REVIEW OF PRICES FOR SYDNEY WATER

FROM 1 JULY 2020

Final Report

June 2020

1 IPART has set prices for Sydney Water's customers from 1 July 2020

Sydney's population is growing, increasing our need for water. Until recently, the region was facing severe drought, with dam levels falling at an unprecedented rate. While recent rain has taken the immediate pressure off the system, it has shown how variable our climate has become.

At the same time, the COVID-19 pandemic is affecting households and businesses throughout Sydney, changing water requirements and pushing many customers into financial hardship.

In setting water, wastewater and stormwater prices, we balanced the importance of affordability for customers against the need to provide sufficient revenue for Sydney Water to meet community expectations and deliver an appropriate level of service over time.

It is also critical to put in place signals that manage long term climate change risks. We have set a higher water usage charge but reduced fixed charges for water and wastewater, which means that customers will be rewarded by saving water at all times, even outside drought. In addition, we have introduced a flexible water usage price, which signals to customers the increased costs of providing water during drought. A higher water usage price in periods of drought provides an even greater reward to customers who reduce their water consumption when it is most scarce.

These new prices mean that the typical household water and wastewater bill will:

- Decrease by 7% in average weather conditions
- Increase by 7% during drought.

At the same time, these prices would provide Sydney Water with enough revenue to deliver a record level of capital expenditure. This will allow Sydney Water to support growth, build resilience to drought, and maintain or improve its levels of service and environmental performance.

IPART's role

We set the maximum prices that Sydney Water can charge for its water, wastewater and stormwater services. We also set maximum charges for its trade waste services, and a range of ancillary and miscellaneous services.

1.1 We are implementing flexible water prices

Households pay a water usage charge, and a fixed charge for water and wastewater services, and in some cases a stormwater charge. In addition to these charges, non-residential customers also pay a usage charge for wastewater, and some pay trade waste prices.

In light of recent drought conditions, we decided to implement flexible water usage prices that vary with dam levels. With dam levels currently high, bills would fall for almost all customers from 1 July. But if dry weather returns and dam levels fall below 60%, the water usage price would rise. This allows Sydney Water to recover increased costs in drought, and encourages customers to respond to these costs by conserving water. But, it does not lock in higher prices when dams are full.

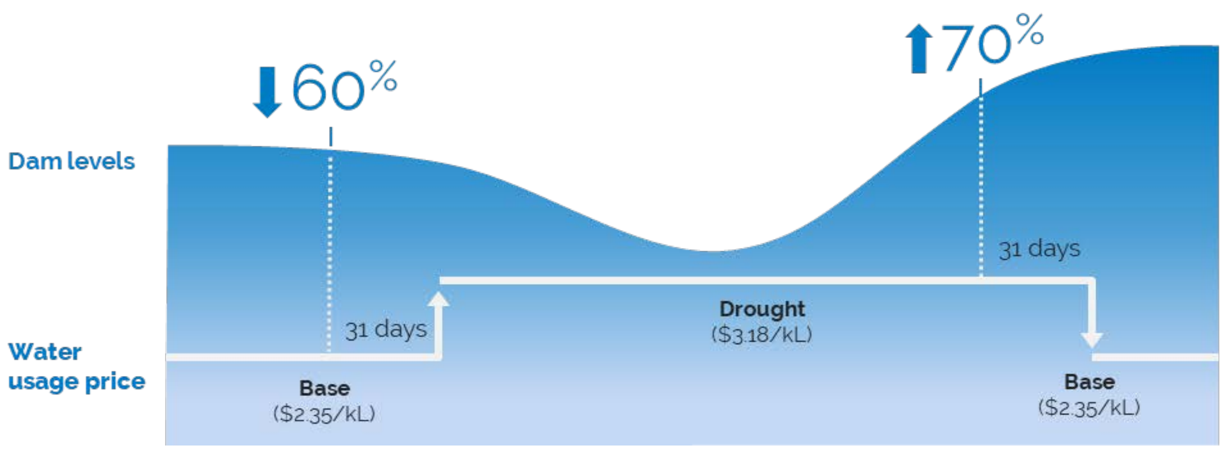
At the same time, we are reducing fixed service charges for water and wastewater, to provide customers with more control over their bills.

How does our flexible pricing work?

From 1 July 2020, the usage price for water will depend on dam levels. If dam levels are above 60%, then water would cost $2.35 per kilolitre. This price has been set with reference to the long term cost of providing water under 'average weather' conditions.

When dam levels fall below 60%, this price would rise to $3.18 per kilolitre as water becomes more costly to supply and increasingly scarce (Figure 1.1). This price would remain in place price until dam levels reach 70%.

Figure 1.1 Flexible water usage prices explained



We have increased the water usage charge, and reduced fixed service prices in all periods. This is to align the water usage price to the long-term costs of meeting growing water demand, which supports water conservation and promotes efficient long-term planning decisions.

The table below summarises the prices for 2020-2024. The water and wastewater service charges for non-residential customers are a multiple of the residential charges in the table, in that they increase proportionally with the size of the meter serving the non-residential customer.

Table 1.1 Old and new prices

	Current price ($2019-20)	Sydney Water proposed price ($2020-21)[a]	IPART decision ($2020-21)
Water usage charge – average weather ($/kL)	2.11	2.16	2.35
Water usage charge – drought ($/kL)	2.11	2.99	3.18
Water service charge ($/year)	96.69	110.44	39.90
Wastewater usage charge ($/kL)	1.17	0.62	1.20
Wastewater service charge ($/year)	614.85	602.59	542.84

Note: These prices are in real $2020-21. They will be adjusted by inflation (CPI) from 2021-22 to 2023-24.

a: These are the prices proposed by Sydney Water in response to our Draft Report

Box 1.1 Bill impacts

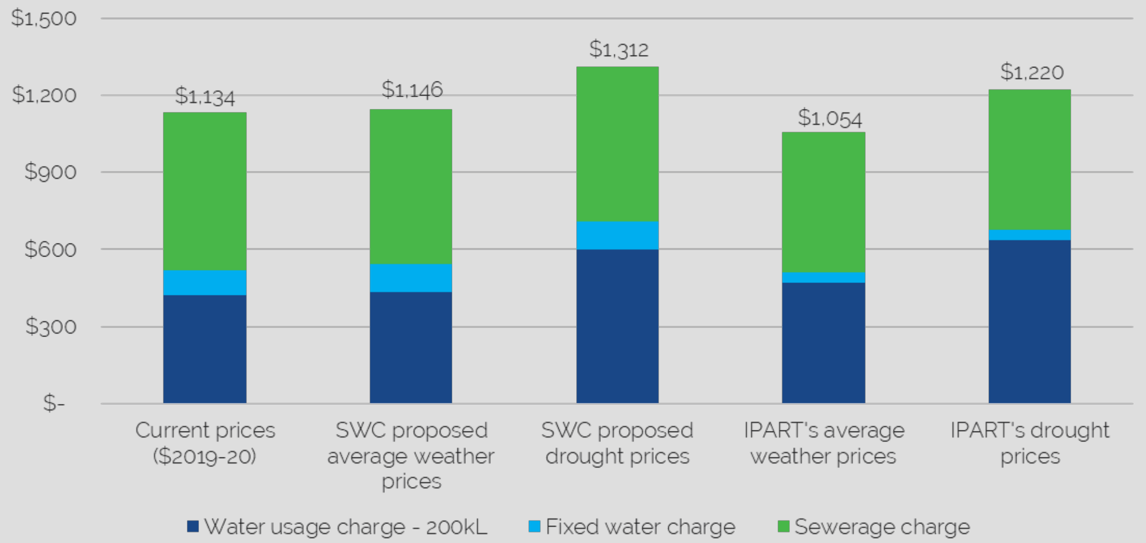
The decrease in service charges and increase in the water usage charge means that if customers reduce their water use, they reduce their bill.

A typical household using 200kL of water per year would see a decrease in their bill of around 7% during normal weather periods, and an increase of 7% during drought. Reducing water consumption by 13% would offset this increase, and keep bills unchanged from current levels.

The decrease in bills in normal weather periods is driven by a combination of lower interest rates and our decisions on Sydney Water's expenditure allowances.

To see the impact for your bill, check out our bill calculator.

Figure 2 A typical household bill ($2020-21)



We consider our flexible prices are more appropriate than an inclining block tariff (IBT)

We received broad support from stakeholders for the idea of some form of more flexible water pricing in response to our draft decisions. However, some stakeholders argued that an Inclining Block Tariff (or IBT) – where customers pay a usage price for a set amount of water, and then a higher water usage price if they consume above this threshold – would be a more effective way of pricing water. We considered the points raised in submissions and decided to implement flexible pricing, whereby the one water usage price at any point in time varies with dam levels, because:

- Drought increases the cost of supplying water, and Sydney Water needs to recover these costs in order to maintain service standards. A drought price ensures customers only pay these costs when they are needed.
- A higher water usage price during drought sends a clear message to customers about the need to change behaviour and conserve water while it is most scarce, without locking in higher prices when dams are full.
- The flexible prices we have implemented do not distinguish between 'essential' and 'non-essential' uses of water. We heard from stakeholders that there are differing views about what constitutes 'essential' water usage. For example, submissions noted that large volumes of water are needed in Sydney's west for parks and gardens which provide much needed shade. Instead, our flexible prices recognise that the cost to produce water is not influenced by the end use of that water.
- A drought price is relatively simple to implement for all water users, while implementing an IBT would be more difficult to implement for non-residential customers with differing water needs.
- While some stakeholders suggest that an IBT is more equitable, our evidence is that household size is the largest determinant of water use, and so setting an IBT would disadvantage large, low income families.
- The flexible prices we have implemented acknowledge and address climate uncertainty. If our climate becomes hotter and drier, prices would respond to reflect the higher costs of supplying water in a drier climate.

1.2 Promoting resilience through record capital and contingent expenditure

In light of Sydney's increasingly variable climate and growing population, we have allocated a record capital expenditure allowance to Sydney Water. We recognise the need for Sydney Water to invest in its network to keep levels of service high and build resilience to drought, service key development areas, as well as meet its environmental obligations. At the same time, we did not find that all of Sydney Water's proposed expenditure is efficient.

In setting Sydney Water's prices, we have provided allowances for:

- $4.6 billion of base capital expenditure (capex) for 2020-2024. This is 10% lower than Sydney Water's proposal, but 41% higher compared to capex over 2016-2020.

- A cost pass-through allowance to recover Sydney Water's costs to upgrade its network if the Sydney Desalination Plant is expanded.
- $5.5 billion in base operating expenditure (opex) for 2020-2024. This includes $1.5 billion in bulk water purchases and $4.0 billion in core opex. This is 1% less than proposed by Sydney Water, and 2% more than Sydney Water's actual opex over the last 4 years. Sydney Water's efficient opex has risen with population and drought.
- We have allowed for additional opex of $80 million per year in drought periods.
- A *continuing efficiency factor* of 0.8% per annum, from 2021-22 onwards, to ensure that Sydney Water continues to seek to innovate and drive for efficiencies.

Together, Sydney Water will recover $10.3 billion of revenue from customers over the 2020 period.

In response to our Draft Report, Sydney Water expressed concerns that IPART may not provide it with sufficient revenue to remain financeable in the current low inflation environment. As discussed in Chapter 6, the rate of return that we have set – the Weighted Average Cost of Capital (or WACC) - represents an efficient real rate of return, which would provide Sydney Water with sufficient revenue to remain financeable over the next four years. In addition, the cost of debt true-up that we introduced in the 2018 WACC review would allow Sydney Water to manage its financing risks during this period.

1.3 Getting value for everyone by holding Sydney Water to account

We considered how to encourage Sydney Water to continually improve its performance, and publish better information to facilitate planning and encourage competition in the long-term interests of its customers. We ask Sydney Water to:

1. Collaborate with stakeholders to understand the long-run costs of providing water

   We recommend that Sydney Water collaborate more closely with stakeholders to better understand the long-run costs of providing water. A better understanding of how these costs are influenced by the option of using purified recycled water for drinking would signal the potential value of recycled water to the market.

2. Publish estimates of long-run wastewater costs by area

   We have published estimates of Sydney Water's long-run costs of providing wastewater services by area, and have asked Sydney Water to improve on these estimates. This information can help to signal where it is most beneficial to invest in recycled water schemes and facilitate the efficient entry of private sector water providers into the market.

3. Meet community expectations on water leakage and conservation

   We have decided to monitor Sydney Water on its water conservation targets on a quarterly basis. It is important that Sydney Water's leakage is in line with community expectations, and we want Sydney Water to meet its targets for leakage, demand management and water recycling – particularly during drought.

4. Continue to engage with customers to better understand their preferences and needs

> We have approved almost $80 million in discretionary spending to allow Sydney Water to improve waterway health. But, Sydney Water could do more to understand what its customers are willing to pay for improved environmental outcomes.

Thanks to recent rainfall, Sydney is no longer in immediate need of additional water sources. **But now is not the time for complacency.** It is vitally important that Sydney Water, the NSW Government and other stakeholders conduct robust, coordinated planning – including consideration of all viable options – to identify the optimal suite and sequence of long-term water supply augmentation and conservation measures. We are willing to support and assist this process in any way we can.

We will conduct a review of our regulatory framework

After the completion of this price review, we will also commence a public review of our regulatory framework. This review will look to improve our framework and approach to regulating water utilities; to strengthen incentives for the water utilities to innovate and be efficient; and to enhance outcomes for customers. We will draw on stakeholder views, and the approaches and experiences of other economic regulators, to inform our approach to future price reviews.

Contents

2 Our decisions

We have set the maximum prices Sydney Water can charge its customers for water, wastewater, stormwater and other miscellaneous and ancillary services.[1] These prices allow Sydney Water to meet the service standards prescribed in its operating licence and other regulatory requirements (such as those imposed by the Environment Protection Authority). They will also allow Sydney Water to meet service standards above those imposed by regulatory requirements, through 'discretionary' expenditure, where we have found there is sufficient evidence that Sydney Water's customers are willing to pay for these outcomes.

Further detail on our role and our review process is included in Appendix C.

This chapter outlines:

- The key themes influencing this review, and
- Our key decisions.

A complete list of our decisions is included in the final section of this chapter.

Throughout this report, we compare the prices and bills that we have set, to Sydney Water's proposed prices, in $2020-21 terms, unless otherwise specified. We compare prices to what customers would pay from 1 July 2020, with the prices and bills in future years of the determination from 2021-22 onwards increasing by inflation.

2.1 The key themes influencing this price review

For this review, five key themes have influenced our decisions:

1. The need for flexible water usage prices in 'average weather' and drought conditions.
2. Sydney Water's operating environment and cost drivers.
3. The costs of servicing new development and the low interest rate environment.
4. The need for better information on long term costs of providing water and wastewater.
5. Challenges arising from the COVID-19 pandemic and consequent lockdown.

Flexible water usage prices for 'average weather' and drought conditions

In its November 2019 update to its pricing proposal, Sydney Water put forward information on how its business is affected by drought and proposed cost pass-throughs to manage drought. The significant rainfall event in February 2020 has meant that we are no longer in drought, with dam levels currently over 80%. However, the variability in the weather conditions experienced in recent months has highlighted the need to consider flexible water pricing.

1 These are monopoly services that we review under Section 11 of the Independent Pricing and Regulatory Tribunal Act 1992 (NSW) (the IPART Act).

Our decision is to set a water usage price based on average weather conditions, in light of the recent rise in dam levels. We have built in to the determination a drought usage price, which is triggered when dam levels fall below 60%.

In drought, the usage price would increase to reflect the costs of managing drought, which include short-term investments to conserve water and reduce leakage as dam levels fall. Our decision sends a strong signal to customers to conserve water in periods of scarcity, without locking in higher prices when dams are full.

In this report, we have used the term 'drought' to describe periods where water storage levels drop to 60% and below. This mirrors the current operating regime for the Sydney Desalination Plant. This does not necessarily mean we are technically in drought.

Our decisions on water usage prices are detailed in Chapter 7.

Sydney Water's operating environment and cost drivers

For this determination period, Sydney Water has proposed an 89% increase in its capital expenditure, above the amount allowed in IPART's 2016 determination period.[2] Sydney Water has also proposed a 3.8% increase in its operating expenditure over that allowed under the previous determination.[3] The request for greater expenditure is driven by the extra costs of providing services to Sydney's growing population, as well as a change towards a more proactive asset-management strategy, partly driven by a need to address recent deterioration in the environmental performance of Sydney Water's wastewater network.

We engaged expert consultants Atkins Cardno (Atkins) to review Sydney Water's historical capital expenditure, its proposed operating and capital expenditure, and assess whether Sydney Water's proposed expenditure is efficient. Our findings and decisions regarding Sydney Water's capital and operating expenditure for the determination period are outlined in Chapters 3 and 4.

The costs of servicing new development and low interest rates

A key driver of Sydney Water's proposed increase in investment is to meet the costs that it incurs to service new developments as Sydney's population expands. For many water utilities, a 'developer charge' is levied on a developer, to provide a signal to the developer about the costs of servicing new properties. In contrast, because developer charges are set to zero for Sydney Water, these costs are instead added to Sydney Water's Regulatory Asset Base (RAB) and gradually recovered from the broader customer base. This means that over time the costs of servicing new growth accumulate and place upward pressure on prices, potentially reducing the affordability of bills.

In the short-term, the current low interest-rate environment has meant Sydney Water has been able to propose a small bill reduction for the 2020-24 determination period, even as it proposes large increases in capital and operating expenditure. However, over the medium to long term,

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2 Sydney Water, Keeping Sydney liveable, productive and thriving for a sustainable future: Update to 1 July Price Proposal, 12 November 2019, p.6; IPART calculations.

3 Sydney Water, Keeping Sydney liveable, productive and thriving for a sustainable future: Update to 1 July Price Proposal, 12 November 2019, pp.6 & 7.

if interest rates stop falling or begin rising, continued high expenditure could cause prices to rise and customer bills to increase.

The need for better long term price signals

We have set water usage prices with reference to the long-run marginal cost (LRMC) of providing water. LRMC signals the costs of supplying water to meet demand over the long term. It provides customers a signal about the long-term costs of consuming water.

We used information provided by Sydney Water on the future costs of water supply augmentation to estimate LRMC when setting the water usage price. However, our analysis of Sydney Water's LRMC modelling identified a number of limitations, and we consider Sydney Water should work more closely with relevant stakeholders, including IPART and the Department of Planning, Industry and Environment, to develop robust, long-term supply options that inform its LRMC estimates, under a range of scenarios. This is detailed further in Chapter 7.

Our view is that the wastewater usage price should also be set with reference to LRMC. Setting wastewater prices with reference to the long-run costs of supplying wastewater services can signal where it is most efficient to invest in water recycling schemes.

In this review, we have estimated Sydney Water's LRMC of providing wastewater services by area. However, as our estimates were based on limited information, we have decided to maintain the wastewater usage price at its current level ($1.20/kL) for the time being. Instead, we have asked Sydney Water to work on improving these estimates, which would allow the wastewater usage price to be set with reference to LRMC in future. This is detailed further in Chapter 8.

Challenges arising from the COVID-19 pandemic and consequent lockdown

The COVID-19 pandemic began in the latter stages of this review. The full impact on Sydney Water's operations and customers is unknown at this stage, however we have made efforts to address this to the extent possible:

- We have worked with Sydney Water to understand how the pandemic and the changed economic conditions could affect it in terms of productivity, forecast connections and water sales.
- We also considered price impacts on customers, including businesses.

In most cases, we have not made specific changes to our decisions because of COVID-19. We consider our regulatory framework is sufficiently flexible to accommodate changes to the environment over the next four years. For instance, at the next price review in 2023-24, we will undertake an ex-post review of capital expenditure to ensure that the efficient level of capital expenditure incurred over the next four years is rolled into the RAB at the next price re-set. The demand volatility adjustment mechanism will account for, and 'true-up', significant variances between forecast and actual water sales over the next four years.

We discuss the potential impacts of COVID-19 in relevant sections of the report.

2.2 Our key decisions

The key decisions we made in our review, including where you can find them in this report, are outlined in the following figure.

Figure 2.1 Key decisions in this price review

	Refer to:
1. How many years to set prices for	Chapter 13
2. What form of regulation to apply	Chapter 13
3. How much revenue Sydney Water needs to deliver its services efficiently	Chapters 3,4,5,10
4. How much water is likely to be consumed and by how many customers	Chapter 7
5. How should Sydney Water's costs be shared amongst customers, how should we structure its prices?	Chapters 7-9 and 11-12
6. The impact of our decisions	Chapter 15

Our final decisions on key issues are outlined below.

Table 2.1 Decisions on revenue requirement issues

Topic	IPART's Decision	Rationale
Capital expenditure - historical	Set efficient expenditure at $3.2 billion between 2016-17 and 2019-20.	Our view is that Sydney Water's historical capital expenditure was, for the most part, efficient.
Capital expenditure - forecast	Efficient expenditure is $4.6 billion over the 2020 determination period.	We reduced Sydney Water's proposed expenditure allowance by $502 million, based on the advice of our expert consultants. We applied a continuing efficiency factor of 0.8% per annum, from the second year of the determination period, reducing capital expenditure by an additional $51 million over the 2020 determination period.
Operating expenditure	Set efficient operating expenditure over the 2020 determination period at $5.5 billion. A reduction of Sydney Water's proposed expenditure of $0.1 billion.	Minor adjustments to some operating expenditure items. Apply a continuing efficiency factor of 0.8% per annum, from the second year of the determination period.

Topic	IPART's Decision	Rationale
Cost pass-through	Include additional operating expenditure, of about $80 million per year, as a drought pass-through. Include an adjustment for the impact of water restrictions on demand, during drought. Accept Sydney Water's proposed network expansion costs if SDP is expanded.	Our drought water usage price would recover the efficient operating costs, and the impact of water restrictions on demand, during drought. We would include Sydney Water's network expansion costs as an uplift to the water service charge, if the Government decides to expand SDP.
Return on assets	We have set the WACC at 3.4%.	We calculated the WACC using our standard methodology, applying updated market information, and consider it will provide Sydney Water with sufficient revenue to be financeable over the 2020 period. We reviewed how we estimate inflation expectations, following feedback from Sydney Water, and consider our 2018 WACC method remains appropriate.
Output measures	We have set output measures to: ▼ track the progress of discretionary expenditure and ensure Sydney Water's customers are informed on discretionary expenditure. ▼ monitor Sydney Water's performance on leakage and water conservation. We have rationalised existing output measures.	This will hold Sydney Water accountable on the progress of its discretionary expenditure and ensure it collects relevant information to inform our next review. Our increased monitoring of leakage and water conservation should encourage better performance by Sydney Water on these measures.

Table 2.2 Decisions on pricing issues

Topic	IPART's Decision	Rationale
Prices – Water usage price	Set a base usage price of $2.35/kL during average weather conditions, and apply an uplift during times of drought (when dam storages are 60% or below). The drought usage price is $3.18/kL.	Base usage price is set with reference to Sydney Water's estimate of LRMC. The drought price reflects additional expenditure that results from drought and sends a price signal to customers on the increased costs of water during periods of scarcity.
Water service price	Set a water service charge of $39.90 for residential/ non-residential customers on 20mm meters.	Service charge is calculated as a residual after the revenue raised from the usage charge.
Prices – Wastewater services	Maintain the usage price of $1.20/kL in 2020-21, and a base service charge of $363.48. Remove previous discharge allowance component from service charge for non-residential customers.	This reflects our preference to set the wastewater usage price in the future with reference to LRMC. Improved transparency, simplicity and cost-reflectivity of non-residential service charges by removing the discharge allowance.
Prices – Stormwater services	Maintain the way we set stormwater prices, and set prices using our final expenditure allowances and WACC.	The current method of setting prices is appropriate.

Topic	IPART's Decision	Rationale
Trade waste charges	Largely accept Sydney Water's restructured trade waste prices.	Sydney Water reviewed its prices in line with our recommendations in the last review.
Miscellaneous charges	Accept Sydney Water's proposed miscellaneous prices. Recommend Sydney Water review its Sydney Water Developer Direct (SWDD) prices.	Our consultants identified a number of incidental errors in the way SWDD calculates its prices, which has resulted in prices being too low for SWDD to generate a commercial rate of return.

Table 2.3 Decisions on other proposals

Topic	IPART's Decision	Rationale
Demand volatility	We will maintain the demand volatility adjustment mechanism (DVAM) for the 2020 determination period.	The DVAM provides an appropriate mechanism to manage uncertainty.
Efficiency carryover mechanism (ECM)	To maintain an ECM for Sydney Water's core operating expenditure, and not extend it capital expenditure in this review.	This removes an incentive for the utilities to delay efficiency gains for operating expenditure. However, we have not identified a suitable incentive mechanism to apply to capital expenditure.
Unregulated pricing agreements	Maintain existing ability to enter into unregulated pricing and service level arrangements with large customers, and expand the definition of a large customer.	While there has been no uptake of these agreements we do not see cause to remove the option of having them. Expanding the definition of a large customer will make more customers eligible.
Discretionary projects	We have developed a discretionary expenditure framework. We have allowed Sydney Water to recover the costs of its proposed projects from customers.	Our framework will allow utilities to be responsive to customers while providing accountability around the delivery of proposed projects.
Drought cost pass-through mechanism	To reflect the increased costs in providing water during drought through an increase in the water usage price.	As above, recovering the costs of drought by increasing the water usage price, which also signals to customers the increased value of water during periods of scarcity.
Recycled water	To continue to defer setting prices for these schemes.	Sydney Water's proposed prices are reasonable, as they are consistent with the pricing principles we developed in our 2019 Recycled Water review.

2.3 Our decisions

2.4 Our recommendations

3 Capital expenditure

This chapter sets out our assessment of Sydney Water's efficient level of capital expenditure, our final decisions on the efficient level of capital expenditure during the 2016 determination period, and Sydney Water's proposed capital expenditure for the 2020 determination period. Our decision on the asset lives to apply to Sydney Water's existing and new assets is also outlined in this chapter.

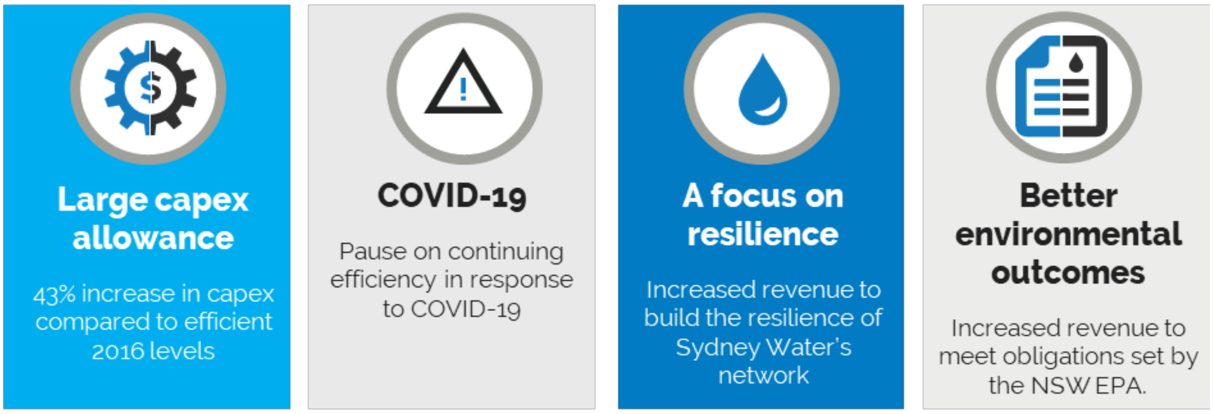
Under the building block method, capital costs are not recovered as they are expended. Instead, efficient capital expenditure is added to the Regulatory Asset Base (RAB) and recovered over time through allowances for a return on assets and regulatory depreciation (discussed in Appendix H). An outline of how we set an efficient expenditure allowance is provided at Appendix E.

As with operating expenditure, we engaged Atkins to review Sydney Water's historical and forecast capital expenditure and recommended the efficient amount to include in the RAB.

We compare the costs that we have assessed, to Sydney Water's proposed costs, in $19-20 terms.

Figure 3.1 provides a summary of our final decisions.

Figure 3.1 Our final decisions summarised



- We are providing Sydney Water with a **$4.6 billion capital expenditure allowance** for the 2020 determination period. This gives it significant flexibility to choose the projects it needs to deliver. It can also change priorities as better information emerges about economic conditions, climate or the growth in customer connections.
- Sydney Water indicated **COVID-19** could have an impact on its operations. We consider this impact is highly uncertain. Therefore, we have not made significant adjustments to its expenditure, apart from a 1-year pause on the continuing efficiency adjustment we have applied.
- We have included expenditure on **resilience projects** over the 2020 determination period. However, Sydney Water has not demonstrated the prudency of all its proposed programs, including the resilience element of the Prospect to Macarthur Link.
- Our decision on efficient capital expenditure allows for **better environmental outcomes** to meet the obligations set by the NSW Environmental Protection Authority.

3.1 Our decisions

We decided:

1 To adopt the values in Table 3.1 to set Sydney Water's efficient level of past capital expenditure to be included in the Regulatory Asset Base (RAB) for the 2016 determination period.

2 To adopt the values in Table 3.2 to set Sydney Water's efficient level of base capital expenditure to be included in the RAB for the 2020 determination period.

3 To accept Sydney Water's proposed contingent capital expenditure on network upgrades, to be recovered from prices, if a Government decision is made to expand the Sydney Desalination Plant (SDP).

Our decisions on Sydney Water's capital expenditure are to include:

- **An efficient historical capital expenditure allowance of $3,198.4 million for the 2016 determination period**. This is a 1.6% - or $51.7 million – reduction on Sydney Water's actual capital expenditure over the period, to reflect scope adjustments consistent with our view of the level of efficient historical capital expenditure.
- **A base capital expenditure allowance of $4,585.7 million for the 2020 determination period**. This is a $501.8 million (10%) reduction from Sydney Water's proposal of $5,087.2 million, but a 43% increase relative to Sydney Water's efficient level of actual capital expenditure over the previous 4 years (the 2016 determination period). As discussed further in Appendix F, this includes a continuing efficiency adjustment of 0.8% per annum across Sydney Water's capital program, from 2021-22 onwards.
- **A cost pass-through allowance of up to $436 million for the 2020 determination period**. We have accepted Sydney Water's proposal for $436 million for network upgrades in response to the possible expansion of the Sydney Desalination Plant (SDP). This expenditure would be recovered from prices only if a NSW Government decision is made to expand SDP within the 2020-24 period.

Table 3.1 Our decision on Sydney Water's efficient capital expenditure for the 2016 determination ($2019-20, $million)

	2016-17	2017-18	2018-19	2019-20	Total
Base capital expenditure					
Sydney Water's proposal	638.6	826.3	853.8	931.2	3,249.8
Scope adjustment	*-5.2*	*-5.2*	*-4.3*	*-37.0*	*-51.7*
Total efficient base capital expenditure	**633.4**	**821.1**	**849.5**	**894.2**	**3,198.4**
				% Variance	*-1.6*

Note: Totals may not add due to rounding.

Source: Atkins/Cardno, Supplementary Report – Expenditure Review of Sydney Water, June 2020, Table 4-11, p 45; IPART Analysis.

Table 3.2 Our decision on Sydney Water's efficient capital expenditure for the 2020 determination period ($2019-20, $million)

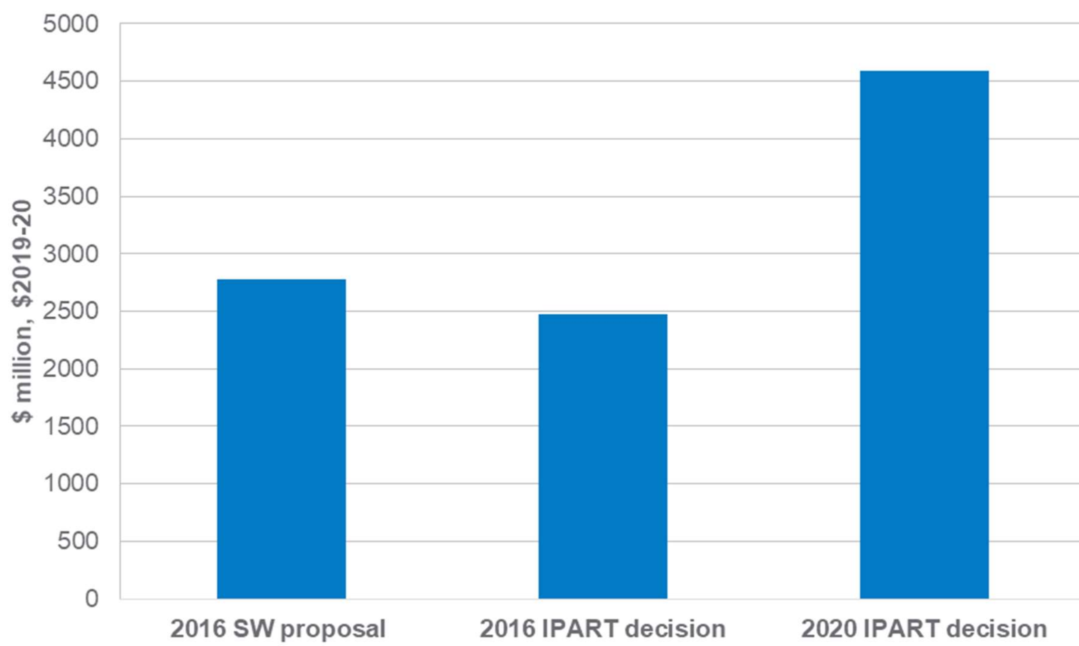
	2020-21	2021-22	2022-23	2023-24	Total
Base capital expenditure					
Sydney Water's proposal	1,532.7	1,200.9	1,204.7	1,148.9	5,087.2
Scope adjustment	*-149.1*	*-42.4*	*-93.4*	*-109.6*	*-394.6*
Catch up adjustment	-	-	*-28.9*	*-27.4*	*-56.3*
Continuing efficiency	-	*-9.3*	*-17.2*	*-24.1*	*-50.6*
Total efficient base capital expenditure	**1,383.6**	**1,149.2**	**1,065.0**	**987.8**	**4,585.7**

Note: Totals may not add due to rounding.

Source: Atkins/Cardno, Supplementary Report – Expenditure Review of Sydney Water, June 2020, Table 4-16.

Our decision on Sydney Water's efficient capital expenditure is $1,146 million per annum over the 2020-24 period. While this is 10% lower than Sydney Water's November 2019 updated proposal of $1,272 million per annum, it is 8% higher than our draft decision, and represents a large increase when compared to our decision in the 2016 determination.

Figure 3.2 Our decision on Capital Expenditure compared to the 2016 Determination



3.2 Sydney Water's submission to our Draft Report

In its submission to our Draft Report, Sydney Water commented that:

- the continuing efficiency double-counts efficiencies already identified in its forecasts, and
- using continuing efficiencies (ie, top-down cuts) in addition to scope reductions creates a risk of double-counting costs.[4]

We have considered Sydney Water's comments and confirm that our and our consultant's three-step approach to the expenditure review does not double-count efficiencies. Our consultant divides up the 'catch-up' adjustments that would reflect the efficient level of expenditure for a 'frontier' company at the beginning of the regulatory period into two separate categories, detailed in Steps 1 and 2 below. The third step is to then apply a continuing efficiency factor to recognise that a frontier company would continue to innovate and improve over time, as detailed in Step 3 below.

Therefore, there is no double-counting of efficiency adjustments.

An overview of the process we, along with our consultant, applied to establish efficient expenditure is as follows:

1. **Review of changes in activities and costs.** This step involves identifying inefficiencies within proposed changes to a utility's specific programs and does not apply to base expenditure to avoid double-counting with Step 2. These adjustments are clearly distinct from the types of efficiencies identified in Step 2 in that they correct for an inefficient change to a utility's activities (and costs) rather than the business processes employed to deliver the utility's services. If the utility's proposed changes in activities (and associated costs) are not efficient, a **scope adjustment** is made.

   For instance, we decided to reduce Sydney Water's proposed expenditure on water reactive maintenance by $39.5 million to reflect an efficient level, and unit cost, of responding to leaks and burst in its network.

2. **Review of business processes relative to the frontier.** This step identified the effectiveness of business processes (eg, decision making and procurement processes) relative to a benchmark frontier company[5]. Where we identify improvements that can be made relative to the benchmark, a **catch-up adjustment** is made. This encourages the utility to move to the efficiency frontier.

   We then recommend a level of catch-up we consider the utility will be able to make in the next determination period.

3. **Review available data on frontier shift.** We consider a number of data points such as the efficiency gains of well-performing utilities and broader productivity trends (eg, multi-factor productivity or total-factor productivity). This recognises that in competitive markets (which we are trying to replicate through our regulatory framework) firms must innovate to achieve continuing efficiency gains over time.

