	6.47	-1.30
LIS RAB at 2004-05 Rolled Forward using Projected Capex less Second Stage ADP	6.24	-1.53

Source: Second Pricing Order of 2013, CEPA

4.3.1. Re-estimation of the opening RAB in 2004-05

Very little information is available on the original calculation of the DORC value used to set the opening RAB for 1 July 2004. Given this, it is not possible to critically review the original estimate to derive a range for the plausible DORC values.

In any case common practice has been to undertake an economic valuation of the assets based on expected cash flows. This can be done by projecting future cash flows for a given price path. But this introduces a number of complications. Firstly, it introduces the problem of the circularity in assuming a price path to set a RAB that then is an input to the determination of the price path. Secondly, forecasting cash flow can be complex especially in regard to future investment: is the business's right to operate being valued or simply the income generated by the existing assets. In establishing the initial line-in-the-sand value for Sydney Water, IPART used a simpler approach of calculating the present value future cash flows based on free cash generated in the latest year. This avoids the need to forecast future prices and cash flows (including capex requirements).

Key steps in the calculation of the value of the assets under this approach are:

1. ***Estimation of cash generated.*** This was derived from the SA Water Annual Reports and the SA Auditor General's reports. Cash generated from operations was calculated as:

   Revenue from customers (excluding capital contributions) plus CSOs.

   Less costs excluding depreciation and interest expense.

   Less tax.

   IPART used the cash generated for the latest available year. This can introduce greater variability in the calculation and it can be argued that investor expectations would be based on an average over recent years rather than the latest available years. We therefore used an average of post-tax cash flows for six years (converted to real terms (July 2004 prices)) to 2003-04. Use of an average rather than the latest available year increases the RAB by 4.7%. The cash flows are for SA Water as a whole. We then use the 2004-05 DORC RAB valuation to split the cash flows between water and wastewater (this approach results in 62.6% of the total cash flows being allocated to water).

2. ***Discount rate.*** In its 2004-05 Transparency Statement the SA Government used a range of 6-8% for the real pre-tax WACC, but in subsequent years it used a 6% real pre-tax WACC in calculating the maximum price band. A 6% real pre-tax WACC approximates the mid-point of the range used by IPART for its 2003 determination for Sydney Water. This converts to a 3.6% real post-tax

WACC which is used to calculate the present value of the post-tax cash flows. Sensitivity testing was undertaken using upper and lower bounds of 4.1% and 3.0%.

3. ***Period of analysis.*** We have tested a range for the period of analysis (i.e., the period for which free cash flows are held constant) between 15 and 35 years, with 25 years taken as the mid-point. It is important to note that these values do not represent the average economic life of the assets included in the RAB. This is because the cash flows generated from existing assets will reduce over time as the assets age and diminish in value or are fully depreciated, while over the period of analysis cash flows are held constant. Therefore, the implied average asset life will be higher than a given period of analysis. For example, 40 years of constant free cash flows is roughly equivalent to a 60-year average asset life, based on a declining balance approach. We have not undertaken a detailed analysis of the average life of the assets in SA Water's RAB as at 1 July 2004. However, as a cross check we have calculated the approximate asset life implied by the net book value divided by depreciation. In 2004, the opening RAB was $6.46b, with depreciation of $116 million, giving an average remaining asset life of 56 years.[90] For comparison, we also note that:
    - IPART used a 20-year period for the calculation of the present value of the stream of cash flows.
    - ERA adopted a shorter 10-year period for its economic valuation of the RAB.
    - While the details of the approach taken by ESC are not fully transparent, it appears that their approach adopted an average *asset life* of 50 years.

The table below shows the range for the water-only 1 July 2004 opening RAB based on an economic value approach, under the various combinations of assumptions.

Table 4.4: Economic value RAB 1 July 2004 – Water Assets – Sensitivity Testing ($ billion, July 2004 prices)

Period (years)	Real Post-Tax WACC		
	3.0%	3.6%	4.1%
15	$2.65	$2.54	$2.45
20	$3.30	$3.13	$2.99
25	$3.87	***$3.62***	$3.43
30	$4.35	$4.03	$3.79
35	$4.77	$4.38	$4.09

Source: CEPA. Green indicates values below the 1 July 2004 RAB value proposed to be adopted by the Inquiry.

The values range from $2.45 billion to $4.77 billion, with most values below the opening 1 July 2004 RAB for set in the 2005-06 Transparency Statement, that the Inquiry proposes to adopt as its starting point ($4.15 billion). The mid-point estimate is $3.62 billion, which is $0.53 billion below the RAB determined by the SA Government. As shown above, the assumptions applied materially impact the resulting valuation. The question is then what factors should be considered in choosing an appropriate point within the range.

We note that the approach above – while consistent with the methodology applied by other States – could be seen as a relatively simplified representation of the 'implicit contract' with consumers. Instead of

[90] 2004-05 Transparency Statement – Part A. Values are for SA Water's total water and wastewater assets, expressed in nominal terms.

expressing the implicit contract as maintaining a constant historical level of *free cash flow*, an alternative approach would be to maintain a constant historical *rate of return*, based on a depreciating RAB balance over the remaining life of the assets. From this perspective, the selection of an appropriate point from the range of economic values would need to consider both the expected rate of return and remaining asset life prevailing at the time the line-in-the-sand valuation is to be drawn. We consider that these issues merit further consideration by the Inquiry, as information from SA Water would likely be required to establish a more robust understanding of the appropriate asset life assumptions.

While the sensitivity analysis above implies a potentially wide range of values, we have undertaken a simple cross check of mid-point value, by comparing it to the following 'rule of thumb' RAB estimate: *RAB = return on capital x book value / WACC*. As indicated in the table below, this approximate value is close to the mid-point of the ranges we have considered.

Table 4.5: RAB cross check - calculations

1 July 2004	
SA Water book value (DORC for water + wastewater)	$6.57 billion
Actual 2004-05 return (EBIT/DORC value)	5.3%
Target WACC	6.0%
Implied RAB (water + wastewater) – 1 July 2004	$5.81 billion
Implied RAB (water only) – 1 July 2004	$3.63 billion
Mid-point of economic value range – 1 July 2004	$3.62 billion

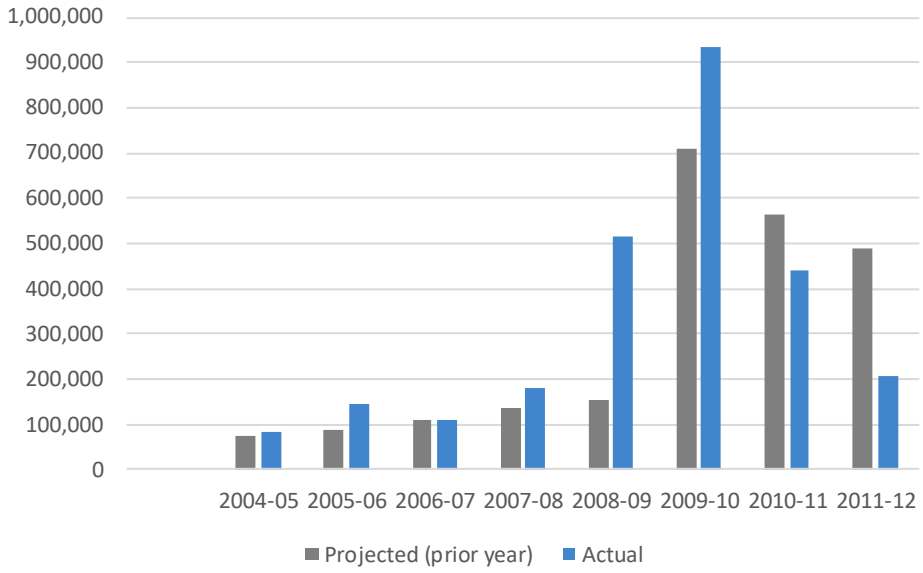
Source: CEPA analysis, SA Water.