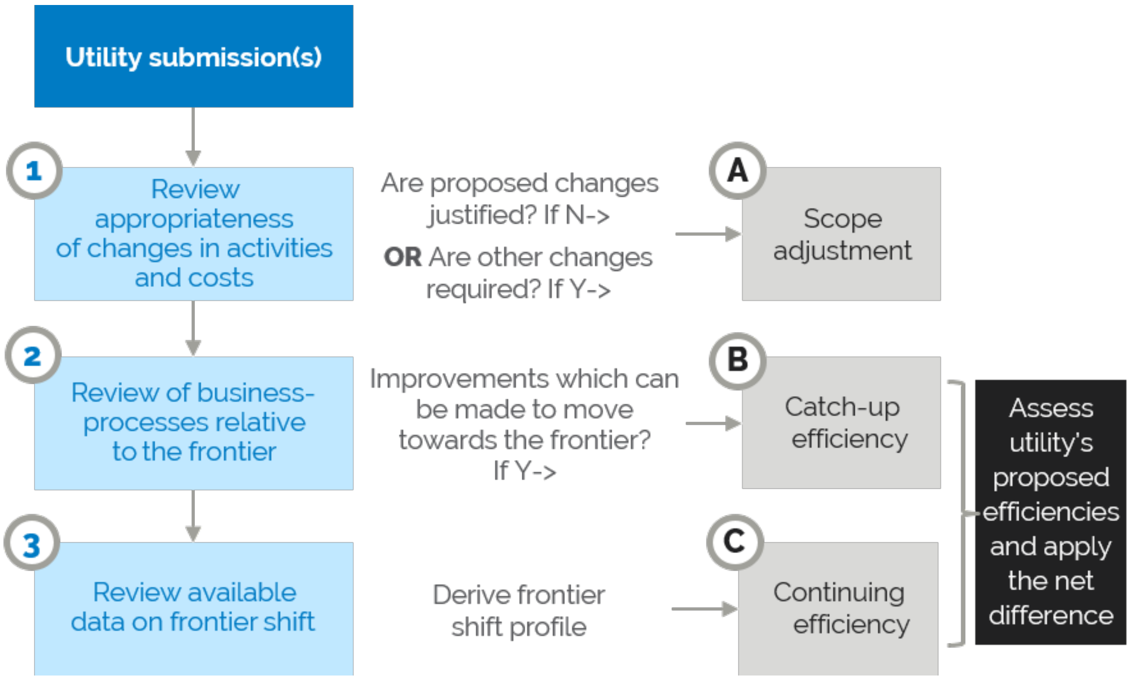
4 Sydney Water, *Submission to IPART's Draft Report – Review of prices for Sydney Water from 1 July 2020*, April 2020, pp 9-10.

5 We detail our approach to the frontier company and shift in the frontier curve at Appendix F.

We have set the continuing efficiency adjustment with reference to long-term multi-factor productivity trends. Our methodology and rationale for applying a continuing efficiency factor to Sydney Water's expenditure is covered in detail at Appendix F.

We compare the total efficiency challenge we derive from Steps 2 and 3 with the efficiencies applied by the utility in its own submission. We then apply the net difference as an adjustment to the utility's submission.

Figure 3.3 Atkins' approach to assessing efficiency



Data source: Atkins/Cardno, Supplementary Report – Expenditure Review of Sydney Water, June 2020, p 5.

3.3 Reasons for our decisions

In making our decisions, we reviewed Sydney Water's historical capital expenditure and the savings it achieved over the 2016 determination period. We then considered the capital programs Sydney Water proposed for the 2020 period including whether the proposed expenditure is fully justified and any potential further savings it could achieve through greater efficiencies in delivering its capital program.

We commissioned Atkins to assist us in our review. Atkins also undertook a strategic review of Sydney Water's long-term investment planning, asset management systems and processes, and demand forecasts. Our decisions on Sydney Water's capital expenditure reflect Atkins recommendations.

Actual capital expenditure over the 2016 determination period

We have accepted Atkins' recommendation to set Sydney Water's efficient level of capital expenditure over the 2016 determination period at $3,198.4 million. Our decisions and Atkins findings are explained in further detail in Appendix G.

Atkins considered the prudence of capital investments during the 2016-20 period, based on the information available at that time and how the investment was executed.

During the current determination period, 2016-20, Sydney Water has delivered a larger capital expenditure program ($812 million p.a.) relative to the 2012-16 determination period ($772 million p.a.).

The primary drivers were to meet 'Existing Mandatory Standards', 'Growth', and 'IT'.

- **Existing Mandatory Standards –** Expenditure on reticulation sewers increased in 2017-18 and 2018-19, in response to Sydney Water's reclassification of all sewers that may overflow to waterways as critical.
- **Growth –** Rates of new development in the 2016-20 period were at unprecedented levels and this resulted in additional expenditure in the current period, relative to our 2016 allowance.
- **IT –** Additional IT expenditure on the 'Customer experience' platform also increased relative to 2016 estimates.

Overall, Atkins found Sydney Water's capital expenditure in the 2016 determination period to be prudent, with four minor adjustments outlined further in Appendix G.[6]

Proposed capital expenditure for the 2020 determination period

We have **set an allowance of $4,585.7 million** for Sydney Water's base capital expenditure over the 2020 determination period, based on Atkins' analysis.

The reasons for our allowance are explained in further detail in Appendix G.

Sydney Water's submission to our Draft Report

Sydney Water contested the majority of our draft decisions on its proposed capital expenditure allowance over the 2020 period where we proposed reductions.

6 The four adjustments are a:
- $31.7 million adjustment to the Prospect to Macarthur Link program, to reflect our view that further water planning is required and the resilience portion of the total expenditure (about 50%) is not prudent.
- $14.7 million write-off to historical IT expenditure reflecting changes to the program of expenditure over the 2016 period,
- $2.6 million adjustment to correct a water service program code, and
- $2.7 million adjustment to wastewater expenditure in 2019-20, reprofiled over 2020-24.

The key main points of contention were around the following programs:

- Prospect to Macarthur Link (ProMac)
- Growth expenditure (for Water and Wastewater)
- Environmental expenditure, including critical and non-critical sewers, and the wet weather overflow abatement program.

The Prospect to Macarthur Link, and resilience expenditure

We decided to include $205 million of costs for the Prospect to Macarthur Link to service the growth projected by Sydney Water and the NSW Government.

How we reached our decision

Sydney Water proposed that $484 million for the **Prospect to Macarthur Link (ProMac)** be included in its capital expenditure allowance for the 2020 determination period.

Our draft decision was that it was not prudent to proceed with ProMac in the next Determination Period. This was because total reservoir storages – the driver for constructing the link – were significantly in excess of (more than double) the construction trigger set out in the drought options study and storage in the Upper Nepean dams, following a large rainfall event in February 2020. Instead, we considered it prudent to defer this scheme in order to develop a more comprehensive drought response and long-term supply-demand plan, before proceeding with large-scale resilience investments.

Sydney Water, in its submission to our Draft Report, stated that $453 million should be included over 2020-24 to cater for new customer demand (growth) and improve system resilience.[7] In response to Sydney Water's submission to our Draft Report, we asked Atkins to undertake a supplementary review of ProMac.

Atkins found that the justification for expenditure on the scheme has evolved significantly since July 2019, with ProMac initially positioned as an investment required to service growth (July), and later put forward to service drought/resilience (November 2019).[8] In its submission to our Draft Report, Sydney Water in April 2020 positioned the project as servicing both growth and resilience (about 50% each).[9]

Economic analysis of the scheme commissioned by Sydney Water found that, taking account of the probability of different drought scenarios, **the resilience capex would not be cost-beneficial** to proceed from 2020. A stronger case was found for the **growth capex** portion of the pipeline.[10]

7 Sydney Water, *Submission to IPART's Draft Report – Review of prices for Sydney Water from 1 July 2020*, April 2020, p 8.
8 Atkins/Cardno, Supplementary Report – Expenditure Review of Sydney Water, June 2020, p 30.
9 Sydney Water, *Submission to IPART's Draft Report – Review of prices for Sydney Water from 1 July 2020*, April 2020, p 41.
10 Atkins/Cardno, Supplementary Report – Expenditure Review of Sydney Water, June 2020, p 30.

Atkins concluded that expenditure for the purposes of 'resilience' on the Prospect to Macarthur Link ($280.2 million over the 2020-24 period) should be deferred, noting that a proportion of scope could be deferred[11], because:

- Dam storages are significantly in excess of (more than double) the construction trigger set out in the drought options study.
- Deferring this scheme allows time for a comprehensive drought response and long-term supply-demand plan to be developed.
- Based on Sydney Water's cost benefit analysis there would be a benefit, in present value terms, of deferring this expenditure.

We decided to accept Atkins' recommended efficient ProMac costs at $205 million over the 2020-24 period. Our decision effectively allows Sydney Water to proceed with those elements of the project's scope that cater for future customer growth over the 2020-24 period.

We have approved additional costs to increase resilience over the 2020-24 period

Our decision on Sydney Water's efficient capital expenditure allowance includes provision for additional capex items that will improve the resilience of Sydney Water's water and wastewater networks. This includes decisions to accept:

- Blue Mountains Cascade Supply: $41 million over 2020-24.

  This expenditure is to upgrade the Cascade water filtration plant to enable it to use an alternative supply, and upgrade the emergency supply from the Orchard Hills System to secure supply. It will also increase the capacity of the emergency supply from the Orchard Hills System, slowing the drawdown of Oberon Dam in future drought conditions. We agree with Sydney Water that this scheme is prudent and efficient, and we have not recommended any adjustments to Sydney Water's proposed capital expenditure on this program.

- Wastewater pumping stations renewals program: $126 million over 2020-24.

  Sydney Water has 680 wastewater pump stations within its wastewater network that it considers require renewal. Over the 2020-24 period, Sydney Water proposed expenditure of $26.6 million per annum ($106 million over 2020-24), a 15.6% increase on the $23.0m per annum expenditure in the previous period (2017-20). We decided to include $126 million of expenditure in the 2020 period, a $20 million increase on Sydney Water's proposal, to recognise the need for additional costs to build resilience of the network and manage risk of asset failure over the forward period.[12]

11 In its supplementary report, Atkins noted that Stage 1 of Sydney Water's delivery approval for ProMac discussed that – if reservoir storages were to recover – some of the project could be deferred and it would become a purely growth project. This paper was prepared before the February 2020 rainfall event.

12 $126 million is the summation of the Atkins recommended expenditure for years 2021 to 2024 in the table on the bottom of page 199 of the Atkins/Cardno, Final Report – Expenditure Review of Sydney Water.

Growth capital expenditure

We decided to include $1.7 billion expenditure to service population and customer growth over the 2020-24 period.

In reaching our final decision, we recognise that growth expenditure is inherently uncertain and will be affected by external factors, such as migration and population growth forecasts following restrictions imposed by COVID-19. Nonetheless, we acknowledge that preemptive servicing of key development areas may be required.

Our draft decision was to approve growth expenditure of $1.4 billion over 2020-24. In response, Sydney Water requested in its submission to our Draft Report that we reinstate $236 million of growth expenditure, making the case that greater greenfield and commercial development will lead to higher costs per connection and that infrastructure development in Western Sydney will be a key driver for expenditure

We asked our consultant Atkins to review Sydney Water's submission to our Draft Report and any additional information that was available.

Atkins undertook a supplementary review and did not find that Sydney Water has robust top-down empirical justification for major cost drivers to validate a reversal of our draft decision adjustment. However, Atkins did recognise that it is reasonable to assume that greenfield growth will form a higher proportion of growth in future and that servicing greenfield development is likely to entail higher initial unit costs than servicing infill.

We decided to reinstate half of the expenditure adjustment we made in our draft decision, and an additional $205 million for the growth portion of the ProMac project. This results, over the 2020-24 period, in a total expenditure allowance of:

- $276 million to service growth for water services.[13]
- $674 million to service growth for wastewater services.[14]
- $744 million to service major project growth expenditure for both water and wastewater.[15]

13 Atkins/Cardno, Supplementary Report – Expenditure Review of Sydney Water, June 2020, Table 4-3. . This figure includes the growth expenditure element of ProMac.

14 Atkins/Cardno, Supplementary Report – Expenditure Review of Sydney Water, June 2020, Table 4-3.

15 IPART calculations. This is deduced by subtracting total expenditure ($1,694 million) for water ($418.6 million) and wastewater growth ($1,275.6 million) before application of efficiency targets, and reducing that total by the general growth expenditure for water ($276 million) and wastewater ($674 million). Refer to Atkins/Cardno, Supplementary Report – Expenditure Review of Sydney Water, June 2020, Table 4-12 and 4-13.

Environmental capital expenditure

We have included an additional $80 million of capital expenditure to recognise the additional obligations set by the NSW Environmental Protection Authority (EPA) which Sydney Water must meet to better environmental outcomes.

We have decided to include an additional $80 million of expenditure, when compared to our draft decision, to recognise the most recent information available on Sydney Water's environmental obligations set by the NSW EPA.

The adjustments relate to the following key programs:

Non-critical and critical sewers (+ $60 million)

Atkins reviewed the EPA's most recent advice to Sydney Water and additional information provided by Sydney Water in its submission to our Draft Report, which highlighted two key changes:

- **Overflows to waterways program:** Based on the formal advice provided by the EPA to Sydney Water and the directions that it has been given, there is less ability for Sydney Water to introduce any scope reductions to its Overflows to waterways sub-program. Therefore, Atkins recommend that the 10% scope reduction that we applied in our Draft Report be reversed.
- **Critical sewers program:** Atkins are of the view that an efficiency adjustment of 18% for the critical sewers program is still appropriate. It found that as the program is in its infancy there is scope for greater efficiencies. It expects the largest efficiencies will be gained by optimising work based on feedback received in executing the program to meet the EPA's expectations. However, acknowledging the scale of the short-term task in front of Sydney Water in realising the proposed efficiencies, it recommends an efficiency reduction not be applied in the first two years of the 2020-24 period.

Wet weather overflow abatement (+ $20 million)

Atkins has revised its recommendation on the catch-up efficiency it applied to this program, and now recommends that it only applies in years 3 and 4 of the 2020 determination period. This follows additional documentation provided to it by Sydney Water. It recognises that Sydney Water's expenditure program for the first two years of the 2020 determination period is already well-advanced and there is an urgency to deliver these initial projects quickly to meet the obligations set by the EPA. In the longer-term, Atkins considers there is still opportunity for Sydney Water to innovate within the program and to deliver the outcomes at a lower cost.[16]

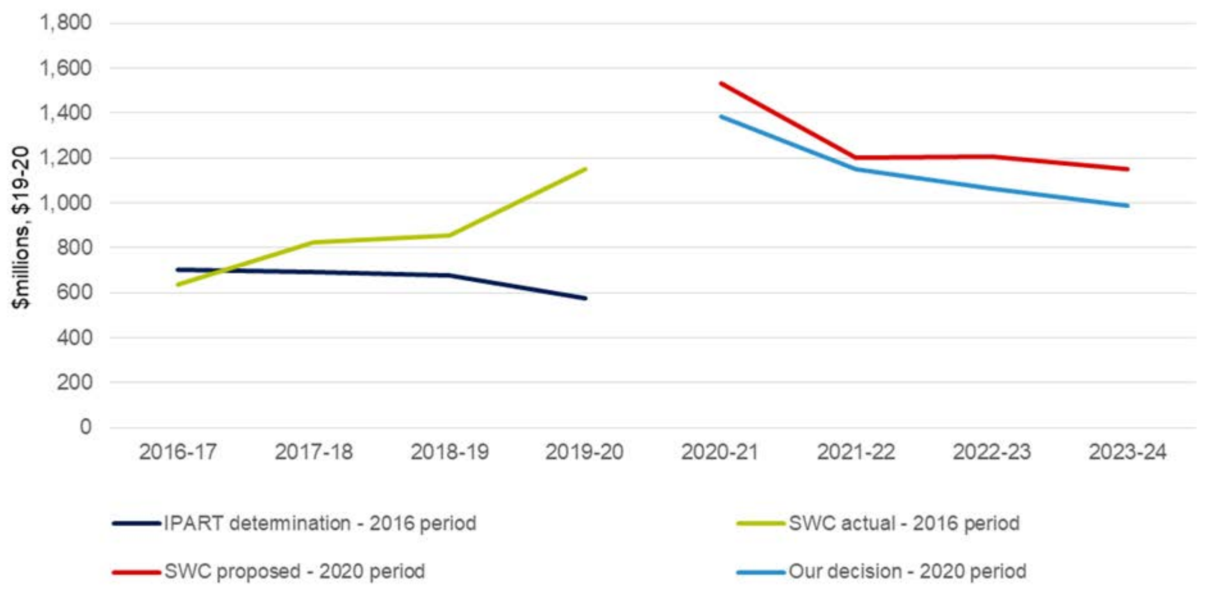
16 Atkins/Cardno, Supplementary Report – Expenditure Review of Sydney Water, June 2020, p 40.

3.4 How do our decisions differ from Sydney Water's proposals?

Sydney Water's capital expenditure for the 2016 determination period was $3,250.1 million, which exceeded the IPART allowance of $2,473 million. Atkins considers Sydney Water's efficient level of capital expenditure is $3,198.4 million. [17]

Our decision on Sydney Water's capital expenditure allowance over the 2020 determination period represents an increase of 85% when compared to our 2016 decision, a 41% increase compared to what Sydney Water actually spent over the 2016 determination period (2016-17 to 2019-20), and only a 10% reduction to what it has proposed over the 2020-24 period. In our 2016 decision, we applied a reduction of 10% to proposed capital expenditure allowance.

Figure 3.4 Sydney Water's capital expenditure over the 2016 and 2020 determination period ($2019-20 millions)



Note: Sydney Water's 2019-20 capital expenditure is a forecast.

Data source: IPART analysis

3.5 We broadly accepted Sydney Water's proposed asset lives

We decided:

4 To adopt the asset life values in Table G.5, of Appendix G, when including capital expenditure in the RAB.

Our decision is to agree with Sydney Water's proposal that we continue to use the 2016 determination expected asset lives for new assets. To incorporate the finance lease capital expenditure into the water RAB, our decision is to calculate a weighted average expected life for water assets that includes finance lease assets (weighted by forecast capital expenditure). Our remaining asset lives are very similar to those proposed by Sydney Water. Further information is provided in Appendix G.

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17 Atkins/Cardno, Supplementary Report – Expenditure Review of Sydney Water, June 2020, p 45; IPART calculations.

4 Operating expenditure allowance

This chapter sets out how we assessed Sydney Water's operating expenditure allowance when setting prices for the 2020 determination period. This expenditure includes Sydney Water's core operating expenditure on day-to-day items (such as labour, energy, materials, operating contracts, contractors) and bulk water purchases from SDP and Water NSW (see Box 4.1 below for more information). It also includes our decision on any additional expenditure that customers would pay to recover Sydney Water's costs of responding to drought.

To inform our decisions on operating expenditure, we engaged Atkins to review the efficiency of Sydney Water's proposed operating expenditure allowance and to recommend any efficiency savings that it considered that Sydney Water should achieve.[18]

We also considered the potential impacts of COVID-19 on operating costs and the level of ongoing efficiency improvements that water utilities, including Sydney Water, should be able to make over the next four years. Note that the figures in this chapter are in $2019-20.

Figure 4.1 summarises how we set Sydney Water's operating expenditure allowance.

Figure 4.1 How we set Sydney Water's operating expenditure for the 2020 period

1. Sydney Water's November 2019 proposal
2. Reduce this by the scope adjustments that Sydney Water has accepted
3. Adjust water reactive maintenance to reflect an average level of repair activity and efficient cost
4. Apply a continuing efficiency adjustment of 0.8% in years two to four

18 Atkins has reviewed Sydney Water's July 2019 submission, its November 2019 update to its submission and its submission to IPART's Draft Report in April 2020. In its supplementary report in June 2020, Atkins accepted some of Sydney Water's arguments for including additional operating expenditure and provided further justification for its revised recommended scope adjustments.

Box 4.1 Sydney Water purchases 'bulk water' to supply its customers

To supply water to households and businesses, Sydney Water purchases 'bulk water' from Water NSW and the Sydney Desalination Plant (SDP), before it transports treated water to a customer's tap.

Around 30%[a] of Sydney Water's proposed operating costs are for bulk water. Sydney Water does not own or operate the assets that produce bulk water, such as dams and desalination plants.

Concurrent to setting Sydney Water's prices to its customers, we are reviewing and setting the prices that Water NSW charges Sydney Water for its bulk water costs. For more information, please see our Final Report on our Review of prices for Water NSW Greater Sydney from 1 July 2020. In 2017, we set SDP's charges to Sydney Water for the water it provides to Sydney Water.

a Sydney Water, Annual Information Return, 12 November 2019

4.1 Our decisions on operating expenditure

We decided:

5 To set the efficient level of Sydney Water's baseline operating expenditure as shown in Table 4.1.

6 To set the efficient level of Sydney Water's cost pass-through operating expenditure as shown in Table 4.1.

Our decision is to set Sydney Water's allowance for base operating expenditure at $5,467.9 million over the 2020 determination period. This is made up of $3,991.2 million of core operating expenditure and $1,476.8 million in bulk water purchases from Water NSW and SDP, in non-drought periods. The prices that Sydney Water pays for its bulk water purchases from Water NSW and SDP are regulated by separate IPART determinations, which reflect efficient bulk water costs.

When dam levels fall to 60%, the drought cost pass-through will be triggered and we have included an allowance of up to $326.3 million per year, to recover Sydney Water's costs of managing drought.

As part of this review, we have made small number of efficiency adjustments to Sydney Water's proposed core and drought operating expenditure allowances. However, we also acknowledge the efficiency reductions applied by Sydney Water in its July 2019 and November 2019 pricing proposals.

Our decision on Sydney Water's core operating expenditure allowance is $55.6 million (or 1.4%) lower than Sydney Water's November update to its submission.

Table 4.1 Decision on Sydney Water's efficient operating expenditure ($million, $2019-20)

Item	2020-21	2021-22	2022-23	2023-24	Total
Core operating expenditure					
Water	478.6	487.8	483.2	476.8	1,926.4
Wastewater	482.1	479.3	460.9	455.0	1,877.3
Stormwater	14.5	14.7	14.8	14.9	58.8
Recycled water	33.0	32.6	31.6	31.5	128.6
Total core operating expenditure	**1,008.1**	**1,014.4**	**990.5**	**978.2**	**3,991.2**
Bulk water					
Water NSW	195.6	196.1	196.5	197.1	785.3
SDP	174.0	172.3	172.3	172.8	691.5
Total bulk water	369.6	368.4	368.9	369.9	1,476.8
Total base operating expenditure	**1,377.7**	**1,382.8**	**1,359.3**	**1,348.1**	**5,467.9**
Drought cost pass-throughs					
Total pass-throughs	**82.6**	**81.9**	**81.3**	**80.6**	**326.3**

Note 1: Operating expenditure associated with Sydney Water's BOO contracts at its water filtration plants has been included in water services rather than bulk water purchases

Note 2: Operating costs exclude ring-fenced recycled water costs, including corporate overheads allocated to recycled water. Totals may not add due to rounding

Note 3: See Table 4.6 for further information for a break-down of cost pass-through expenditure
Source: IPART analysis

Our decisions reflect our assessment of the level of operating expenditure an efficient utility would incur in delivering services to Sydney Water's customers. In making our decisions, we considered:

- Sydney Water's operating expenditure over the 2016 determination period
- The level of operating expenditure Sydney Water forecast over the 2020 determination period
- Efficiency savings we consider Sydney Water could make over the four years of the 2020 determination period.

We have accepted Atkins' recommendations on operating expenditure for water reactive maintenance, the scope reductions that Sydney Water has accepted, and we have applied a continuing efficiency factor (0.8% per annum) to Sydney Water's operating expenditure post other adjustments.[19]

As shown in Table 4.2, Sydney Water's July proposal includes base effiencies of $104.5 million which we have accepted and therefore did not apply a further catch up efficiency. For continuing efficiency, we have netted out Sydney Water's $88.9 million efficiency challenge proposed in November 2019 and applied a consistent efficiency adjustment across both operating expenditure (of $48.0 million) and capital expenditure from 2021-22 onwards.

We present detailed analysis of efficiency factors in Appendix F.

19 We have excluded Sydney Water's proposed $88.9 million efficiency challenge and instead applied Atkins' recommended 0.8% efficiency adjustment in years 2 to 4 of the four year 2020 determination period.

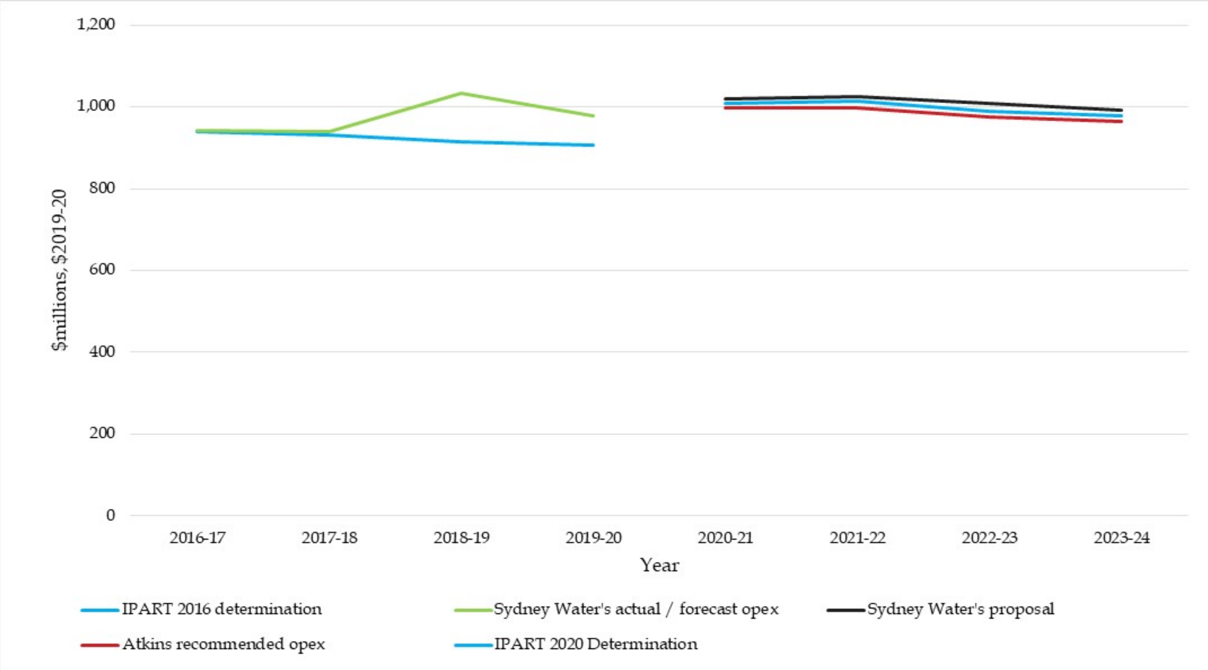
Table 4.2 Decision compared to Sydney Water's proposed core operating expenditure for the 2020 determination period ($million, $2019-20)

Item	2020-21	2021-22	2022-23	2023-24	Total
Baseline core operating expenditure					
Sydney Water's proposal (Nov 2019)[1]	1,018.7	1,026.3	1,009.7	992.1	4,046.7
Less: scope adjustments that Sydney Water has accepted	-7.2	-10.1	-19.3	-20.2	-56.9
Less: adjustment for water reactive maintenance to reflect average level of repair activity	-8.4	-9.3	-10.0	-11.8	-39.5
Add: Sydney Water's Nov efficiency challenge (continuing efficiency)	5.1	15.7	26.1	42.0	88.9
Expenditure to be applied continuing efficiency on	1,008.2	1,022.6	1,006.5	1,002.0	4,039.3
Less: continuing efficiency amount	-	-8.2	-16.0	-23.8	-48.0
Decision on operating expenditure	**1,008.1**	**1,014.4**	**990.5**	**978.2**	**3,991.2**

Note 1: Sydney Water's proposal (Nov 2019) includes $104.5million of base efficiencies and its additional $88.9 million of efficiency challenge.
Note 2: Totals may not add due to rounding
Source: Sydney Water's update to 1 July Price Proposal, 12 November 2019, Table 2-4, p19; IPART analysis

Figure 4.2 compares our decisions on Sydney Water's efficient operating expenditure over the 2016 and 2020 determination periods to Sydney Water's actual / proposed expenditure.

Figure 4.2 IPART's decision compared to Sydney Water's historical and proposed core operating expenditure ($millions, $2019-20)



Note: Year 2019-20 represents Sydney Water's forecast of its operating expenditure. Years 2016-17 to 2018-19 are actuals.
Source: Sydney Water, Annual Information Return, 12 November 2019; IPART calculations

Sydney Water's operating expenditure performance over the 2016 period is summarised in Box 4.2.

Box 4.2 Sydney Water's operating expenditure over the 2016 period

Over the 2016 determination period, Sydney Water's total actual operating expenditure was $5,601.6 million. This was $209.3 million (or 3.9%) higher than the expenditure allowance we used to set prices in 2016. This is set out in Table 4.3.

Table 4.3 Sydney Water's operating expenditure over the 2016 determination period ($ million, $2019-20)

	2016-17	2017-18	2018-19	2019-20	Total
Determination	1,359.6	1,354.7	1,341.5	1,336.6	**5,392.4**
Actual/forecast[a]	1,361.6	1,339.0	1,461.1	1,439.9	**5,601.6**
Difference	2.0	-15.7	119.6	103.3	**209.3**
Difference (%)	0.1%	-1.2%	8.9%	7.7%	**3.9%**

a Figure for 2019-20 is a forecast.

Source: Sydney Water, Annual Information Return, 12 November 2019; IPART analysis

The difference between the allowance for operating expenditure in the current determination period and the amount Sydney Water spent helps inform our decision on the efficient level of operating expenditure over the 2020 determination period.

Sydney Water's higher expenditure was in large part driven by:

- Drought conditions - prolonged dry weather and higher than anticipated growth has resulted in greater demand and declining service performance.
- Increased preventative and reactive maintenance works on wastewater and water assets.
- Other cost increases including higher electricity prices, higher-than-expected IT expenditure, costs related to city planning, unanticipated land tax costs.

The higher expenditure was partially offset by savings from BOOT (Build Own Operate and Transfer) water filtration costs and efficiency gains that Sydney Water was able to realise over the period.

4.2 Efficient core operating expenditure over the 2020 determination period

In its November 2019 update to its submission, Sydney Water proposed core operating expenditure of $4,047 million over the four year 2020 determination period. This was:

- $135.3 million (3.5%) higher than its July 2019 proposal – the key drivers of this increase was to account for additional forecast water and wastewater reactive maintenance, which arose from increased bursts/leaks during the drought conditions.
- $151.7 million (3.9%) higher than its actual core operating expenditure over the 2016 determination period.
- $354.8 million higher (9.6%) than the operating expenditure we used to set prices in 2016.

In addition to the $57 million of scope adjustments that Sydney Water has accepted, Atkins has recommended an additional reduction of $59.9 million for scope adjustments and a further reduction of $32 million to account for the value of water lost above the economic level of leakage over the 2016 determination period. We have included $39.5 million of these scope and efficiency adjustments in our final decision.

Instead, we decided to accept Sydney Water's proposed operating expenditure in response to our Draft Report, with two important adjustments. These adjustments are to:

- Reflect the spending on leakage management that an efficient frontier company would need to incur. We have reduced Sydney Water's proposed expenditure on water reactive maintenance by $39.5 million to reflect an efficient level, and unit cost, of responding to leaks and burst in its network. We have not accepted Atkins' recommendation for a reduction of $32 million for the value of lost water above the economic level of leakage for the 2016-20 period.
- Adopt a continuing efficiency adjustment of $48.0 million, rather than apply Sydney Water's proposed efficiency adjustment of $88.9 million. This is because we decided to apply a consistent efficiency challenge across all operating and capital expenditure. This is consistent with our view that there is equal scope for an efficient 'frontier' firm to innovate across its operating and capital programs.

Together, our adjustments reflect a $55.6 million (or 1.4%) reduction to Sydney Water's November 2019 proposal of $4.0 billion. This is a small margin and likely less than the margin for error in Sydney Water's forecast of year-to-year operating expenditure.

Our operating expenditure reflects an efficient 'envelope' of expenditure that will allow Sydney Water to meet or exceed service standards, and encourage good planning for future growth, drought and resilience. In particular, we have provided Sydney Water with an expenditure allowance that represents a gradual return to the efficient, long-term average, level of water maintenance activity. Combined with the recent improvement in weather conditions after the heavy rainfall in February 2020, this will help Sydney Water achieve higher levels of performance.

We therefore expect that Sydney Water would be able to deliver additional efficiencies and improve its environmental and leakage performance over the 2020 determination period within this allowance.

The following sections provides detail on our decisions on Sydney Water's operating expenditure allowance, including Atkins' key findings.

4.2.1 Sydney Water's proposed operating expenditure

In assessing Sydney Water's proposal (July 2019 and its November 2019), Atkins found it to be generally efficient, albeit with some areas for scope and efficiency adjustments (which we detail below).

Sydney Water's July 2019 proposal included $104.5 million of base efficiencies from various program initiatives including the Production Improvement Program, Business Connect, Supply Chain Improvement programs.[20]

Atkins found that these base efficiencies mainly stemmed from activities to bring Sydney Water to the efficiency frontier and has accepted it as a form of 'catch up efficiency'.

We have not applied any further 'catch up efficiency' as we support the base efficiencies that Sydney Water has identified in its proposal. We have consequently applied Sydney Water's proposal as a base for our assessment.

4.2.2 Sydney Water accepted $57 million of our scope adjustments in response to our Draft Report

Our decision incorporates the $57 million of scope adjustment that Sydney Water has accepted in its response to our Draft Report. This is detailed in the table below.

Table 10 Scope adjustments that Sydney Water has accepted ($2019 20, $million)

Item	2021	2022	2023	2024	Total
Infrastructure resilience investigation	2.0	2.0	2.0	2.0	8.0
BOO water treatment - volume	0.2	0.3	0.3	0.3	1.1
City Planning	-	-	8.0	8.0	16.0
Water wise behaviours campaigns (transfer to cost pass-through)	5.0	5.0	5.0	5.0	20.0
Prospect South to Macarthur link[1]	-	2.9	4.0	4.9	11.8
Total	**7.2**	**10.1**	**19.3**	**20.2**	**56.9**

Note: Sydney Water revised its Prospect to Macarthur link proposed operating expenditure from $39.8 million to $27 million in its response to our Draft Report.

Source: Sydney Water's response to our Draft Report, April 2020, p 45-46

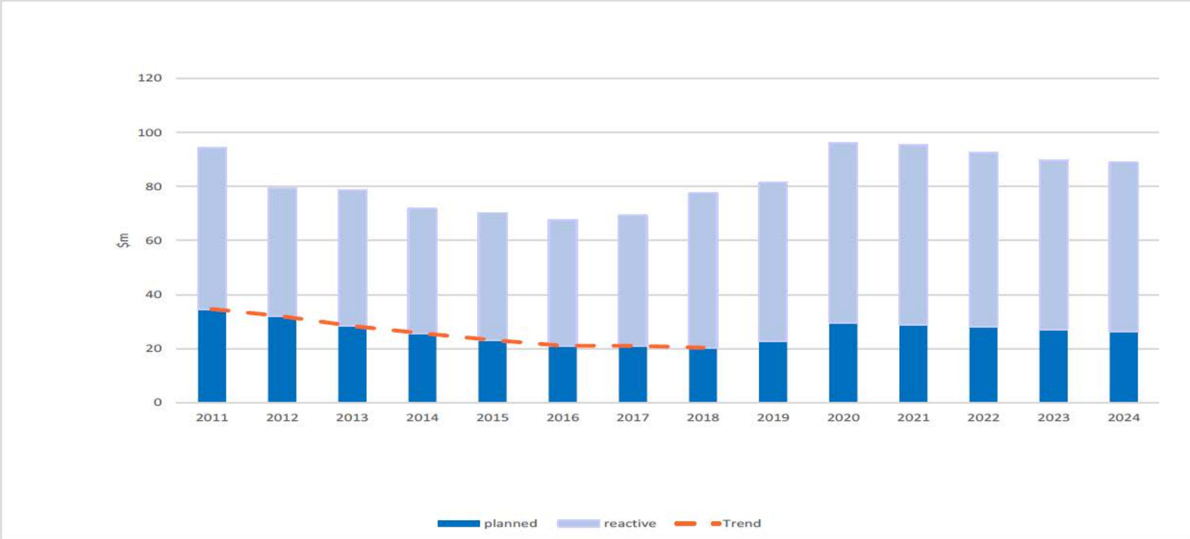
4.2.3 Adjustment to water maintenance

Atkins reviewed Sydney Water's balance of planned[21] and reactive water maintenance expenditure (see Figure 4.3 below) and recommended a $39.5 million reduction to reflect a long-term average level of reactive maintenance work, and the efficient 'unit cost' of this average level of activity.

20 Sydney Water's July 2019 proposal, Attachment 10 Operating expenditure, p 53; Atkins Final Report March 2020 p 137-138

21 Planned maintenance includes the inspection and repair of valves, meters and ancillary assets which are critical to the operation of the network as well as active leakage detection.

Figure 4.3 Sydney Water's expenditure on planned and reactive maintenance for its water network



Source: Atkins/Cardno, Supplementary Report - Expenditure Review of Sydney Water, June 2020, p 15.

Planned maintenance for its water network

Sydney Water reduced its planned maintenance over the first part of the 2016 determination period, before it increased its planned maintenance activities in 2019 and 2020 in response to the recent drought. For the 2020 determination period, Sydney Water has proposed to continue its planned maintenance expenditure at a level close to, or at, its expenditure in 2019-20. Importantly, Sydney Water's proposal includes an increase in active leakage detection.[22] Sydney Water's objective is to be more efficient through a higher number of planned activities and reducing reactive work.

Atkins supported Sydney Water's proposed level of expenditure for *planned* maintenance for the 2020 determination and commented that an integrated approach to flow monitoring and leakage detection activities is required. We agree with Atkins' findings.

Reactive maintenance for its water network

In July 2019, Sydney Water proposed $162 million in base operating costs for reactive maintenance on water works, over the next four years. In November 2019, it proposed an additional $98 million - a total of $260 million – of expenditure on reactive water maintenance for the 2020 determination period, based on its forecast that very high levels of water main breaks and other damage caused by very dry soil were expected to continue over the 2020 period.[23]

22 The additional work proposed also includes addressing inoperable and inaccessible valves and undertaking valve inspections and repairs. Installing additional valves aims to minimise the number of properties impacted during shutdowns to the network. Atkins/Cardno, Supplementary Report – Expenditure Review of Sydney Water, June 2020, pp 15-16.

23 Atkins/Cardno, Supplementary Report – Expenditure Review of Sydney Water, June 2020, p 18.

Reactive maintenance activities include locating and repairing mains breaks and leaks in the distribution networks to:

- Maintain the operating licence requirements for continuity and pressure to customers, and
- Reduce leakage to an economically efficient level.