4.3.2. Allowance for efficiency testing of capex

Key twin principles of regulation are that consumers should not pay for inefficient costs and that utilities should be given incentives to not spend more than is efficient. This has led regulators to establish rigorous processes for the review of the efficiency of the capex proposed (an *ex ante* test) and, in most cases, the efficiency of capex spent (*ex post* test). As noted above, while in some cases there may be small/negligible reductions in the proposed capex from the *ex ante* efficiency review, reductions of 20% or more are not uncommon.

The Inquiry's approach rolled capex actually spent into the RAB; actual capex was 11% higher than the projected capex over the period. Experience with regulated businesses that are not subject to competition indicates that capex proposals can include significant amounts of spending that cannot be shown to be efficient. In the case of SA Water these concerns are amplified by the weaker *ex-post* efficiency incentives. However, it is not possible to now undertake rigorous efficiency reviews of capex programs going back to 2004-05.

Figure 4.1: Comparison of projected and actual capex



Source: CEPA analysis, SA Water.

As a proxy for the effect of efficiency reviews of the capex proposed and spent, we have rolled forward the RAB using planned rather than actual capex. This implicitly assumes all the proposed capex was efficient but all the overspend was due to inefficiency. In practice, each will be a mix of efficient and inefficient spending but the overall result – a reduction of 11% in the capex rolled into the RAB is comparable to the outcomes of efficiency reviews of proposed capex by regulators.

4.3.3. Inclusion of second stage of ADP

As noted above the decision to double the capacity was controversial and has not been demonstrated to be efficient. In the absence of robust analysis to demonstrate it was efficient it would likely not pass the tests to be included in the allowed capex. Hence, our sensitivity has removed the cost of the increase in capacity funded by SA Water. As the total cost of the increase in capacity was $450 million and the Commonwealth provided $228 million towards the cost, $222 million (nominal) has been removed from the planned capex in 2009-11.

4.3.4. Extension to wastewater and total RAB

We have also estimated the wastewater RAB on the same basis. To do this we:

1. Estimated an initial economic value wastewater RAB for 1 July 2004, as the difference between the estimate for SA Water as a whole based on the net present value of free cash flows and the estimate for the water-only assets. This is accompanied by sensitivity testing on the discount rate and period of analysis.
2. Rolled the opening RAB forward using projected rather than actual capex. As actual wastewater capex was slightly lower than the projected capex, this adjustment results in a small increase in the wastewater RAB

The table below summarises the results of this analysis, again based on the mid-point assumptions outlined above. If just the first change – an economic value for the opening RAB – was made the wastewater RAB in

2013 would be $3.13 billion, $0.45 billion below that in the Second Pricing Order of 2013.[91] If all the changes were made the RAB in 2013 would be $3.15 billion, $0.43 billion below that in the Second Pricing Order.

Table 4.6: Comparison of Wastewater RAB from Second Pricing Order May 2013 with Alternatives ($ billion, December 2012 prices)

Option	Value ($b)	Difference from Pricing Order ($b)
RAB Value Second Pricing Order May 2013 to apply from 1 July 2013	3.58	
Re-calculated RAB using "Roll-forward"	3.46	0.12
LIS RAB at 2004-05 Rolled Forward using Actual Capex	3.13	0.45
LIS RAB at 2004-05 Rolled Forward using Projected Capex	3.15	0.43

Source: Second Pricing Order of 2013, CEPA

The absolute dollar impact is smaller than the impacts on the water-only RAB. This largely reflects the difference in the absolute quantum of water and wastewater assets. Application of an alternative methodology to water-only assets would result in inconsistent estimates for the total RAB and its component parts, and an may result in an overestimate of methodologically-consistent RABs for the SA Water as a whole and the wastewater components. Hence, restricting the review to water-only assets may result in an overestimate of required revenues and prices.

The table below combines the estimates for the water and wastewater RABs to construct methodologically consistent estimates of the total RAB for SA Water, based on the alternative approaches outlined above. If just the first change – an economic value for the opening RAB – were made the wastewater total RAB in 2013 would be $9.90 billion, $1.45 billion below that in the Second Pricing Order. If all the changes were made the RAB in 2013 would be $9.39 billion, $1.96 billion below that in the Second Pricing Order. If implemented this would result in a reduction in SA Water's 2013-14 revenue cap of around -12%.

Table 4.7: Comparison of Total SA Water RAB from Second Pricing Order May 2013 with Alternatives ($ billion, December 2012 prices)

Option	Value ($b)	Difference from Pricing Order ($b)
RAB Value Second Pricing Order May 2013 to apply from 1 July 2013	11.35	
Re-calculated RAB using "Roll-forward"	10.78	0.57
LIS RAB at 2004-05 Rolled Forward using Actual Capex	9.90	1.45
LIS RAB at 2004-05 Rolled Forward using Projected Capex	9.62	1.73
LIS RAB at 2004-05 Rolled Forward using Projected Capex less Second Stage ADP	9.39	1.96

Source: Second Pricing Order of 2013, CEPA

[91] Based on the mid-point values for the WACC and period of analysis ranges we have considered.

4.4. IMPACT

In the table below, we present the indicative impact of the alternative 1 July 2013 RAB valuations on SA Water's 2013/14 revenue cap, average revenue per ML and dividends. The percentage reduction in these values may be considered as a proxy for the average bill impact across all customer groups. We also present the impact on the return on equity component of the revenue cap, as a proxy for the impact on dividends to the SA Government. These calculations are performed on the basis of ESCOSA's 2013 Determination – i.e., what would the 2013/14 revenue cap have been, had the RAB values above been adopted. Results are presented for the water-only and combined water and wastewater cases.

Table 4.8: Impact on 2013/14 revenue cap - Change from Second Pricing Order RAB Valuation (December 2012 prices) – Water-only.

Option	Revenue cap ($m / % change)	Revenue/ customer ($ / % change)	Revenue/ML ($ / % change)	Return on equity ($m / % change)
Re-calculated RAB using "Roll-forward"	-29 / -4%	-38 / -4%	-129 / -4%	-10 / -6%
LIS RAB at 2004-05 Rolled Forward using Actual Capex	-65 / -9%	-86 / -9%	-291 / -9%	-22 / -13%
LIS RAB at 2004-05 Rolled Forward using Projected Capex	-84 / -11%	-112 / -11%	-378 / -11%	-29 / -16%
LIS RAB at 2004-05 Rolled Forward using Projected Capex less Second Stage ADP	- 99 / -13%	-131 / -13%	-444 / -13%	-34 / -19%

Source: CEPA

Note: The return on equity impact represents a maximum impact on dividends, as it assumes a 100% pay-out.

Table 4.9: Impact on 2013/14 revenue cap - Change from Second Pricing Order RAB Valuation (December 2012 prices) – Water and Wastewater

Option	Revenue cap ($m / % change)	Revenue/ customer ($ / % change)	Revenue/ML ($ / % change)	Return on equity ($m / % change)
Re-calculated RAB using "Roll-forward"	-38 / -3%	-50 / -3%	-169 / -3%	-13 / 5%
LIS RAB at 2004-05 Rolled Forward using Actual Capex	-96 / -9%	-127 / -9%	-431 / -9%	-32 / 13%
LIS RAB at 2004-05 Rolled Forward using Projected Capex	-114 / -10%	-152 / -10%	-513 / -10%	-38 / -15%
LIS RAB at 2004-05 Rolled Forward using Projected Capex less Second Stage ADP	-129 / -12%	-171 / -12%	-580 / -12%	-43 / -17%

Source: CEPA

Note: The return on equity impact represents a maximum impact on dividends, as it assumes a 100% pay-out.

5. TRANSITION ISSUES

The Inquiry's discussion paper Digging Deeper raises the questions of:

- Should the Inquiry limit itself to recommendations on the RAB or consider the transitional issues in moving to a new RAB?
- To what extent should the Inquiry consider the impacts on SA Water and the SA Government in considering either the value of the RAB or the transition path?

We consider that the Inquiry should consider and advise on the issues in the implementation of a lower RAB value. However, the implementation is best done in the context of ESCOSA's determination of a new price path for SA Water from 2020. A number of other factors will affect the overall revenue path for SA Water – such as trends in the WACC – and may be considered in determining the transition path for prices that reflect the Inquiry's recommendation on the RAB value. Importantly these factors should not affect the determination of the revised RAB and this should also be 'blind to ownership'. This is consistent with the NCP principles and regulatory practice in Australia.

5.1. SHOULD THE COMMISSION CONSIDER TRANSITION PATHS?

Consideration of the implementation of the Inquiry's recommendations is required under the second Term of Reference of the inquiry which states that:

> *"2. If there are any changes proposed to the RAB valuation, the Inquiry will also consider and report on a possible implementation program and timetable which would ensure a fair and reasonable balance between the interests of consumers and the Government (as Owner of SA Water)."*

In any case consideration of transition paths and implementation issues is important in ensuring the effectiveness of the Inquiry. If issues of impacts and transitions are not addressed these issues can be become barriers to the implementation of the Inquiry's recommendations. The key issue is what factors are relevant and how should these be considered in the implementation of the Inquiry's recommendations.

5.2. WHAT FACTORS SHOULD BE CONSIDERED IN DETERMINING A TRANSITION PATH?

The best practice principles of regulation were the starting point for the assessment of the RAB above. That is, how would an independent regulator assess the opening RAB and its roll-forward given those principles, statutory requirements, and regulatory precedents. This also provides the framework for considering transitional and implementation issues.

There are a number of valid issues to be considered in implementation of the recommendations:

- integration with ESCOSA processes;
- impacts on consumers; and
- impacts on the financeability of the utility and the reasonable interest of the owners.

One of the impacts that the Inquiry will need to consider is the management of the transition in the financing of the business to a lower RAB. The standard regulatory financeability tests discussed below assume a standard gearing of the business for the RAB. In this case the change in the RAB may require a change in financing strategy (e.g., reduction in debt) to adapt to the changed RAB. This may require a period of transition as if the change is implemented in one step the burden of the costs of servicing existing debt levels may be excessive and impact on business operations and decisions.

Beyond this, how the change in RAB should integrated with the ESCOSA processes and potential price paths will be a key issue and may be an overarching issue. In considering the impacts on various stakeholders it is common for prefer a smoother, more consistent price and revenue trajectory. This helps avoid sudden price and revenue/profitability shocks for stakeholders. UK regulators have an explicit requirement to ensure the financial viability of the regulated business (subject to its efficient management and operation) that has been translated into formal financeability assessments. Some jurisdictional regulators in Australia (e.g., ESC and IPART) also undertake financeability analyses in as part of their decision-making. Whether or not formal financeability analysis is undertaken or not, decisions on the transition path for prices and revenues are taken in the context of the overall regulatory determination rather than the component parts. This suggests that while the Inquiry can consider and advise on the timetable and transition paths for the adoption of a new RAB the implementation of this – in the form of a new price path – is best done through the ESCOSA review of prices. Hence, the transition path for prices and revenues in aggregate would be determined through the review of prices from 2020.

However, there are largely common elements in how financeability analysis is considered in decision-making by regulators that are highly relevant to the Inquiry's consideration of transitional and implementation issues:

1. The criteria for the assessment of financeability do not vary with ownership. The question is the impact on the ability if the regulated entity to finance its activities not the impact on the beneficial owner or who that owner is.
2. The primary responsibility for the financeability of the entity rests with the business and its owner rather than the regulator. Underlying this is the presumption that financeability issues are matters and timing and that the building block approach will provide a revenue stream that is sustainable over the long term.
3. Following from (2), financeability adjustments will be rare and revenue-neutral over the long term. To the extent that a positive adjustment is provided in a period it will be offset by an NPV-equivalent negative adjustment in future periods.
4. Financeability adjustments, if made should be a transparent positive or negative factor, not embedded in the building block cost assumptions (e.g., WACC, opex or capex). This is, financeability concerns are not factored into the decision on each of these components.

The principle that regulation should be 'blind to ownership' is embedded in the National Competition Policy that has underpinned the reform of the utility governance and regulation since the early 1990's (including the NWI). Competitive neutrality is a key principle of NCP and its objective is:

> *"the elimination of resource allocation distortions arising out of the public ownership of entities engaged in significant business activities: Government businesses should not enjoy any net competitive advantage simply as a result of their public sector ownership."*[92]

[92] Section 3(1), Competition Principles Agreement – 11 April 1995 (As amended to 13 April 2007).

The NCP also required that prices oversight should be established for Government Business Enterprises and that:

> *"its prime objective should be one of efficient resource allocation but with regard to any explicitly identified and defined community service obligations imposed on a business enterprise by the Government or legislature of the jurisdiction that owns the enterprise."*[93]

While the decision on the RAB will impact on SA Government as owner, these provisions do not support a regulator giving different weight to the consideration of those impacts because the owner is the SA Government and that it could potentially impact on budgetary decisions. The competitive neutrality principles underpinning NCP require that government-owned utilities operate within a commercial framework and are regulated on the same basis as privately-owned utilities. This means that who the dividends flow to and how they are used should not be relevant.

The discussion paper also notes that there are other factors that may result in reduction in SA Water, such as:

- The possible reduction in the WACC.
- The possible introduction of retail competition. If efficient component pricing is used – as the paper suggests – this will not affect the financial viability of the networks. Hence it should not be relevant.

While the WACCs determined by regulators have been falling this reflects the reduction in market rates. For example, the shift to trailing averages better reflects the actual cost of debt of utilities and the reduction in the trailing average cost of debt reflects the impact of the lower cost of new debt. Hence it is not obvious that it will result in a deterioration in cash flows that should be offset by a different decision on the RAB. Furthermore, these concerns may be premature as they anticipate future trends in market rates and the decision of ESCOSA. Hence the question of the impact on the financeability of SA water of the confluence of a reduction in the RAB and reduction in the WACC is best considered by ESCOSA through the financeability analysis of its decision on the 2020 price review.