In its review, Atkins found that:

1. The declining trend in planned maintenance in the first part of the 2016 determination period is likely to have impacted on Sydney Water's ability to respond to increasing leakage from water main bursts and ancillary assets.
2. The shortfall of sufficient flow monitoring and leakage detection technology hampered Sydney Water's ability to quickly and efficiently locate and repair leaks before they 'broke out' above ground. This was a significant factor that increased the level of leakage.
3. The delay in locating and repairing some leaks while they were relatively small is likely to lead to a higher cost of repairing breaks and leaks in the system.

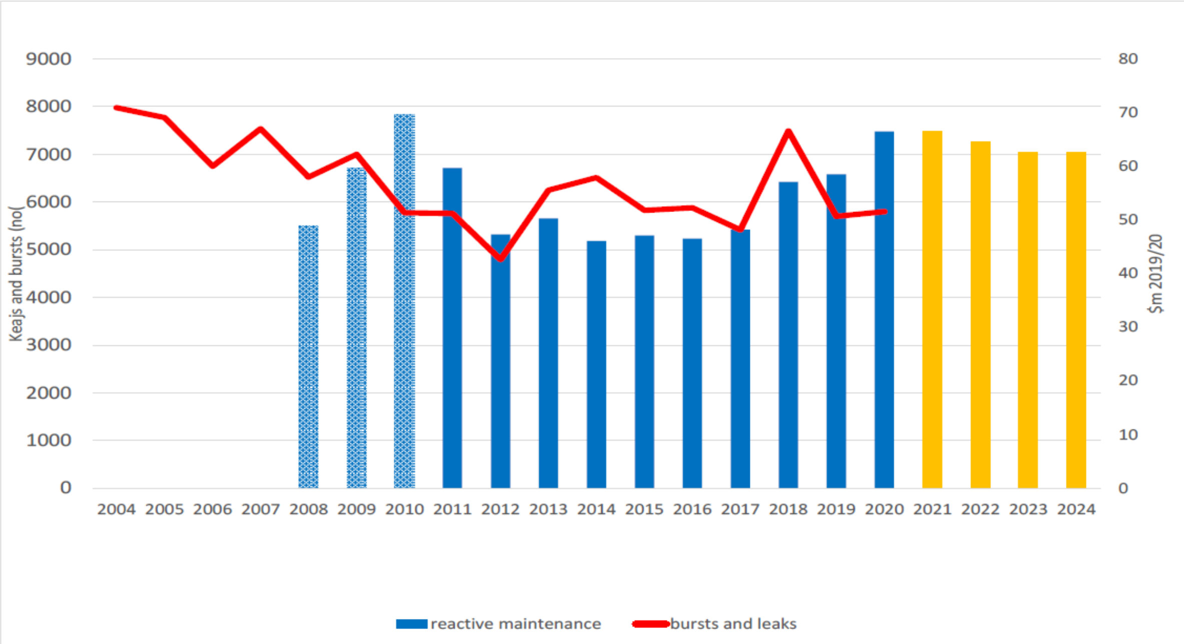
Atkins has since obtained additional data from Sydney Water and revised its approach to estimating the 'efficient' level of reactive maintenance for the 2020 period. Atkins' revised approach takes Sydney Water's historical expenditure on water reactive maintenance, and makes two adjustments to reflect:

- The efficient forecast number of repairs, consistent with the long-term average level of activity.
- The efficient unit cost of repairing leaks and bursts, given that Sydney Water's historical unit costs were inefficiently high due to insufficient flow monitoring and leakage detection technology.

Adjustment to the efficient number of repairs

Atkins compared the historical and proposed reactive maintenance expenditure with the trend of bursts and leaks over the past 10-15 years (see Figure 4.4 below).

Figure 4.4 Sydney Water's main bursts and leaks vs reactive expenditure



Source: Atkins/Cardno, Supplementary Report – Expenditure Review of Sydney Water, June 2020, p 16.

Atkins found that following the Millennium drought, the number of leaks/breaks reduced by 36% in the following five years as weather returned to more average conditions.[24] It also found that Sydney Water's resourcing in its maintenance area is relatively flexible and that it should be able to do more proactive work if there is a reduced need for reactive maintenance work.

Based on the annual reactive expenditure and the number of repair activities (bursts and leaks, and other asset leaks), Atkins derived an average cost per repair that Sydney Water has incurred over the 2017-19 period and considered three scenarios for the total number of repairs over the 2020 determination period.

1. Sydney Water's forecast. Sydney Water's proposed expenditure on water maintenance implied that the highest level of activity over the past 10 years – the period of the recent drought – would be sustained over the determination period (assuming that the unit cost of this work remained unchanged).
2. A reducing profile of total repairs implied from the reducing burst rates following the 2007 drought. This profile would be consistent with a reduction in the number of bursts and leaks to around its lowest level over the past 10 years
3. A long-term average level of repairs (an average of scenarios 1 and 2).

Atkins concluded that scenario 1 (Sydney Water's proposal) likely overstates the repair profile now that the drought has ended. Conversely, scenario 2 (assuming a repair profile similar to the 2007 to 2012 period) might not reflect the lagged effect of the drought on network repairs. Atkins considers that scenario 3 is the most appropriate outcome and, to reflect this, recommends reducing Sydney Water's proposed expenditure.

24 Atkins/Cardno, Supplementary Report – Expenditure Review of Sydney Water, June 2020, p 18.

We consider a gradual reduction in water maintenance to a level consistent with its long-term average is appropriate, and reinforces our view that Sydney Water should continually review and reprioritise its expenditure to adapt to changes in conditions over the period.

Adjustment to Sydney Water's historical unit cost of repairs

As outlined above, Atkins found that the lack of sufficient flow monitoring and leakage detection technology over the 2016 determination period resulted in delays in Sydney Water locating and repairing leaks while they were relatively small.

This means that it is likely that Sydney Water's historical 'unit cost' of repairing breaks and leaks in the system is inefficiently high. Therefore, to set the efficient expenditure allowance for the 2020 period, Atkins has adjusted Sydney Water's historical unit costs to reflect the efficient cost of this activity, and applied the adjusted cost to the forecast number of repairs.

To do so, Atkins obtained additional data from Sydney Water, and estimated the impact of inefficient leakage management over the 2016 period on the 'unit cost' of repairing breaks and leaks. First, Atkins found that Sydney Water's average unit cost of leakage repairs, over 2013-2016, was 12% lower than the average cost over 2017-2019. And, after adjusting for the fact that different types of bursts and leaks have different repairs costs, Atkins estimated that Sydney Water's costs were 6% higher in the 2016 period because of the delays in repair.

Given this, Atkins' considers that an average reactive maintenance saving of 6% can be achieved and has phased this saving over the 2020 determination period to allow time for new enhanced detection and repair processes to be implemented.

These two reductions result in a $39.5 million reduction to Sydney Water's proposed expenditure on water maintenance.[25] We have accepted this reduction, and we consider that Sydney Water's operating expenditure allowance for water maintenance reflects the efficient costs that a utility with 'frontier' leakage management would need to incur, on average.

4.2.4 Efficiency adjustment

We have applied a continuing efficiency adjustment 0.8% per year, to apply from 2021-22, which equates to $48 million over the 2020 determination period. As outlined in Appendix F, we delayed application of this efficiency adjustment by one year, in recognition of the likely short-term management challenges presented by COVID-19.

In applying our efficiency factor, we have netted out – effectively replacing – Sydney Water's efficiency challenge with our efficiency factor.

In response to our Draft Report, we note that Sydney Water considered that a 0.6% per year continuing efficiency adjustment would be appropriate in the circumstances. Our decision to delay our efficiency adjustment by one year, in effect, results in an 0.5% per year adjustment over the 4-year regulatory period.

25 In Atkins' revised supplementary report dated 9 June 2020, Atkins has revised this reduction to $41.8 million, based on an updated value of $260 million for Sydney Water's proposed water reactive maintenance (instead of $256 million applied previously). This updated value was provided by Sydney Water from its fact checking process of Atkins' original supplementary report. We have maintained a $39.5 million reduction and acknowledge the information that Sydney Water provided during the fact checking process.

4.2.5 We did not include two expenditure reductions recommended by Atkins

Our final decision on Sydney Water’s operating expenditure does not include two other expenditure reductions recommended by our consultants. While we still consider Sydney Water will have scope to innovate and outperform our operating expenditure allowance, our operating expenditure allowance will provide an ‘envelope’ of expenditure to meet or exceed service standards, encourage good planning to meet the challenges of future growth, and promote resilience to drought.

Prospect to Macarthur

Parallel to its capital expenditure for the Prospect to Macarthur project (discussed in Chapter 3), Sydney Water proposed $38.8 million in operating expenditure for this project.

In our Draft Report, we reduced this operating expenditure to nil, as we agreed with Atkins' revised recommendation at the time, that it is more prudent to do more thorough planning before proceeding with the drought resilience project, given the rise in the dam levels in February 2020.

In response to our Draft Report, Sydney Water has reported that the project is not only a drought resilience project but also required for growth purposes. However, the project has been delayed, with a corresponding reduction in operating expenditure, resulting in a new forecast of $27 million over the 2020 determination period.

Atkins had previously found the basis of Sydney Water's original forecast estimate to be overstated. Based on this initial assessment, Atkins recommended that the efficient level of expenditure should be $13.2 million instead of $27 million.

We agree there is merit in Atkins' findings, as there is considerable uncertainty about the operating expenditure costs for ProMac, given the partial reduction in capital expenditure for the resilience portion of this project. Instead, given the reduction in capital expenditure for this project, the operating expenditure portion of this project could be used by Sydney Water to more effectively plan for resilience, drought and future supply augmentations.

We have accepted Sydney Water’s proposed operating expenditure allowance for this item.

BOOT water treatment

In our Draft Report, we reduced this operating expenditure by $6.6 million, based on Atkins’ finding that Sydney Water took a low risk approach in estimating future costs, which will likely overstate the increase in treatment works required. Atkins made an adjustment to reflect this risk sharing between Sydney Water and its customers.

Sydney Water opposed this reduction in response to our Draft Report, on the basis that it has recalculated water quality cost estimates, using a major rainfall event in 2012, to model the impact of the recent heavy rainfall in February 2020.

Atkins recognises there is new evidence of probable deteriorating water quality from greater inflows, rather than drought conditions, which is likely to elevate the risk of increased treatment costs. However, this risk has been identified in its Final Report findings and thus it has no reason to change its view.

Atkins maintains its recommendation to reduce BOOT water treatment expenditure by $6.6 million. We agree there is merit in Atkins' findings, however, we also cosider that there are currently heightened risks around water quality, and the proposed reduction is a very small (0.1%) proportion of Sydney Water's total operating expenditrue allowance.

We have accepted Sydney Water's proposed operating expenditure allowance for this item.

4.3 Other findings from Atkins' review

4.3.1 Impact of leakage above the economic level

In its Final Report in March 2020, Atkins recommended a reduction of $40 million to Sydney Water's operating expenditure allowance, to reflect the value of water lost from the system above the economic level of leakage (ELL), and hence inefficiency in Sydney Water's operations. We accepted this recommendation for our Determination.

In response to our Draft Report, Sydney Water commented that:

> "it should not be penalised for not investing in the high-cost leak detection technology for which there has been no clear justification in the past"[26]

We agree with Atkins' view that technology has improved quickly in this area over recent years and it is reasonable for a frontier company with relatively high burst rates to keep up with technological advancements, such as having continuous flow monitoring systems and associated leakage detection technologies in place to identify changes in flow and leakage well before it is visible on the surface.

In its Supplementary Report, Atkins has revised its estimate of the value of water lost above the ELL to $32 million. This is based on the refilling of dam levels in early 2020, which has increased the ELL and changed the estimate of the value of water in Atkins' calculation.

Atkins concludes that this recommended water leakage adjustment is to reflect the broader costs (social and environmental) of depleting a water resource at time of drought, in that the water lost to leakage had to be replaced by water from other sources (the dams) and demand management measures. This adjustment does not reflect the impacts on repair costs or forecast workload, which we account for when assessing the efficient costs of water maintenance (outlined above).

It is vitally important that Sydney Water ensures that leakage does not exceed the economic level, otherwise a cost is imposed on the broader community – through inefficiently drawing more on a scarce resource and potentially bringing forward the need for costly supply augmentation and/or demand management measures, such as restrictions.

26 Sydney Water, *Submission to IPART's Draft Report – Review of prices for Sydney Water from 1 July 2020*, April 2020, p47.

We have decided to not make an adjustment for this in this price determination and have provided Sydney Water with an expenditure allowance that represents a gradual return to a long-term average level of maintenance activity. Combined with the likely improvement in climate conditions from pre-February 2020 conditions, this will help Sydney Water achieve higher levels of performance.

Relative to its performance in the 2016 determination period, we expect Sydney Water will significantly improve on its leakage performance over the 2020 determination period. As outlined in Chapter 14, we are looking to strengthen the reporting requirements for Sydney Water's activities on water conservation and leakage, via its Operating Licence Reporting Manual, to improve transparency and encourage improvements in its performance.

4.3.2 Wastewater reactive maintenance

Sydney Water's proposed expenditure allowance includes $273 million on wastewater reactive maintenance. In our Draft Report, we reduced this by $30 million – supporting Atkins' finding that some of the increase in wastewater reactive expenditure could have been avoided by more effective asset management and greater proactive maintenance (eg, CCTV inspections) during the 2016 determination period.

We did not question the importance of this work, but viewed that customers should not be paying for this additional work stemming from inefficient management.

In response to our Draft Report, Sydney Water presented new information suggesting that the EPA has now explicitly set a higher expectation for meeting wastewater overflow requirements, and that it will require more expenditure than it proposed in November 2019.

As outlined in Atkins' supplementary report, it recognises from the new information that there are additional pressures on Sydney Water to respond in a timely way and effectively. However, Atkins still questions whether the likelihood and consequence of dry weather overflows could be reduced by rebalancing the mix of proactive and reactive work over time, and investigating more innovative solutions such as real-time monitoring of the network.

Atkins found that Sydney Water's resourcing is flexible enough that it can carry out more proactive maintenance in areas of high likelihood and consequence, should the need for reactive maintenance reduce over the 2020 determination period, and deliver more tangible benefits.

Atkins revised recommendation does not make an adjustment to Sydney Water's maintenance expenditure allowance, however it recommends that the outcomes from this expenditure be revisited at the next determination.

We agree with Atkins' recommendations.

4.3.3 Electricity

In our Draft Report, we reduced this operating expenditure by $4.2 million, based on Atkins' finding that Sydney Water did not achieve its renewables target over the 2016 determination period. The target that Sydney Water has set for the 2020 determination period only catches up to what was meant to be achieved by 2020 and not beyond.

Atkins' view is that as technology improves in wastewater treatment plants, there may be more opportunities to improve energy efficiency, and it applied a modest adjustment of a stretched renewables target of 2%.

In response to our Draft Report, Sydney Water views there is an error in Atkins' energy savings calculation and that additional renewables would not meet its cost benefit assessments for identified schemes.

Atkins still considers there is an opportunity for Sydney Water to develop its renewables potential over the 2020 determination period, for medium to long-term benefits. However, Atkins reconsidered that its scope adjustment may double count the continuing efficiency applied to the whole of the electricity program and revised it to a nil adjustment.

We accept Atkins' recommendation, however we would expect that Sydney Water continue to explore innovative and cost-effective solutions for renewable energy.

4.3.4 Other stakeholder comments on operating expenditure

There were limited comments from other stakeholders on our recommended operating expenditure. However, the NSW Government's submission to our Draft Report stated that it:

> "supports providing Sydney Water with an explicit allowance for water conservation and proposing a way of monitoring Sydney Water's expenditure and delivery of its water conservation activities. However, IPART should consider re-profiling the water conservation expenditure such that a greater proportion of the funds are provided within the base level of funding available outside of drought, and a smaller proportion is added during drought. Higher base level funding would allow for development of a broader suite of water conservation programs to achieve more long-term benefit for Sydney's residents."[27]

In response to our Draft Report, Sydney Water did not propose any re-profiling of water conservation expenditure. In fact, it accepted our draft decision to re-profile $20 million of water wise advertising campaigns from baseline operating expenditure to the cost pass-through.

We do not have enough information at this stage to re-profile the amount and timing of expenditure on water conservation. However, our regulatory review, which commences in the next financial year, will look at a range of issues including how we can ensure that our regulatory framework provides the appropriate incentives for the utilities to deliver an efficient level of water conservation and leakage reduction activities.

27 NSW Government submission on IPART Draft Reports on Sydney Water, Hunter Water and Water NSW Prices 2020, 11 May 2020, p1

4.4 Bulk water costs

Sydney Water purchases most of the bulk water it needs to supply its customers from Water NSW. It also purchases bulk water from the SDP when this plant is operating, and pays a fixed charge when the SDP is in water security shut down mode. Therefore, Sydney Water's bulk water costs depend on a range of factors, including:

- The volume of water it needs to purchase to meet its customers' demand
- Water NSW's and SDP's prices, which are regulated by IPART, and
- SDP's mode of operation, which is governed by the operating rules set out in the Metropolitan Water Plan.

Our decision on Sydney Water's bulk water costs is shown in Table 4.5 below. We have accepted Sydney Water's proposed SDP costs (non-drought conditions)[28] and our decision on Water NSW bulk water costs is based on our assessment on the efficient level of Water NSW's expenditure.[29]

Table 4.5 Decision on Sydney Water's bulk water costs ($millions, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Water NSW	195.6	196.1	196.5	197.1	785.3
SDP	174.0	172.3	172.3	172.8	691.5
Total	**369.6**	**368.4**	**368.9**	**369.9**	**1,476.8**

Source: Sydney Water, Annual Information Return, 12 November 2019; IPART calculations

Our base expenditure allowance for SDP costs assumes that SDP is not operational, and does not include any costs if a Government decision is made to expand SDP.

As discussed in Chapter 7, our decision is to include an uplift to the water usage price in drought conditions, to recover the forecast costs of operating SDP. And, to the extent that SDP's actual operating costs are different to our forecasts, these would be recovered from our existing SDP cost pass-through formula.[30] This cost pass-through would also recover any capital costs that Sydney Water might be asked to pay SDP over the 2020 determination period, if the Government were to expand SDP.

28 We have adjusted this for actual March to March 2020 CPI values now available for the Final Report.

29 IPART Final Report, Review of Water NSW prices for 2020-24

30 The SDP cost pass-through mechanism would adjust Sydney Water's water service price annually if SDP's charges to Sydney Water vary during the determination. If the Government decided to expand SDP during the 2020 determination period, Sydney Water may face higher charges from SDP. The existing cost pass-through mechanism would pass-through these costs into Sydney Water's water service charges to its customers.

4.5 Cost pass-through operating expenditure

In its November 2019 update to its pricing proposal, Sydney Water proposed an additional $347.8 million in operating expenditure via cost pass-throughs, which would be recovered from prices if drought conditions persist.

Sydney Water, in response to our Draft Report, has not objected to our scope adjustments to its proposed pass-through costs. Relative to our Draft Report, we have made a slight adjustment in delaying the application of the continuing efficiency factor by one year, consistent with the approach for other operating and capital expenditure.

Our decision is to set the operating expenditure for the cost pass-through as shown in Table 4.6 below.

Table 4.6 Decision on cost pass-throughs for operating expenditure ($millions, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Sydney Water's proposal (Nov 2019)	77.6	90.1	90.1	90.1	347.8
IPART adjustments					
SDP network expansion	*-*	*-0.5*	*-0.5*	*-0.5*	*-1.5*
Water conservation	*0.0*	*-12.0*	*-12.0*	*-12.0*	*-36.0*
Water wise behaviours campaign	*5.0*	*5.0*	*5.0*	*5.0*	*20.0*
Efficiency adjustment	*0.0*	*-0.7*	*-1.3*	*-2.0*	*-3.9*
Total adjustment	5.0	-8.2	-8.8	-9.5	-21.4
Decision on cost pass-through	82.6	81.9	81.3	80.6	326.3

Note: Totals may not add due to rounding

Source: Sydney Water, Annual Information Return, 12 November 2019; IPART calculations

As discussed in Chapter 7, we have re-allocated Sydney Water's proposed $1.5 million of operating expenditure to increase its network if the Government were to expand SDP. This is because the trigger for this expenditure is a Government decision to expand SDP, rather than dam levels falling below a certain level.

5 Notional Revenue Requirement

To set prices, we first determine the efficient costs that Sydney Water would require to deliver its services. This chapter presents our approach and decisions on the notional revenue requirement (NRR), which is the sum of the efficient costs of providing Sydney Water's regulated services in each year of the determination period. We then set water, wastewater and stormwater prices to recover this amount of revenue.

As discussed in Chapter 4, we have made a decision to include additional drought costs, as a cost pass-through. Therefore, we have prepared an NRR that would apply in average weather conditions, and an NRR for drought conditions which includes the efficient operating expenditure that Sydney Water would incur in drought. Chapter 7 explains how the drought NRR would be reflected in our proposed uplift to the water usage price.

In response to our Draft Report, Sydney Water argued that our NRR was too low because it considered our estimate of expected inflation we use to set the real WACC, is too high. We address this issue in Chapter 6.

5.1 How do we assess the notional revenue requirement?

We used the 'building block' approach to calculate the NRR. In this approach, we break down Sydney Water's costs into five components (or building blocks), namely the:

- **Operating cost allowance,** to cover costs such as maintenance and administration costs.
- Capital cost allowance, comprised of:
  - **return on** the assets that Sydney Water uses to provide its services
  - **regulatory depreciation** (or a **return of** the assets that Sydney Water uses to provide its services), which involves deciding on the appropriate asset lives and depreciation method.
- **Tax allowance**, which approximates the tax liability for a comparable commercial business.
- **Working capital allowance,** which represents the holding cost of net current assets.

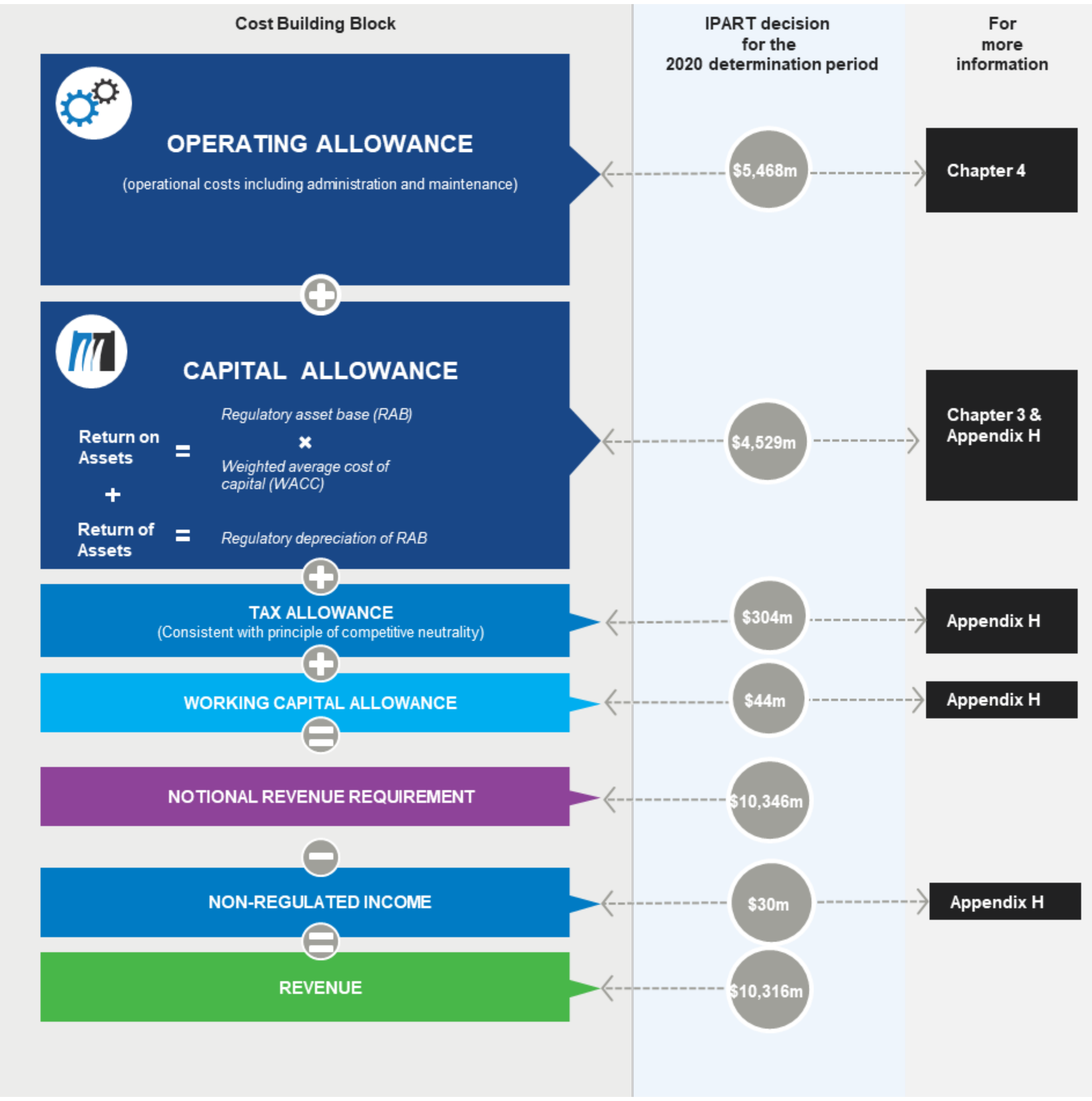
The annual sum of these building block items is the NRR, and represents our assessment of the total efficient costs Sydney Water should incur in delivering its services. Once we calculated Sydney Water's NRR, we took account of any adjustments to accommodate revenue that Sydney Water will receive from other sources.

We have set an NRR that would apply in average conditions, and a separate NRR that would apply in drought conditions.

We then decided on the approach we would use to allow Sydney Water to recover the NRR via its prices. This involved setting the **target NRR** for each year – that is, the actual revenue we expect Sydney Water to generate from prices for that year. We smoothed the revenue requirement across the determination period to make prices constant in real terms over the four years. In making this decision on target revenue, we consider a range of factors, including implications on price levels, the rate they would change, and any impacts on Sydney Water and its customers.

Figure 5.1 illustrates our approach to calculating the NRR and how we set prices.

Figure 5.1 The building block model



Note: Numbers may not add due to rounding.
Source: IPART analysis

A full discussion of our approach to calculating the NRR and how we set prices is set out in Appendix H.

5.2 Our NRR for the 2020 determination period

We decided:

7 To set the "average weather" Notional Revenue Requirement (NRR) of $10.3 billion as shown in Table 5.1.

8 To set the "drought" NRR of $10.9 billion as shown in Table 5.2.

The NRR in average weather conditions is $10.3 billion over four years, as set out in Table 5.1. This is $356.6 million (3.3%) less than Sydney Water's proposal over the four years of the 2020 determination period. We present our decisions related to each of the building blocks in the table below. Further information is presented in Appendix H.

Table 5.1 Decision on "average weather" NRR and comparison to Sydney Water's proposal ($ million, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Operating expenditure	1,377.7	1,382.8	1,359.3	1,348.1	5,467.9
Return on assets	650.8	680.2	704.0	724.2	2,759.2
Depreciation	397.5	431.7	460.7	480.2	1,770.1
Tax allowance	80.6	66.4	73.3	84.0	304.4
Return on working capital	9.4	11.1	11.6	12.3	44.3
Total NRR	**2,516.0**	**2,572.2**	**2,609.0**	**2,648.7**	**10,345.9**
Sydney Water's proposal	2,559.6	2,661.1	2,713.2	2,768.6	10,702.5
Difference ($)	-43.6	-88.9	-104.2	-119.9	-356.6
Difference (%)	-1.7	-3.3	-3.8	-4.3	-3.3

Note: Totals may not add due to rounding. The notional revenue requirement is our assessment of the efficient economic costs of delivering services. Before setting prices, we make other adjustments such as subtracting a share of non-regulated income.

Source: Sydney Water update to 1 July Price Proposal, 12 November 2019, p 60; IPART calculations

In drought, the NRR would rise to $10.9 billion, as shown in Table 5.2.[31] Chapter 7 explains how this increase would be reflected as an uplift to the water usage price.

31 The increase in the NRR largely reflects an increase in operating expenditure, due to Sydney Water's proposed drought cost pass-throughs which we have accepted, and additional bulk water costs incurred by Sydney Water from the operation of SDP.

Table 5.2 Decision on "drought" NRR and comparison to Sydney Water's proposal ($ million, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Operating expenditure	1,520.5	1,523.9	1,499.7	1,488.0	6,032.0
Return on assets	650.8	680.2	704.0	724.2	2,759.2
Depreciation	397.5	431.7	460.7	480.2	1,770.1
Tax allowance	80.8	66.6	73.5	84.1	304.9
Return on working capital	10.4	12.1	12.6	13.3	48.3
Total NRR	**2,659.9**	**2,714.4**	**2,750.5**	**2,789.7**	**10,914.5**
Sydney Water's proposal	2,723.1	2,826.0	2,880.0	2,936.1	11,365.2
Difference ($)	-63.2	-111.6	-129.5	-146.4	-450.7
Difference (%)	-2.3	-3.9	-4.5	-5.0	-4.0

Note: Totals may not add due to rounding. The notional revenue requirement is our assessment of the efficient economic costs of delivering services. Before setting prices, we make other adjustments such as subtracting a share of non-regulated income.

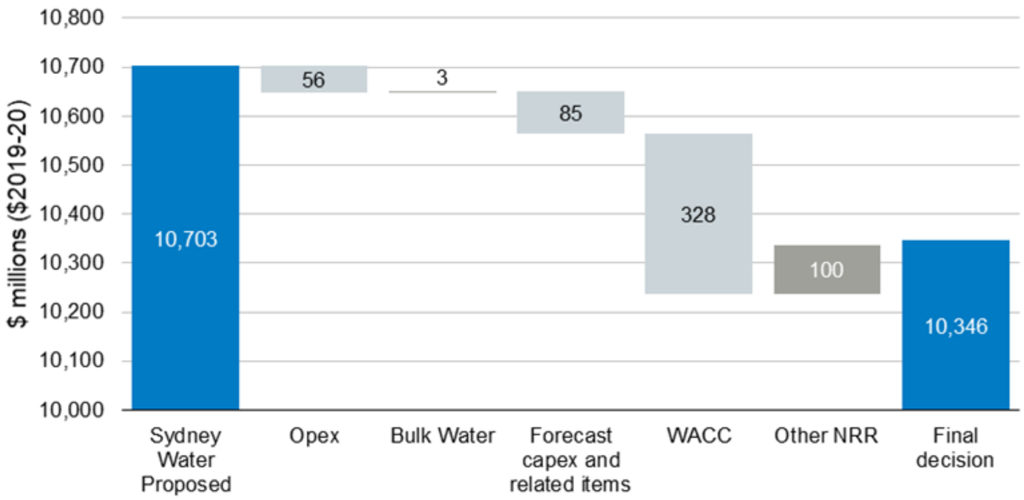
Source: Sydney Water update to 1 July Price Proposal, 12 November 2019, p 60 & 67; IPART calculations

As at June 2020, dam levels are around 80% and the NRR for normal weather conditions would apply. In the following sections, unless specified as "drought NRR", we compare the "average weather" NRR against the NRR used to set prices in the 2016 Determination and that in Sydney Water's proposal.

5.3 Our NRR is lower than proposed by Sydney Water

Compared to Sydney Water's proposal, our NRR is $356.6 million, or 3.3%, lower over the four years of the 2020 determination period. Figure 5.2 shows that a reduction in interest rates (ie, the WACC) has had the largest impact on the NRR. This is largely a function of timing; while Sydney Water's proposal used the same methodology to set the WACC as IPART, between when Sydney Water submitted its proposal and now, interest rates have fallen and the WACC is now 3.4%.

Figure 5.2 The key decisions in changes from Sydney Water's proposed NRR to our NRR



Note: The NRRs shown are before adjustments for non-regulated revenue, miscellaneous revenue, trade waste revenue, cost pass-throughs and DVAM. Other NRR includes changes in working capital, tax depreciation and asset lives.

Source: IPART calculations

Compared to the NRR we set in the 2016 Determination, our total NRR (before adjustments) is $48 million (or 0.5%) higher than we used to set prices in 2016 over 4 years.[32] It reflects:

- A higher allowance for operating costs, reflecting a modest increase to Sydney Water's costs (3.5%).
- A lower WACC, resulting in a large decrease (-19.8%) in return on assets, offset by an increase in the depreciation allowance as a result of a larger RAB due to inflation and capital expenditure.

In response to our Draft Report, Sydney Water argued that our NRR was too low, because the estimate of expected inflation we use to set the real WACC, was too high.

We consider that our Final WACC of 3.4%, which is based on applying our standard 2018 WACC methodology, would provide Sydney Water with sufficient revenue over the 2020 period. We address Sydney Water's concerns around our estimate of expected inflation in detail in Chapter 6, but in summary our view is that:

- Overall, our WACC estimate provides an efficient rate of return to Sydney Water.
- There is a strong benefit in maintaining our established and transparent approach, given the uncertainty in estimating inflation expectations, and that there is no alternative estimate which provides a compelling case that it is a better option for this price review.
- We would need a strong case to change how we estimate a single WACC parameter in isolation as the financial market data are interrelated. Rather, we consider that elements of the WACC methodology should be considered together through a periodic WACC review.

32 Further, typical bills will be lower than in 2019-20 (in real terms). This is due to an increase in customer numbers, essentially sharing the costs amongst more customers.

While we are confident that our WACC methodology is robust, we note that our WACC is currently above most of the WACCs provided in other comparable jurisdictions (see Table 6.2). The exception is the Essential Services Commission of Victoria (ESC).

IPART's relatively high WACC, along with other elements of our pricing decisions and regulatory framework – including our allowances for capital and operating expenditure, our provision for a trailing average cost of debt, and our decisions on dynamic prices and price structure, which combined significantly mitigate cost and revenue risk - indicates that Sydney Water will be in a relatively stable financial positon over the 2020 determination period. Our financeability analysis is presented in Chapter 15 and Appendix K.

Table 5.3 Comparison of real post-tax WACCs across Australian jurisdictions

Published by	Calculated for	Date published	Real post-tax WACC (%)
ESCOSA [a]	SA Water	March 2020	2.71
	AER (indicative)	March 2020	2.74
	ERA (indicative)	March 2020	2.74
	QCA (indicative)	March 2020	1.91
	OTTER (indicative)	March 2020	2.80
	ICRC (indicative)	March 2020	2.56
ESC	South Gippsland Water (PREMO) [b]	February 2020	3.68
	Western Water (PREMO) [b]	March 2020	3.36
	Goulburn-Murray Water (WCIR)	June 2020	4.00
AER	Directlink	June 2020	2.21
	Energex	June 2020	2.41
	Ergon Energy	June 2020	2.41
	SA Power Networks	June 2020	2.42
ESCOSA	SA Water [c]	June 2020	2.42 – 2.96
IPART	2020 Draft Reports	March 2020	3.20
	2020 Final Reports	**June 2020**	**3.40**

[a] In its March 2020 Draft Determination – statement of reasons for its review of prices for SA Water, the Essential Services Commission of South Australia (ESCOSA) presented a comparison of its draft WACC for SA Water to a range of indicative WACCs calculated by ESCOSA based on the published methodologies of other regulators in Australia namely the Australian Energy Regulator (AER), the Economic Regulation Agency of Western Australia (ERA), the Queensland Competition Authority (QCA), the Office of the Tasmanian Economic Regulator (OTTER) and the Independent Competition and Regulatory Commission of the ACT (ICRC). We note that in response, Frontier Economics (on behalf of SA Water) criticised ESCOSA's approach for not including ESC and IPART WACCS in the comparison and for calculating indicative WACCs for each jurisdiction rather than reporting WACCs that had been published by the regulators themselves in each of these jurisdictions. Frontier Economics presented an inter-jurisdictional comparison of published WACCs from several jurisdictions over a period from April 2018 to March 2020. Our view is that comparing current WACC estimates to WACC estimates that were published as far back as mid-2018 is not appropriate. To illustrate this point, IPART's current WACC estimate is 3.4% but in mid-2018 it was 4.1% (ie, 0.7% higher). We have therefore chosen to exclude WACC estimates that were published before 2020.

[b] Under the ESC's PREMO approach, the return on equity is determined by a menu based incentive mechanism rather than reflecting market-based returns. This limits direct comparison between the ESC's cost of capital allowance and other regulators' WACCs.

[c] ESCOSA's Final Determination set real post-tax WACCs for each year of the 2020 determination period. That is, 2.96% in 2020-21, 2.75% in 2021-22, 2.59% in 2022-23 and 2.42% in 2023-24.

Note: while we have attempted to include all comparable (ie, real post-tax) cost of capital estimates published in 2020, it is possible we have unintentionally omitted one or more estimates from this comparison that we were unaware of.

Source: ESCOSA, SA Water Regulatory Determination 2020, Draft Determination: Statement of Reasons, March 2020, p 305. Frontier Economics, Assessment of ESCOSA's treatment of inflation when setting SA Water's allowed rate of return, April 2020, pp 27-34. IPART, WACC Biannual Update, August 2018, p 6. ESC, South Gippsland Water draft decision, February 2020, pp 23-24. ESC, Western Water draft decision, March 2020, pp 29-30. ESC, Goulburn-Murray Water final decision, June 2020, p 21. AER, Final Decision Directlink Transmission Determination 2020 to 2025 – Overview, June 2020, p 20. AER, Final Decision SA Power Networks Distribution Determination 2020 to 2025 – Overview, June 2020, p 26. IPART, Review of Prices for Sydney Water – Draft Report, March 2020, Appendix H.

Sydney Water, in its response to our Draft Report, also proposed a number of small adjustments to the NRR. These are addressed in Appendix H.