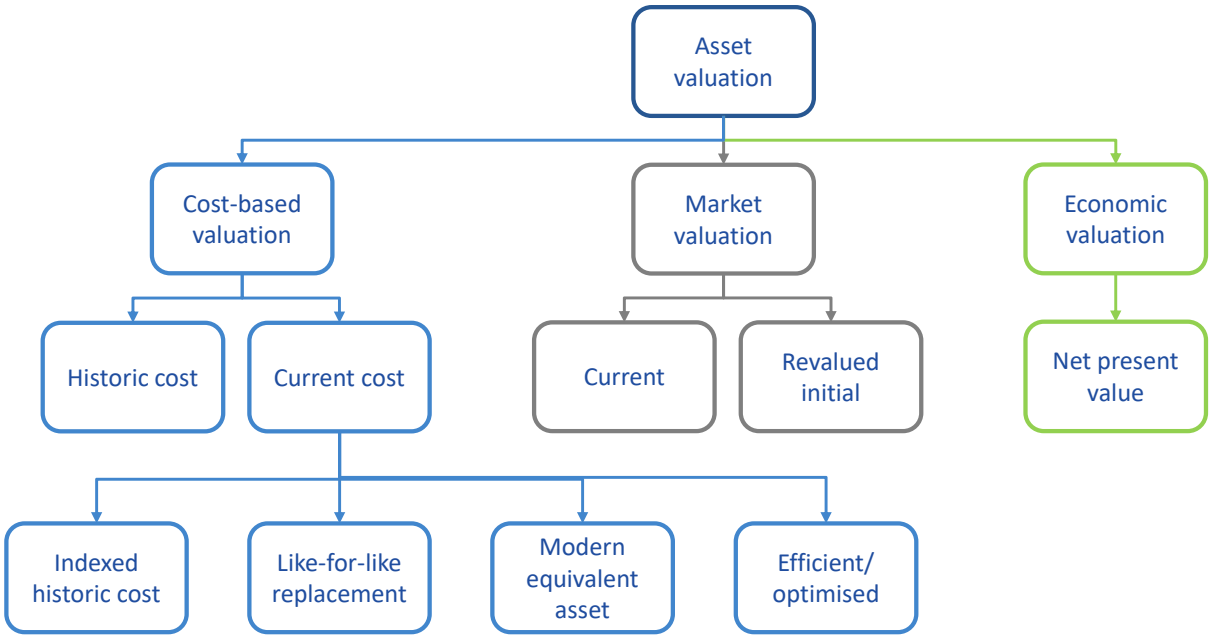
Promotion of competition where possible was a key objective of the NCP. It recognised that the reasonable interest of the monopoly facility needs to be recognised but not at the expense of discouraging efficient competition. Efficient component pricing – which the paper suggests may be used – is a means of reconciling these objectives and should not affect the reasonable financial interests of SA Water. Hence it should not be relevant.

[93] Section 2(4)(b), Competition Principles Agreement – 11 April 1995 (As amended to 13 April 2007).

Appendix A SUMMARY OF RAB VALUATION APPROACHES

The diagram below provides an overview of the different approaches.

Figure A.1: Different approaches to asset valuation



Source: CEPA

These valuation approaches can lead to materially different initial asset base valuations.

A.1. COST-BASED

The traditional form of valuation used for debt and equities is cost-based, which is also sometimes known as book-based or accounting-based valuations. Two forms exist:

- historic cost; and
- current, or replacement, cost.

Historic cost valuation (depreciated actual/historic cost)

This is the standard approach to asset valuation adopted by most companies. Assets are recorded at their purchase cost in the company's balance sheet and then depreciated over the asset life.

Some modifications have been seen to this approach, especially in relation to property, whereby periodic revaluations—often at the company's discretion—are undertaken.

Current cost valuation

In recognition of the problems posed by inflation and long-lived assets (an important issue for infrastructure and utility companies) an alternative approach to book valuation, known as current cost or inflation accounting, was established in the 1980s in the UK, New Zealand and some Australian States—this is also referred to as replacement valuation and has been employed in some US utility industries.

There are several alternative ways of undertaking current cost valuations:

- simple revaluation of the historic cost by a price index (indexed depreciated historic cost (IDHC);
- a like-for-like replacement cost, e.g. a 50ML per day wastewater treatment plant being replaced by a new 50ML wastewater treatment plant using the same technology (depreciated replacement cost (DRC));
- the modern equivalent asset (MEA), e.g. a 500 MW coal-fired power station being replaced by a 500 MW combined-cycle gas-turbine power station; and
- the optimal / most efficient replacement asset, e.g. 50ML per day wastewater treatment plant based on the most efficient technology available. Once depreciated, this approach is known as the depreciated optimised replacement cost (DORC).

These alternative approaches may lead to divergent asset values and differ according to the complexity of the calculation. The like-for-like, MEA and DORC approaches also require significant judgement, often requiring independent engineering and/or economic advice, on the unit costs of the assets, land values and, in the case of DORC, the optimised approach.

The simplest approach is the application of the retail (or consumer) price index.

A.2. MARKET-BASED

Two forms of market valuation exist, those given by:

- capital market valuation of securities (both equity and debt); and
- bidders when an asset is sold (or resold).

In both cases, what is being provided is a valuation of the assets based on the market perceptions of the ability of the company to make profits.

For capital market valuations to exist there is a need for the company to have securities that are quoted on an exchange. When this is the case it is relatively simple to determine the value of the company: the total value of the security is given by the number of securities multiplied by the price of the security.

A.3. FINANCIAL/ ECONOMIC BASED

The final standard approach to asset valuation is that of economic valuation. This involves the calculation of discounted expected future profit streams for the company, rather than that just accruing to shareholders as given by the market value of equity. In other words, the assets are valued based on discounted cash flows.

A refinement of this approach has been used in the UK to set regulatory asset values, making use of market values of listed companies. Market values reflect expectations of future cash flows. Setting a RAB based on a value shortly after privatisation ensures that the RAB value is consistent with financial expectations indicated at the time of sale. For water and sewerage in England & Wales, there was no concept of regulatory capital value until some years after privatisation: the approach was developed by Ofwat in a 1992 consultation paper and developed by the Monopolies and Mergers Commission in referrals of the gas and water companies in 1993 and 1995.

This also suffers from the problem of circularity identified for regulated companies when using market values.

A.4. HYBRID APPROACH (DEPRIVAL VALUE)

As defined by the NWI:

> *"The deprival value is the value of future economic benefits that would be foregone if the entity is deprived of an asset. If the asset to be lost is to be replaced, it can be valued at its market value, replacement cost or reproduction cost, depending on the circumstances. If the asset is not to be replaced, then it should be valued at its economic value, which is the greater of either the net present value of the income expected to be earned from the asset, or the fair market value. The optimised deprival value [ODV] is the lesser of the DORC and the economic value of the asset."*[94]

A.5. FAIR VALUE

As defined in Owens (2018b):

> *"the "fair value" method, as defined in International or Australian accounting standards. AASB 13 (Fair Value Measurement) and AASB 116 (Property, Plant and Equipment) state that fair value can be estimated using either an income or a depreciated replacement cost (DRC) approach. An income approach looks at the net present value of the income streams forecast to be generated by the assets into the future; the DRC approach looks at the cost of replacing the assets. The main challenge with the income approach is the circularity problem (prices need to be set to generate income streams, but the resulting asset value is then used to determine the prices); and the challenge in determining replacement costs is the sheer intellectual task of determining efficient costs of replacing assets given existing cities, new technologies and cost uncertainties."*[95]

Therefore, the fair value approach can refer to either an economic-based approach or the DRC.

A.6. ADVANTAGES AND DISADVANTAGES OF DIFFERENT VALUATION TECHNIQUES

There are advantages and disadvantages from the different options, a summary of the key ones is set out in the table below. that arise with each of the broad options.

Table A.1: Advantages and disadvantages of asset valuation techniques

Approach	Advantages	Disadvantages
Historic cost	Reflects what companies paid for the asset. Consistent with financial capital maintenance (FCM). Simple: Is readily understood and produced as part of the annual reporting process.	With long-lived assets or periods of high inflation provides a value that is significantly different to the replacement cost and/or the real value. Some circulatory: Might include monopoly returns if these were expected at the time of purchase. Does not represent the opportunity cost of consumption of an asset. Doesn't reflect changes in technology over time.

[94] NWI (2004), page 7, footnote 7.

[95] Owens (2018b), page 13.

Approach	Advantages	Disadvantages
Current cost / Replacement cost	Reflects the opportunity cost of the assets and so sends strong signals about consumption. It also provides appropriate signals about new entry, something that can be important in a sector that is still developing and regulated without license requirements about areas of service etc. Achieves operational capital maintenance (OCM).	Defining what is meant by replacement cost is difficult – several different options. Subjective / subject to judgement. Very dependent on assumptions, especially when considering modern equivalent asset forms of replacement cost. Difficult in sectors where few comparators exist for valuation, or the impact of very circumstance specific situations can be significant. Values can be volatile. Not consistent with financial capital maintenance (FCM).
Market value	Reflects the view of investors about the future profit streams of the assets. Can provide a clear signal about investor perceptions of value, especially for contestable markets or new investment (marginal Q theory).	Requires companies to be listed – this can be a problem for companies that are part of a larger group or unlisted. However, where listed comparators exist t may be possible to proxy values. Circularity problem unless a one-off ex post valuation is used. Even if circularity were not an issue there is still a timing concern given the potential volatility of stock markets.
Economic value	Reflects the earning potential of the assets and so provides a clear valuation of future profit streams.	Dependent on assumptions and may include a degree of circularity. This can make this a difficult valuation approach to apply. Most examples of this approach are focused on pre-privatisation estimates.

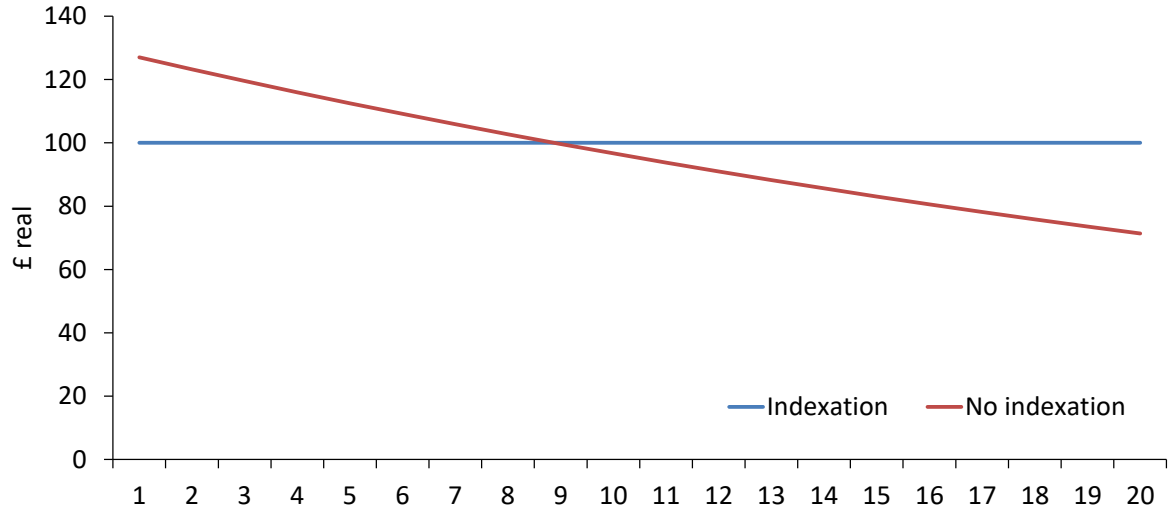
Source: CEPA

A.7. NOMINAL OR REAL DISCOUNT RATE

Either a real or a nominal discount rate can be applied to the RAB. If a real discount rate is used, the capital charges calculated will be expressed in real terms, while if a nominal discount rate is applied, the capital charges will be nominal values.

While the NPV will be equal, applying a real WACC to an indexed RAB produces a lower initial cash-flow than applying a nominal WACC to an un-indexed RAB.

Figure A.2: Illustrative indexation example: Revenues in real terms over time



Source: CEPA

Appendix B OTHER REGULATORS' APPROACHES TO SETTING THE RAB

B.1. WATER (AUSTRALIA)

NSW

IPART's approach to setting the initial value of Sydney Water's RAB dates back to its decision for the 1996 price path:

> *"In July 1995, the NSW Treasury convened a Water Industry Asset Valuation Working Group to consider pricing issues associated with asset valuation. The Working Group decided to adopt a "line-in-the-sand" (LIS) approach in which a distinction is made between past and new investments. As past investments were made for a variety of economic and political reasons, the Working Group concluded that it would be inappropriate to apply a commercial return to the written down replacement value of such investments. However, a commercial rate of return should be required for new investments.*
>
> *The Working Group considered two options for the implementation of the [line-in-the-sand] approach, namely the accounting and the annuity method."*[96]

At this point IPART did not adopted the "line-in-the-sand approach". Instead IPART constructed the RAB as follows:

> *"- an opening regulatory asset value for existing assets is established based on the net present value of future cash flows at current price levels*
>
> *- the regulatory asset base is then adjusted through time to take account of renewals of existing assets and new capital expenditure."*[97]

In its 1998 decision, IPART simply stated:

> *"The Tribunal will consider the process of rolling forward the asset base to arrive at regulatory asset values in the next major review for SWC in 1999/2000."*[98]

In its 2000 review, IPART estimated the value of Sydney Water's RAB using an optimised deprival valuation (ODV) approach:

> *"According to the ODV approach, three underlying bases need to be considered:*
>
> *• Replacement cost—the cost of replacing the existing assets with identical assets in the same condition (ie after allowing for depreciation). For regulatory purposes, these costs can be optimised by adjusting for technological change and past poor investment decisions (such as bad location). The value so obtained is called the Depreciated Optimised Replacement Cost.*

[96] IPART (1996), medium-term price path from 1 July, page 16.

[97] Ibid., page 18.

[98] IPART (1998), medium-term price path from 1 July 1998, page 22.

> • *Recoverable amount—the future revenue stream, minus cash operating costs, that the assets will generate. This figure is then adjusted to today's dollars (ie present value) to allow for the time value of money (or interest cost). This is the 'Line in the Sand' (LIS) methodology referred to in previous determinations for Sydney Water and Hunter Water*
>
> • *Net realisable value—if the assets are surplus to requirement, the value is the price the assets could be sold for in the open market.*
>
> *Once an amount has been estimated for each of these bases, whichever is higher of the recoverable amount and the net realisable value is considered to be the Economic Value of the assets. Whichever is lower of the Economic Value and the Depreciated Optimised Replacement Cost (DORC) is the Optimised Deprival Value of the assets."*[99]

As the DORC was certain to be much higher than the economic value, IPART estimated the value of Sydney Water's assets by using the economic value approach. IPART noted that the

> *"LIS value is equal to the present value of future free cashflows. For the current determination the LIS value as of the end of 1998/99 was estimated using the actual free cashflow in that year. The free cashflow is actual cash revenue less cash operating costs and renewals expenditure. The opening regulatory base for the regulatory period was obtained by rolling forward the 1998/99 LIS value one year to 1999/00."*[100]

It is not clear from IPART's determination whether it adopted either of the 'accounting' or 'annuity' methods that were proposed by the Working Group in 1995. IPART do note in a footnote that

> *"As the assets are clearly not surplus there is no need to test their net realisable value so the Economic Value is equivalent to the LIS."*[101]

We understand based on these statements and discussions with former IPART staff, that IPART based the economic valuation on the one year cash flows with a 20 year timeframe.