5.4 We adjusted the NRR to account for revenue that Sydney Water will receive based on other decisions we have made

Before setting prices to recover the NRR, we subtract revenue that Sydney Water is forecast to receive from other sources. This ensures that the utility does not over-recover that efficient level of expenditure, and that customers do not pay too much. These other sources include:

- **The demand volatility adjustment mechanism (DVAM).** This mechanism seeks to ensure there is a reasonable match between Sydney Water's revenue requirement and its revenue from water sales. We would consider applying a demand volatility adjustment when actual water sales, over the previous determination period, differ from the forecast sales that we used to set prices by more than +/-5%. This review is the first time we have applied a DVAM: our decision is to return $18.4 million to customers over the 2020 determination period, to account for higher than forecast water sales over the 2016 determination period. This is explained in more detail in Chapter 7 and Appendix O.
- **Trade waste services, miscellaneous services, raw water and bulk water services**. These are used by small subsets of customers, and they are priced separately to the water, wastewater and stormwater services. Chapter 12 provides our detailed assessment of the prices for these services.
- **A share of revenue from non-regulated sources,** when made using regulated assets. This acknowledges that the customers have paid for the asset, and should therefore share in some of the unregulated revenue Sydney Water has earned from regulated assets. Appendix H explain how we have treated non-regulated revenue from various sources.

In response to our Draft Report, Sydney Water largely agreed with these adjustments. We discuss its comment on non-regulated revenue in Appendix H.

We decided:

9 For non-regulated revenue, in accordance with Table 5.3:

   – To allow Sydney Water to retain the revenue from recycled water schemes where the water displaces some potable water sales, as compensation for lost potable water sales.

   – To share with customers 10% of the revenue from the sale of biobanking credits.

   – To share with customers 50% of other non-regulated revenue from rentals and recycled water schemes where the water does not displace potable water sales.

10 To subtract, from the NRR, the revenue from our decisions on the demand volatility adjustment mechanism, trade waste services, miscellaneous services, non-regulated assets, and raw water and bulk water services, as set out in Table 5.5.

Table 5.4 Non-regulated revenue to be removed from the NRR ($ million, $2019-20)

Revenue source	2020-21	2021-22	2022-23	2023-24	Total
Biobanking	1.0	0.4	0.2	0.5	2.1
Recycled water	2.2	2.2	2.2	2.2	8.8
Other, including rentals	5.0	4.7	4.5	4.4	18.6
Total	**8.2**	**7.3**	**6.8**	**7.1**	**29.5**

Note: This is revenue from s16A recycled water schemes and includes the additional $50,000pa to Sydney Water to reflect 50% share of the revenue from its least cost recycled water schemes (see Chapter 11).

Source: IPART calculations

Table 5.5 presents our decisions on adjustments to the NRR.

Table 5.5 Adjustments to the NRR ($ million, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
IPART decision NRR from building blocks	2,516.0	2,572.2	2,609.0	2,648.7	10,345.9
Total adjustments (DVAM, SDP & WNSW)	6.3	0.0	0.0	0.0	6.3
Trade waste revenue	24.7	25.0	25.3	25.6	100.7
Miscellaneous charges	12.3	12.4	12.6	12.7	50.0
Non-regulated revenue	8.2	7.3	6.8	7.1	29.5
Total adjustments	**51.5**	**44.8**	**44.7**	**45.4**	**186.5**
Revenue to be recovered by water, wastewater and stormwater prices	**2,464.5**	**2,527.4**	**2,564.2**	**2,603.3**	**10,159.4**
Sydney Water's proposal: revenue to be recovered by water, wastewater and stormwater prices	2,570.6	2,609.4	2,647.5	2,692.2	10,519.7
Difference ($)	-106.1	-82.0	-83.3	-88.9	-360.3
Difference (%)	-4.1	-3.1	-3.1	-3.3	-3.4

Note: Totals may not add due to rounding.

Source: Sydney Water update to 1 July Price Proposal, 12 November 2019; IPART analysis

5.5 We smoothed the revenue requirement before setting prices

We decided:

11 To set prices to recover the total NRR over four years, in present value terms.

Our decision is to set prices to recover the adjusted NRR by the end of the determination period, rather than to recover the annual NRR by the end of each year of this period. This is in line with our usual practice. With this approach we set prices over the 4-year determination period so that the present value of the target revenue equals the present value of the NRR (see Table 5.6). That is, the price path is NPV neutral, even though the target revenue to be recovered in each year of the period will not exactly equal the NRR in each year. This approach smooths the impact of price changes over the period, thus reducing price volatility for customers, and revenue volatility for Sydney Water.

Table 5.6 Comparison of NRR and smoothed target revenue ($ million, $2019-20)

	2020-21	2021-22	2022-23	2023-24	4-year NPV[a]	Total
Adjusted NRR	2,464.5	2,527.4	2,564.2	2,603.3	9,358.2	10,159.4
Target revenue from prices	2,482.7	2,520.3	2,557.5	2,597.4	9,358.2	10,157.9
Difference	18.3	-7.1	-6.8	-5.9	0.0	-1.5

a Sum over the four years on a present value basis, assuming a discount rate equal to the real pre-tax WACC (4.2%).

To set prices for each service, we calculate a separate NRR for water, wastewater and stormwater services, to ensure customers who do not have access to one or more of the services do not pay for them.[33] Each of these NRRs are based on the cost build-up for the individual service, with an allocation of corporate costs.

5.6 Summary of our building block decisions

Our decision on Sydney Water's operating expenditure allowance is provided and explained in Chapter 4. In relation to the remaining building blocks, our decisions are summarised below and discussed in more detail in Appendix H.

We decided:

12 To calculate the tax allowance using:

- A tax rate of 30%
- Sydney Water's forecast of assets free of charge, and
- Sydney Water's forecast tax depreciation, adjusted for our decisions on capital expenditure.

13 To calculate the return on assets using a WACC of 3.4% and RAB values shown in Table H.1 and Table H.2 in Appendix H.

14 To calculate the working capital allowance as set out in Table H.13 in Appendix H.

33 The adjustments are allocated depending on the infrastructure that is used to derive the revenue. The DVAM adjustment is taken from the water NRR because the over recovery is from water usage.

6 Inflation and the WACC

To set the appropriate rate of return for Sydney Water, we calculate the weighted average cost of capital (WACC). To do this, we calculate a nominal WACC estimate, and reduce this by an estimate of expected inflation over the determination period, to derive a real WACC. Our estimate of expected inflation has a large impact on the prices we set, as well as the financeability of Sydney Water.

Sydney Water, along with the other water utilities (Water NSW, Hunter Water and SDP), argued that our estimate of expected inflation is too high, which results in a real WACC that is too low. The utilities have also proposed that IPART include a true-up for the difference between expected and actual inflation.

In this chapter we set out our analysis and final decisions regarding inflation expectations, with further analysis in Appendix J. In reaching our final decisions, we have reviewed our 2018 WACC method in light of the evidence and analysis put forward by the utilities, and engaged an expert peer review by the CIE.

Our final decisions are:

1. To adopt an estimate of inflation expectations of 2.3%, consistent with our established 2018 WACC method.
2. To not accept the utilities' proposals for an end of period true-up for the difference between actual and expected inflation.
3. At the next regulatory period, to implement a true-up to the cost of debt which is calculated based on the change in the nominal cost of debt during the regulatory period, to more closely align with the refinancing risk faced by the utilities.

We found that adopting our established 2018 WACC method to estimate expected inflation remains appropriate, because:

1. In applying our standard WACC method, Sydney Water will recover a real rate of return from customers to provide it with sufficient revenue to remain financeable.
2. We considered alternative methods to estimate inflation expectations, however, none of these methods provided a compelling reason for change given the uncertainty in estimating inflation expectations and the strong benefit in maintaining our established and transparent approach.
3. We would need a strong case to change how we estimate a single WACC parameter in isolation as the financial market data are interrelated.

In addition, a true-up for the difference between actual and expected inflation would not address the impact of inflation on Sydney Water's cashflow risks **over the next regulatory period**. The cost of debt true-up that we established in our 2018 WACC review would address financing risks over the next regulatory period.

Instead, the ‘risk’ of a difference between actual inflation, and our estimate of inflation expectations in the WACC, accumulates over many regulatory periods as inflation is indexed into the value of assets in the Regulatory Asset Base (RAB). Given this, at our next WACC review, we will evaluate the utilities’ inflation risk that arises from a real WACC framework, and whether addressing this risk results in cost reflective pricing for customers over time. This could include considering how the RAB is indexed by inflation, reviewing our method for estimating the nominal WACC and our estimate of inflation expectations in the WACC.

6.1 Why estimating inflation matters

Expected inflation is a key input into the WACC, which is used for calculating the revenue requirements and setting prices for Sydney Water’s customers. Our decisions need to be as accurate and unbiased as practicable because a WACC that is slightly inaccurate has a large impact on prices. For instance, if we set the WACC too high, customers would pay too much and the regulated business could be encouraged to over-invest, and if we set it too low, the business’ financial viability could suffer, and it may under-invest. Neither outcome is in the long-term interest of customers.

Broadly speaking, inflation has three impacts in the real-WACC building block model:

1. An estimate of expected inflation is used to set real prices over the regulatory period via the WACC. The utilities then use revenue provided from regulated prices to fund their capital assets through a combination of debt and equity.
2. Actual inflation is indexed into prices. That is, actual inflation will determine how quickly the real Year 1 prices/revenue allowances increase over the regulatory period.
3. Actual inflation is indexed into the RAB. If inflation is 1% higher over the determination period, this 1% difference is indexed into the RAB and gradually recovered from customers over the life of the assets – through the return on assets we set, and slowly through the regulatory depreciation allowance. Indexing the RAB in line with actual inflation provides a consistent real price for capital assets over their economic life.

Under a real WACC framework, when a utility invests in a new asset, we include this asset into the RAB and provide the utility with a real rate of return on this asset. The Real WACC is derived from the Fisher equation, as follows:

$$1 + Nominal\ WACC_t = (1 + Real\ WACC_t) \times (1 + expected\ inflation_t)$$

$$Real\ WACC_t = \frac{1 + Nominal\ WACC_t}{1 + expected\ inflation_t} - 1$$

The best estimate of inflation expectations

Therefore, when setting the real WACC, our aim is to derive the best estimate of the market's inflation expectations, as opposed to strictly replicating actual inflation. That is, we are setting a real WACC by deflating the nominal WACC by our best estimate of inflation *expectations* at the time we set the WACC. Our consultants, the CIE, agreed with this logic:[34]

> IPART is attempting to measure the inflation expectation held by agents at the time of WACC sampling and that this expectation cannot be observed historically…
>
> The other point to note about measuring inflation expectations is that the uncertainty about future inflation is not of relevance. It is the accuracy with which IPART can measure inflation expectations that is at issue, not whether this is an accurate measure of actual inflation.

Inflation risk accrues gradually

Over time, we then increase the nominal value of this asset in line with actual inflation. At the same time, the value of the asset is gradually depreciated as the asset wears out. The rate of return for that asset in future years is based on the nominal value of the asset in each year, with a regulatory depreciation allowance based on the future nominal value of the asset. If there is a difference between expected and actual inflation, this difference is effectively capitalised into the future value of the asset (the RAB), and gradually recovered from customers – in nominal terms – over the life of the asset.

When a utility finances the cost of an asset with debt – through a bond or a loan – it often does so by paying a nominal cost of debt. The interest rate that it agrees to pay its borrower is:

$$Nominal\ Cost\ of\ Debt_t = (1 + Real\ Cost\ of\ debt_t) \times (1 + expected\ inflation_t) - 1$$

This interest rate is often fixed over the life of the bond, or loan. The interest rate does not change based on the difference between actual, and expected inflation.

If the utility borrows in nominal returns and:

- If inflation is higher than expected, the utility experiences a 'gain', in that the value of the asset in the RAB has increased relative to the amount that the utility has borrowed to purchase the asset. This gain is gradually recovered through a higher nominal return on assets, and regulatory depreciation, provided to the utility, over the life of the asset.
- Conversely, if inflation is lower than expected, the utility experiences a 'loss', in that the value of the asset in the RAB has decreased[35] relative to the amount that the utility has borrowed to purchase the asset. This shortfall is gradually reflected through a lower nominal return on assets, and regulatory depreciation, over the life of the asset.

34 CIE, *Peer Review – Inflation and WACC*, p9.
35 Or to be precise, the future value of the RAB has not increased as quickly as expected.

This analysis highlights two key risks arising from how we estimate expected inflation:

1. The value we adopt for expected inflation has a direct impact on the real WACC we set in each year of the regulatory period.
2. Differences between our estimate of expected inflation, and actual inflation over time, are indexed into the RAB and are gradually recovered – in *nominal* terms, at least – from customers.

6.2 Our review process

In 2018 we completed a full review of our WACC method.[36] We undertook extensive public consultation and analysis, including releasing an Issues Paper and a Draft Report, holding a public hearing, and hosting workshops with stakeholders. The utilities were closely involved in this process. For instance, Sydney Water commented that:

> IPART's existing WACC methodology works well, incentivising improved financial efficiency and stability. These sentiments have been echoed by our external rating agency, which have maintained our generally stable credit rating.[37]

We stated in our Issues Paper for the current review that we intended to apply the method we established in the 2018 WACC review. In its response, Sydney Water did not question the approach, but requested IPART use judgement when applying the WACC because a low WACC could have implications for Sydney Water's financeability.[38]

In our Draft Report we determined the appropriate WACC to be 3.2% (as was predicted by Sydney Water in its response to our Issues Paper). Sydney Water (and the other water utilities) have responded that this WACC is too low and threatens their financeability. Section 6.4 provides detail on their concerns.

In response, we have considered the utilities' concerns (see section 6.5), and engaged a consultant, the Centre for International Economics (CIE), to peer review how we estimate expected inflation when setting the Real WACC. In addition, Appendix J provides a full discussion of IPART's analysis of Sydney Water's financeability, and how we applied our 2018 Financeability test framework in this review.

36 The final report can be found on the IPART website here: https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/investigation-administrative-legislative-requirements-sea-wacc-methodology-2017/final-report-review-of-our-wacc-method-february-2018.pdf

37 Sydney Water submission to IPART Review of our WACC method Draft Report, December 2017, p1.

38 Sydney Water pricing proposal, 1 July 2019, p39.

6.3 Our approach to estimating expected inflation

In our 2018 WACC review, we decided to calculate the expected rate of inflation by calculating a geometric average of:

- the Reserve Bank of Australia's (RBA) 1-year ahead forecast from its Statement of Monetary Policy to represent inflation expectations for the first year of the determination, and
- 2.5%, the midpoint of the RBA's target band for inflation, in all subsequent years of the determination.

We also synchronise the sampling dates, so that we use the same data for debt, equity and estimating expected inflation at the time of the two-monthly sampling window. The synchronised method is unbiased because it recognises that movements in debt, equity and inflation are correlated.

Our reasons for adopting a geometric average approach in the 2018 WACC review

In our 2018 WACC review, we decided on a 'geometric average' approach because it is more accurate, less complex and more replicable than other approaches such as breakeven inflation (BEI). In particular, we said:

> We recognise the in-principle benefits of using the BEI method to calculate inflation. However, on-balance, we have decided to maintain our draft decision to use a geometric average approach as we consider that currently, there is not a sufficient case for change:
>
> 1. While our analysis suggests that liquidity in the inflation-linked bond market is not currently an acute concern, we remain concerned that the market may not remain sufficiently liquid throughout the business cycle. Therefore, the accuracy of the BEI method may vary at different points in the economic cycle.
>
> 2. In part, due to data limitations, the BEI method is a slightly more complex, and less replicable, method compared to a geometric average.

More detail on this decision is provided in our 2018 Review of WACC report.[39] In Appendix J, we have also analysed the recent performance of market-based measures of expected inflation – including breakeven inflation rates and inflation swap data.

39 The report can be found on the IPART website, p79: https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/investigation-administrative-legislative-requirements-sea-wacc-methodology-2017/final-report-review-of-our-wacc-method-february-2018.pdf

The AER has recently amended its approach to estimate inflation expectations

The Australian Energy Regulator (AER) amended its approach estimate inflation expectations in late May, recognising that this is an unprecedented economic environment and noting that "…COVID-19 is having a significant impact on our economy and we are factoring this into our decisions."[40]

For its 2020-2025 network revenue determinations, the AER is implementing a trimmed mean inflation forecast from the RBA for the first two years of its forecast window, and an estimate of 2.5% for the remaining eight years. It argues that due to the volatility in the CPI series, a trimmed mean contributes to the best estimate of inflation over a ten-year period. This approach results in an estimate of expected inflation of 2.27%.

The RBA's trimmed mean inflation forecast for the first year of the determination period is 1.25% which, when combined with three years of 2.5% (RBA midpoint of target inflation) as per IPART's methodology, produces an inflation expectation of 2.2%. This is slightly below the 2.3% we have calculated in our approach.

The AER notes however, that this change will not necessarily apply in future determinations. Rather, it is an emergency response during these unprecedented economic conditions. The AER has announced a larger review of its inflation methodology, which will determine the approach for future periods.

6.4 Sydney Water's feedback

Sydney Water, along with Hunter Water, Water NSW and Sydney Desalination Plant Pty Ltd wrote submissions in response to our Draft Report, arguing that our approach to estimate inflation expectations is flawed. They raised two key issues, explained below.

The utilities argue that our approach is not producing a reasonable estimate of expected inflation in current market conditions

Sydney Water argues that our estimate of expected inflation, of 2.3%, is too high when market-based measures of expected inflation have fallen dramatically in recent months. Its concern is that because our inflation expectations are too high, our estimate of the real WACC for the 2020 determination period is too low. In its response to our Draft Report, Sydney Water wrote:

> IPART's measure of inflation (2.3%) is upward biased relative to the majority of alternative inflation expectations for the next four years, as it gives very little weight to market conditions.

40 AER, *AER provides update on 2020-25 network revenue determinations*, 22 May 2020.

Sydney Water is concerned that this 'error' has implications for its financeability, and a true-up mechanism should be established

All stakeholders indicated that the inflation 'error' would result in windfall losses/gains for the three water utilities. Furthermore, Sydney Water claimed that this is because it would permanently under- or over-recover its nominal WACC.

> "…markets are expecting actual inflation to remain at about 0.65% for 2020-24, well below IPART's forecast inflation of 2.3%. If this expectation proves correct, Sydney Water will suffer a loss of $1.3 billion for 2020-24, a shortfall which equity holders must bear."[41]

Sydney Water suggested that a comprehensive review of IPART's 2018 WACC method is required, but in the interim, a **lower inflation expectation of 1.7%** should be adopted. It also proposed an **end of determination true-up** on actual inflation, with any adjustments to be included in prices in the following determination.

6.5 Our analysis and decisions

Sydney Water's feedback has raised two main questions which we have considered:

1. Is our estimate of expected inflation appropriate?
2. Should we implement a true-up for inflation at the end of the period?

For each of these problems we undertook analysis, and sought advice from our consultant (CIE) before coming to a decision.

The CIE has reviewed the reasonableness of our approach and logic in making our decisions, and found that our approach is "…coherent and the underlying logic makes sense."[42] However, the CIE notes also that the utilities have valid claims, and that the difference in opinion arises because there are two separate issues at play: the first being whether IPART is accurately measuring inflation expectations (question 1 above), and the second being that the utilities borrow in nominal terms and therefore are subject to large inflation risk over time (question 2).

41 Sydney Water submission to IPART Draft Report, p118.
42 CIE, *Peer Review – Inflation and WACC*, p1.

6.6 Is our method appropriate?

We have reviewed our method to estimate inflation expectations when setting the real WACC. In doing so, we considered a number of different options, and assessed these options against key principles. We then reviewed the information since the 2018 WACC review - that is, recent inflation outcomes, as well as the recent performance of market-based measures of expected inflation (BEIs, and inflation swaps). Our consultants, the CIE, then reviewed our findings.

Our view is that the evidence is consistent with our estimate of expected inflation

Although recent developments increase uncertainty, a 2.3% estimate is consistent with our view that **the best estimate of expected inflation is towards the bottom end of the RBA 2-3% inflation target**:

- The RBA's research on long-term inflation expectations – derived from financial market data and surveys of households and businesses – suggests inflation expectations are anchored between 2-2.5%.
- The financial market information, leading into the current crisis, suggested inflation expectations of 1.6-1.7%.
- The RBA's most recent Statement of Monetary Policy – which accounts for recent developments – suggests over the next two years, there are countervailing impacts on inflation, with the deflationary effects from the spare capacity in the labour market and in the economy expected to be partly offset by the inflationary impact of supply disruptions.

An approach based on RBA forecasts remains appropriate

In our view, the RBA is objective, and best-placed, to analyse what all available information suggests for future inflation. Given the RBA's status as the inflation-targeting central bank, even though its inflation forecasts do not exactly align with the length of a determination period, we consider that its forecasts and outlook on inflation would also carry a high weight with agents in the economy (which are a broader set than those who buy and sell inflation indexed bonds, or inflation swaps).

In comparison, recent movements in market-based measures of inflation (BEI, and inflation swaps) highlight that they do not necessarily perform well in periods of financial stress. The RBA's most recent Statement of Monetary Policy notes:[43]

> Both short- and long-term market-based measures of inflation expectations have declined since the widespread outbreak of COVID-19 in early 2020; however, it is difficult to interpret the magnitude of these declines because functioning in these markets has been significantly impaired recently.

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43 RBA, Statement of Monetary Policy – May 2020, Inflation, viewed 5th June 2020, https://www.rba.gov.au/publications/smp/2020/may/inflation.html.

Our consultants did not find a compelling reason to change our approach

The CIE reviewed our approach to estimating expected inflation, and has agreed with our analysis that we should maintain our current approach. In particular, it noted:[44]

> The BEI method and IPART's current method do provide increasingly divergent views of inflation. The volatility in inflation measured using the BEI method is supportive of IPART's previous findings. Given this, there is no particular reason for IPART to change to this method without thorough consideration and consultation, given it has reviewed this in the past at length.

We decided:

15 To apply our 2018 WACC method and adopt an estimate of inflation expectations of 2.3%.

6.6.2 Our analysis of the options

We considered three broad approaches to estimate inflation expectations:

1. Maintaining **our current approach**, which is the geometric average of the RBA's 1-year ahead inflation forecast with a 2.5% estimate in future years.
2. Refining our current approach to use **all available information from the RBA's most recently available SMP forecasts.** That is, to use the RBA's 1- and 2-year ahead inflation forecasts, and review the RBA's guidance on medium-term inflation to consider where we set the inflation estimate for Years 3 and 4.
3. To use, or have reference to, the inflation expectations derived from **market-based measures of inflation**, that is, from break-even inflation (BEI) and/or inflation swap data, as put forward by Sydney Water.

The RBA approach (option 2) contained two key changes to the status quo approach (see Table 6.1):

1. **Timing.** It adopted an inflation expectation from May 2020, combined with financial data from February-March 2020. Given the current uncertainty, this option balanced the **increased accuracy** from a more contemporaneous inflation forecast against the **potential bias** introduced from sampling data in different periods.
2. **Method.** It adopted the RBA's 2-year ahead forecast to represent expected inflation for the second year of the determination, and reviewed the RBA's qualitative guidance on medium-term inflation expectations, in the May Statement of Monetary Policy, to decide whether there is sufficient evidence to deviate from a 2.5% expectation in subsequent years of the determination.

44 CIE, *Peer Review – Inflation and WACC*, p9.

Table 6.1 Comparison of the two methods of estimating inflation

Element	Status quo	RBA approach
Year 1 estimate	The 1-year ahead forecast in the **February 2020** Statement of Monetary Policy that was available during the WACC sampling window 1.75%	The 1-year ahead forecast from the most recently published **May 2020** Statement of Monetary Policy 2.75%
Year 2 estimate	2.5%	The 2-year ahead forecast from the most recently published Statement of Monetary Policy 1.5%
Future year estimates	2.5%	2.5% as a default. Deviate from 2.5% to the extent there is medium-term inflation guidance in the most recently published Statement The May statement did not provide sufficient guidance to deviate from 2.5%
Average estimate	**2.3%**	**2.3%**

We reviewed the three options against key principles

In assessing the three options, we firstly established four principles that our estimate of expected inflation should meet:

- **Accurate – unbiased**. The estimate needs to be unbiased, in that over time it reflects an accurate estimate of expected inflation.
- **Accurate – dynamic.** Our estimate should react (but not over-react) to new information.
- **Sustainable.** The estimate should provide appropriate and stable cashflows to Sydney Water over time.
- **Objective and transparent.** We should use objective decisions, rather than judgement, to estimate inflation. Our estimates should be applied using a transparent process accepted by stakeholders, with opportunity for consultation.

Table 6.2 compares how each of the three options performs on these principles.

Table 6.2 Comparison of the three options

	Current approach	RBA approach	BEI approach
Is it unbiased?	**Generally yes.** Assumes that economic agents believe the RBA is a credible inflation targeter over a long period of time.	**Generally yes.** Assumes the RBA's forecasts are unbiased and economic agents believe these forecasts.	**Potentially.** In our view, bond market measures tend to under-forecast inflation expectations in periods of financial stress, and may be affected by Quantitative Easing policies.
Is it dynamic?	**Generally no.** Only one year out of the four updates due to the geometric average.	**Generally yes.** We could update every year if the RBA provides clear guidance.	**Yes.** As outlined above, it might over-react to changes in market conditions due to illiquidity.
Is it sustainable?	**Mixed.** If the inflation forecasts are too static this creates temporary cash flow issues.	**Mixed.** It relies on the quality and detail in the RBA's inflation forecasts.	**Mixed.** Most of the time these measures react appropriately to new information, except in times of financial stress.
Is it objective/ transparent?	**Yes.** It can be applied objectively, and reflects the outcomes of a public IPART review process.	**Mixed.** This is a departure from our WACC review (albeit a relatively small departure). There may be some judgement in interpreting the RBA's medium-term forecasts.	**No.** This is a large departure from our WACC review. There is a limited pool of inflation linked bonds to estimate expected inflation, and this is a more technical method of calculating inflation expectations. Because of this, there may be disagreement on how we calculate this measure.

Table 6.2 shows that none of the three options are unambiguously superior. However, the first two options – the status quo, and relying more on the RBA forecasts – both provide an inflation forecast of 2.3%. We re-reviewed the bond market approach, and found that the concerns we had during our 2018 WACC method review remain valid. For instance, we found that the market-based forecast of 0.65%, as Sydney Water had asserted, was substantially impacted by recent illiquidity in these markets alongside the COVID-19 pandemic. Before the recent pandemic, a more realistic estimate from these measures would have been about 1.6-1.7%, and it was difficult to extract a signal from these markets in the recent market volatility. Details of this analysis, as well as the rest of our analysis of the three options can be found in Appendix J.

The CIE found that our approach is reasonable for the current pricing reviews. Looking forwards, the CIE suggested that the next WACC review could reconsider some aspects of our method for estimating expected inflation, including:

- The merits of the BEI method, and
- The time period over which we apply an estimate of inflation expectations.

We agree with the findings of the CIE, and intend to review our estimate of inflation expectations in the WACC at the next WACC review.

6.7 A true-up for inflation expectations

The utilities are seeking an ex-post true-up of inflation, so that they are not adversely impacted if our estimate of inflation expectations, set at the beginning of the regulatory period, turns out to be different to actual inflation over the period. We considered this request, but have decided not to implement such a true-up, because:

- When estimating the real WACC, we are estimating expected inflation, and not actual inflation. Unlike other cost pass-throughs, errors in estimating inflation expectations are not a directly observable variable.
- An inflation true-up does not match the impact of actual inflation on a utility's cash flows over the next regulatory period.
- If we are willing to true-up unobservable variables, this would suggest a true-up for the entire WACC (or more generally, even an ex post true-up of the utility's actual rate of return).
- Our cost of debt true-up is the appropriate tool to address the risk of unfunded debt costs over the next regulatory period.

Our consultants (CIE) reviewed this reasoning and agree that:

> We also do not see any possible role for an inflation true up in relation to more accurately measuring inflation expectations.
>
> It is not possible to undertake a true up of inflation expectations, because the 'true' inflation expectation is not observed.[45]

Instead, our view is that the primary financial risk to a utility's cash flows during the regulatory period is an unanticipated increase in borrowing costs (on new debt). This is addressed through the cost of debt true-up we introduced in the 2018 WACC review, and we have considered small refinements to the true-up.

Over time, the 'inflation risk' to the utilities that arises from a difference between expected inflation and actual inflation is indexed into the RAB and gradually recovered – in nominal terms, at least – from customers. Consequently, we intend to review how the RAB is indexed by inflation when we next review our WACC method.

We decided:

16 To not accept Sydney Water's proposal for an end of period true-up for the difference between actual and expected inflation.

17 At the next regulatory period, to implement a true-up to the cost of debt based on the change in the nominal cost of debt during the regulatory period.

The following sections summarise our analysis.

45 CIE, *Peer Review – Inflation and WACC*, p1.

6.7.1 Our analysis of the inflation true-up

Inflation risk affects the RAB over time

The risk of a sustained difference between expected and actual inflation is effectively capitalised into the future value of the asset (the RAB), which means that inflation-risk accumulates over multiple regulatory periods.

Our view is that this issue should be carefully considered when IPART next reviews its real WACC framework. In particular, this review could weigh up whether a WACC method that more closely matches the 'cost of service' for the regulated utility results in prices that are more, or less, cost reflective for customers over time. That is, a real-WACC framework seeks to set prices based on the 'real' value of the service provided by a capital asset to customers over its useful economic life, which tends to increase in line with inflation. Under a nominal WACC framework, the value of an asset is fixed in nominal terms over time, so the 'real' price charged to customers for this service decreases over its economic life.

The CIE has provided an initial analysis of this problem.[46] In their view, there are arguments for and against addressing this risk.

On the one hand, the CIE notes that the utilities cannot hedge against the inflation risk (without paying a premium to issue inflation linked debt), because the inflation priced into financial markets is lower than the inflation expectation measured by IPART, due to the risk premia that affect inflation-linked bond prices. The CIE also notes that the risks are exacerbated by the large amount of uncertainty about inflation outcomes currently, and the current low returns environment (which means that the difference between estimated inflation expectations and actual inflation outcomes will have a larger proportional impact on businesses than if returns were higher).

On the other hand, the CIE notes that the equity beta allowed by IPART may already be reflecting that utilities are bearing inflation risks. And, that if the businesses we regulated were insulated from this risk, while maintaining the same beta, we may then be overcompensating the utility.

We agree with these considerations. In addition, the fact that the utilities are exposed to inflation risk – in that its cashflow position improves with higher inflation, and its cashflow deteriorates with lower inflation, is potentially a diversifiable risk.

The CIE report also outlined that there are a number of potential solutions to insulate the utilities from inflation risk. And, that in weighing up the options, it is important to match any adjustment with changes in the utilities' underlying costs, and to manage volatility in customer prices.

If IPART decided to address this risk, the CIE's proposed approach would be to adjust how we index the RAB to reflect the estimate of expected inflation we assume for the utility's cost of debt. And to apply a symmetric adjustment to how we index prices over the regulatory period, to reflect that a proportion of these costs represent debt costs locked in on the basis of expected inflation.

46 CIE, *Peer Review – Inflation and WACC*, p10.

We have decided, at this point in time, to not adjust how we roll forward the RAB, or index prices over the regulatory period. In particular, we are cautious adjusting a single parameter within our real-WACC framework in isolation. Reducing the utility's overall risk would have a broader impact on the overall efficient rate of return. Instead, we intend to review these points – with the appropriate level of consultation with stakeholders – when we next review our WACC method.

Our cost of debt true-up addresses financial risk

In our 2018 WACC review, we introduced a true-up to the cost of debt to account for movements in debt costs during the regulatory period. This true-up reflects that movements in interest rates would gradually flow through to customer prices in competitive markets.

The primary financial risk to a utility's cash flows during the regulatory period is an unanticipated increase in borrowing costs (on new debt). It is not inflation risk.

Our cost of debt true-up addresses this risk by effectively setting an annual cost of debt for the utilities. However, we acknowledge that the utilities generally borrow in nominal terms, and that our 2018 WACC method did not explicitly state whether the true-up would be based on changes in the real, or the nominal, cost of debt.

Given that the financing risks that Sydney Water faces relate more closely to changes in the nominal cost of debt, at the next regulatory period, we would implement a true-up to the cost of debt which is calculated based on the change in the nominal cost of debt during the regulatory period.

Inflation expectations are not observable

Our regulatory framework includes a range of cost pass-throughs for:

- Differences between actual and forecast water sales (DVAM)
- Changes in the cost of debt
- A range of uncontrollable operating costs, and capital costs (such as the SDP pass-through, a pass-through for contingent capital costs if SDP is expanded, and Water NSW pass-throughs).

These pass-throughs are based on observable variables. Even the cost of debt true-up is based on bond yield information produced by the RBA, calculated using the actual costs paid by businesses who raise debt in the market.

By contrast, the utilities have proposed an adjustment to an estimate of inflation expectations of the market at the time the nominal WACC was set. However, inflation expectations at a point in time are not necessarily the same as what actual inflation turns out to be. For this to be a reasonable true-up, we would have to make the very big assumption that actual inflation reflects the 'true' *expectation* of inflation in each regulatory period.

In particular, the NERA report commissioned by Sydney Water suggests that all measures of forecast and expected inflation (the RBA, inflation swaps, BEIs and market economists) over-predicted actual inflation over the past last 10 years.[47] This is important, because together it suggests that the "true" estimate of inflation expectations in recent years was higher than actual inflation. And, it suggests that although IPART's 2018 WACC method would also have overestimated actual inflation, it does not necessarily mean that our method did not accurately reflect inflation *expectations*.

An inflation true-up may introduce large cashflow risks for the business, or affordability concerns for customers

The utilities have proposed a true-up that retrospectively adjusts for the difference between actual and expected inflation, by calculating:

- (Expected inflation – actual inflation) *times* the RAB

As an example, we considered the value of this true-up if actual inflation is 1% higher, per year, than our estimate of inflation expectations, based on Sydney Water's current Notional Revenue Requirement (of about $2.5 billion per year) and RAB (of about $20 billion). Firstly, if actual inflation is 1% higher each year than our expectation, Sydney Water's nominal revenues would be about $150 million higher than we initially anticipated over four years. At the same time, the inflation true-up formula would ask Sydney Water to repay about $800 million to customers – 1% of the RAB (or $200 million) per year – in the following regulatory period. Given Sydney Water already considers its financeability in the upcoming period is marginal, Sydney Water may not have the financial headroom to return this amount to customers.

Symmetrically, if actual inflation is 1% per year lower than our estimate of expected inflation, bills could increase by about 10%, per year, in the following regulatory period. Customers may not be able to afford to repay this true-up to the utility and maintain an appropriate level of service.

Why only calculate inflation on an ex post basis?

If we decided to adjust our estimate of inflation expectations for actual inflation outcomes, it raises a question of whether the entire WACC should be calculated on an ex-post basis in each year of the regulatory period. For example, to use actual equity market returns as an estimate of the expected market risk premium.

A reduction in inflation over the regulatory period might also be associated with a drop in equity returns, for example, if both factors reflect a generally sluggish economy. Only including an adjustment for inflation might miss important correlations in financial market data.

47 NERA Economic Consulting, April 2020, *Inflation forecasting and recovery of efficient debt costs*, A report for Sydney Water, Chapter 4.

Our WACC framework aims to estimate the real rate of return at the beginning of each year (in the case of debt), or the beginning of each regulatory period (in the case of equity), that an efficient business would need to finance its capital assets. It does not then seek to adjust prices for the actual rates of return earnt by borrowers, or the equity owners, which are affected by a range of financial shocks that are independent to financing costs.

6.8 Sydney Water's financeability

Sydney Water has argued that the real-WACC is too low and creating financeability concerns.

In our financeability test, if we are concerned whether the utility's benchmark financial ratios do not meet our targets, the first step is to review our regulatory allowances (including the WACC method).

We have reviewed the estimate of expected inflation that we use to set the real WACC, and consider that our 2018 WACC method remains appropriate.

There are also a range of important factors which suggest our real WACC is producing a sufficient cashflow to the utilities. The full analysis is available in Appendix J, but a summary is presented below:

- Recent RBA evidence suggests the market risk premium is lower than in our WACC. The 2019 bulletin article[48] states that equity risk premiums "…are lower than previously thought", and estimated it at around 4% (well below our current estimate of 9-10%).
- Our WACC is at the higher end of the range when compared to other regulators.
- Broader macroeconomic trends (such as the RBA's move to Quantitative Easing) support a low real rate of return.
- Our regulatory mechanisms (such as drought pricing, the cost of debt true-up and the demand volatility mechanism) materially reduce downside financial risk for Sydney Water. Not all regulators apply these mechanisms, so they have not been fully embedded into the benchmark financial ratios of credit agencies. Furthermore, some of these mechanisms (particularly drought pricing) have been introduced in this pricing review and are not reflected in our current target financeability ratios.

Appendix J presents IPART's analysis of Sydney Water's financeability, and how we applied our 2018 Financeability test framework in this review.

48 RBA, Bulletin – June 2019, The Australian Equity Market over the Past Century, viewed on 6th May 2020, https://www.rba.gov.au/publications/bulletin/2019/jun/the-australian-equity-market-over-the-past-century.html

7 Water prices

Sydney Water's water prices allow it to recover its efficient costs for providing water to residential and non-residential customers. Water prices consist of two parts:

- a water usage charge for each kilolitre of water a customer uses, and
- a fixed water service charge, which applies regardless of how much water a customer uses.

We have restructured Sydney Water's water prices to give customers greater control over their bills and reward customers for becoming more water efficient. To do this we have reduced the portion of Sydney Water's revenue from fixed charges and increased the water usage charge. This change is also more cost reflective as the increased water usage charge is more consistent with our best estimate of the long-term costs of providing water.

We have also decided to implement dynamic water usage pricing to manage Sydney Water's additional costs during drought, and to send a stronger signal to customers to conserve water in periods of scarcity. This mechanism means Sydney Water will charge customers at a higher per kilolitre rate in drought when water storage levels are low.

This chapter outlines our decisions on water pricing for the 2020 determination period including:

- Water usage prices, including the design of the dynamic pricing mechanism.
- Water service prices.
- Water sales and customer number forecasts.
- Cost pass-through mechanisms for the Sydney Desalination Plant (SDP) and Water NSW bulk water costs.
- A service charge cost pass-through for SDP expansion costs.
- The Demand Volatility Adjustment Mechanism (DVAM) for managing differences between actual water sales and water demand forecasts.

7.1 We set prices to reward water efficiency in all periods

We consider it is fairer, and more cost reflective, for Sydney Water's customers to base their bills more on the amount of water they use and reduce fixed charges. This allows vulnerable customers to better manage their bills by controlling their water usage and provides a greater reward for customers who become more water efficient.

By increasing the non-drought water usage price from $2.16/kL to $2.35/kL we are able to reduce fixed water service prices from $96 to $40. This means most households will have lower water bills outside of drought periods, while still receiving a greater reward for saving water.

Increasing the water usage price does mean that high water users will pay more. This reflects that their usage brings forward the need to build water supply sources in the future, such as dams and desalination plants. Our modelling of Sydney's long-run marginal cost (LRMC) of water indicates the current water usage price is too low to encourage customers to make efficient decisions about their water use. We discuss why we consider Sydney Water's LRMC of water supports a higher water usage price in Appendix P.

The water usage price will also increase when water storage levels are low. This reflects the additional costs of supplying water during drought, and provides a stronger reward to customers for complying with water restrictions.

7.2 Water usage prices

The severe drought of 2017-19 brought into focus that our existing water usage pricing did not sufficiently encourage customers to manage their usage during drought, and did not reflect the value of water during drought. In the past, water restrictions in Sydney have lasted several years and have reduced demand by up to 17%.[49] This also resulted in large reductions in revenue for Sydney Water at a time when its costs are higher in managing drought.

We have introduced a dynamic water usage pricing mechanism as an equitable and cost reflective way to recover Sydney Water's additional costs for managing drought. Under this mechanism the water usage price will be higher when water storage levels are low.

In response to our Draft Report, Sydney Water supported our dynamic pricing approach, but proposed a lower water usage charge in drought and non-drought periods, and a higher fixed service charge. Some stakeholders supported our approach, but a number opposed dynamic pricing and instead proposed other approaches to water usage pricing. We discuss stakeholder feedback below.

We decided:

18 To set:

- A non-drought water usage price at $2.35/kL in 2020-21 and hold the price constant over the 2020 determination period (excluding inflation).
- A drought water usage price at $3.18/kL in 2020-21 and hold the price constant over the 2020 determination period (excluding inflation).

19 That the drought water usage price would commence 31 days after water storage levels fall below 60% and remain in place until 31 days after storage levels reach 70%.

20 To remove the current $0.13/kL uplift to the water usage price if SDP is operating.

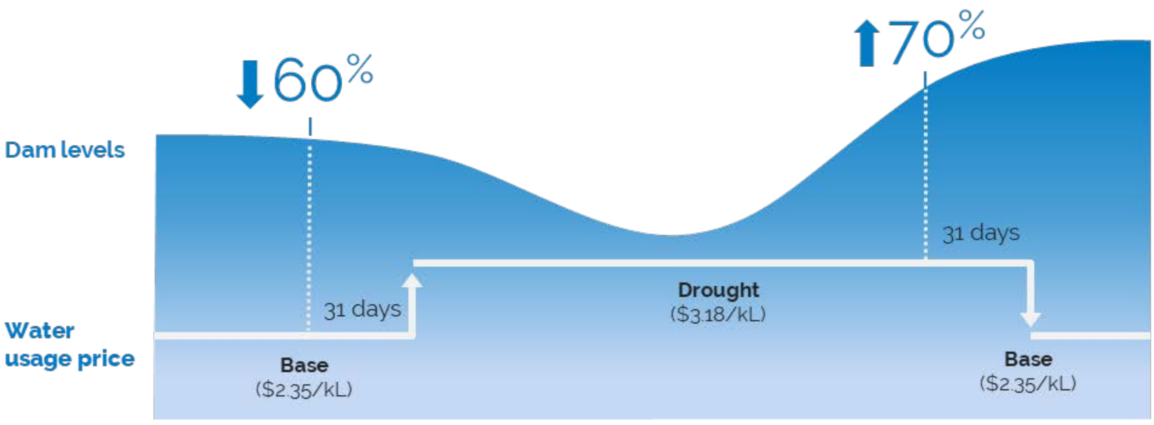
49 Atkins/Cardno, *Sydney Water Corporation Expenditure and Demand Forecast Review-Final Report*, 5 February 2020, Chapter 4.

7.2.1 How the dynamic pricing mechanism will work

Our dynamic pricing mechanism means that the water usage price varies between a non-drought price of $2.35/kL and a higher drought price of $3.18/kL, based on water storage levels.

Our final dynamic pricing mechanism is broadly the same as proposed in our Draft Report, except we have decided to change the trigger for starting and finishing drought pricing periods. We decided on a "rolling" trigger where the drought water usage price will apply from 31 days after dam levels fall below 60% and return to the base price 31 days after dams exceed 70% again, as shown in Figure 7.1.

Figure 7.1 Water usage prices change 31 days after dam level triggers



Source: IPART analysis.

These triggers have a number of key advantages:

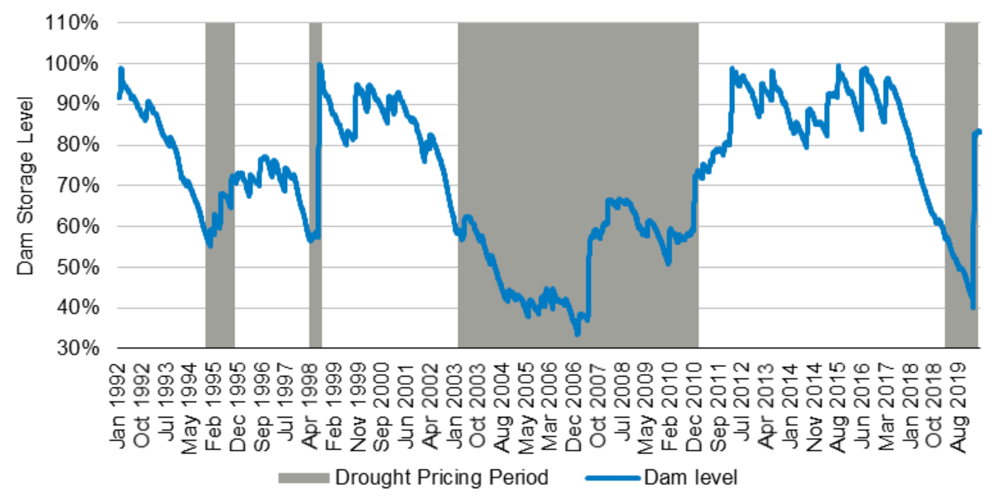
- The "on" and "off" triggers are asymmetric so only a significant increase in water storage levels will turn off the drought price. This will minimise price volatility due to small fluctuations in dam levels and ensure Sydney Water has greater certainty of its funding for drought management projects.
- The drought price only applies for a limited time and is closely related to dam levels to closely reflect Sydney Water's costs.
- By lagging the trigger by one month, Sydney Water is able to communicate with customers about price changes, which would provide a better opportunity for customers to adjust their behaviour.

We discuss alternative triggers and why we decided on a one-month implementation lag in Appendix M.

Historical analysis

To understand how the drought price could apply, Figure 7.2 shows what water usage price would have been in place over time based on Sydney Water's historical dam levels between 1992 and 2020. Our analysis indicates Sydney Water would have applied a drought price around a third of the time between 1992 and 2020. A large part of this would have been during the Millennium Drought period (2003-2010). During more typical dry periods the price increase would have applied for 3-12 months at a time.

Figure 7.2 Hind-cast of dynamic pricing on historical dam levels (Jan 1992- May 2020)



Note: Grey boxes indicate periods where a drought price would have applied if our new dynamic pricing mechanism was in place.

Data source: Water NSW.

7.2.2 Sydney Water supported dynamic pricing

In its November pricing proposal Sydney Water proposed a single water usage price with a series of service charge cost pass-throughs to manage additional drought costs. However, in response to our Draft Report, Sydney Water changed its position to support dynamic pricing.

Sydney Water considered the drought price would reflect costs relating to drought response activities and cover the expected impact of water restrictions on demand. It would also provide a fair and practical approach to dealing with the different cost drivers under drought and non-drought demand conditions and gives a signal to customers to help conserve water during drought.

Sydney Water also supported removing the SDP uplift in the usage charge and instead include expected costs from operating the plant to be included in the drought price. This further supports a clear drought pricing signal and is an easier message to communicate to customers.

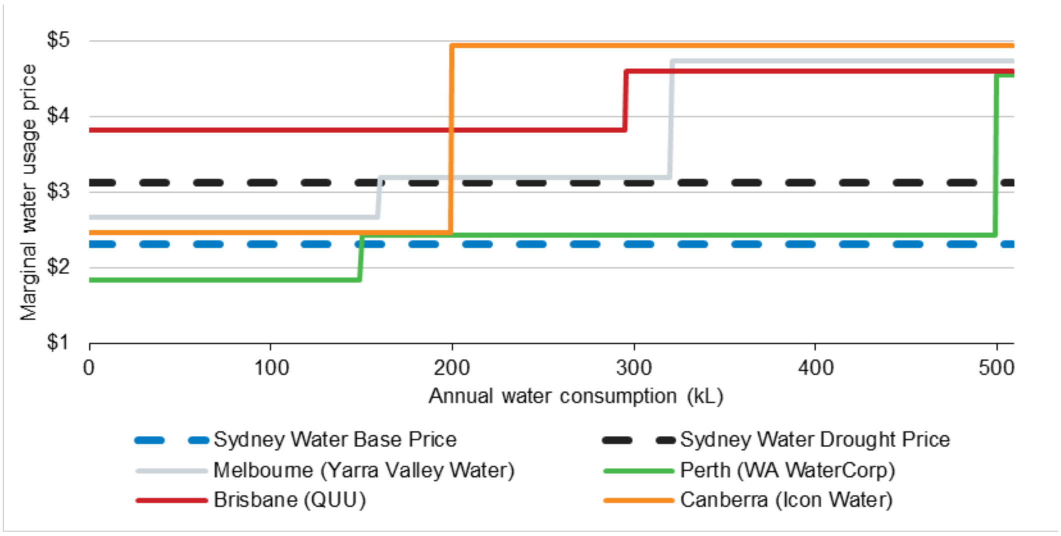
7.2.3 Some stakeholders strongly preferred an Inclining Block Tariff

We received a number of submissions to our Draft Report regarding the dynamic approach to water pricing. While there is strong agreement that the current pricing method needs updating, some submissions suggest that an Inclining Block Tariff (IBT) would be a better change than the one we have suggested.

Specifically, the Public Interest Advocacy Centre (PIAC), the Energy Water Ombudsman NSW (EWON) and Cate Faehrmann, a NSW Greens MP all supported an IBT over a dynamic price.

Under an IBT structure the water usage price a customer pays increases as they use more water. For example a customer could pay a lower per kilolitre price for the first 200 kilolitres per year, and then a higher per kilolitre price above that level. An IBT is designed to provide customers with an "essential" amount of water at a lower price, while penalising high water users with an increased marginal rate for what is assumed to be discretionary expenditure. Figure 7.3 compares IPART's proposed drought and non-drought prices with the water usage prices of other Australian utilities which use an IBT structure.

Figure 7.3 Water usage price structures of other Australian utilities ($2019-20)



Data source: Yarra Valley Water website https://www.yvw.com.au/help-advice/help-my-account/understand-my-bill/fees-and-charges, WA Water Corp website https://www.watercorporation.com.au/Help-and-advice/Bill-and-account/Rates-and-charges/Residential-water-use-charges-explained,
Queensland Urban Utilities website https://urbanutilities.com.au/residential/accounts-and-billing/water-and-sewerage-charges-2019-20, Icon Water website https://www.iconwater.com.au/~/media/2019-2020-water-and-sewerage-prices.pdf.

We did not agree with stakeholders that an IBT would be more equitable and efficient than our proposed dynamic pricing approach as discussed below. We have responded more fully to the specific arguments stakeholders have raised in Appendix L.

Drought pricing closely relates customer prices with Sydney Water's costs

Our dynamic pricing approach is designed to recover Sydney Water's additional costs during drought, as well as providing a price signal for the need to reduce water usage in the short-term.

Under a permanent IBT, the additional short-term costs of managing drought would need to be "averaged out" through the usage charge between drought and non-drought periods. It would be difficult to accurately forecast the frequency and length of future droughts, meaning we would likely end up over charging customers if drought does not eventuate. Under our drought pricing approach customers are charged only when we are in drought so prices more accurately reflect costs.

In addition, a permanent IBT does not account for the impact of water restrictions on discretionary water usage. For example under an IBT, a high use high income customer receives a greater economic reward per kilolitre from not filling their pool (which they would be required to do regardless of the price signal), than a low use, low income customer receives from taking a shorter shower.

Our pricing framework acknowledges and addresses climate uncertainty

If our climate is hotter and drier, and water storage storages are lower on average, drought prices will respond to the increased cost of providing water. But, if conditions are hotter and wetter, consumers would be protected from paying for unnecessary costs.

The IBT approach proposed by PIAC smooths the costs of drought, which involves making a forecast of future climate in the face of considerable uncertainty, and/or relying on historical relationships.

Our dynamic price is efficient

If calculated correctly, the long run marginal cost of water supply (LRMC) will signal the costs of supply meeting demand over the long-term, subject to the system's performance standards (ie, the acceptable frequency and duration of water restrictions).

We recognise, however, that estimating LRMC is inherently uncertain and imperfect, which is one of the reasons we are erring on the 'higher usage price side' and adding costs incurred during drought to the water usage price. As the costs of supplying water are higher during drought periods, we consider that it is efficient to recover these costs through a higher water usage price to provide a greater reward to customers who reduce their consumption.

Under an IBT, we cannot set two prices for water at the same time without making at least one of those prices inefficient. Importantly, we also cannot simply design an IBT for non-residential users without opening opportunities for arbitrage.

An IBT may disadvantage some vulnerable customers

Our analysis shows that household size, and not household income, has the largest impact on water use. This analysis suggests that large low income families could be disadvantaged by an inclining block tariff.

In its submission, EWON noted that during the Millennium Drought the NSW Government provided a family discount to compensate for the distributive impacts of the IBT.[50] We note that this approach could still be employed in combination with dynamic pricing if the Government wanted to do so.

Sydney Water proposed lower water usage prices and higher fixed charges

Sydney Water did not support our draft decision to increase the average weather usage price from $2.16/kL to $2.35/kL. Sydney Water considers that maintaining the current usage price of $2.16/kL is more efficient and equitable outcome for customers because it is:

- Consistent with the LRMC estimates we included in our Draft Report as well as its own analysis
- More consistent with the results of its customer research
- More equitable for some customers groups, as there are likely high hidden costs to a material price increase.

We did not agree with the analysis Sydney Water used to justify maintaining the current water usage price. We discuss Sydney Water's arguments further in Appendix P. But broadly we consider that:

- After adjusting for a number of limitations in Sydney Water's LRMC modelling, a water usage price of $2.35/kL is more cost reflective in the absence of more reliable estimates. In Box 7.1, we highlight some limitations of Sydney Water's LRMC estimates, and that we consider that Sydney Water should work closely with stakeholders (including IPART) to develop more robust estimates of LRMC.
- Sydney Water's customer research indicated customers had some willingness to pay a higher portion of their water bills through usage charges, to gain greater control over their bills, consistent with Sydney Water's proposed $2.93/kL drought price.
- Our analysis indicates the majority of households will benefit from a higher water usage charge and lower service charge. This price will also benefit small non-residential customers.

50 Energy and Water Ombudsman NSW submission to IPART Draft Report, 24 April 2020, p 3.

Box 7.1 Sydney Water should better understand its future supply needs

An accurate estimate of LRMC is essential for Sydney Water to set an efficient price signal to customers, and to inform its long-term planning decisions.

In reviewing Sydney Water's LRMC model, we identified the following limitations:

- Sydney Water had annuitized capital expenditure for supply augmentations using asset lives much longer than the simulation period, meaning a large proportion of future capital expenditure was not being recovered.
- Over the long term, Sydney Water projected water sales growth is around 30% lower than if it had simply projected water sales to grow at the same rate as in its four year forecast for the 2020 Determination Period. While not necessarily incorrect, we estimate that this ambitious demand forecast led to a significant reduction in LRMC (~$0.40/kL).
- The suite of augmentations Sydney Water used to estimate LRMC model was not sufficient to estimate the cost of supplying water in the long-term. The four supply augmentations it identified would only meet demand for 33 years using its demand forecast (and 29 years assuming the simple demand forecast described above).
- The estimation window began a number of years before the start of the 2020 Determination Period

As a next step, we consider that Sydney Water should work more closely with relevant stakeholders, including IPART and the Department of Planning, Industry and Environment, to develop robust, long-term supply options that inform its LRMC estimates, under a range of scenarios. This should include, at a minimum, scenarios that assume:

- average future conditions (including the "average" impact of climate change)
- drought conditions, and
- estimates that are based on current policy settings, and alternative policy settings which include the use of purified recycled water for drinking water.

7.2.4 The drought usage price reflects the increased costs of supplying water

Our drought water usage price and water sales forecasts are designed to recover Sydney Water's additional drought costs, and to account for the effect of water restrictions on demand, without locking in higher prices when Sydney is not in drought.

Sydney Water's drought costs have a number of different triggers including decreasing water storage levels, the implementation of water restrictions, and expansion of the Sydney Desalination Plant (Table 7.3).

In theory, a more cost-reflective pricing approach would be to apply a separate price uplift for each of these triggers. In practice, each of these individual uplifts would be small, (see Table 7.1), and would only provide a minor price signal to customers as to the short-term impact of their water usage.

Table 7.1 Sydney Water's proposed drought costs (excluding costs associated with expansion of SDP)

	Annual cost $millions	Trigger	Cost per unit of water supplied $/kL	Source
Water purchases from SDP	63	Dam storage below 60%	0.12	2017 IPART SDP determination
Water conservation projects based on the Economic Level of Water Conservation (ELWC)	33	Dam storage 40-50%	0.06	SWC November update
	53	Dam storage 30-40%	0.10	
	63	Dam storage below 30%	0.12	
Implementing water restrictions	15	Government implements restrictions	0.03	SWC November update
Water restrictions advertising and communications	10	Government implements restrictions	0.02	SWC November update
Drought management	2	Unclear	<0.01	SWC November update

Source: Sydney Water pricing proposal update, 12 November 2019 p 49.

How did we calculate the drought water usage price?

We calculated the drought water usage price by starting with the non-drought water usage price of $2.35/kL, and then:

- Added the efficient operating costs of responding to drought in Table 7.1,
- Reduced water sales forecasts by 15% to reflect the impact of water restrictions, and
- Included an adjustment to account for the demand response to the higher water usage price.

These result in a drought water usage price of $3.18/kL. We discuss our water sales forecasts further in Appendix N.

We have removed the existing SDP usage charge uplift

Our new drought price takes into account the additional usage charges Sydney Water has to pay to SDP while it is providing water.[51] Given our drought price trigger will align closely with the current operating rules for when Sydney Water receives water from SDP, Sydney Water will be able to recover its additional bulk water costs through the higher water usage price. We have therefore incorporated the existing $0.13/kL SDP uplift to the water usage charge into the new drought water usage price.

51 Under IPART's 2017 SDP price determination, from 1 July 2020, Sydney Water will be required to pay SDP $0.63 per kilolitre of water supplied. Currently SDP provides around 15% of Sydney's Water demand.

7.3 Water sales forecasts

We use water sales forecasts to estimate the amount of revenue that would be recovered from water usage charges. We have decided in this review to set two water sales forecasts, one for drought periods and one for non-drought periods.

To forecast the revenue that Sydney Water would recover from water usage prices, we accepted Sydney Water's proposed water sales forecasts, but we also applied a 1.7% reduction to account for the elasticity of demand as a result of the price increase. Further information on Sydney Water's demand forecasts, and how we estimated the elasticity of demand, is outlined in Appendix N.

Our drought water sales forecast accounted for the impact of water restrictions and our higher drought water usage price on demand. Based on these adjustments, under a drought scenario, we forecast water sales to be 16.9% lower than the equivalent year of the non-drought forecast.

We considered the impacts of COVID-19 on our water sales forecasts

We decided not to make any adjustments to our water sales and customer number forecasts to account for the impacts of the COVID-19 pandemic. Following the release of our Draft Report, we worked with Sydney Water to model the potential impacts of COVID-19 on international migration and business practices. Although there is considerable uncertainty, the impacts of COVID-19 on these numbers are within the range of forecasting errors observed over the 2016 period.

We decided:

21 To adopt the drought and non-drought water sales forecasts in Table 7.2 for the 2020 determination period.

Table 7.2 IPART water sales and demand forecasts for non-drought and drought scenarios (ML)

	Non-Drought					Drought			
	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Residential	381,797	379,563	384,361	389,105	395,025	312,978	316,937	320,852	325,737
Non-Residential	125,238	124,505	126,079	127,635	129,577	102,664	103,962	105,247	106,849
Unfiltered	1,812	1,807	1,807	1,807	1,812	1,807	1,807	1,807	1,812
Unmetered	3,704	3,694	3,694	3,694	3,704	3,103	3,103	3,103	3,112
Total water sales	512,550	509,569	515,941	522,241	530,118	420,551	425,809	431,008	437,509
Non-revenue	56,818	52,770	52,903	53,036	53,201	49,152	49,261	49,371	49,508
Total Demand	569,368	562,339	568,843	575,277	583,319	469,703	475,071	480,379	487,017

Source: Atkins/Cardno, *Sydney Water Corporation Expenditure and Demand Forecast Review-Final Report*, 5 February 2020, p 98-99.

7.4 Water service charges

By increasing the base water usage price, we have reduced the amount of revenue Sydney Water needs to recover from service charges. We have therefore decided to set the benchmark water service price to $39.90 a year ($57 a year lower than 2019-20), excluding inflation and the cost pass-throughs discussed below. This is a smaller reduction than we proposed in our Draft Report because of some changes in our positions on Sydney Water's proposed expenditure.

We decided:

22 To accept Sydney Water's forecasts of customer numbers in Table 7.3.

23 To set the water service charge for a 20mm meter at $39.90 a year in 2020-21 and hold this price constant over the 2020 determination period. Prices for larger meter sizes will be calculated by multiplying the 20mm price by a meter factor.[52]

Table 7.3 Water customer numbers

	2019-20	2020-21	2021-22	2022-23	2023-24
Residential individual meters	1,304,309	1,339,003	1,374,172	1,407,634	1,439,467
Residential shared meters	625,458	627,886	630,142	632,387	634,574
Non-residential	118,842	120,056	121,270	122,484	123,698
Total	**2,048,609**	**2,086,945**	**2,125,584**	**2,162,505**	**2,197,739**

Data Source: Sydney Water Annual Information Return to IPART, November 2019.

52 Non-residential service charges for larger water meter sizes are calculated as: (meter size in mm)^{2}x(20 mm meter price)/400.

In setting the water service charge, we have accepted Sydney Water's forecast of water customer numbers. Based on advice from our expenditure consultants, we have accepted Sydney Water's proposal for residential customer numbers to increase by around 1.9% a year and non-residential customers to increase by 1.1%, on average over the 2020 determination period. [53]

As we allocated the increased costs of supplying water under the drought scenario and the impact of lower water sales volumes to the water usage price, the revenue recovered from service charges is unchanged over drought and non-drought periods.

Sydney Water proposed an increase in the Water Service Charge

In its submission to our Draft Report, Sydney Water proposed a 12% increase in the water service charge to $108 a year.[54] This is mainly due to its preference to maintain the current water usage charge at $2.16/kL, as well as its higher proposed capital and operating expenditure.

7.5 Service charge cost pass-throughs

We have decided to include three cost pass-throughs to the water service charge:

- The existing cost pass-through to account for the difference between Sydney Water's actual and forecast costs of purchasing water from SDP. This formula would also accommodate any potential additional bulk water costs arising from an expansion of SDP.
- A new contingent cost pass-through for the efficient capital costs that Sydney Water would incur in upgrading its network to accommodate an expanded SDP, should the Government decide to expand SDP.
- The existing cost pass-through for Shoalhaven Transfer pumping costs that Sydney Water incurs from Water NSW.

These will be added to (or subtracted from) the base service charge in the year after costs are incurred.

SDP cost pass-through

We have decided to maintain the bulk water cost pass-throughs to true-up Sydney Water for the difference between forecast and actual bulk water costs from SDP and Water NSW Shoalhaven Transfers included in the 2016 Determination with minor amendments to reflect our new drought pricing triggers. The service charge cost pass-through mechanism will capture:

- differences in SDP's actual service charges (fixed costs) to Sydney Water, compared to our forecasts
- any forecast error in our estimate of the water usage charge adjustment, and

53 Atkins/Cardno, *Sydney Water Corporation Expenditure and Demand Forecast Review-Final Report*, 5 February 2020, pp 89-90.
54 Sydney Water submission to IPART Draft Report, 27 April 2020 p 69.

- any additional charges from SDP if the NSW Government decides to expand SDP during the 2020 determination period.

Water NSW cost pass-through

We have maintained the Water NSW service charge cost pass-through in the 2016 Determination. During periods of low water availability, Water NSW pumps water from dams in the Shoalhaven system to supply Sydney. As these costs are unpredictable, we consider it is appropriate for Sydney Water to pass-through these costs only when needed.

We have maintained the Water NSW cost pass-through mechanism for Shoalhaven Transfer pumping costs. The cost pass-through formula will pass-through the difference between Sydney Water's forecast bulk water costs and its actual bulk water costs from Water NSW as a result of Shoalhaven transfers to Sydney Water's water service charge in the following year.

As discussed in Appendix M, because we have decided to implement the dynamic prices on a rolling basis (rather than on a quarterly basis), we have made a minor adjustment to the mechanism we proposed in the Draft Report.

SDP expansion costs

If the NSW Government decides to expand the Sydney Desalination Plant during the 2020 determination period, we have decided to allow Sydney Water to recover its additional efficient costs through a cost pass-through to the water service charge. Specifically, Sydney Water can:

- recover additional direct payments to SDP (both additional fixed and bulk water charges) through the existing SDP bulk water cost pass-through (discussed above), and
- recover a portion of its capital costs for expanding its water distribution network to manage additional flows from SDP (remaining capital costs would be added to the water RAB and recovered from customers in future regulatory periods). This pass-through would increase water service charges by around $5 a year.

We decided:

24 To maintain the existing SDP service charge cost pass-through to true-up Sydney Water for the difference between forecast and actual payments to SDP.

25 To maintain the Water NSW cost pass-through mechanism from the 2016 Determination to recover Shoalhaven Transfer pumping costs.

26 To allow Sydney Water to recover the capital costs for expanding its network, if it is required to accommodate additional flows from an expanded SDP, via an annual cost pass-through to the water service charge as set out in Table 7.4.

   – The trigger for this cost pass-through would be the NSW Government deciding to expand SDP.

   – The cost pass-through would apply from the financial year following the decision.

   – At the end of the determination period, the depreciated value of these assets would be added to Sydney Water's RAB and recovered through the NRR.

Table 7.4 Cost pass-through for SDP network upgrade costs ($2020-21)

$ a year	2020-21	2021-22	2022-23	2023-24
Residential customers, and non-residential customers with 20mm meter	7.13	7.13	7.13	7.13

Note: Non-residential service charges for larger water meter sizes are calculated as: (meter size in mm)^{2}x(20 mm meter price)/400.

7.6 Demand volatility adjustment mechanism

The Demand Volatility Adjustment Mechanism (DVAM) rebalances Sydney Water's revenue if it over-recovers or under-recovers its revenue allowance due to a material difference between forecast and actual water sales.

Consistent with our draft decision, we have decided to reduce water prices by $18.4 million over the 2020 determination period to refund customers for higher than forecast water sales over the first three years of the 2016 determination period.

We have also accepted Sydney Water's proposal to calculate the DVAM on a one year lagged basis going forward. So at the next determination we will compare forecast and actual water sales over the period from 2019-20 to 2022-23 (the last year of the 2016 determination and the first three years of the 2020 determination). This ensures any adjustments are based on actual water sales.

We have decided to maintain the materiality threshold from the 2016 Determination, so an adjustment will only be considered if water sales exceed +/- 5% of forecasts.

To account for the dynamic pricing mechanism, we have decided to calculate the DVAM by comparing actual water sales to a composite water sales forecast which accounts for drought and non-drought pricing periods. To do this we have prepared monthly drought and non-drought water sales forecasts based on seasonality data. The composite forecast will be pro-rated between the drought and non-drought forecasts based on the number of days of drought pricing within each month.

We decided:

27 To reduce Sydney Water's NRR by $18.4 million over the 2020 determination period, to address the over-recovery of revenue by Sydney Water over the first three years of the 2016 determination period, due to a material difference between its forecast and actual water sales.

28 At the next determination of Sydney Water prices, to consider an adjustment to Sydney Water's NRR to account for over-recovery or under-recovery of revenue due to material differences between forecast water sales and actual water sales over the four years from 1 July 2019 to 30 June 2023.

- A material difference is defined as +/- 5% of forecast revenue from water sales over the four year period.
- Water sales forecasts for 2019-20 are the same as in IPART's 2016 final report.
- To use the daily water sales forecasts as set out in Table 7.5, for the 2020-21 to 2022-23 financial years. This would apply the drought, or non-drought, water sales

forecasts on a pro-rata basis, depending on the number of drought and non-drought pricing days in the month.

– Unfiltered water sales forecasts will be consistent between drought and non-drought periods.

Table 7.5 Daily Water Sales forecasts for non-drought and drought periods (ML)

	Non-Drought				Drought			
	2020-21	**2021-22**	**2022-23**	**2023-24**	**2021-22**	**2021-22**	**2022-23**	**2023-24**
Treated Water								
July	1,271	1,287	1,303	1,319	1,105	1,119	1,132	1,146
August	1,317	1,333	1,351	1,367	1,124	1,138	1,152	1,166
September	1,377	1,395	1,413	1,430	1,128	1,142	1,156	1,171
October	1,410	1,429	1,446	1,463	1,154	1,169	1,183	1,197
November	1,440	1,459	1,477	1,494	1,158	1,172	1,187	1,201
December	1,447	1,466	1,483	1,501	1,171	1,186	1,200	1,215
January	1,520	1,538	1,556	1,592	1,189	1,204	1,219	1,234
February	1,478	1,496	1,513	1,495	1,185	1,200	1,215	1,230
March	1,409	1,426	1,443	1,477	1,155	1,170	1,184	1,199
April	1,355	1,372	1,388	1,406	1,146	1,160	1,174	1,189
May	1,368	1,385	1,402	1,420	1,149	1,163	1,178	1,192
June	1,307	1,323	1,339	1,356	1,105	1,119	1,133	1,147
Unfiltered Water	5	5	5	5	5	5	5	5

Note: Water sales in the 2023-24 financial year will be considered in the DVAM calculation for the following period.
Data source: Sydney Water, IPART Analysis.

8 Wastewater prices

Currently, customers pay the following charges for wastewater services:

- Residential customers pay a fixed service charge, which includes an amount for a deemed volume of wastewater discharge.
- Non-residential customers pay a fixed service charge based on the size of their meter, and a per kL usage charge for any wastewater discharge above that of a residential customer.[55]

As summarised in Table 8.1, we have refined how wastewater prices would be set for the 2020 determination period. Our decisions are to:

- Maintain the current wastewater usage charge of $1.20/kL for the 2020 determination period (excluding inflation).
- Remove the 150kL deemed discharge allowance for non-residential customers and instead charge based on actual wastewater discharge. This will result in lower bills for around half of wastewater customers who discharge less than 150kL a year.
- Recover discretionary expenditure for diverting untreated wastewater discharges from Vaucluse-Diamond Bay by adding a new "discretionary services charge" that would be paid by all wastewater customers.
- Maintain a minimum wastewater bill for non-residential customers.

In this chapter, we also explain our view that the wastewater usage price should be set with reference to the long-run costs of providing these services (or LRMC).

As a result of our decisions on Sydney Water's efficient revenue requirement, and how wastewater prices are set, the wastewater charge for a typical residential customer would decrease by 13.6% in 2020-21, and then increase by the rate of inflation over the 2020 determination period.

55 Trade waste charges for non-residential customers with higher strength wastewater discharges are discussed in Chapter 12.

Table 8.1 IPART's wastewater prices ($2020-21)

	2019-20 ($2019-20)	2020-21	2021-22	2022-23	2023-24
Residential					
Residential service charge ($/year)	439.35	363.48	363.48	363.48	363.48
Deemed discharge allowance ($/year)	175.50	180	180	180	180
Discretionary service charge ($/year)		1.04	1.04	1.04	1.04
Non-Residential					
Non-residential service charge for a 20mm meter ($/year)[a]	585.80	484.64	484.64	484.64	484.64
Deemed discharge allowance ($/year)	175.50	0	0	0	0
Wastewater usage charge ($/kL)	1.17	1.20	1.20	1.20	1.20
Discretionary service charge for a 20mm meter ($/year)[a]		1.39	1.39	1.39	1.39

[a] Service charge for 100% sewerage discharge factor. Non-residential customers also pay for usage based on their metered discharge.

Note: The non-residential service charge and discretionary service charge for larger water meter sizes is calculated as: (meter size in mm)^{2}x(20 mm meter price)/400x discharge factor.

Source: Sydney Water November update to its 1 July 2019 pricing proposal and IPART modelling.

We decided:

29 To maintain the wastewater usage charge at $1.20/kL (in $20-21).

30 To set the residential wastewater service charge as set out in Table 8.1.

31 To set a deemed residential wastewater usage allowance equal to the wastewater usage charge for 150kL deemed wastewater discharge.

32 To set a non-residential wastewater service charge as set out in Table 8.1, based on the relevant meter size multiplied by the customer's sewerage discharge factor.

33 To remove the discharge allowance component of the wastewater service charge for non-residential customers and instead apply the usage charge to all deemed wastewater discharge.[56]

34 To set a minimum service charge for a non-residential meter equal to the residential service charge.

56 Deemed wastewater discharge is a customer's water usage multiplied by their sewerage discharge factor.

Table 8.2 Comparison of existing and new wastewater price structures

	Residential customers		Non-residential customers	
	Current	**Decision**	**Current**	**Decision**
Wastewater service charge	Single charge equal to 75% of the 20mm meter charge	Unchanged	Meter size charge multiplied by sewerage discharge factor	Unchanged
Deemed discharge allowance (included in service charge)	Usage charge for 150kL deemed discharge	Unchanged	Usage charge for 150kL deemed discharge	Remove deemed allowance
Discretionary service charge	N/A	Fixed charge per customer	N/A	Meter sized charge multiplied by sewerage discharge factor
Wastewater usage charge	Do not pay usage charges	Unchanged	Metered discharge[a] above 150kL multiplied by wastewater usage price	All metered discharge[a] multiplied by wastewater usage price
Minimum wastewater bill	Bill is the same for all customers	Unchanged	Residential service charge plus the deemed discharge allowance	Residential service charge

a Metered discharge here is equal to a customers metered water usage multiplied by the customer's sewerage discharge factor.

8.1 Wastewater usage charge

Currently, all customers pay a deemed usage charge, based on the cost of 150kL of wastewater discharged.

An explicit wastewater usage charge applies only to non-residential customers who discharge above this amount. These customers pay a wastewater usage charge per kilolitre of the estimated volume of domestic strength waste[57] they discharge into the wastewater system.

As discussed in Section 8.2, we are removing the non-residential deemed discharge allowance, and instead charging non-residential customers only for an estimate of their metered discharge. This will mean a bill decrease for approximately half of non-residential customers, providing bill relief particularly in the short-term for businesses that are impacted by COVID-19 shutdowns. Wastewater usage charges would remain unchanged for the other half of non-residential customers with wastewater discharges above the discharge allowance.

57 The costs of higher strength discharges are recovered through liquid trade waste prices, which are levied on non-residential customers in addition to standard wastewater charges.

The wastewater usage price is currently $1.17/kL. For the 2020 determination period, Sydney Water proposed reducing water usage charges to $0.61/kL to reflect the short-run marginal cost (SRMC) of providing wastewater services. However, we have decided to maintain the current wastewater usage price over the 2020 determination period (excluding inflation), as:

- Our preference is to base the wastewater usage price on the LRMC of providing wastewater services, and
- We would like Sydney Water to develop a better understanding of its long-run marginal cost (LRMC) for providing wastewater services, before we decide to change the wastewater usage price.

Table 8.3 Wastewater usage charge ($2020-21)

	2020-21	2021-22	2022-23	2023-24
Sydney Water proposed	0.62	0.62	0.62	0.62
IPART price	1.20	1.20	1.20	1.20

Source: Sydney Water, *12 November update p 70* and IPART analysis.

IPART's view on LRMC pricing has changed over time

In our 2012 review of price structures for metropolitan utilities, we decided that wastewater usage charges should be set with reference to (but necessarily at) the short run marginal cost (SRMC) of transporting, treating and disposing of domestic strength effluent. We argued that SRMC is more applicable for non-residential sewerage pricing since the current sewerage systems are based around individual sewerage plants that are not interconnected.

In our 2016 Sydney Water price review, we indicated that there were various arguments for and against SRMC versus LRMC pricing. Sydney Water agreed that LRMC was a relevant concern given ongoing population growth and the need for additional infrastructure.[58]

More recently, as part of our 2019 Central Coast Council water price review, we indicated that the LRMC of supplying wastewater services is a more appropriate basis for setting wastewater usage prices, and this is our current thinking.[59]

LRMC is a more appropriate basis for setting wastewater usage prices

We consider the LRMC of supplying wastewater services is a more appropriate basis for setting wastewater usage prices. This is because the LRMC includes both the short-term operating costs, and the long-term capital costs, associated with an additional unit of wastewater discharge.