In its 2003 decision, IPART used the RAB it established in its 2000 review of Sydney Water's prices, and rolled this forward into the 2003 to 2005 regulatory period by adding an allowance for efficient capex, and accounting for inflation, depreciation and asset disposals.[102]

VIC

The initial RAB was set by the Victorian Minister for Water in 2004.

The Minister received advice from the ESC that recommended a line-in-the-sand approach (which we assume to mean a net present value of future cash flows). We understand that the RAB chosen matched the scenarios prepared by the ESC using and economic value approach.

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[99] IPART (2000), pages 20-21.

[100] IPART (2000), footnote 46.

[101] IPART (2000), footnote 48.

[102] IPART (2003), page 6.

The Minister determined the starting RAB values, which were based on a mixture of economic value (using either expected returns for a single year or businesses' proposed returns) or businesses' proposed prices and revenues unadjusted.[103]

WA

In response to the ERA's inquiry into *Urban Water and Wastewater pricing*, the Government of Western Australia Department of Treasury and Finance noted that:

> *"The approach employed by the Water Corporation is however more of a "top down" approach where, rather than calculating the asset value according to an approved methodology it is derived according to the current revenue forecasts (pre-tax profit to the year 2008/09), which in turn are based on assumed price paths.*
>
> …
>
> *The Water Corporation acknowledges that there is a degree of circularity in its method for setting the initial regulatory asset value, as this value is based on expected revenue, whilst the revenue for the determination period is based on the asset value. However, this method of determining the initial asset value is employed in order to maintain the Water Corporation's forecast prices and revenues, and by implication the value of the Water Corporation's business. Thus avoids the adverse impact of any regulatory shock, were government to introduce cost-based regulation.*
>
> *The ERA accepts this method of initial asset value determination, as the $9,100 million regulatory asset value proposed by the Water Corporation is within the feasible range of the scrap value of the assets and a depreciated optimised replacement cost (DORC).*
>
> …
>
> *Although no DORC assessment of the Water Corporation's asset value has been undertaken, the Water Corporation has indicated that the written down replacement value of assets at 20 June 2004 was $11,048 million. Consequently it can be assumed that a calculated DORC value would be significantly higher than the regulated asset value proposed by the Water Corporation (which corresponds to a value of about $8,000 million at 30 June 2004)."*[104]

In its final report on the Inquiry the ERA stated that:

> *"The methodology applied by the Corporation in deriving its proposed asset value is consistent, in a general sense, with a deprival-value approach to asset valuation and with the methodology that the Authority has determined as appropriate for the determination of regulatory asset values for the service providers that are the subject of the current study.*
>
> *The Authority has undertaken analysis to verify the Corporation's determination of the proposed asset value by constructing a set of regulatory accounts based on the Corporation's forecasts of operating and capital costs, and determining the asset value that results in the value of a building block determination of a revenue requirement to equate to the Corporation's forecast of actual revenue."*[105]

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[103] ESC (2005a) and ESC (2005b).

[104] DTF (2005), pages 16-17.

[105] ERA (2005).

The ERA provides a summary of the calculations (i.e., projected revenues, cost of service, WACC and the RAB based on its NPV calculations) in Table 4.1 of its report. Therefore, in setting the initial RAB the ERA relied on the economic-based approach.

B.2. ENERGY (AUSTRALIA)

NSW

For NSW electricity distribution networks, the initial 1996 asset values were:

> *"based on a public exchange of correspondence between the Tribunal and the Government, in which the Tribunal set electricity prices having regard to, among other things, an average 20 per cent real price reduction target for the industry as a whole. The financial modelling conducted for the 1996 review was done in conjunction with NSW Treasury.[106]"*

In the 1999 review the Premier provided a direction - as allowed under the National electricity rules to - that the value was to be based on a DORC valuation of the assets. This was a public direction published in IPART's 1999 report.[107] Given that direction IPART established the opening RAB for 2000 and this was rolled forward in subsequent decisions based on the DORC value. The exception was Broken Hill where the use of the DORC value would have been clearly unsustainable and a lower value was set.

The DORC value was the value for assets in place at 30 June 1998, which was then rolled forward using inflation, capex and depreciation.

The process for determining the DORC value was as follows:

1. The NSW Treasury commissioned GHD to prepare a DORC value for all the businesses based on the asset register, estimates of current replacement cost, and optimisation of underutilised assets. In practice there was minimal optimisation.
2. IPART commissioned an independent review of the GHD estimates by PB Power who found that:

> *"The approach taken to gather and verify data from each of the six distribution companies is essentially consistent. All the distribution companies appear to be in the process of upgrading their asset databases, but none were at a final stage of completion where data could be supplied with a guaranteed degree of accuracy. • The Consortium ODRC valuation is based generally on the standard costs contained in Table 1 of the Guidelines. The current accuracy of these costs has been considered by the Consortium and PB Power and the costs have been found to be reasonable. • Our experience indicates that unit cost differentials could be in the order of 30% for certain categories of asset. The real value of some asset classes in each specific valuation therefore may be considerably higher or lower than those using standard costs for the valuation of electricity businesses with different mixes of asset types. • We consider the asset lives used by the Consortium in the valuation in general to be reasonable and in some cases conservative. • The possible effects on the ODRC valuation of each of*

[106] IPART (1999), page 51.

[107] Ibid.

the electricity businesses of using more appropriate asset lives is discussed. We are unfortunately not able to quantify our comments relating to increased valuation as this would require access to more detailed information and is outside of the scope of this work."[108]

3. IPART benchmarked the DORC values against those in other states and found the values (per customer, per GWh and per km) across the NSW networks as a whole were comparable to or higher than the values for the Victorian DNSPs as a whole at that time.[109]
4. IPART adopted the GHD DORC values - excluding capital contribution to avoid customers paying twice for the same assets - with the adjustment for Broken Hill as noted above.

On the evidence at that time the unit values seemed reasonable (as replacement cost estimates go) and the asset age assumptions reasonable the main uncertainty was the potential incompleteness of the asset register. But from the information available to IPART there was no purposeful adjustment of the asset values up or down.

VIC

In Victoria, the value of the two rural-based electricity networks was set below the DORC, and the three urban networks above the DORC. This was done so that prices could be equalised across the five privatised distribution networks. The Victorian Government locked in these values in 1995.[110]

WA

In Western Australia, the transmission and distribution network owner, Western Power, noted in 2004 that it applied the ODV approach. However, it also noted that while ODR was considered the most appropriate it was not appropriate to apply it to all assets and in some cases it used a DORC method.[111] The Western Australia Electricity Networks Access Code 2004 specified that:

"6.46 For the start of the first access arrangement period, the capital base for a covered network must be determined using one of the following asset valuation methodologies:

(a) depreciated optimised replacement cost ("DORC"); or

(b) optimised deprival value ("ODV").

6.47 If under section 6.46 the ODV asset valuation methodology is used to determine the capital base at the start of the first access arrangement period for the covered network that is covered under section 3.1, the valuation must utilise, to the extent possible, any ministerial valuation under section 119 of the Act of the network assets which comprise the covered network."[112]

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[108] Ibid., page 55.

[109] Ibid., page 56.

[110] Abbott and Kantor (2014), page 69.

[111] Western Power Corporation (2004), pages 5-6.

[112] ERA (2007), page 78.

Therefore, we understand that the initial RAB was based on ODV/ DORC (the differences between the ODV and DORC were minimal),[113] we also understand that the initial value (set in 2004) was rolled forward by the addition of actual and forecast new facilities investment less depreciation and inflation adjustment, and that this approach was adopted going forward.[114]

[113] Western Power Corporation (2004), page 7.

[114] ERA (2007), pages 78-79, 196.

Appendix C ASSESSMENT CRITERIA

This appendix sets out the criteria applied for the evaluation of the approach adopted in setting the RAB for SA Water. It looks at the criteria for the process as well as the methodology and separates the roll-forward from the setting of the initial RAB. This is important for the development of the recommendations.

Drawing upon the best practice principles of regulation, this section sets out the criteria to be used in assessing the approach used in setting the RAB for SA water and the alternatives proposed.

C.1. BEST PRACTICE PRINCIPLES OF REGULATION

In their manual for the evaluation of regulatory systems Brown et al (2006) review the various best practice principles for regulation and distil three 'meta-principles':

> *"It is clear that a regulatory system can be effective only if that system satisfies three basic meta-principles:*
>
> • **Meta-Principle 1: Credibility**—Investors must have confidence that the regulatory system will honour its commitments.
>
> • **Meta-Principle 2: Legitimacy**—Consumers must be convinced that the regulatory system will protect them from the exercise of monopoly power, whether through high prices, poor service, or both.
>
> *Stepping back, it is clear that the common element in both of these principles is that investors and consume*rs believe the regulatory system operates fairly. Because investors and especially consumers are unlikely to perceive the system as fair if it is closed and opaque, this in turn implies a third principle:
>
> • ***Meta-Principle 3: Transparency***—The regulatory system must operate transparently so that investors and consumers "know the terms of the deal."
>
> *This third principle is especially importa*nt for consumers. When regulators regulate in secret, consumers tend to assume the worst—that the regulator or government has been "bought out" by new private investors and that consumers will end up paying for this "secret deal." Such fears are not groundless. ... Even if regulators have done their best to protect consumer interests, it is naïve to expect that consumers will have confidence in the system if they do not understand what the regulator or government has agreed to. Without such knowledge, they will tend to assume the worst. Therefore, the long-term sustainability of any regulatory system requires transparency because transparency is the first step to trust.
>
> *The three meta-principles, if satisfied, will give overall legitimacy to a regulatory s*ystem. Without legitimacy, a regulatory system, even if technically competent, will not survive. Legitimacy requires that consumers and investors believe that the regulatory system is producing value for them. If consumers and investors do not see any value coming out of the regulatory system, it will not have any allies when there is a political crisis."[115]

The SA Water RAB was not set through a formal regulatory process but this increases rather than reduces the importance of these principles. In other sectors and jurisdictions, the setting of the RAB is a critical

[115] Brown et al (2006), page 7.

decision in the regulation of monopoly services. Indeed, because the RAB was in effect set by the owner it raises greater questions about the balance drawn between the interests of the owner and the consumer (i.e. credibility and legitimacy meta-principles) and increases the importance of the transparency meta-principle.

How well these meta-principles are achieved depends on both the regulatory governance and process and the regulatory substance.[116] That is, how the decisions are reached and the quality of those decisions.

A key requirement for good governance is the separation of policy and regulatory functions. Good outcomes are more likely when the regulatory, policy, and operational functions are well defined and performed by separate entities, with clear checks and balances to ensure transparency, consistency, predictability, and accountability. This separation of roles minimizes the potential conflicts of interest,` reinforces the independence of the regulator, helps clarify the regulator's objectives, and provides a better environment for private participation. This principle of separation of regulation and policy/ownership is embedded in the National Competition Policy which provides the overarching framework for the National Water Reforms.

C.1.1. Principles for best practice regulation – The process of regulation

Drawing upon the Utility Regulators' Forum (URF) 'Principles for Best Practice Regulation' (1999) we can set out the following principles for process by which decisions are made.

Table C.1: Principles for best practice process of regulation

Principle	Features
Communication	Information to stakeholders on a timely and accessible basis.
Consultation	Participation of stakeholders in the process
Independence	Autonomy – free from undue political interference.
Flexibility	Using appropriate instruments in response to changing market conditions and experience. Regulation must be feasible in the light of the stage of development of the market.
Effectiveness and Efficiency	Efficient and timely regulatory decision making Cost effectiveness emphasized in data collection and policies.
Accountability	Clearly defined process and rationales for decisions with the ability for appropriate review. This aims to ensure that the regulator adopts objective and fair decision making.
Transparency	Process is open to stakeholders to participate effectively and with a realistic expectation that their views will be considered and will be reflected in the regulator's decisions.

Source: CEPA

We have consciously based the principles above on best practice principles current in Australia prior to the initial decision on the RAB in 2003 and hence known and available to the decision makers at that time. To

[116] Ibid.

impose today's expectations on the decisions on RAB going back to 2003 could be seen to impose an unfairly high standard with the benefit of hindsight. However, it should be noted that since then the approach to regulation has developed in a way that moves well beyond communication and consultation with consumers and other stakeholders. Current expectations are that the utility and regulator will actively engage with consumers, facilitate their participation in the decision-making process, and respond to the views expressed. Indeed, we are now seeing the negotiation of settlements, or agreed positions, between the regulated businesses and consumers.[117]

C.1.2. Principles for best practice regulation – The substance of regulatory decisions

The principles for best practice in the substance of regulation have been more constant over time. Drawing upon the URF 'Principles for Best Practice Regulation' (1999) and other statements of best practice principles at the time we can summarise these principles as follows.

Table C.2: Principles for best practice substance of regulatory decisions

Principle	Features
Efficiency	The regulatory framework has strong incentives to promote efficient service provision. Reductions in costs in capex and O&M and in different years are rewarded equally Prices reflect the efficient costs of supply (including an appropriate return) for each service and reflect variations in costs due to time and location of the provision of the service.
Commercial Sustainability	Regulated revenues provide a commercial return on investment and sufficient cash flows to finance efficient provision of services, including efficient investment.
Social Sustainability and Equity	Prior commitments on the provision of essential services are recognizes. Impacts on customers are assessed and if necessary transition paths established to ensure that they are not excessive. Subsidies, if necessary, are transparent, efficient, and, as far as possible, transitional.
Consistency with Government's sector policy and reform	Regulated approaches and decisions support published Government policies and sector reforms to the extent this is consistent with the objectives, functions and powers of the regulator.
Transparency	Regulatory decisions are well explained. Models and data used are published (subject to commercial confidentiality) and can be replicated. Stakeholders can participate in the process and see how the information and views provided are considered.
Certainty and Predictability	Rules and approaches are complete and well-specified and allow stakeholders to predict outcomes with reasonable certainty.
Consistency	Consistent regulatory models and approaches over time and across utilities/services.

[117] For example, following the draft decision on the 2018-2023 revenue reset, which rejected TransGrid's proposed upgrade of the network supplying inner-Sydney, TransGrid engaged with consumer and other stakeholders to reach agreement on a revised option. This option reduced the initial commitment and set up governance arrangements for project that provided a continuing role for consumers. This was then endorsed in the AER's final decision.

Principle	Features
	Modifications in approach due to differences in context and circumstances are considered carefully and justified.

Source: CEPA

Two points require further explanation. Firstly, transparency appears in both the principles for good process and good decision-making. This reflects both the importance of transparency and that there are two aspects of transparency that are equally important: that the process is transparent so that stakeholders can be effectively involved and that the outcomes are transparent and well-explained. Stakeholders may not agree with the outcomes, but they should be able to understand the basis of the decision and anticipate future decisions. If not, decisions are unlikely to be accepted.