Setting wastewater usage prices with reference to LRMC has the following potential benefits. It provides a more efficient price signal, particularly to large non-residential customers, who can adjust their consumption and investment decisions. LRMC would encourage competition, as it would inform the value of any avoided costs for private-sector wastewater or recycled water schemes. This, in turn, could promote the viability of recycled water schemes,

58 IPART, *Review of Prices for Sydney Water Corporation from 1 July 2016*, Final Report p 161.

59 IPART, *Review of Central Coast Council's water, sewerage and stormwater prices*, Final Report, May 2019, p 105.

particularly if separate LRMCs are estimated for each catchment area of Sydney Water's network.

We estimated LRMC of Sydney Water's wastewater catchments

Sydney Water's planning documents indicate it anticipates considerable capital investment in many of its wastewater catchments as a result of population growth. Based on these documents, we developed LRMC estimates for 18 of Sydney Water's 27 wastewater catchments. These estimates included short-run costs such as treatment and transport as well as long-run capital costs.

Sydney Water's wastewater catchments are determined by geography and therefore vary considerably in size, treatment technology, and future growth projections. This is reflected in our LRMC estimates, which ranged from \$0.82/kL for the Cronulla catchment to \$16.71/kL for the small Bombo catchment south of Wollongong. The average LRMC across all catchments is \$3.53/kL, noting this is heavily weighted towards Sydney Water's three largest catchments: Malabar and North Head, and Bondi (Table 8.4). We also note that our estimates of SRMC, by catchment, also varied considerably. A full list of our estimates and a map of Sydney Water's wastewater catchments is at Appendix P.

Table 8.4 Comparing wastewater LRMC estimates for large catchments and the network as a whole (\$2020-21)

	Dry weather flow GL/yr	LRMC \$/kL	Short-run operating costs \$/kL
Bondi	44.5	1.48	0.62
Malabar	165.3	2.89	0.45
North Head	119.7	3.63	0.50
Other catchments	115.8	5.15[a]	0.93[a]
All catchments	**445.4**	**3.53**	**0.60**

a Average across all other 15 catchments weighted by dry weather flows.

Note: LRMC estimates include forecast capital augmentations to address growth and an estimate of operating costs for treatment and transport. The values here are somewhat higher than in the Draft Report as we have calculated them using the pre-tax real WACC of 4.2%.

Source: IPART analysis of Sydney Water data.

Our analysis of these LRMC estimates indicates that:

- The estimates are generally lower for the large ocean outfall catchments in eastern and southern Sydney than for smaller catchments in western and northern Sydney, and the South Coast region.
- Catchments experiencing rapid population growth such as West Camden and Riverstone have very high LRMC estimates. This reflects the high cost of constructing new treatment capacity (compared to amplifying capacity at an existing treatment plant in an established catchment area).
- LRMC was generally higher in inland catchments with secondary and tertiary treatment than those with primary treatment. This is because the costs of secondary and tertiary treatment – including future capital costs – are typically higher. With that said, some tertiary treatment catchments without significant augmentation needs, such as Cronulla and Quakers Hill, had low LRMC estimates.

- Meeting environmental standards are a potential driver of future costs in some catchments, especially wet weather overflows and Hawkesbury-Nepean discharge targets.

We would like to work with Sydney Water to improve these estimates to develop a better understanding of Sydney Water's actual cost drivers. These by-catchment LRMC estimates could also provide a unit basis of the avoided costs that could be achieved by recycled water schemes.

Sydney Water opposed using LRMC to set the wastewater usage price

As we noted in our Issues Paper and Draft Report, Sydney Water proposed reducing the wastewater usage price by 48% to more closely reflect SRMC. In response to our Issues Paper Sydney Water stated that it supports pricing based on LRMC in principle; however, in practice LRMC is not an appropriate basis at the present time. Specifically it considered SRMC was:

- Well understood and administratively simple.
- Is likely to be more stable than LRMC.
- Is more efficient relative to a poorly calculated LRMC.

It considered there was not sufficient information to create accurate estimates of future capital needs across so many catchments and argued an inaccurate estimate could lead to inefficient pricing outcomes. It argued the need for a postage stamp price across all catchments would mean a wastewater usage price set with reference to LRMC would be too high in low cost catchments and far too low high cost catchments. It considered this would lead to "inefficient-bypass" in low cost catchments, where customers could invest excessively in on-site recycling, or other technologies to reduce discharge and strand otherwise efficient Sydney Water assets.

Sydney Water also acknowledged a too low wastewater usage charge could lead to underinvestment. However, it argued this could be mitigated through other mechanisms such as its new Operating Licence requirement to report current and projected capacity constraints which could assist private utilities to identify opportunities for market entry.

Sydney Water also noted that given wastewater usage is particularly inelastic, an increase in the wastewater usage charge may not have a large impact on behaviour.

In response to our Draft Report Sydney Water reiterated its preference for SRMC based costs. It acknowledged there are costs and benefits to both approaches, but considered that SRMC provides a better price signal as the main driver of wastewater system cost is pollutant load (a short run cost), rather than volume (a long run cost). It again expressed its concern that there is insufficient information to create accurate LRMC estimates, and that an early, inaccurate signal could lead to worse customer outcomes. Box 8.1 summarises Sydney Water's feedback to our estimates of wastewater LRMC by catchment.

Box 5 Modelling issues related to estimating wastewater LRMC

Sydney Water provided a detailed response to our wastewater LRMC estimates. It argued that various aspects of our approach have led to us to materially overestimate some short-run and long-run costs. The two major concerns raised by Sydney Water are summarised in this box, along with our response.

More broadly, as emphasised in our Draft Report, we welcome any improvements to our LRMC estimates from Sydney Water, and are keen to continue working with Sydney Water to develop more accurate estimates.

Volume-driven vs. load-driven costs

Sydney Water argues pollutant load, rather than wastewater volumes, drive the majority of its wastewater operating costs and a large proportion of its capital costs. Sydney Water appears to have therefore proposed excluding load-based costs altogether from a volume based calculation. We agree that pollutant load is the main cost driver, but are not necessarily convinced that volume is an unsuitable proxy for pollutant load. In particular, we already use volume as an estimate of pollutant load in setting trade-waste prices for commercial customers.

By definition, the load of a pollutant entering a constraint point in a wastewater network, such as a treatment plant, is equal to the pollutant concentration in the influent wastewater multiplied by the volume of wastewater passing that point. During dry weather we can assume that load entering the plant, will equal the sum of the load produced by all customers. We also assume when we set the wastewater usage charge, that the concentration of wastewater is the same for all customers. If this holds, the load produced by a customer would be directly proportional to the volume produced.

Peak flows vs. average flows

Sydney Water has raised the important point that many costs in the wastewater system, including the sizing and re-sizing of pipes and pumps are determined by peak wet weather flows, rather than dry weather flows. This is because stormwater infiltration accounts for two thirds or more of peak wet weather flows.

Sydney Water therefore argues that an increase in wastewater flows (ie, dry weather flow), only accounts for some of the augmentation costs and it would not be efficient to signal to the customer the full cost of expanding the asset to overcome a capacity constraint. Sydney Water argues in these circumstances it would be more appropriate to calculate LRMC based on changes in peak weather flows rather than average dry weather flows.

We acknowledge this point, and we suggest that Sydney Water could develop LRMC estimates that separate the impact of wet weather flows, and customer demand, on future augmentation costs.

With that said, we also note that under IPART's cost allocation method, we aim to assign costs (eg, Sydney Water's costs wastewater expansion costs) to the "impactor": the party responsible for the costs being incurred. In the case of a wastewater capacity expansion, the impactor is of course the discharge produced by wastewater customers (ie, dry weather flows). The fact that assets need to be oversized to manage additional peak wet weather flows is a design constraint, which doesn't take away from the fact that the underlying driver of costs is growing customer demand. Therefore, on a cost allocation basis, the customer could still pay the full cost of their discharge including the cost of managing stormwater infiltration.

Source: Sydney Water, *Response to IPART's Draft Report and Determination*, 27 April 2020, Appendix D.

Notwithstanding its concerns, Sydney Water supports a broader price review for both water and wastewater services, and plans to engage closely with IPART on this.

A lower wastewater usage price does not address Sydney Water's concerns

We consider Sydney Water's concerns around the accuracy of LRMC pricing can be overcome with better information and do not justify a *lowering* of the wastewater usage charge. In our Issues Paper, we addressed many of barriers Sydney Water identified for setting wastewater charges[60] and we consider LRMC pricing is preferable in the future.

The majority of Sydney Water's existing customer base, and a large proportion of growth, is contained within its Malabar and North Head catchment areas. A postage stamp LRMC estimate would be fairly close to the estimates for these two areas. Our LRMC analysis indicates the Bondi catchment is the only catchment with a large number of non-residential customers and an LRMC estimate that is significantly less than the weighted average - and therefore the only catchment with the risk of inefficient bypass. Conversely, LRMC estimates in "growth" catchment areas have LRMC estimates that are at, or above, the average system costs.

Residential customers' wastewater discharges are fairly inelastic, however, this is largely irrelevant as their bills are effectively fixed, regardless of the wastewater usage price. Lowering the wastewater usage price provides even less incentive for large non-residential customers to minimise their wastewater discharge, and these are the only customers with significant scope to curb their discharges to delay augmentation costs in most catchments.

Stakeholder submissions were mixed

Stakeholders provided mixed feedback on how wastewater usage prices should be set.

Flow Systems supported moving towards setting wastewater usage prices with reference to the LRMC of wastewater servicing, due to longer term capital spending being critical to ecologically sustainable wastewater treatment capacity.[61] It argued that Sydney Water's concern of 'inefficient bypass' is overstated because it is customer demand, rather than minor cost differences, that drives decisions about the location of recycled water.

Open Cities expressed a preference for a greater proportion of costs to be recovered from usage prices, to recognise usage and discharge reductions and efficiencies achieved by customers of recycled water utilities. PIAC, and Professor Peter Coombes, also supported setting explicit usage prices for residential customers.

With respect to setting an explicit wastewater usage price for residential customers, we agree with the analysis of the Productivity Commission, which did not support a wastewater usage price to send price signals to residential customers. It noted:

> ….it is unlikely that demand for domestic sewage services can be influenced by price to the same degree as demand for water overall, given that households have less scope to adjust their use of indoor (as opposed to outdoor) water in response to price changes, which is what determines wastewater production.[62]

60 IPART issues paper pp 98-100.
61 Flow systems, Submission 24 April 2020, p2.
62 PC 2011, *Australia's Urban Water Sector*, p 143

We consider that setting the wastewater usage price with reference to a robust estimate of LRMC, would promote efficient consumption and investment decisions by non-residential customers, and encourage the efficient entry of private sector schemes into the market.

We plan to work with Sydney Water to develop these robust estimates, and will consider how to implement findings from this process as part of our upcoming Regulatory Review.

8.2 Wastewater service charge

We have made some changes to the wastewater service prices. Specifically, we have decided to:

- Remove the deemed wastewater discharge allowance for non-residential customers to make prices more cost reflective for small non-residential customers.
- Continue to apply a sewerage discharge factor when setting the service price for non-residential customers.
- Maintain the current 150kL discharge allowance for all residential customers
- Maintain a minimum charge for non-residential customers, equal to the residential service charge.
- Include a separate service charge to recover the costs of the Vaucluse Diamond Bay project.

8.2.1 Sydney Water proposed increasing wastewater service charges

Sydney Water proposed increasing the wastewater service charge by 7%. However, because the wastewater usage charge would be lower, the net result is that the total wastewater charge would be lower, as shown in Table 8.5.

Our decision is to maintain the wastewater usage price and eliminate the deemed allowance for non-residential customers, resulting in lower fixed charges, especially for non-residential customers.

Table 8.5 Comparison of Sydney Water's proposed and IPART's wastewater fixed charges for 2020-21 ($2020-21)

		Sydney Water proposal	IPART decision
	2019-20 ($2019-20)	2020-21	2020-21
Residential			
Wastewater service charge ($/year)	439.35	508.06	363.48
Deemed usage charge ($/year)	175.50	93.51	180
Total	**614.85**	**601.57**	**542.84**
Non-Residential			
Wastewater service charge for 20 mm meter ($/year)[a]	585.80	677.40	484.64
Deemed usage charge ($/year)	175.50	0.00	0.00
Total	**761.30**	**677.40**	**484.64**

[a] Assumes a 100% sewerage discharge factor.

Source: Sydney Water November 2019 update, IPART analysis

8.2.2 Removing the deemed wastewater allowance for non-residential customers

Currently all residential and non-residential customers' bills include a deemed wastewater allowance equal to the wastewater usage charge for 150kL of discharge. Non-residential customers are then charged explicitly for wastewater discharges in excess of 150kL. We have decided to remove this allowance for non-residential customers in the 2020 determination period and instead charge non-residential customers only for their actual usage. This will result in lower usage charges for the around half of non-residential customers (that discharge less than 150kL).

We will, however, maintain the 150kL discharge allowance for residential customers. This is because residential wastewater discharges tend to be more predictable than non-residential customers and 150kL is a reasonable estimate for typical discharge for a residential customer. It is also more difficult to relate water usage and wastewater discharge for residential customers given the considerably different levels of outdoor usage between residential customers. Non-residential customers can more closely relate their water usage and wastewater discharge by requesting Sydney Water to review their discharge factor.

Making wastewater prices more cost-reflective

In our 2019 Central Coast Council Price Determination, we removed the discharge allowance from non-residential customers' service charge as we considered that non-residential customers' wastewater prices will be more transparent and cost reflective if they are based on all discharges (calculated as metered water usage multiplied by the relevant discharge factor).[63]

There are pros and cons to removing the deemed allowance. On the one hand:

- Non-residential customers who discharge less than the discharge allowance that we set would face more 'cost-reflective' bills. This is likely to apply to a significant number of customers, and will provide bill relief particularly for those currently negatively impacted or closed due to COVID-19.
- It would overcome the quarterly billing issue in the current arrangement whereby non-residential customers with seasonal businesses pay for usage above their allowance quarterly, even when they do not exceed the allowance over the year.
- Removing deemed discharge is a step towards more usage based pricing, which is consistent with our intention to move toward LRMC-based usage pricing for wastewater.

On the other hand, it will introduce inequity between residential and non-residential customers as residential customers who discharge less than 150kL of wastewater would pay the full allowance while non-residential customers would not.

There would also be a small decrease in revenue recovered for non-residential discharges which will be recovered through higher meter connection (service) charges, mostly from residential customers. We estimate wastewater service charges are about 1% a year higher as a result of this change.

On balance, our decision is to remove the deemed wastewater component for non-residential customers as it is a move towards more cost reflective prices, albeit only for one segment of the customer base.

In its submission on the Draft Report, Sydney Water was supportive of this decision, however requested a one-year implementation delay to communicate the change to customers.

We considered this request, however have decided to implement the change from 1 July 2020 (the beginning of the determination period) for two reasons:

- Affected customers will be receiving a bill reduction, so it is unlikely that Sydney Water will get many enquiries about the change. We do not think a year is required to notify customers of a bill decrease.
- This change will provide bill relief for customers discharging less than the allowance now. We consider this particularly important in the current COVID-19 climate, where many small businesses have closed their doors, and so are not discharging much (if anything) to the wastewater system.

63 IPART, *Review of Central Coast council's water, sewerage and stormwater price to apply from 1 July 2019*, Final Report, May 2019, p 102.

8.2.3 Continue to use discharge factors when setting wastewater service prices

The discharge factor measures the percentage of a customer's water consumption that is discharged to the wastewater network. They effectively convert the size of a water meter to a wastewater meter (for meter-based service charges) and to estimate wastewater discharge volumes (to apply wastewater usage charges). Discharge factors are used because, unlike water consumption, wastewater discharges are often not separately metered.

Frontier Economics, in its 2018 report on the regulatory barriers to water recycling,[64] recommended that IPART consider the merits of removing the discharge factor applying to wastewater service charges, arguing that most of the costs in the wastewater network are sunk. By contrast, Sydney Water is in favour of retaining discharge factors.

Our decision is to continue to use discharge factors to set wastewater prices, because:

- A customer's discharge factor reflects its potential peak load on the wastewater system, and this is the principle on which we allocate the fixed costs across customers.
- Neither Sydney Water nor Hunter Water proposed a change to the status quo.
- There would be a significant price impact on non-residential customers with low discharge factors, without a clear rationale for making this change. If we removed discharge factors, we estimated that nearly 5%of non-residential customers – over 3,000 customers – would see a bill increase of over 50%. Furthermore, 1% of customers would see their bill at least double.

8.2.4 Maintaining the same wastewater service charge for houses and apartments

We have decided to maintain the same deemed discharge allowance for residential houses and apartments.

Sydney Water provided analysis which suggested that, based on the current discharge allowance, a typical house would have an effective discharge factor of 68% and an apartment would be 94%.[65] Sydney Water argued this is reasonable given the different water use characteristics of houses and apartments. That is, that apartments discharge a larger portion of their water into the wastewater system compared to houses, which use more water on pools and gardens that does not enter the wastewater system.

After analysing data provided by Sydney Water, as well as the IPART household survey, we consider that there is not strong evidence for setting different discharge allowances for houses and apartments, given their differing water usage characteristics.

64 Frontier Economics, *Economic regulatory barriers to cost-effective water recycling*, July 2018, p 75. (See link)

65 The discharge factor is the deemed ratio of wastewater discharge to water usage for a property. For comparison, Sydney Water's default discharge factor for calculating non-residential wastewater usage charges is 78%. See Sydney Water, Pricing proposal to IPART, July 2019, Attachment 4, p 31.

8.2.5 Maintain a minimum charge for non-residential customers

We currently set a minimum wastewater service charge for non-residential customers. This is set so that the service charges for each non-residential meter is no less than the standard residential charge (ie, 75% of the 20mm service charge plus the deemed discharge allowance). Without a minimum charge, some non-residential customers with a low discharge factor could pay significantly less than residential customers.

We decided to retain a minimum charge, but to adjust it so that the minimum charge is equal to the residential service charge only. This is because we have decided to remove the discharge allowance from non-residential customers' bills. Without making a symmetric adjustment to the minimum charge, some non-residential customers who consume less than the discharge allowance would, in effect, be charged the entire discharge allowance through the minimum charge.

Sydney Water did not support this change in its submission, because the change to the minimum charge cannot be applied to unmetered properties, or non-residential customers in mixed-multi developments (because of a lack of data). However, we consider that we should make bills more cost reflective bills for the non-residential customers who consume less the discharge allowance. More information on unmetered properties and mixed-multi developments can be found in Chapter 12.

8.2.6 The wastewater service charge includes discretionary expenditure on the Vaucluse-Diamond Bay project

Sydney Water proposed to upgrade its wastewater system at Vaucluse-Diamond Bay to stop the daily release of untreated wastewater from three cliff-face outfalls during dry weather.

As discussed in Chapter 10, our decision is to allow Sydney Water to recover these costs of this project from all of its wastewater customers. We decided to recover the costs of the Vaucluse-Diamond Bay project through a specific discretionary services component of the wastewater service charge. This charge would be $1.04 a year ($2020-21) for all residential customers.

Our draft decision was that the non-residential charge would not multiplied by the sewerage discharge factor. However, Sydney Water noted that this generates an implementation issue. Our draft decision required a change in Sydney Water's billing system that would cost more than the amount to be recovered from the change. Therefore, we have decided that non-residential customers would pay a meter-based charge, multiplied by their sewerage discharge factor, set with reference to a $1.39 a year charge for a customer with a 20mm meter and 100% discharge factor.

While we have a separate charge to recover the forecast cost of this project, Sydney Water has decided not to list this charge as a separate line item on the bill, for simplicity. Instead, Sydney Water proposes to communicate the progress of this project to customers annually by sending an insert with water bills, updating a webpage on the Sydney Water website and including a line on bills directing customers to this webpage. We support this decision.

8.3 Billable wastewater volumes and customer numbers

We use forecast billable wastewater volumes[66] and wastewater customer numbers to set wastewater service charges, specifically:

1. We multiply forecast billable wastewater volumes by the wastewater usage charge to estimate the share of the wastewater NRR recovered from usage charges, and then
2. Divide the remainder of the wastewater NRR by the forecast number of wastewater customers[67] to calculate the wastewater service charge.

Sydney Water has forecast a 1.7% annual increase in residential customers and a 0.6% annual increase in non-residential customers. Our expenditure review consultants, Atkins, reviewed Sydney Water's proposed customer numbers. Following their review, we have accepted Sydney Water's proposed wastewater customer numbers for the 2020 determination period.

We forecast that billable wastewater volumes will increase by 11% from 2019-20 to 2020-21, primarily as a result of our decision to remove the deemed discharge allowance for non-residential customers.[68] We then forecast billable volumes to increase by around 0.2% a year over the 2020 determination period, consistent with forecast growth in non-residential customers.

As show in Table 8.6, we calculated our billable wastewater volumes by accepting Sydney Water's forecast increases, which are based on the predicted increase in customer numbers. We then adjusted the forecasts to account for the increase in billable wastewater usage due to our decision to remove the 150kL deemed discharge allowance for non-residential customers.

Table 8.6 Build-up of IPART's billable wastewater volumes (ML)

	2019-20	2020-21	2021-22	2022-23	2023-24
Sydney Water forecast	80,110	80,177	80,267	80,430	80,578
Plus estimate of wastewater volumes covered by the deemed volume		8,536	8,519	8,519	8,519
IPART forecast		88,713	88,806	88,949	89,096

Note: We estimate the average discharges for customers who currently discharge less than the current allowance is 52kL per customer.

Source: IPART analysis of Sydney Water data.

66 Billable wastewater is wastewater discharged by non-residential customers on which the wastewater usage charge applies.

67 Customers here means the number of residential customers plus the number of non-residential 20mm equivalent meters (ie, larger non-residential meters count as more than one 20mm equivalent).

68 Previously, discharges of less than 150kL a year were not explicitly “billable” even though customers still implicitly paid the usage price for these discharges through the discharge allowance.

9 Stormwater drainage prices

Sydney Water provides stormwater services to around 600,000 customers, who are within its stormwater catchment areas.[69] We set stormwater charges for all residential and non-residential customers in these stormwater catchments. We also set separate stormwater charges for customers in the Rouse Hill stormwater catchment.

Our decision is to maintain the way we set stormwater prices.

- **Residential customers** would pay a fixed charge which is higher for houses than apartments.
- **Non-residential customers** would be charged based on their land area. Non-residential customers in multi-unit buildings pay the same rate as residential apartments.
- Customers which make a small contribution to stormwater loads would be eligible a **low impact** rate.

Under these decisions, stormwater prices would fall by 2.8% in 2020-21 and then remain constant over the 2020 determination period (excluding inflation).

We have also accepted Sydney Water's proposed price reductions for Rouse Hill stormwater customers.

9.1 Stormwater prices

We decided:

35 To set the charges in Table 9.1 for Sydney Water customers in declared stormwater catchments.

69 Sydney Water submission to IPART Draft Report, p87.

Table 9.1 IPART's stormwater drainage charges ($2020-21)

$ per annum	2019-20 ($2019-20)	2020-21	2021-22	2022-23	2023-24
Residential					
Unit/Low impact	24.62	23.94	23.94	23.94	23.94
Stand-alone house	78.88	76.70	76.70	76.70	76.70
Non-Residential					
Multi-premise/Small (<200 m^2)	24.62	23.94	23.94	23.94	23.94
Low impact/Medium (201-1,000 m^2)	78.88	76.70	76.70	76.70	76.70
Large (1,001 - 10,000 m^2)	459.67	447.00	447.00	447.00	447.00
Very Large (10,001 - 45,000 m^2)	2,043.03	1,986.57	1,986.57	1,986.57	1,986.57
Largest (>45,000 m^2)	5,107.59	4,966.43	4,966.43	4,966.43	4,966.43
Vacant Land					
Vacant Land	78.88	76.71	76.71	76.71	76.71
Low Impact assessed Vacant Land	24.62	23.94	23.94	23.94	23.94
All customers					
Waterways Health Improvement Program	0.00	0.85	0.85	0.85	0.85

Source: Sydney Water pricing proposal, November 2019, p 102, Atkins/Cardno, IPART analysis.

In its July 2019 initial price proposal, Sydney Water proposed increasing stormwater prices by 8%. Sydney Water attributed this increase to higher capital expenditure for managing deteriorating assets and its new Waterways Health Program. In its November 2019 price update, this increase was revised to a smaller price increase of 2.7% compared to 2019-20 prices, due to lower interest rates and minor changes to proposed stormwater expenditure.

Our decision is to set Sydney Water's stormwater prices 2.8% lower than current prices, and then increase these prices by the rate of inflation over the 2020 period. This reflects the recommendations of our expenditure review consultants (Atkins), which are discussed in Chapters 3 and 4, as well as our decisions on the WACC, discussed in Chapter 5.

9.1.1 We are maintaining constrained area pricing

Our decision is to maintain the current 'constrained area-based' approach for setting non-residential stormwater prices. Under this approach, larger properties pay higher stormwater charges overall, but the charge per m^2 is relatively lower compared smaller properties, which pay proportionally more per m^2 than larger properties.

We have decided to maintain the current approach and general price structure for setting Sydney Water's stormwater charges, as:

- We consider that prices should be cost-reflective and reflect an impactor pays approach (whereby the party that created the need to incur the cost pays). A property's land area is a reasonable and readily available proxy for the costs that each property imposes on the stormwater system.

- It recognises that land area is a key cost driver, but not the only cost driver, of stormwater costs. A variety of factors determine each property's contribution to the stormwater system, such as land size and slope, vegetation or proportion of impervious area, land use, soil type, on-site retention and reuse and property management.
- We consider that continuing to charge on a constrained area-basis mitigates potential bill impacts on any one customer group (in this case, larger properties) associated with transitioning to or adopting a different price structure.
- It is consistent with the existing stormwater pricing approach for Hunter Water and the Central Coast Council.

9.1.2 We have maintained the low-impact customer category

We have also maintained the low impact discount, for residential and non-residential customers who demonstrate their properties make a relatively small contribution to stormwater load, for example by storing or reusing stormwater collected on their property. The low-impact rate for residential customers would be set equal to the charge for apartments. The low-impact rate for non-residential customers would be set equal to a medium sized non-residential property.

9.1.3 Stakeholder feedback was mixed

We received three stakeholder submissions to our Issues Paper that addressed stormwater charges.

On one hand, the Property Council of Australia supported Sydney Water's proposed approach to calculating stormwater charges on a constrained area basis.

On the other hand, two submissions (from Mr Michael Mobbs, and Professor Peter Coombes) recommended that stormwater pricing should be better aligned with local government rates. Mr Mobbs also raised concerns that customers could be better informed on how to qualify for bill reductions through the low impact category.

We acknowledge the concerns raised by Mr Mobbs and Professor Coombes. However, implementing their proposals would require changes to the legislative framework for local government charges, which is beyond the scope of this review. Sydney Water provides information about the low-impact 'discount' on stormwater charges on its website.[70] This website explains which customers might be eligible for the low-impact rate and provides a direct link for customers to apply for the low-impact rate.

Following release of our Draft Report the Property Council of Australia made another submission to reiterate its support of calculating stormwater on a constrained area basis. Sydney Water is also supportive of the decisions made in the Draft Report.

70 Available at: https://www.sydneywater.com.au/SW/water-the-environment/how-we-manage-sydney-s-water/stormwater-network/discount-on-low-impact/index.htm

9.1.4 Stormwater customers would also fund the Waterways Health Improvement Program

Sydney Water proposed expenditure for a Waterways Health Improvement Program, to improve the quality of waterways across its stormwater network. As this is not a requirement of Sydney Water's operating licence, we considered this as a discretionary project. Sydney Water noted it had engaged with customers on this program and considered there is willingness to pay.

As we discuss further in Chapter 10, we consider Sydney Water has demonstrated customers are willing to support this outcome and it should be included in prices. Indeed, customers may be willing to pay more to achieve even better environmental outcomes from an expanded program.

For the 2020 determination period, we have set a price of $0.85 per year, recovered from all stormwater customers, to fund the Waterways Health Program.

9.2 Rouse Hill stormwater charges

Sydney Water owns and manages trunk drainage services in the Rouse Hill area as well as a large amount of flood-prone land. The stormwater drainage system in Rouse Hill consists of large areas of open space to accommodate flood flows, natural creeks and grass lined channels, and artificial wetlands.

There are currently two charges that are levied on properties within the Rouse Hill Area:

- **A Rouse Hill stormwater drainage charge,** which recovers the operating costs of the drainage system, including for activities such as cleaning out trash racks, regenerating bushland and weed and ground management.
- **A Rouse Hill land charge,** which recovers a portion of Sydney Water's capital expenses for the same system. It is charged to new properties that connect (or have connected) to Sydney's water system in the Rouse Hill stormwater catchment area between 1 July 2012 to 30 June 2026.[71]

We have accepted Sydney Water's proposal to gradually reduce Rouse Hill stormwater charges by 17% over the 2020 determination period (excluding inflation). We largely accepted Sydney Water's proposal to reduce land charges in 2020-21 and then hold prices constant for the 2020 determination period (excluding inflation), updating Sydney Water's proposed prices for our WACC of 3.4%.

We decided:

36 To set the stormwater drainage charges and land drainage charges for Rouse Hill stormwater customers as set out in Table 9.2.

37 To continue to exempt Kellyville Village customers from Rouse Hill stormwater drainage and land drainage charges, and instead charge these customers the residential charges as set out in Table 9.1.

71 Sydney Water, Pricing proposal to IPART, July 2019, Attachment 4, pp 9-10.

Table 9.2 IPART's prices for Rouse Hill stormwater prices ($2020-21)

	2019-20 ($2019-20)	2020-21	2021-22	2022-23	2023-24
Stormwater drainage charge	149.25	146.05	139.56	133.08	126.59
Land drainage charge[a]	389.38	338.24	338.24	338.24	338.24

[a] Land drainage charges apply for five years to new properties connecting to the Rouse Hill stormwater network between 1 July 2012 and 30 June 2026.

Source: Sydney Water 12 November update, p 74 and IPART.

9.2.1 Rouse Hill stormwater drainage charges

Sydney Water proposed gradually reducing its Rouse Hill stormwater drainage charges from $149 per year in 2019-20 to $127 per year in 2023-24 (excluding the effect of inflation). In the 2016 Determination, IPART set these charges so that Sydney Water could recover its cumulative operating expenditure (as prices had previously been set at levels less than forecast costs) from Rouse Hill customers by 2022–23.

Sydney Water has indicated that its updated modelling is that its cumulative operating position is on track to break even by 2022–23, after which the charge can be set to recover ongoing operating costs only. It proposed a gradual transition to smooth stormwater prices.

We have accepted Sydney Water's proposed price transition.

We have also maintained our current pricing approach where we set an annual fixed stormwater drainage charge for residential and non-residential properties with areas less than or equal to 1,000m^2, and the annual fixed charge *times* land area in m^2/1000 in real terms for non-residential properties greater than 1000m^2. That is, a pure area-based charge for non-residential properties greater than 1000 m^2.

9.2.2 Rouse Hill land drainage charges

Sydney Water has proposed to reduce the land charge by 13% from $389 per year in 2019-20 to $354 per year in 2020-21. According to Sydney Water, this is due to an anticipated increase in property growth over the next period, driven by an increase in density in greenfield areas such as Box Hill.

Currently new properties that connect (or have connected) to Sydney Water's system in the Rouse Hill stormwater catchment area between 1 July 2012 and 30 June 2026, pay the Rouse Hill land drainage charge for a five year period.

We set the land charge in the 2016 determination to recover 50% of the net present value of Sydney Water's efficient and prudent capital costs in Rouse Hill over 2012-13 to 2025-26. We added the remaining 50% to Sydney Water's wastewater RAB and recovered through general wastewater prices across Sydney Water's broader customer base.

We received one stakeholder submission that addressed Rouse Hill charges. The Property Council of Australia expressed support for Sydney Water's proposal to gradually reduce the Rouse Hill stormwater drainage charges over the 2020-24 period.

Our decision is to accept Sydney Water's proposed approach to set land drainage charges for the Rouse Hill area. However, we have set a lower price because interest rates have fallen. The prices we set assume a WACC of 3.4%, whereas Sydney Water assumed a WACC of 4.1% in its calculations.

9.2.3 Continuing to exempt Kellyville Village properties from Rouse Hill stormwater drainage charges until at least 2024

Kellyville Village properties were originally excluded from Rouse Hill charges as they existed prior to the Rouse Hill development and were treated by the (now defunct) Kellyville Wastewater Treatment Plant. However, properties in Kellyville Village are now connected to the Rouse Hill integrated water system (although they do not receive recycled water).

In the 2016 Sydney Water Final Report, we indicated that there was merit in charging Kellyville Village residents the Rouse Hill stormwater drainage charge because this charge reflects the costs of the services Kellyville Village properties actually receive. However, we did not adopt this position, as we did not have time to consult on this issue as it was raised late in the 2016 Sydney Water price review.

Kellyville Village properties currently pay Sydney Water's standard stormwater drainage charges until they are redeveloped. In its 2020-24 Price Proposal, Sydney Water indicated its preference for Kellyville Village properties to continue to pay the standard stormwater charge over the 2020 determination period, and then consider shifting to pay the Rouse Hill stormwater drainage charge from the next price review (ie, 2024). By 2024, the Rouse Hill stormwater drainage charge would be closer to Sydney Water's standard stormwater drainage charges. Sydney Water has recommended delaying charging Kellyville Village properties the Rouse Hill charge to manage bill impacts.

On balance, we agree with Sydney Water's proposal to commence charging Kellyville Properties the Rouse Hill stormwater charge in 2024, as this minimises the price impacts on the properties.

10 Discretionary expenditure

Discretionary expenditure is expenditure by a utility to provide services or achieve outcomes that are beyond the service standards or environmental obligations specified in the utility's operating licence or other regulatory requirements.

Sydney Water has included two discrete discretionary expenditure projects in its pricing proposal:

- To upgrade its wastewater system at Vaucluse-Diamond Bay to stop the release of untreated wastewater during dry weather, and
- To deliver improved waterway health through stormwater management activities, as part of a Waterways Health Improvement Program (WHIP).

This is the first time we have explicitly set prices to recover the costs of discretionary projects. We have adopted this approach to allow and encourage utilities to be responsive to their customers. Demonstrating customer support and ensuring accountability are the underpinning principles of our approach to discretionary expenditure.

We have developed a framework to guide our assessment of discretionary expenditure, and to ensure the delivery of the commitments made by utilities to their customers is subject to the appropriate oversight (see Appendix V). In submissions to our Draft Report, Sydney Water and PIAC asked us to conduct a separate public review of our discretionary framework, to clarify aspects of the framework, ensure its robustness and allow input from a wider range of stakeholders.[72] We agree that this would be a positive step, and we will review and refine elements of our discretionary expenditure framework. We intend for the framework presented in this report to remain in place until our separate review of the framework is completed.

We have also made decisions on Sydney Water's proposed discretionary expenditure, and how the costs of this discretionary expenditure should be recovered from customers. Chapter 14 outlines the output measures that track the delivery of discretionary expenditure, and ensure customers are informed of the outcomes and bill impacts of this discretionary expenditure.

72 Sydney Water, *Keeping Sydney liveable, productive and thriving for a sustainable future: Response to IPART's Draft Report and Determinations*, 27 April 2020, p 90; Public Interest Advocacy Centre, *Submission to IPART's Draft Report Review of Prices for Sydney Water from July 2020*, 27 April 2020, p 11.

10.1 Customer engagement is a key element of a utility's pricing proposal

As outlined in our *Guidelines for Water Agency Pricing Submissions*, a utility should have a strong and up to date understanding of its customers' preferences, and this should inform a utility's decision-making and pricing submission.[73]

In our 2016 Sydney Water pricing review we noted that we would consider, and could allow, discretionary expenditure to be recovered via regulated prices, but that we would require clear evidence that the utility's customers have the capacity and willingness to pay for the discretionary expenditure.[74] Our recycled water framework also allows for the costs of recycled water schemes to be recovered from the broader customer base to the extent that there is sufficient evidence that the broader customer base is willing to pay for the external benefits of the recycled water scheme.

It is our view that significant or material changes to a utility's service standards, environmental obligations or other regulatory outcomes should be addressed by appropriately consulting with customers and the entity which enforces the regulation, so that any update to standards or regulations reflects community preferences.

However, where the cost to achieve a discretionary outcome is relatively small, utilities can propose recovering expenditure through prices from either part of, or its entire, broader customer base.

10.2 We have developed a framework for discretionary expenditure

We decided:

38 To establish a discretionary expenditure framework.

We have developed a framework to outline our principles for evaluating discretionary expenditure proposals, including:

1. our assessment criteria
2. the appropriate pricing structures and prices, and
3. the ongoing requirements as discretionary projects are implemented.

Our framework provides guidance to the utilities and establishes processes and checks to ensure that the prices paid by customers are no more than they are willing to pay for the discretionary projects, and that the characteristics of the projects are aligned with those described to customers. A summary of our framework can be found in Table 10.1, and Appendix V.

Our framework has two stages.

- **Stage 1 – Assessment** - Phases 1 to 3 of our framework outlines the steps we will take to assess a utility's proposed discretionary expenditure, including whether it is a discretionary project, has customer support and the expenditure is efficient.

73 IPART, *Guidelines for Water Agency Pricing Submissions*, November 2018, pp.20-21.
74 IPART, *Review of prices for Sydney Water Corporation from 1 July 2016 to 30 June 2020 - Final Report*, June 2016, p 37.

- **Stage 2 – Delivery and Oversight** - Phases 4 and 5 of our framework focus on implementation, and measures to ensure delivery of the projects in line with customers' expectations.

Table 10.1 Overview of our discretionary expenditure framework

Phase	Description
Phase 1: Project definition	▼ **The project or outcome is adequately described and defined**. At a minimum, the project or outcome specification must include the following characteristics and conditions: – Location, customers/users benefiting from (or creating the need for) the project, delivery timeframes, whether it will be replacing another service and outcomes expected. ▼ The project or outcome **fits within the utility's responsibilities and is related to its monopoly services.** ▼ The project is discretionary.
Phase 2: Willingness to pay	▼ Survey participants are given **sufficient context and information** on the proposed project or outcome. This should align with the characteristics and conditions of the project definition identified in Phase 1. ▼ The survey identifies customers' maximum **willingness to pay in dollar amounts**. These will be the upper limit to **the customer share of cost of the project/outcome** estimated in Phase 3**.** ▼ The survey used to elicit customer willingness to pay is **well designed and results are statistically valid.** ▼ Bill impacts should be shown in the context of the broader bill impact.
Phase 3: Efficiency test	▼ **The project/s is prioritised and optimised** within the utilities' broader responsibilities. ▼ The project/s is the **most efficient way of achieving the outcome**. ▼ Total efficient cost estimates should transparently **net off any avoided costs and/or grants.**
Phase 4: Recovery & delivery incentives	▼ The proposed **prices to customers recover only the efficient cost** of the outcome or project determined in phase 3. ▼ Bill impact per household is equal to or less than willingness to pay from phase 2. ▼ Charges are recovered from customer categories whose willingness to pay was assessed in phase 2. ▼ **A separate RAB** with appropriate asset lives to enable discretionary expenditure to be tracked. ▼ Transparent and accountable – utility to develop and propose approaches to ensure accountability. ▼ Next period adjustment will consider whether any underspend is returned to customers or retained by the utility for other projects or as an efficiency gain.
Phase 5: Implementation & performance commitments	▼ **Capture the program as an output measure** to ensure sufficient reporting on what is achieved. ▼ **Ex-post adjustment mechanism** to ensure only investments in line with project definition in willingness to pay survey are added to the RAB. ▼ Where proposed expenditure is not carried out or outcomes are not delivered, funds collected through the discretionary charge may be returned to customers in the subsequent determination period. ▼ Outline expectation that the **charge remains equal to or below demonstrated willingness to pay amount** over the long term.

10.2.1 Assessment of a utility's proposed discretionary expenditure

We first consider whether a proposed project is sufficiently related to a utility's monopoly service provision, and then whether it is necessary to meet a utility's mandatory obligations or if it is discretionary.

What is discretionary expenditure?

A utility's proposal can include two categories of costs. These are the costs to:

- Comply with its **mandatory obligations**. For example, service levels under its operating licence and environmental licence obligations set by the Environment Protection Authority (EPA).
  - We set prices to recover the efficient level of these costs that enables a monopoly service provider to deliver its services in compliance with its other regulatory obligations.
- Undertake **discretionary projects**. These are projects which are not driven or required by an external regulator or body.

The framework encourages investment that reflects customer preferences

Our framework emphasises the importance of demonstrating customer willingness to pay for discretionary projects. Utilities should aim to conduct robust and well-designed willingness to pay surveys which produce statistically significant results. This will ensure that any expenditure proposals put forward by a utility will be sufficiently supported and, therefore, will likely be approved. The application of this framework is new, and we acknowledge that utilities are still developing their approaches to discretionary expenditure proposals. Therefore, we expect Sydney Water to recognise and adopt potential improvements during the next four years.

We engaged a consultant, Gillespie Economics, to provide guidance on demonstrating willingness to pay, and to review the willingness to pay survey conducted by Sydney Water.[75] As willingness to pay acts not only as an important gauge of customer support, but also as a cap on the contribution we allow a utility to recover from customers, it is important that these studies have integrity and are based on the appropriate principles. In our view, it is also important that these studies can be used when assessing the costs and benefits of significant projects.

The required evidence of willingness to pay should be proportional to the proposed expenditure

We note that it is important that the extent of the willingness to pay surveys conducted by the utility are proportionate to the relative quantum of the discretionary expenditure proposed compared to its overall expenditure proposal.

Two approaches to willingness to pay studies were identified from utilities' pricing proposals:

75 Gillespie Economics, *Assessment of Hunter Water's and Sydney Water's Customer Willingness to Pay Surveys, Report for IPART*, January 2020.

- **Economic willingness to pay studies,** which elicit the maximum willingness to pay across the population of customers for defined environmental, social or cultural outcomes.
- **Market research based willingness to pay studies,** which estimate the proportion of customers who would be willing to pay a price that would cover the costs of different levels of a proposed investment.

The first type of study provides an estimate of the indirect and non-use benefits that a project may provide to the customer base. This value may be higher if people outside the customer base also value an outcome.

We recognise that the size of the proposed discretionary expenditure influences the level of resources and evidence required to demonstrate that each element of the framework has been met. For example, a small-scale capital project should not necessitate the same extensive customer engagement and gateway processes, including a cost-benefit analysis and economic willingness to pay study, as a larger project.

A market research approach may be appropriate for smaller proposed discretionary investments, and for selecting projects to engage further with customers on from a menu of possible projects without requiring the same level of detail as an economic measure of willingness to pay.

Economic willingness to pay studies, however, should be conducted in conjunction with a market research approach, cost-benefit analysis, and business case for larger projects, to ensure that thorough and robust processes are in place to support greater amounts of proposed expenditure.

Costs should only be recovered from categories of customers with demonstrated willingness to pay

We consider that there should be alignment between the categories of customers surveyed to demonstrate willingness to pay, and the categories of customers that bear the cost of discretionary expenditure.

Utilities should only recover the efficient level of expenditure

As part of our framework, we apply our usual efficiency test to discretionary capital expenditure to ensure customers are only charged the efficient cost of delivering the project or outcome. Where the proposal is for a specific project, it can be included in the expenditure review with other capital expenditure, including ex-post capex reviews.

Where the proposal is for a funding envelope to deliver an outcome over the determination period, we would expect to see accurate estimates of likely outcomes and that any efficiencies that materialise through the implementation of a program could result in the delivery of 'more' of the outcome, to the extent this is consistent with customers' willingness to pay.

10.2.2 Implementation of a utilities' discretionary expenditure proposal

Ensuring utilities are accountable for the delivery of the project

We need to hold utilities accountable for any proposed discretionary expenditure. The delivery of the utility's proposal should match the customers' understanding of what they are paying for, and the outcome should be delivered over the specified timeframe at an efficient cost. This is particularly important given the absence of any additional regulatory processes such as obligatory service standards or environmental standards that a utility must uphold in relation to this type of expenditure.

Transparency is important to ensure that the utility's activities and prices are well understood by stakeholders and its customers. Achieving discretionary outcomes come at a cost to the customer, and are outside of the mandated requirements on utilities in delivering their monopoly services to their customers. It is important that customers fully understand the implications of these outcomes on prices.

Ensuring transparency and accountability to customers

In our Draft Report, we wrote that, to enhance transparency and accountability around discretionary expenditure to customers, we consider that utilities need to adequately inform customers about the discretionary charges they will incur, and the outcomes these charges will deliver. For this reason, we asked Sydney Water to outline for us how it would propose to ensure progress on discretionary projects is communicated effectively to its customers.

In its response to our Draft Report, Sydney Water wrote that including a separate charge on bills would not be in customers' interests, for the reasons that doing so would involve an administrative cost and could confuse many customers who are not familiar with the details of price regulation.[76] In order to communicate with its customers, Sydney Water proposed to report annually to customers on the progress of customer supported projects and the bill impacts of these projects via:

- inserts sent out with bills, which could take the form of an article in the Water Wrap newsletter or a separate leaflet, as well as,
- a webpage on the Sydney Water website, and
- a line on bills directing customers to the webpage.[77]

We accept this proposal.

Delivery incentives

We have established delivery incentives to ensure that utilities are accountable to customers, and that they appropriately gauge project risks prior to making commitments to customers.

[76] Sydney Water, *Keeping Sydney liveable, productive and thriving for a sustainable future: Response to IPART's Draft Report and Determinations*, 27 April 2020, p 94.

[77] Sydney Water, *Keeping Sydney liveable, productive and thriving for a sustainable future: Response to IPART's Draft Report and Determinations*, 27 April 2020, p 93.

Our delivery incentives include:

- Our standard approach to ex-post adjustments to capital expenditure during the next review, coupled with
- A next period adjustment to assess whether any underspend is returned to customers, used to provide similar outcomes, or retained by the utility as an efficiency gain. This is a slightly different approach to our standard approach, as we are focussed on discrete discretionary proposals which may not be 'part' of a much wider expenditure profile where it is expected that proposed expenditure would be subject to on-going review and re-prioritisation as part of normal business.

The utility should be aware of the financial implications if it cannot meet its stated outcomes on which it has gained community support. We realise that this assessment may not be purely objective, however many projects that would be classed as discretionary would be discrete in nature and amenable to defining a clear set of outcomes.

This approach will achieve outcomes based regulation for program expenditure which is closely aligned with customer preferences.

10.3 We will conduct a review of our framework

We decided:

39 To conduct a review of our discretionary expenditure framework after the completion of this pricing review.

In its submission to our Draft Report, Sydney Water requested that IPART review the draft framework after the completion of this price review, as part of our review of our overall regulatory approach, as this would allow focused consultation with stakeholders, many of whom are currently occupied with more immediate and pressing challenges.[78]

Similarly, PIAC stated in its submission to our Draft Report:

> "we strongly recommend that IPART initiate a review of the framework and guidelines for discretionary expenditure at the completion of this determination process, to ensure that the process is robust and able to address the needs and concerns of the community and businesses".[79]

We agree that reviewing and refining elements of our discretionary expenditure framework would be a positive step, and we recognise the value in obtaining views from a broader range of stakeholders outside the current pricing review process. We intend for the framework presented in this report to remain in place until a review of the framework is completed.

78 Sydney Water, *Keeping Sydney liveable, productive and thriving for a sustainable future: Response to IPART's Draft Report and Determinations*, 27 April 2020, p 90-91.

79 Public Interest Advocacy Centre, *Submission to IPART's Draft Report Review of Prices for Sydney Water from July 2020*, 27 April 2020, p 11.

10.4 Sydney Water's proposed discretionary expenditure

After a substantial customer engagement program, Sydney Water has proposed two projects as discretionary expenditure for the 2020 determination period. We discussed Sydney Water's proposed discretionary projects in our Issues Paper, noting that we intended to apply our best practice principles for demonstrating willingness to pay to assess whether the expenditure should be approved for this review. Using these principles as a basis, we have applied our framework for assessing discretionary expenditure to the two proposed projects. Our decision is to set prices for Sydney Water to recover the costs of these projects from its customers in the 2020 determination period.

We decided:

40 To allow Sydney Water to recover the costs of the following projects from its broader customer base:

– For the wastewater ocean outfalls at Vaucluse-Diamond Bay, $62.7 million recovered from all wastewater customers as a meter based charge, as shown in Table 10.2.

– For the Water Health Improvement Program, $22.4 million recovered from all stormwater customers on a per property basis, as shown in Table 10.3.

In developing this framework, we acknowledge that since it is the first time we have assessed proposed discretionary expenditure, we have exercised a level of discretion in allowing Sydney Water to levy discretionary charges for these projects. We have also considered stakeholder submissions, and note that all submissions which commented on Sydney Water's proposed discretionary projects expressed strong support for them.

There are a number of requirements within the framework which aim to ensure transparency and accountability for utilities, which we developed after receiving the proposals for discretionary expenditure from both Hunter Water and Sydney Water. We consider that these should be applicable to future proposals

10.4.1 Diverting untreated wastewater from ocean outfalls at Vaucluse-Diamond Bay

Sydney Water has proposed to upgrade its wastewater system at Vaucluse-Diamond Bay to stop the daily release of untreated wastewater from three cliff-face outfalls during dry weather. Sydney Water proposes to do this by building new infrastructure that would divert the wastewater to a treatment plant in Bondi, so it would be treated before being released into the ocean at Bondi.

Sydney Water has proposed $63.5 million in capital expenditure in 2020-2024 to build assets and divert the wastewater to the Bondi treatment plant. Upon completion, untreated discharges of wastewater through the ocean outfalls will only occur during wet weather events.

In its response to our Draft Report, Sydney Water requested that the charge to customers for this development be calculated including a discharge factor.

Our assessment of the Vaucluse-Diamond Bay discretionary project

On balance, our decision is to allow Sydney Water to recover the efficient costs of the proposed Vaucluse-Diamond Bay project from its wastewater customers, and to agree to Sydney Water's proposal to include a discharge factor in the calculation of the charge to customers.

On one hand, Sydney Water developed this project using appropriate gateway processes, and that customers were consulted on their willingness to pay through an extensive engagement program which was conducted using mostly best practice principles. Our expenditure consultant's also consider that this project is an appropriate and prudent approach to divert wastewater flows from Vaucluse-Diamond Bay.

On the other hand, Sydney Water's surveys did not sufficiently explain the benefits and need for the proposed expenditure. It did not quantify the improvement to the environment and health outcomes for the community. Rather, the focus was on the activity that Sydney Water proposed to address – reducing the release of untreated wastewater from cliff-face outfalls in dry weather.

We do not question that customers are willing to pay for improved environmental and health outcomes. Rather, the limitations of the customer surveys mean we are uncertain of customers' willingness-to-pay for the outcomes of this expenditure. The Vaucluse-Diamond Bay project is a relatively large capital investment, and we consider it important that Sydney Water address these concerns in the future.

Table 10.2 Prices for the Vaucluse-Diamond Bay discretionary project

	2020-21	2021-22	2022-23	2023-24	Total
Residential charge (20mm) ($/year) ($2020-21)[a]	1.04	1.04	1.04	1.04	N/A
Base non-residential charge ($/year) ($2020-21)[b]	1.39	1.39	1.39	1.39	N/A
Efficient capital expenditure ($ million/year) ($2019-20)[c]	11.6	15.9	20.0	15.2	62.7
Efficient operating expenditure ($ million/year) ($2019-20)	0.4	0.4	0.4	0.4	1.6

[a] This charge is the 20mm charge with a 75% discharge factor applied, consistent with residential wastewater charges.

[b] This charge is the 20mm equivalent charge with a 100% discharge factor applied. Due to the nature of non-residential customers, the discretionary charge applied will vary depending on individual meter sizes and discharge factors.

[c] A cumulative 0.8% efficiency factor has been applied to the capital cost.

Note: Totals may not add due to rounding.

10.4.2 Waterway Health Improvement Program (WHIP)

Sydney Water has proposed to deliver improved waterway health through stormwater management activities that will increase: the length of waterways in good health; areas of planted native vegetation; sets of recreation facilities; and the amount of rubbish and litter removed from Sydney waterways each year.

Sydney Water proposed capital expenditure of $16.1 million over the 2020 period.

In its response to our Draft Report, Sydney Water proposed measuring its progress in improving waterway health by reporting:

- the tonnes of gross pollutants, sediment, and nutrients removed every year under the WHIP; and
- the area of native vegetation planted under the WHIP.

Sydney Water also proposed that the WHIP be *area based* for Rouse Hill non-residential properties only.

We have accepted Sydney Water's proposed amendments to how prices are set for, and how it reports on, the WHIP.

Our assessment of the WHIP discretionary project

Our decision is to allow Sydney Water to recover the efficient costs of the proposed WHIP from its stormwater customers only. Furthermore, we have provided an allowance of $22.4 million to Sydney Water over the 2020 determination period, which is $6.5 million more than Sydney Water's proposal.

This amount will cover costs related to managing impacts of stormwater on the water quality of waterways in Sydney Water's declared catchments. Overall, our assessment is that Sydney Water has developed the WHIP through the appropriate gateway processes, and that the project has sufficient customer support to proceed.

In proposing expenditure of $16.1 million over the 2020 period, Sydney Water's deferred about $8.0 million of expenditure to the following regulatory period. However, our expenditure review consultants found that the deferred projects were well-defined, and given customers are willing to pay for better waterway health outcomes in the current period, that Sydney Water should deliver the full program in the 2020 period.

We agree with Atkins assessment, and have allowed Sydney Water to recover the full costs of the program over the 2020 period. We also agree with Sydney Water's proposal regarding Rouse Hill non-residential properties.

We note some specific issues in relation to Sydney Water's customer consultation and discretionary expenditure proposal in Appendix W.

Table 10.3 Prices for the WHIP discretionary project

	2020-21	2021-22	2022-23	2023-24	Total
Stormwater customer charge ($/year) ($2020-21)[a]	0.85	0.85	0.85	0.85	N/A
Efficient capital expenditure ($ million/year) ($2019-20)[b]	8.2	6.1	2.7	5.4	22.4

[a] We have applied the WHIP discretionary charge to all Sydney Water stormwater customers despite meter size.

b A cumulative 0.8% efficiency factor has been applied to the capital cost.

Note: Totals may not add due to rounding.

10.4.3 Sydney Water should better understand customer preferences for improved environmental outcomes

We consider it likely that customers are willing-to-pay for better waterways outcomes well beyond the current scope of Sydney Water's Waterways Health Improvement Program. We have included an allowance of less than $1 per year from stormwater customers to fund this program; and if this expenditure was recovered from Sydney Water's full customer base, the costs would be less than $0.20 per year. However, we cannot approve further expenditure in this review, without sufficient evidence of customer willingness-to-pay, or a well-defined expenditure program.

Sydney Water has indicated, in its response to our Draft Report, that it strongly supports customer input playing a larger role in future price reviews. Sydney Water also considers that it has learned much from the process of expanding its engagement with customers over the past three years, and that it is keen to engage more with IPART, other water utilities and stakeholders to share learnings and discuss opportunities to evolve and further strengthen its approach.[80] IPART welcomes these developments and looks forward to working with Sydney Water on developing and strengthening utilities' engagement with customers within the framework for discretionary projects.

10.5 Future application of the framework

In some instances, expenditure that is discretionary when proposed by the utility becomes part of meeting its monopoly service obligations. This could occur when licence conditions or mandatory environmental standards are changed such that expenditure initially proposed to exceed standards, is now expenditure to meet the new (higher) standards.

There are a number of requirements within the framework which ensure transparency and accountability for utilities, which should be addressed in future proposals.

In future price reviews, we will encourage utilities to apply our framework to any proposed discretionary expenditure, to ensure that all criteria have been met and our principles of transparency, accountability and efficiency are upheld.

We decided:

41 To request that Sydney Water include a business case, proposed output measures and customer engagement strategies in future discretionary expenditure proposals.

80 Sydney Water, *Keeping Sydney liveable, productive and thriving for a sustainable future: Response to IPART's Draft Report and Determinations*, 27 April 2020, p 90.

11 Recycled water prices

Recycled water is wastewater or stormwater that has been collected and treated so that it can be reused for urban irrigation, industrial processes, environmental flows, and some residential uses such as garden watering and toilet flushing.

In July 2019, we finalised a review of the pricing arrangements for the public water utilities' recycled water schemes, which:

- Considered how to fund recycling schemes
- Considered how to set prices to customers of recycled water schemes
- Set a methodology to calculate developer charges for recycled water schemes.[81]

The revised approach reduces regulatory barriers to cost effective water recycling and seeks to ensure that recycled water is assessed in the same way as other options for delivering water and wastewater services.

This chapter provides an overview of the key elements of our recycled water framework. We discuss the prices for recycled water that Sydney Water provides, and how IPART treats the revenue from recycled water schemes.

Our decisions outlined in this chapter align with the approach we established in our 2019 recycled water review and result in minimal changes to Sydney Water's proposal regarding recycled water prices and revenue.

11.1 Our recycled water framework

For funding purposes, we distinguish between 'least-cost' or 'higher-cost' recycled water schemes:

- A 'least-cost' scheme is the most efficient way of supplying water, wastewater and/or stormwater services.
- A 'higher-cost' scheme is one which is not least-cost.

Under our framework, least-cost schemes are funded by developer charges where they apply, and the broader customer base. For example, if a recycled water scheme is the least cost way of providing wastewater services (ie, the collection, treatment and disposal of wastewater), then the utility can recover its costs from the broader customer base via wastewater prices.[82] Sydney Water has two 'least-cost' recycled water schemes.

Higher-cost schemes can also be funded by the broader customer base via water and/or wastewater prices, to the extent the scheme results in any:

81 IPART, Review of pricing arrangements for recycled water and related services, 1 July 2019.
82 IPART, *Review of pricing arrangements for recycled water and related services*, 1 July 2019, p 21.

- Avoided water and/or wastewater costs (net of any foregone revenue to the utility) to the broader customer base
- External benefits, as shown by the broader customer base's willingness to pay.

Any residual costs of the higher cost recycled water scheme (ie, the scheme's costs less the value of avoided costs + external benefits recovered from the broader customer base), should be ring-fenced and be recovered from:

- Any external funding sources, including any government or third party contributions
- Customers of the recycled water scheme, and/or
- Recycled water developer charges.

For this price review, Sydney Water has not made a claim for any additional deferred or avoided costs to be recovered from its broader customer base.[83],[84] Sydney Water has also not sought any additional revenue to be recovered from its broader customer base based on their willingness to pay for any external benefits of recycled water schemes.

In response to our Draft Report on *Review of prices for Hunter Water Corporation from 1 July 2020,* Flow Systems submitted that the recycled water pricing framework adopted by IPART in 2019 is fundamentally anti-competitive.[85] For example, like Sydney Water, Hunter Water has the ability to claim the value of net avoided costs or external benefits from its broader customer base whilst this is not available to community-level water service providers (ie, private water utilities licensed under the WIC Act).

In response, we acknowledge that privately owned water utilities currently have smaller customer bases than Hunter Water's, but we note the these private utilities could still choose to price their services to reflect their customers' willingness to pay for their recycled water and other water and wastewater services. They could also seek other sources of funding, including from Government and third party contributions, to reflect the value of any external benefits or net avoided costs that their schemes may provide to other parties.

Further, IPART's wholesale pricing framework recognises that the prices privately owned utilities pay for wholesale water and wastewater services provided by Hunter Water should reflect the value of any net avoided costs to Hunter Water as a result of the private operator's recycled water scheme, and be discounted accordingly.

Finally, we note that the overarching aim of our funding framework for public water utilities is to support the efficient development of recycled water schemes.

83 In the 2012 Sydney Water price review, IPART agreed to Sydney Water's claim for avoided costs for one of its mandatory recycled water schemes (Rouse Hill) to be added to the RAB. This was an increase to the water RAB of $2.1 million and wastewater RAB of $18.0 million. No further avoided costs on recycled water schemes have been claimed since.

84 In Sydney Water's response to our Draft Report, it highlighted that its Price Proposal was unable to reflect the revised aspects of IPART's Recycled Water 2019 Determination in July 2019. It advises that it is in process of investigating the potential of claiming avoided costs and external benefits for its existing and future recycled water projects. Sydney Water, Submission to IPART's Draft Report on *Review of Sydney Water prices from 1 July 2020*, April 2020, p 96

85 Flow Systems Pty Ltd, *Submission to IPART's Issues Paper – Review of prices for Hunter Water Corporation from 1 July 2020*, April 2020, p 2.

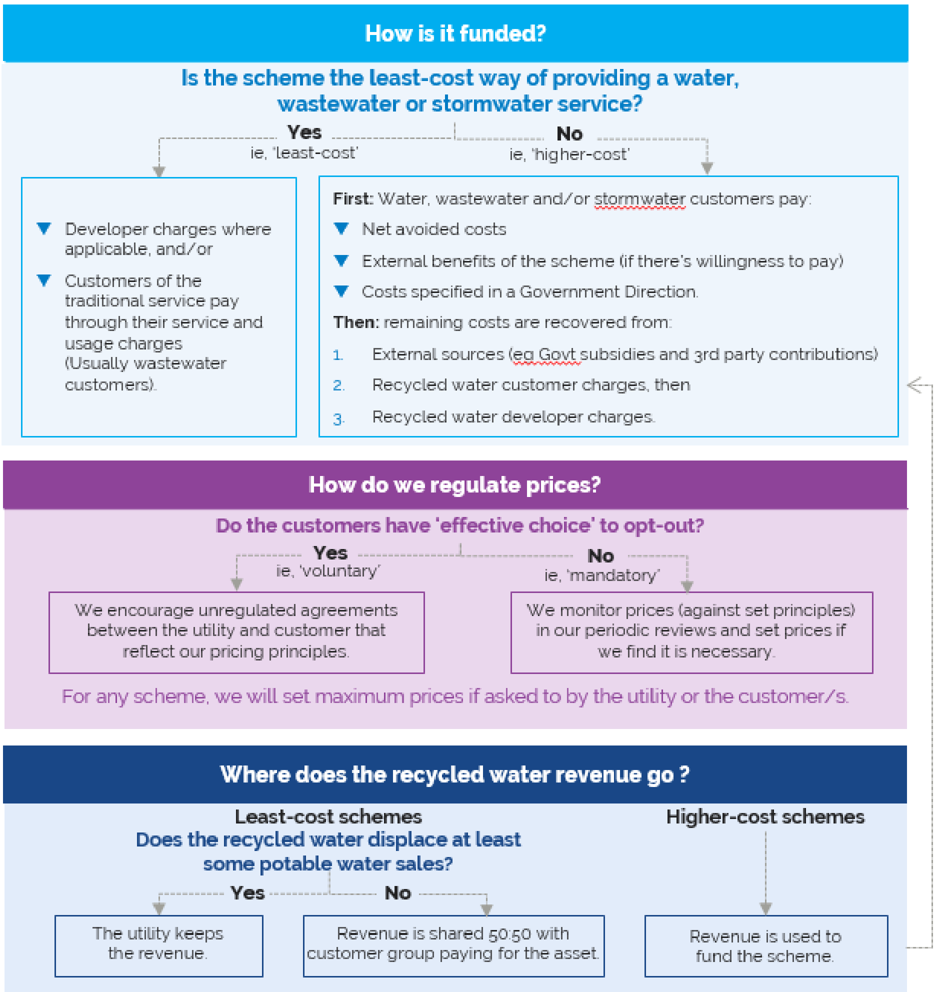
For price regulation purposes, we distinguish between recycled water schemes on the basis of customer choice:

- A scheme is considered **mandatory** if customers have no effective choice but to be supplied by the recycled water scheme. For these, we monitor prices against our pricing principles and may step in to set prices where we deem there is cause, including if we are requested to.
- A scheme is considered **voluntary** if customers have effective choice about whether to be supplied by the recycled water scheme. For these, we encourage unregulated pricing agreements and would set prices under a scheme-specific review if requested to do so by customers or the public water utility.

We also distinguish schemes where IPART has been directed by the Government under Section 16A of the IPART Act, to fund the difference between the efficient cost of a recycled water scheme and the revenue that Sydney Water receives from customers of the scheme.

Figure 11.1 below provides an overview of our approach and Table 11.1 shows the recycled water schemes that Sydney Water currently operates.

Figure 11.1 Key elements of IPART pricing arrangement for recycled water



Source: Based on IPART, *Review of pricing arrangements for recycled water and related services*, 1 July 2019.

Table 11.1 Sydney Water's recycled water schemes

Section 16A	Mandated schemes	Voluntary schemes	Least cost schemes
Rosehill-Camellia	Rouse Hill	Wollongong	Picton
St Marys – Western Sydney Replacement Flows	Hoxton Park	6 schemes at golf courses	Gerringong-Geroa
	Oran Park and Turner Road	2 irrigation schemes	
	Colebee	4 other schemes	
	Ropes Crossing		

Source: Sydney Water Price Proposal 2020-24, Attachment 14 Recycled Water, July 2019; Sydney Water AIR SIR Nov 2019; Email correspondence with Sydney Water, 22 January 2020

11.2 Section 16A recycled water schemes

The Government can issue directions for Sydney Water to complete projects in the public interest, which may not be in the shareholders' interest.[86] At the same time, it can direct IPART (with the Minister's approval) under section 16A of the IPART Act to include the efficient costs of complying with specified requirements in Sydney Water's prices.[87] This can take the form of either:

- A 'standing direction' (which applies whenever IPART makes a determination in relation to a particular government monopoly service), or
- A 'one-off direction' (which applies when IPART makes a particular pricing determination).

Sydney Water has two schemes to which Section 16A directions apply:

- **The Rosehill (Camellia) Recycled Water Project**. This was issued to IPART in March 2008. The broader customer base funds the difference between the charges that Sydney Water pays to the owner of the Rosehill (Camellia) Recycled Water infrastructure and distribution pipelines, and the revenue Sydney Water receives for the sale of recycled water.
- **The Replacement Flows Project (St Marys Recycled Water Project).** This was issued to IPART in August 2007. We assessed the efficient costs of construction and ongoing operation of the project which is funded by the broader customer base.

11.2.1 The full benefits of Section 16A recycled water schemes are not being realised

As part of our expenditure review, our consultants (Atkins) assessed Sydney Water's proposed expenditure of its Section 16A schemes. Atkins did not recommend any scope adjustments in operating expenditure to mandated s16A recycled water services. However,

86 Typically through a direction given under section 20P of the SOC Act.

87 Under Section 16A(3) of the IPART Act the Government may ask IPART to recover certain costs from the customer base, if the costs are: a requirement imposed by or under a licence or authorisation; a requirement imposed by a ministerial direction under an Act; or some other requirement imposed by or under an Act or statutory instrument.

they were critical of the underperformance of the Rosehill-Camellia and the St Marys' treatment plants over the 2016 determination period.

Atkins has found that the full benefit of these schemes has not been realised and Sydney Water has responded to our Draft Report on where they disagreed with Atkins' findings.

Rosehill-Camellia scheme

Atkins found a lack of customers means the production capacity of the plant is not being utilised fully and Sydney Water management should be more pro-active in finding customers and alternative uses of the recycled water.

In response to our Draft Report, Sydney Water advised that it is not in its control that commercial decisions of its scheme customers result in reduction in recycled water demand, and that not all options for expanding the scheme may be prudent or efficient. Sydney Water has advised that it continues to review options as new information becomes available.

St Marys Scheme

Atkins found the plant has not been running to design output and with a lower output than planned. Despite the variation in output volumes, the fixed costs are largely unchanged, thus Sydney Water management should work to maximise output of this plant.

In response to our Draft Report, Sydney Water advised that the reduction in volume is largely due to resolving defects from original construction works. Defects took longer than expected to resolve due to adverse weather. It also stated that its temporary adjustment to the full capacity forecast represented an unavoidable reduction to volume, to carry out essential maintenance and temporary growth related construction projects. Sydney Water advises that its intention is to ultimately have the plant operating at full design capacity once the temporary factors have passed.

We have noted Sydney Water's comment and we maintain our decision that we will not adjust Sydney Water's proposed expenditure for its s16A recycled water schemes. However, we also maintain our view that enhanced monitoring and reporting of the output from recycled water schemes would provide transparency on their performance.

Further detail on output measures is discussed in Chapter 14.

11.3 Sydney Water's proposed prices for mandatory schemes meet our pricing principles

Sydney Water has five existing mandatory recycled water schemes. As outlined above, we monitor Sydney Water's proposed prices for these, and we will only step in and **determine** maximum prices when we identify a need to do so, or if we are asked to.

We decided:

42 To continue to defer setting prices for Sydney Water's recycled water schemes.

We assessed Sydney Water's proposed prices for its mandatory recycled water schemes against our pricing principles (Box 11.1).

We found Sydney Water's proposed prices are reasonable and do not provide cause for us to step in and determine prices.[88]

Box 11.1 Pricing principles for mandatory recycled water services

The structure and level of recycled water prices:

1. Should ensure that appropriate price signals are sent to recycled water users with the aim of balancing supply and demand, and should entail an appropriate allocation of risk.
2. Should include a usage charge, which must have regard to the price of substitutes (such as potable water and raw water). Where the usage charge exceeds the substitute price, water utilities must demonstrate willingness-to-pay by the recycled water customer.
3. May include a fixed service charge, which should have regard to customer impacts, willingness-to-pay and not act as a material incentive for customers to disconnect from the recycled water scheme.
4. Should have regard to an efficient distribution of costs between recycled water customers and developers, in line with our funding framework for mandatory recycled water services.
5. Should be simple and understandable.

Source: IPART, Review of pricing arrangements for recycled water and related services, 1 July 2019, p 68.

11.3.1 Sydney Water's prices for mandatory schemes

Sydney Water's existing mandatory schemes service residential developments. These schemes are also 'higher-cost', and hence their costs are ring-fenced from the broader customer base.

Sydney Water has proposed to:

- Set the usage price at 90% of the base (non-drought) potable water usage price that applies on 1 July 2020. This price would not increase even when the drought water usage price applies.
- Not set a service charge. This is consistent with its current practice.

Table 11.2 shows our assessment of Sydney Water's proposed prices for its mandatory schemes against our pricing principles.

88 In response to our Draft Report, Sydney Water sought clarity on our decision to defer setting prices as we had accepted its proposed price of $1.90/kL, which was based on 90% of its proposed water usage price. We clarify that we defer setting prices as was reflected in our Draft Determination, which did not set a price for mandatory schemes. We accept Sydney Water's proposed price of $1.90/kL and/or its clarified price of 90% of non-drought water usage price. Sydney Water, Submission to IPART's Draft Report on *Review of Sydney Water prices from 1 July 2020*, April 2020, p 95.

Table 11.2 Our assessment of Sydney Water's proposed prices against the pricing principles

Principle	Our assessment
1	The price is likely to support a balance of supply and demand. Sydney Water's proposed recycled water usage price is 10% lower than the base (non-drought) potable water usage price, and is significantly lower than our potable water usage price in drought conditions. Thus, this would mean a greater saving relative to potable water in drought conditions. Whilst a lower price does not necessarily mean greater customer demand, Sydney Water has advised that the flexibility to offer a lower price to encourage demand could be particularly useful in locations with a high volume of water to be managed. Based on current information, we consider that appropriate price signals are sent to balance supply and demand.
2	The usage charge is set lower than the non-drought potable water usage price, which is the alternative for these customers.
3	Sydney Water proposed no fixed charge. This is consistent with guidance in our 2019 framework that "utilities should be cautious in adding new fixed charges to customer bills".
4	Sydney Water's mandatory schemes are partially funded through customer usage charge contributions and developers have provided partial contributions in the capital works stage. However, these funds received do not recover the costs of running these schemes.
5	The overall structure is straightforward and easy to understand.

11.3.2 Stakeholders want to encourage recycled water

A few submissions to our Issues Paper and Draft Report expressed a view that the use of recycled water should be increased and/or incentivised to address the issue of increasing water scarcity.

In response to our Issues Paper, the Committee for Sydney anticipates that recycled water will play a larger role in our water supply system, however noted community scepticism toward recycled water. The Committee therefore supports the current policy of providing a discount on recycled water at 90% of the price of potable water. Sydney Water's proposed approach to set prices less than the potable water usage price, and without the service charge, aligns with this stakeholder's view.

However, in response to our Draft Report, there were several comments that the lower price of recycled water provides little incentive for Sydney Water to pursue more recycled water projects, including to upgrade treatment plants to improve the amount and quality of water available for reuse.[89]

Consistent to our 2019 Recycled Water Determination, we have maintained our decision for this price review to defer setting prices for Sydney Water's mandatory schemes, including Rouse Hill.

89 Clean Ocean Foundation, *Submission to IPART's Issues Paper – Review of prices for Sydney Water Corporation from 1 July 2020*, May 2020, p 1.

We consider that the additional flexibility that it allows Sydney Water does not discourage it from pursuing additional recycled water schemes. Instead, in response to our Draft Report, Sydney Water has highlighted that since its Price Proposal it has continued to refine and progress its strategies to service growth. It flagged an upcoming new Wilton New Town recycled water scheme and will be liaising with IPART, particularly for cases where a future avoided cost claim and/or least cost recycled servicing strategy is likely.[90]

We consider that Sydney Water's proposed prices satisfy our pricing principles and the balance of supply and demand. We note that our revenue sharing mechanism provides a degree of incentive for Sydney Water to identify and pursue least cost recycled water schemes which displace potable water, as it can keep 100% of the revenue.

In addition, if recycled water is used as a substitute for potable water, then Sydney Water's proposed price for recycled water could promote the demand for water recycling. As the recycled water price is lower, and more stable, in periods of drought – compared to potable water, our dynamic pricing encourages risk-averse households and businesses to adopt recycling. The incentive to take up recycling becomes stronger in prolonged periods of drought, and would also be strengthened if there was a broader range of uses for recycled water to include the indirect, or direct, re-use of recycled water.

We also note that our funding framework for the public water utilities' recycled water schemes allows for recognition of the system-wide benefits of recycled water schemes. It ensures the costs of a recycled water scheme will be recovered where its benefits (as measured by avoided costs, external benefits and recycled water customers' willingness to pay) are equal to or greater than its costs.

11.3.3 We are satisfied that the remaining schemes are not mandatory

Sydney Water's remaining two recycled water schemes in Picton and Gerringong-Geroa are 'voluntary', as the recycled water customers, who are non-residential, would have lower barriers to leave the scheme. For these schemes, we encourage unregulated pricing agreements and therefore we will not determine prices, unless requested to by either Sydney Water or the recycled water customers – which has not occurred.

90 Sydney Water, *Submission to IPART's Issues Paper – Review of prices for Sydney Water Corporation from 1 July 2020*, May 2020, p 102.

11.4 We reviewed the share of revenue from least-cost recycled water schemes

In our 2019 review of recycled water pricing, we decided that where there is a least-cost recycled water scheme, the public water utility should retain all of the revenue earned from recycled water sales, as compensation for displaced potable water sales.

For this review, we have distinguished between recycled water sales that do, and those that do not, displace potable water, and decided that where recycled water does not displace potable water sales, revenue is to be shared in a 50:50 ratio with the broader customer base. In most cases, we would expect recycled water use to displace potable water sales. Where recycled water does displaces potable water sales, the utility retains 100% of the revenue.

11.4.1 Not all recycled water displaces potable water

For this review, we have distinguished between those least-cost schemes where the recycled water used displaces potable water sales, and those where it doesn't. In most cases, we would expect recycled water use to displace potable water sales.

Sydney Water identified that both of its least cost schemes do not result in potable water savings.[91]

We have decided to share revenue from recycled water sales from these schemes with the broader customer base, because customers have paid for the asset (essentially on the basis that it is providing a wastewater service) and they should share in a return on the additional revenue, in line with our approach to other sources of non-regulated revenue. The share of revenue to the water utility still provides an incentive to find more least-cost schemes, albeit less than if the utility retained the revenue in full.

In response to our Draft Report, Sydney Water argued that a 50:50 revenue sharing ratio would result in the utility receiving only 20% of the revenue, as it would have to pay tax on all the revenue received (at a rate of 30%). We disagree. Under our price setting methodology, the revenue allowance includes tax on non-regulated revenue shared with customers.