Secondly, we have referred to a principle of recognition of prior commitments on the provision of essential services. In other jurisdictions services are often provided under concession contracts that set out requirements for service standards and pricing. Where regulation is introduced it is generally accepted that it must be consistent with the contract and cannot overwrite its provisions. Changes to the contract need to be negotiated and forward-looking, not imposed with retrospective impact. US regulation has been underpinned by a regulatory compact that recognises the need to preserve the interest of both the utility and the consumers. In Australia these services have historically been provided by government departments/businesses. Pre-corporatisation investments were made without an expectation by governments or consumers that prices would provide a commercial return on the investments. This 'implicit contract' was changed under the NCP and corporatisation of the government-owned suppliers. Under the new 'contract' with customers there was a clear expectation that prices should provide a commercial return on new investments. However, the NCP and NWI provided flexibility in managing the transition for pre-existing assets. The question that goes to the heart of the establishment of the initial RAB is to what extent should the prior implicit contract be respected through a lower initial RAB or lower return on pre-existing assets?

The sections examine how these criteria apply in regard to:

1. The process for determining the RAB.
2. The determination of the initial RAB in 2003.
3. The determination of the RAB at subsequent reviews.

In addition to the above criteria determination of the RAB must also be consistent with NWI.

In the sections below, we set out a number of 'practical questions' that can be used in applying these principles

C.2. PROCESS FOR DETERMINING THE RAB

Key criteria for assessing the process for setting the RAB are:

- **Independence**. Independence requires that the decision maker is independent of any one stakeholder and not subject to political influence. This does not mean, however, the regulator can ignore clearly stated government policy.
    - Was the decision-maker clearly independent of any stakeholder?
    - To the extent that policies impacted the decision, were these clear, public policy commitments of the government?

- **Transparency**. Transparency of process requires that all stakeholders were aware of the process and timetable for making the decisions, the factors to be considered and basis for the decision.
    - Was the process, by which the issues were considered and the decisions made, public?
    - Was there a public timetable for the review?
    - Were terms of reference and/or an issues paper published?
    - Was all information received/considered in making the decision published?
    - Was a draft decision published?
    - Were the processes and criteria for the decision-making clear?
    - Were reasons for the draft and final decisions published?
- **Accountability**. The decision-maker should be accountable for process and for the decisions taken. Transparency is critical for accountability. Beyond this it requires a clear framework that specifies the objectives, powers, and process obligations for the decision-maker and provides a means of holding the decision-maker accountable for complying with these requirements.
    - Are the objectives, powers and process obligations of the decision-maker/regulator clearly set out in rules, regulations or legislation?
    - Are there mechanisms by which stakeholders can hold the decision-maker accountable for its decisions and operating consistently within the framework established for its decision-making?
- **Stakeholder awareness**. This combines the URF categories of communication and consultation into three questions:
    - Were stakeholders informed of the process and issues?
    - Did stakeholders have the opportunity to provide considered, informed comments?
    - If so, were stakeholders comments considered and taken into account in the final decision?

C.3. THE DETERMINATION OF THE INITIAL RAB

Key criteria for assessing the determination of the initial RAB are:

- **Consistency with NWI**. The NWI provide considerable flexibility in the determination of the initial RAB.
    - Was the initial RAB value consistent with the NWI?
- **Economic efficiency**. As the existing assets at the time the initial RAB is established at the commencement of price regulation there is a range of asset values consistent with economic efficiency.
    - Was the initial RAB value consistent with economic efficiency?
- **Commercial sustainability**. The essential requirement for commercial sustainability is that prices cover opex and a commercial return on the RAB. Setting the initial RAB below the maximum value (which in this case is almost certainly the DORC) need not impair commercial viability if gearing reflect the RAB rather than a higher asset value.

- Was a commercial return provided on the initial RAB and future efficient investment?

- **Equity and social sustainability**. The balances interest of consumers and service providers and avoids rents or windfall gains/losses. It should exclude assets funded by customers to avid the utility profiting from investments customers, rather than the utility, have made. It should also consider the impact on customers of higher prices based on a higher RAB for existing assets, especially where this was not part of the original 'implicit contract'.
  - Were the interests of consumers and potential impacts considered and balanced against the interests of the owner in setting the initial RAB?
  - Were customer-funded assets excluded from the initial RAB?
  - How was the transition from current prices to higher prices reflecting the RAB and new investments managed?

- **Transparency**. As noted above transparency of the process is essential, the other requirements is the transparency on the decision: what information was considered, how was it evaluated and weighted, how was the determination of the initial RAB made. This requires that the draft and final decisions provide clear and complete explanation of the decision.
  - Were clear and complete explanations of the draft and final decisions provided
  - Were the explanations/reports sufficiently detailed to:
    - Allow stakeholders to understand the basis on which the decision was made?
    - Allow stakeholders to replicate the analysis and decision?

C.4. DETERMINATION OF THE RAB IN SUBSEQUENT PERIODS

Key criteria for assessing the determination of the RAB in subsequent periods are:

- **Consistency with NWI**. In rolling forward the RAB to future periods the key additional requirement is that a commercial return on, and of, efficient new investment is provided.
  - Was efficient new investment included in the RAB and a commercial return provided?

- **Economic efficiency.** Economic efficiency requires that: 1) the utility has the incentive to undertake efficient new investment through the assurance of a commercial return and 2) customers do not pay for inefficient investment. This requires that the capex be subject to efficiency testing prior to inclusion in the RAB and prices.
  - Was efficient new investment included in the RAB and a commercial return provided?
  - Was capex tested for efficiency at the planning stage and/or prior to inclusion in the RAB?

- **Commercial sustainability**. Commercial sustainability can be impaired through write-downs of the RAB previously determined or failure include, or provide a commercial return on, new efficient investment,
  - Was the previously determined RAB written-down?
  - Was a commercial return provided on new efficient investment?

- **Equity and social sustainability**. This requires a balance between the interest of consumers and service providers and avoids rents or windfall gains/losses (to the extent that these do not provide

appropriate dynamic incentives to the utility). In addition to the issues noted in regard to the initial RAB, customers should not pay for inefficient capex. If assets are revalued based on replacement costs, the utility may earn a higher return that is not matched by increased financial investment or efficiencies. This excess return can be avoided by treating the real capital gain as income.

  - Is capex subject to efficiency testing before inclusion in the RAB?
  - Are real capital gains form revaluation included as income?

- **Consistency of approach**. A key principle of economic regulation is consistency of approach in decisions over time. Historically utilities have been concerned about windfall losses if regulators change approach over time to minimise price increases. Equally customers should not suffer windfall losses through changes in approach that increase prices (or reduce the reduction in prices that would otherwise occur).
  - Has a consistent approach been adopted in RAB valuations over time?
- **Certainty/predictability of outcomes**. Consistency of approach is a pre-requisite for certainty and predictability of decisions over time. However, it also requires that the methodology and inputs used in the determinations are clear and publicly available. Approaches that require substantial judgement or complex technical inputs that are difficult to predict – such as DORC revaluations – will be less predictable and certain than more mechanistic approaches.
  - Is the methodology transparent and consistently applied?
  - Are the inputs to the methodology publicly available or capable of prediction/estimation with reasonable certainty?
  - Is extensive judgement required?
- **Transparency**. The requirements for transparency for the initial RAB apply to subsequent RAB valuations.
  - Were clear and complete explanations of the draft and final decisions provided
  - Were the explanations/reports sufficiently detailed to:
    - Allow stakeholders to understand the basis on which the decision was made?
    - Allow stakeholders to replicate the analysis and decision?

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