For simplicity, our default approach allows the utilities to retain 100% of the revenue if at least **some** potable water sales are displaced by the recycled water scheme. This includes revenue from unregulated products or services. We will share the revenue on an exception basis, ie, where it is clear that the scheme is not displacing potable water sales. Otherwise, Sydney Water should keep the recycled water revenue from least cost schemes.

91 Email correspondence with Sydney Water, 22 January 2020; Sydney Water, Water Conservation Report 2018-19, Table C-1, p40.

11.4.2 The revenue to be shared with customers is minimal

The revenue to be shared with customers is subtracted from the NRR before water prices to the broader customer base are set (see Chapter 5 for more information). However, the impact on water prices is small.

Sydney Water identified two least-cost schemes that did not replace potable water sales.[92] We have reviewed Sydney Water's forecast revenue from these schemes and the current revenue sharing arrangement between Sydney Water and its customers. For one of these schemes, the rental income is captured under Sydney Water's rental income and proposed to be a 90% share to Sydney Water and 10% to customers. For the other scheme, currently all the forecast revenue is deducted from its proposed operating costs, ie, all the revenue is given to customers. We decided to make a revenue adjustment to reflect a 50:50 share of revenue with customers and this results in adding $50,000 per annum to Sydney Water's revenue requirement.

11.5 Sydney Water's update in response to our Draft Report

Sydney Water highlighted in its response to our Draft Report that since its July 2019 proposal, it has continued to refine and progress its strategies to service growth, and that some recycled water infrastructure will be implemented within the 2020 determination period.

Sydney Water advises it does not expect this to result in a material change to its forecast expenditure or regulated revenue over the 2020 determination period.

We note that Sydney Water intends to progress the new Wilton New Town recycled water scheme and we are keen to work with Sydney Water to ensure that the benefits of this scheme are realised.

92 Email correspondence with Sydney Water, 22 January 2020

12 Prices of minor services

Sydney Water provides a range of services beyond those outlined in previous chapters. This chapter explains our decisions on charges for these services, specifically:

- Non-residential trade waste.
- Miscellaneous and ancillary charges (including Sydney Water Developer Direct).
- Fees for late and declined payments.
- Unfiltered water.
- Unmetered water.

Appendix Q discusses how we categorise certain types of properties as 'residential' or 'non-residential'.

12.1 Non-residential trade waste charges

Trade waste charges are levied on industrial and commercial customers whose discharge to the wastewater system is more highly contaminated than regular domestic sewage. Sydney Water has approximately 24,000 commercial and 720 industrial trade waste customers.[93]

Sydney Water currently levies three types of trade waste charges:

- **Pollutant charges**, which recover the costs of the transport, treatment and disposal of trade waste, as well as the corrosion caused by high strength waste.
- **Ancillary and agreement charges**, which recover the cost of administering trade waste agreements and conducting inspections.
- **Wastesafe charges**, which recover the cost of monitoring liquid waste pits.

Further information explaining Sydney Water's trade waste pollutant charges is outlined in Appendix R.

We decided:

43 To set the maximum trade waste prices as listed in Appendix R.

Pricing principles

Ancillary and agreement charges are set to recover the costs of services exclusively provided to trade waste services such as inspections and sampling. Pollutant charges are set to recover the portion of total wastewater opex and capex attributable to trade waste discharges.

93 Sydney Water Pricing Proposal, 1 July 2019, Schedule 6, pp 9-10.

We developed pricing principles for assessing trade waste charges for the 2016 determination period (see box below), and we are satisfied that Sydney Water's trade waste pricing method aligns with these principles.

Box 12.1 IPART's trade waste pricing principles

As part of our 2016 Determination we updated our trade waste pricing principles, in particular to clarify that charges should recover all efficient costs, including corporate costs. The application of appropriate pricing principles to trade waste requires that:

- Standards for acceptance should be set on the basis of the capacity of current systems to transport, treat and dispose of the wastes, having regard to the health and safety of wastewater workers.
- Trade waste charges should cover the efficient costs to the water supplier of handling these wastes, including an allocation of corporate overheads.
- Charges should vary to reflect differences in the cost of treating waste to the required standards at particular locations.
- Water suppliers should set charges and standards in a manner that is transparent and accurate. The method of measurement should be reliable and the basis for setting charges should reflect costs incurred as far as possible.

Therefore, we have accepted Sydney Water's revised prices for trade waste charges for the 2020 period, with one exception. Box 12.2 outlines the revisions that Sydney Water has made to its proposed prices, in response to IPART feedback. It also outlines our decision to hold the BOD corrosion charge for industrial customers constant in real terms, and apply a 1.1% corporate uplift.

Box 12.2 Sydney Water's revised trade waste prices

Sydney Water proposed reductions to most commercial and industrial pollutant charges. It also proposed reductions to commercial agreement charges and Wastesafe charges, but small increases to industrial agreement charges.

Sydney Water proposed eliminating three charges:

- Two "missed Wastesafe service charges" as part of moving to a new approach to managing Wastesafe customers with non-compliant grease traps (see below).
- The "sale of trade waste data" charge which was levied to cover the cost of complex data requests. Sydney Water has not applied this charge in many years. In future, Sydney Water proposes to manage any requests through the "Sydney Water hourly rate" charge in the ancillary services schedule.

Lower pollutant charges for industrial and commercial customers

Pollutant charges allow Sydney Water to recover the variable costs trade waste discharges place on the wastewater system when compared to ordinary wastewater customers. Sydney Water calculates pollutant charges based on the relative load (ie, the mass) of particular pollutants that different types of trade waste customers contribute to wastewater system.

Sydney Water proposed reducing industrial pollutant charges in 2020-21 by 0.2% to 80% compared to 2019-20 prices. The largest reductions are for Nitrogen and Phosphorous nutrients in secondary catchments.

Sydney Water proposed reducing commercial pollutant charges by 25% to 43% compared to 2019-20 prices depending on the type of customer, with the largest reductions for food and automotive businesses. However, Sydney Water proposed increasing pollutant charges for food businesses which do not maintain their grease-traps by 7%.

Sydney Water proposed to increase prices for two minor industrial pollutant charges: excess pH and temperature in corrosion affected catchments.

Higher fixed charges for industrial customers and lower for commercial customers

Fixed agreement charges and Wastesafe charges allow Sydney Water to recover its fixed costs for providing specific trade waste services such as performing inspections and waste sampling, as well as administering trade waste agreements.

Sydney Water proposed a 15% increase in agreement charges for industrial customers; a 36% to 38% reduction in agreement charges for commercial customers; and a 66% reduction in Wastesafe administration charges.

A new pricing method for non-compliant Wastesafe customers

Wastesafe customers (predominately food businesses) are expected to maintain a waste trap (grease trap) consistent with Sydney Water's specifications. Traps require regular pump outs of oils and organic material because if a trap becomes blocked it will significantly increase the amount of pollutant material entering the sewer.

Sydney Water proposed a new approach for dealing with non-compliance, where instead of a fixed missed service fee, non-compliant customers would be charged the same volumetric pollutant charges as if they did not have a waste trap. Therefore, the pollutant charge for a food business would increase from $1.71 per kilolitre of deemed discharge (or $2.37 for “high-strength” businesses) to $13.01 per kilolitre. The higher rate would apply from the time they were deemed non-compliant until they have their trap serviced. Sydney Water will take steps, including a desktop evaluation, contacting the customer and/or making a site visit, to ensure that customers are not charged the higher price when they are unknowingly uncompliant.

BOD charges to increase by 1.1% per year

We are suitably confident in Sydney Water’s modelling to accept Sydney Water’s proposed trade waste prices, with the exception of Sydney Water’s proposed BOD corrosion charge for industrial customers. Sydney Water’s initial modelling for the BOD charge was a “bolt on” to its pollutant model with numerous errors. Sydney Water subsequently submitted a new method for estimating these costs however we remained sceptical of many of the inputs. We have instead recommended holding this charge constant in real terms and increasing it by 1.1% per year to reflect corporate costs.

Sydney Water needs to refine its model in the future

In reviewing Sydney Water’s model we generally considered its approach was reasonable although we identified a number of areas where Sydney Water should look to improve its model in the future. These included:

- Determining if it is appropriate to allocate charges between pollutants on a mass basis, given the relative contribution of different pollutants to Sydney Water’s costs is unlikely to be the same (ie, it may cost more to treat a kilogram of phosphorous than a kilogram of suspended solids).
- Developing a more rigorous approach to calculating industrial corrosion charges.
- Investigating to what extent trade waste customers are a driver of future capital expenditure, compared to other wastewater customers, to determine whether there is a benefit in providing a long run price signal for trade waste customers.
- Calculating how much revenue Sydney Water collects from non-compliant Wastesafe customers based on actual data.

Our decision sets trade waste charges for almost all customers lower than the current determination. Most commercial and industrial pollutant charges are lower, and three charges will be eliminated (two Wastesafe missed service charges and the sale of trade waste data charge).

The only customers which will see bill increases are those with non-compliant waste traps. This is because the Wastesafe missed service charges will be replaced by a higher charge for non-complying customers. This would encourage compliance among these customers, and also reflects the costs to Sydney Water in addressing non-compliance.

In its submission to our Draft Report, Sydney Water welcomed our approach to make a number of charges more cost-reflective, which would provide a better signal to encourage compliance (for example, for WasteSafe customers).[94]

The full list of trade waste prices is outlined in Appendix R.

Trade waste revenue

Trade waste makes up a very small portion of Sydney Water's total revenue (0.9%).[95] We deduct the trade waste revenue from the notional revenue requirement, before setting wastewater prices for the general customer base.

Sydney Water estimates that trade waste revenue for 2019-20 is $33.0 million, and this will drop to $24.6 million across the 2020 Determination due to the reduced Industrial and Commercial Pollutant charges. We have accepted Sydney Water's forecasts, as they are reasonable given the lower prices.

12.2 Miscellaneous and ancillary charges

Sydney Water levies miscellaneous and ancillary service charges for a number of non-contestable one-off services. These charges account for a small proportion of Sydney Water's total revenue – approximately 0.5%.[96]

We decided:

44 To set the maximum prices for miscellaneous and ancillary services to apply from 1 July 2020 as set out in Appendix S.

Reasons for our decision

We have accepted Sydney Water's proposed prices for miscellaneous and ancillary prices, including a proposed 1.1% annual increase to allocate corporate costs to these services.

Sydney Water has 34 miscellaneous and ancillary charges. It proposed:

- Price decreases for 13 charges, with decreases ranging from $0.09 to $891.40 per charge. The reduction in charges was mainly due to a reduction in contractor's costs and fees as well as efficiencies achieved as part of Sydney Water's online portal.
- Price increases for eight charges, with increases ranging from $0.54 to $71.29 per charge. The increases in charges reflect actual contract costs for meter replacements, and changes in Sydney Water's business and operating environment for other charges.
- No change for the other nine charges, except to reflect a 1.1% per annum increase in costs to reflect corporate costs.

The majority of price changes for these services are relatively small, particularly in absolute dollar terms, and these fees are generally for one-off services.

94 Sydney Water submission to IPART Draft Report, 27 April 2020, p 104.
95 Sydney Water Pricing Proposal, 1 July 2019, Schedule 6, pp3.
96 Sydney Water Pricing Proposal, 1 July 2019, Schedule 7, pp3.

For the eight services where Sydney Water proposed a price increase, we compared Sydney Water's proposed prices to the Central Coast Council's current prices, and the prices we have set for Hunter Water. We found that Sydney Water's prices were generally set consistently with the other two utilities. The only exception is Sydney Water's proposed price for water service connections for large meters. However, we have accepted this price, on the basis that these customers would generally be commercial customers, and that the price should be set to reflect Sydney Water's actual costs of providing the service.

Sydney Water also proposed adding one new charge – for the annual test of backflow prevention devices. All properties must have a backflow prevention device installed, to ensure that no water – which could be contaminated – can flow back into Sydney Water's mains (for instance in the event of a fall in mains pressure). Properties are classified as either low, medium or high hazard, according to how well the property drains. For low hazard 20mm or 25mm customers, Sydney Water's meters are sufficient backflow protection, but for higher hazard or larger meter properties, separate backflow devices must be installed.

All backflow devices have to be installed by a licenced plumber, and must be tested annually to ensure they remain functional. Sydney Water maintains a register of approximately 31,000 testable devices, of which approximately 6,000 are non-compliant (ie, the property owner has not had the device tested). This represents a risk to the quality of the water supply.

Sydney Water has proposed a new ancillary charge for the annual testing of these devices. The charge would cover a Sydney Water contractor visiting the property, conducting the annual test of the backflow device, and lodging the test report. The fee ($229.44) would be levied only on non-complying customers.

We have accepted Sydney Water's proposed charge, as this fee is only levied on non-compliant customers.

12.3 Dishonoured or declined payment and late payment fees

Sydney Water has proposed to slightly increase its late and dishonoured or declined payment fees, to reflect a proposed 1.1% annual increase to allocate corporate costs to these fees.

We decided:

45 To set the maximum price for late payments as set out in Table 12.1.

46 To set the maximum price for dishonoured or declined payments as set out in Table 12.1.

47 To publish the terms and conditions for the late payment fee.

Table 12.1 Final prices for late payment, and declined payment fees ($2020-21)

Charge	2019-20	2020-21	2021-22	2022-23	2023-24
Late payment fee	4.74	4.75	4.80	4.85	4.90
Dishonoured or declined payment fee	14.26	14.30	14.46	14.62	14.78

Reasons for our decisions

Sydney Water's Customer Contract states that it may charge customers, the higher of:

- the interest on their overdue account balance, or
- a late payment fee, but only if the maximum late payment fee is specified by IPART as part of a review conducted under the Independent Pricing and Regulatory Tribunal Act 1992 (NSW).

Under the Customer Contract, if the customer's payment of the bill is dishonoured or declined, Sydney Water may charge a dishonoured or declined payment fee.

Sydney Water has indicated that these late payments increase its costs, including for: printing and posting reminder bills and overdue notices; phone calls and other follow up actions; and the funding cost that comes from the delay in receiving revenue. Sydney Water applies the higher of a late payment fee, or interest accrued to the overdue bill, to recover these costs.

We received a submission from PIAC questioning the necessity of these fees, noting that late or declined payments are often a result of socioeconomic disadvantage, and suggesting that the impact on the customers is far greater than the impact on Sydney Water. However, Sydney Water has provided evidence that there are a significant number of customers who have not paid their bills by the due date (30%), and that around 15% are significantly overdue, many of whom are not in financial hardship.[97] It estimates around 250,000 instances of late payment and 275 instances of dishonoured or declined payment in 2020-21, which may remain steady over the four-year price path.

Under its Customer Contract, Sydney Water can only charge in accordance with any terms and conditions specified by IPART. These conditions provide safeguards for vulnerable customers and address the risk that customers experiencing financial hardship will be negatively impacted.

IPART conducted a detailed review of Sydney Water's late payment fee during the 2016 price review. The fee reflected the combined interest and debt recovery costs across a range of different customer situations. We determined that Sydney Water's proposed fee was reasonable, simple to understand, and below that charged by other service providers (see Table 12.2).

[97] Sydney Water pricing proposal to IPART, June 2019, Appendix 4B, p 2.

Table 12.2 Comparison of late payment fees charged by other service providers ($2019-20)

Company	Late payment fee
AGL – electricity	$12.73 (not subject to GST)
AGL – gas	$12.73 (not subject to GST)
Origin/Integral	$10.90 (not subject to GST)
Energy Australia	$12.00 for market retail contracts (excludes customers on Flexi Saver and Secure Saver energy plans)
Optus	$15.00 (no GST applies) If the bill is more than $50 and the total amount owing is not paid the due date.
Telstra	$15.00 for overdue amounts more than $70

Source: Sydney Water pricing proposal to IPART, June 2019, Appendix 4B, p 3.

Our decision is to accept Sydney Water's proposal, as it has proposed to largely maintain these fees, with the exception of applying an uplift to allocate corporate costs to these fees.

We have also decided to publish the terms and conditions for late payment fees established in 2016. Under its Customer Contract, Sydney Water can only charge late payment fees in accordance with any terms and conditions specified by IPART. We did not include the terms and conditions for late payment fees in the Draft Report. Sydney Water asked us to re-publish the terms and conditions for late payment fees in the Final Report to avoid the need for us or customers to reference the 2016 Final Report to understand these terms and conditions.[98]

The terms and conditions for late payment fees include a seven-day grace period for customers. Sydney Water supported retaining this grace period in its submission to our Draft Report.[99] We have retained this condition. We discuss how this grace period interacts with Sydney Water's working capital allowance in Appendix H. In its submission to our Draft Report, EWON noted that late payment fees are not allowed to be charged to vulnerable customers by energy companies. EWON considered that similar protections should apply in the water sector.[100] We note that Sydney Water's terms and conditions for late payment fees have similar protections, for example, Sydney Water cannot charge a late payment fee where customers are in hardship or where EWON has asked Sydney Water to waive the fee.

98 Sydney Water submission to IPART Draft Report, 27 April 2020, p 105.
99 Sydney Water submission to IPART Draft Report, 27 April 2020, p 105.
100 EWON submission to IPART Draft Report, 24 April 2020, p. 4.

Box 12.3 Sydney Water terms and conditions for late payment fees

Sydney Water will not charge a late payment fee where:

- there is a billing matter being considered by the Energy and Water Ombudsman NSW (EWON)
- the customer has made an arrangement with Sydney Water to pay by instalments or another payment plan
- part of the bill is being paid using Sydney Water's payment assistance scheme
- Sydney Water is aware that the customer has sought assistance from a community welfare organisation that is part of the payment assistance scheme
- the customer is registered with Sydney Water's BillAssist program
- the customer has been identified as being in hardship
- the customer pays by Direct Debit, or
- EWON has asked Sydney Water to waive the fee.

The fee will only be levied:

- if the customer has been notified in advance of the late payment fee and the circumstances in which it may be levied, and
- at least 7 days after the due date.

Source: IPART Final Report, Review of prices for Sydney Water Corporation from 1 July 2016 to 30 June 2020, p. 15.

12.4 Unfiltered water charges

Unfiltered water is water that has chemical treatment, but not at a water filtration plant. The unfiltered water charge is currently set at a small discount to the treated water usage price to reflect the reduced water filtration costs incurred by Sydney Water.

Currently, Bluescope Steel's Port Kembla plant in Wollongong is Sydney Water's only unfiltered water customer.[101]

We decided:

48 To set the maximum unfiltered usage charge at $0.31/kL less (in $2020-21) than the usage charge for potable water.

Reasons for our decision

Our decision is broadly cost-reflective and is in line with Sydney Water's proposal. The average forecast filtration cost for the 2020 Determination period is $0.31/kL, only marginally lower than the projected discount price of $0.33/kL for 2019-20.

The current structure of unfiltered water charges will remain, which includes a fixed service charge set at the same level as the charge for potable water (based on meter size). Sydney Water broadly accepted our decision in its submission to our Draft Report.[102]

[101] Sydney Water pricing proposal to IPART, June 2019, Attachment 4, pp14.
[102] Sydney Water submission to IPART Draft Report, 27 April 2020, p 105.

12.5 Unmetered water charges

Some residential and non-residential properties do not have water meters, meaning they do not pay explicit water usage charges. Instead, they pay for water usage based on a deemed allowance which is added to their fixed water service charge. Sydney Water data shows there are approximately unmetered 14,000 customers.[103]

We decided:

49 To maintain the current approach to charging unmetered properties, which includes:

– A water service charge equal to the residential service charge, and

– 180 kL of deemed water usage per year (ie, 180 kL *times* the water usage price).

Reasons for our decision

Our decision is consistent with Sydney Water's proposal. We consider that unmetered customers should continue to pay a water service charge that reflects the residential service charge.

Our view is that it is appropriate to include a deemed usage component for unmetered customers, as this accords with the impactor pays principle. We consider that 180 kL of deemed usage (slightly above average apartment usage, but below average residential consumption) is appropriate given that 80% of unmetered customers are either small inner-city terraces or small non-residential shops.[104] We note that customers are at liberty to have a meter installed if they believe they are consuming less than the deemed amount. Sydney Water will provide the meter free of charge, and the customer is responsible for the cost of installation.

Sydney Water's response to our Issues Paper provided justification for the continuation of a 180 kL deemed usage. It maintains that since its 2012 review of water use for unmetered properties, the total number of unmetered properties continues to decline. Sydney Water states the number of unmetered non-residential properties has significantly reduced, by over 50% since 2012. Therefore, it does not consider that the administrative cost to increase deemed usage charges is warranted for this review, given its view that the type of unmetered residential properties and their consumption habits have not changed.

Our decision is to accept this reasoning and maintain the deemed water usage charge for unmetered properties at 180 kL per year.

[103] Sydney Water pricing proposal to IPART, June 2019, Attachment 4, pp15.
[104] Sydney Water submission to IPART Issues Paper, October 2015, p 105.

We have reconsidered our approach to charging temporarily unmetered properties. In the Draft Report, we proposed to charge these properties based on their historical water usage. That is, unmetered properties would be charged a water usage price applied to the average daily usage over the previous twelve months, specific to that property, multiplied by the number of days the property is unmetered. This was in line with our decision in our 2019 Central Coast review.[105] However, Sydney Water indicated our approach would be difficult to administer in practice. This is because temporarily unmetered properties in its area of operations are usually unmetered due to redevelopment and that this is only for a short period of time.[106]

12.6 Sydney Water Developer Direct

During this review, we examined the services offered through Sydney Water Developer Direct (SWDD). Sydney Water currently competes with private sector Water Servicing Co-ordinators (WSCs) to provide application and construction services for some smaller customers, to ensure that new development is adequately serviced with water, wastewater and stormwater services. Box 12.4 provides a background of the market, and the services that Sydney Water currently offers through SWDD.

Our finding is that SWDD should revisit its model for pricing application services, to address concerns identified by our consultants, Cardno. We have decided to continue to defer regulating construction services offered by SWDD because these services are outsourced by SWDD, and we consider that the margin applied by SWDD is reasonable.

105 IPART 2019, *Review of Central Coast Council's water, sewerage and stormwater prices*, p 16.
106 Sydney Water submission to IPART Draft Report, 27 April 2020, p 106.

Box 12.4 Certifying that new developments are fit to be part of Sydney Water's network

Developers must acquire a Section 73 Compliance Certificate (s73 Certificate) from Sydney Water to certify that a new development has satisfied all of its requirements relating to the availability of drinking water, wastewater, recycled water or stormwater services for that development.[107]

Sydney Water provided these services until 2001, after which it exited the market as it considered that the work could be better provided by the broader market. This resulted in the establishment of a Water Servicing Coordinator (WSC) market. WSCs act as a point of contact between Sydney Water and the developer. They advise and assist customers on how to meet the requirements to obtain a s73 Certificate, prepare design sketches and seek quotes from construction services providers for any necessary works. These services broadly fall under the umbrella of 'application services'. Some WSC's also provide construction services, which may include detailed design work, project management, engaging constructors to build works, or utilising their own construction teams.

The WSC model has attracted complaints from customers relating to prices and quality of service. Sydney Water has engaged with WSCs in an attempt to address these issues. Specifically, Sydney Water:

- Now requires all WSCs to integrate coordination and design services where they used to be completed by separate teams. This overcomes an issue whereby WSCs could avoid responsibility for errors by each blaming the other team.
- Has refreshed its procurement arrangements to provide greater certainty and encourage collaboration with WSCs.
- Has introduced 'Accreditation Categories' to strengthen the WSC scheme. There are 17 categories which cover different services, sizes of infrastructure and roles. This ensures that work is only completed by WSCs that have sufficient knowledge and experience to complete works to a high standard.

Alongside these improvements, Sydney Water launched SWDD in July 2017 in response to customer feedback about the WSC market. SWDD provides the following services:

- Application services for developments requiring only 'minor works', or no works. For these types of developments, developers can now choose whether to engage a WSC or to use SWDD for application services. For developments requiring major works, Sydney Water still requires developers to engage a WSC. The services provided by SWDD, as listed on the Sydney Water website, include:
  - Assessment of building plans and development applications
  - Notice of Requirements if there is a need for works
  - A quote for any construction work outlined in the Notice of Requirements
  - Section 73 Certificate and full Building Plan Approval, once the developer has met all of Sydney Water's requirements.
- Various construction services, including:
  - new private main to meter connections for water, wastewater and recycled water
  - capping an existing connection, and
  - asset protection slabs and concrete easements.

Stakeholders raised concerns with SWDD

We received a number of submissions in response to our Issues Paper regarding SWDD. These submissions varied in their complaints, but largely followed the same themes that SWDD has an unfair advantage in the market as a result of:

- Information asymmetries – for instance, Sydney Water appears to promote SWDD services on its website over WSCs.
- Different compliance requirements – for instance, software required for sketches, and fees for sewer service diagrams appear different between WSCs and SWDD.

As such, submissions claimed that SWDD prices are not in line with market rates: that SWDD undercharges for application services and then overcharges for construction services. While it outsources construction services, submissions suggested that it was not possible for WSCs to join SWDD's panel, and that they were locked out of that construction work.

We engaged a consultant to review SWDD

In our 2018 Developer Charges review we received submissions that SWDD was using its market power to undercut WSCs' prices. We consulted directly with WSCs and assessed SWDD services.

At that stage we deferred judgement until this review. However, we have now received more submissions, and decided to undertake a full scale review.

We engaged Cardno to review of SWDD. In particular, they examined whether Sydney Water is using vertical integration to undercut application services offered by WSCs or cross-subsidising its application and construction services.

Cardno's main findings were that:[108]

- Sydney Water has **appropriately ring-fenced** all SWDD costs, with one exception where there is no formal agreement between Sydney Water and SWDD for sharing software costs.
- The **information asymmetries** noted in submissions are, on the whole, a result of **misunderstanding** rather than an intentional unfair treatment of WSCs.
- SWDD is **not intentionally acting in an uncompetitive way**, however there are two places where it has unintentionally created an uneven playing field.
- SWDD is, in some cases, subject to **different requirements** to WSCs. Specifically, there are minor inconsistencies in their requirement for Engineering Competency Standards accreditation, and in contractual requirements with Sydney Water. These differences could result in a minor cost advantage for SWDD, though this would not be significant.

[107] Sydney Water's submission to IPART Issues Paper, December 2017, p 39.
[108] Cardno's report can be found on our website.

- SWDD is not currently earning a **commercial rate of return** on its services. SWDD uses a cost build-up approach to calculate its fixed price for application services, and Cardno found a number of issues with the approach. Specifically, it notes that the number of applications assumed each month is not historically accurate, and that SWDD staff utilisation rates are not accurate. Taking this into account, Cardno believes application prices should be higher.

To address these concerns, Cardno recommended that Sydney Water review its pricing model to account for the errors identified in the model, and that it ensure that SWDD requirements are pulled in to line with those required of WSCs.

We recommend that SWDD revisit its model for pricing application services

We agree with the findings of Cardno, and recommend that Sydney Water review SWDD.

We recommended:

1 That Sydney Water:

– Review the Engineering Competency Requirements and require SWDD to meet the same standards as WSCs

– Review its quality management system and provide evidence that it satisfies the same criteria applied to prospective WSCs through the tender process.

– Revisit its assumptions for the allocation of staff time to SWDD activities and increase the utilisation rate it applies to the cost build-up.

– Formalise a level of service agreement between itself and SWDD for the provision of the SWDD software.

– Adjust the SWDD pricing model to base pricing on a rolling average number of applications as opposed to an anticipated flat rate.

We decided:

50 To defer regulation of SWDD construction services.

Sydney Water has stated it will adopt our recommendations in its annual application fee review. However it notes that it does not agree that SWDD has been earning less than a commercial rate of return given its recent performance and how young the business is.[109]

Given that Sydney Water has indicated it is willing to work with IPART to implement the recommended changes, we consider this is the fastest and lowest cost approach to rectifying this issue. However, should any party continue to be concerned, there is an established process to lodge a competitive neutrality complaint. More information about this process can be found on our website.

[109] Sydney Water submission to IPART Draft Report, 27 April 2020, p 128-129.

13 Form of regulation

This chapter discusses the 'form of regulation', or the set of methods we use to regulate prices for the utility's monopoly services. The form of regulation can determine how risk is allocated amongst the regulated utility, its customers and taxpayers, and includes:

- How long we set prices for before our next review.
- Whether prices are directly or indirectly controlled.
- How we can incentivise the utility to improve its performance.
- How revenue and cost risks are shared between the utility and its customers.

In the 2016 Sydney Water review, we introduced two new mechanisms to encourage it to become more efficient and provide more flexibility to better respond to customers' preferences and behaviour. These mechanisms were:

- The efficiency carryover mechanism (ECM), and
- The option for unregulated pricing agreements (UPAs).

This chapter also assesses these mechanisms over the 2016 determination period, and whether we decided to apply them for the next price path.

We have decided to comprehensively review our form of regulation and will undertake this in a broad consultative process before our next review of Sydney Water's prices. This will seek to identify ways we can improve the framework and our approach, to strengthen incentives for the water utilities to innovate and be efficient, and to enhance outcomes for customers – drawing on stakeholder views and the approaches and experiences of other economic regulators.

13.1 A 4-year determination period

For each water pricing review, we decide how long to set prices for (the length of the determination period). In general, the determination period can be between one and five years, depending on the circumstances. In Appendix B (Box B.4) we list the matters we consider when we set the determination length.

We decided:

51 To set a 4-year determination period.

Our decision is to set prices from 1 July 2020 for four years, as we consider this appropriately balances a range of matters – including incentives for efficiency gains, minimising regulatory costs, and risks of inaccurate forecasts. This is the same as Sydney Water's proposal, and Hunter Water's revised proposal. PIAC, in its submission to our Issues Paper, also supported a four year period, as did the Property Council of Australia in its submission to our Draft Report.

While we view the length of the determination period as an open question in future reviews, for the current review, the forecasting uncertainty of the utility's costs and demand (especially given the recent climate variability and high levels of capital expenditure) makes a 4-year price path more appropriate than a 5-year determination.

13.2 We will maintain setting a price cap

We decided:

52 To set a maximum price cap.

Our decision is to maintain our approach to set a maximum price cap for Sydney Water. Compared to alternatives such as a revenue cap or weighted average price cap, we consider price caps provide transparency and pricing certainty to customers and ensure that, as much as practical, prices reflect efficient costs, and where appropriate, signal the long-run cost of providing the service.

We note that price caps relative to other options (such as a revenue cap) expose the utility to revenue volatility risk and to manage this we have previously introduced a revenue volatility adjustment mechanism. This is further is discussed Chapter 7.

Our approach is supported by Sydney Water for this determination period. No other stakeholders raised alternative forms of regulation.

13.3 We will retain the current efficiency carryover mechanism

We decided:

53 To maintain the efficiency carry-over mechanism for operating expenditure for the 2020 determination period.

In 2016, we introduced an efficiency carryover mechanism (ECM) for operating expenditure, which allows a utility to retain permanent efficiency savings for a fixed period regardless of when in the determination period they are achieved.

As outlined in Box 13.1, this mechanism aims to remove the incentive for a utility to delay efficiency savings from the end of one determination period to the beginning of the next. The ECM currently applies to Sydney Water's core operating expenditure only, and our decision is to maintain the current arrangement.

To date, we have not applied the mechanism in practice – it was available for Sydney Water, Hunter Water and Water NSW[110] but none of the utilities made a claim under the mechanism for this price review.

110 IPART, *Review of prices for Hunter Water Corporation From 1 July 2016 to 30 June 2020 Final Report*, June 2016, p13-14, and IPART, *Review of prices for Sydney Water Corporation From 1 July 2016 to 30 June 2020 Final Report*, June 2016, p16.

Box 13.1 The benefits of an Efficiency Carryover Mechanism

An Efficiency Carryover Mechanism (ECM) mitigates the incentive for a regulated utility to delay reporting efficiency savings. This is because any permanent cost savings retained by the business for the current period will be passed onto customers through lower prices at the next price determination regardless of when these savings are identified within the regulatory period.

Without this, utilities could be incentivised to delay implementing efficiencies. Under our pricing framework, we set maximum prices for the regulatory period based on our assessment of the business' efficient costs, and if the business can deliver its services at a lower cost, then it retains the benefits until we reassess its costs at the next price review. This is 'incentive regulation' because it rewards the utility for finding efficiencies, which, if permanent, are passed on to customers in the next pricing period. However, the financial reward to the utility is highest in the first year (as this means the reward is collected in each year of the determination) and deteriorates over the regulatory period, hence providing an incentive to delay efficiencies to the start of the following determination period.

For an ECM to apply:

1. The regulated utility will need to include details of efficiency savings in its next pricing submission, and be able to demonstrate these are permanent efficiency improvements.
2. IPART will then assess the efficiency gain and the appropriate level of funds to be carried forward.

Applying the ECM

If the utility decides to apply the ECM, the utility would need to calculate the following values:

- **Under (over):** first the utility identifies the difference between the base allowance set by IPART to its actual expenditure.
- **Outperformance:** second, the utility only reports where it underspends against our allowances (overspends are omitted).
- **Permanent gain:** working backwards from year 4 to year 1, the utility then determines how much of the outperformance in year 4 also occurred in year 3, how much of the outperformance that occurred in both year 4 and 3 occurred in year 2, etc.
- **Incremental gain:** working forwards from year 1 to 4, it then determines the first year that a permanent saving occurred. It is this 'incremental gain' in each year that would be carried forward for four years through the ECM calculation that follows.
- **ECM calculations:** ensures that any incremental gain is carried forward and held for four years.

At the next determination period, we would consider these calculations, and decide whether the savings identified by the utility are permanent.

For further information, please see our 2016 Sydney Water Final Report.

The ECM only applies to core operating expenditure

As noted, the ECM applies to operating expenditure only – it does not apply to **capital expenditure**.[111] In our 2016 Final Report, we did acknowledge the potential value in encouraging efficient trade-offs between operating and capital expenditure, and that this issue could be explored further in the future.[112] In the lead up to this review, we asked the utilities whether the ECM should be extended to include capital expenditure.

The utilities expressed mixed views on an ECM for capital expenditure

Neither Hunter Water nor Water NSW proposed broadening the ECM. Water NSW considers that a capital incentive scheme (either ECM or another) would not result in improved outcomes for the business and customers; the lumpy nature of capital expenditure can be related to different stages of the asset life-cycle, business decisions and planning, and/or government-directed investment, rather than efficiency.

On the other hand, Sydney Water indicated interest in exploring an ECM for capital expenditure and re-iterated its proposal from 2016.

We maintain our views outlined in our 2016 price reviews, which are:

- To limit the ECM on operating costs only because:
  - The risks of unintended consequences associated with strengthening capital expenditure incentives (such as to over-forecast and inefficiently defer capital expenditure).
  - The additional complexity, such as the practicality of undertaking an ex-post assessment of capital expenditure, and the nuances of achieving equalised incentives across operating and capital expenditure.
- Our ECM is asymmetric in the sense that while it equalises the incentive to achieve permanent efficiency savings over time, it preserves all other features of the current form of regulation. That is:
  - Permanent cost increases are held by the business until the next price review, when they are assessed by the regulator and, if determined to be efficient, passed on to customers (through price increases as a result of an increase in the business's operating expenditure allowance) – this provides an incentive for the business to avoid inefficient increases in costs.
  - Temporary over and under spends are retained by the business – this provides an incentive for the business to manage within its budget.

We have received no other stakeholder comments on the ECM.

111 This was due to the additional complexity of introducing an ECM for capital expenditure, the risk of unintended consequences (ie, incentivising the business to over-forecast and inefficiently defer capital expenditure), and the limited opportunities for efficient trade-offs between operating and capital expenditure.

112 Further information on the ECM is available in Chapter 3 and Appendix E in the 2016 Final Report of our determination of Sydney Water's prices. IPART, *Sydney Water Corporation: Maximum prices for water, sewerage, stormwater drainage and other services from 1 July 2016*, Final Report, June 2016.

13.4 We will retain the option for unregulated pricing agreements

We decided:

54 To maintain an option to enter unregulated pricing agreements with large non-residential customers (defined as those with annual water consumption greater than 7.3 ML).

Our current form of regulation involves setting maximum prices for regulated services that apply to all customers for each year of the determination period. In our 2016 review, we decided to allow Sydney Water to enter into unregulated pricing agreements (UPAs) with large non-residential customers, provided the costs and revenues of these unregulated agreements were ring-fenced from the regulated cost base.

As yet, Sydney Water has not entered into any UPAs with its customers. At a high level, Sydney Water supports maintaining the flexibility of UPAs, and the Property Council of Australia was the only stakeholder to comment on UPAs in response to our Sydney Water Issues paper, expressing support for the option. The Property Council of Australia supported unregulated pricing agreements in its submission to our Draft Report.

Sydney Water considers a barrier to uptake is the potential for a future Tribunal to remove the option of UPAs and possibly stranding investments with a cost recovery period of greater than the determination period for large customers. Our view is that incentives generated from UPAs should be maintained over time, so we will allow any gains, in the form of increased revenue or decreased costs, to be retained by the parties involved. However, while we view it as unlikely that the option of entering into UPAs will be removed, we cannot bind the decisions of a future Tribunal.

In its response to our Issues Paper, Sydney Water suggested two potential ways to address these barriers:

- Consider seeking approval from the NSW Treasurer to set prices for UPAs, which are not equal to the maximum prices set by IPART, for the tenure of any mutual agreement.
- Consider a price formula for UPAs.

These approaches would apply to existing agreements prior to a future Tribunal making the decision to remove the option of future UPAs, and they would only apply for the remaining tenure established in any commercial agreement. Sydney Water notes that these approaches may be administratively costly, meaning regulatory requirements may be prohibiting a more economically efficient outcome for customers.

The utilities already have the ability to seek approval from the NSW Treasurer to levy prices below those set by IPART. Regarding setting a price formula for UPAs, Sydney Water has not included sufficient detail on this approach for IPART to consider. And, given that UPAs are designed to encourage negotiations between the utility and large customers with potentially unique costs of service and/or service level requirements, it is likely that any pricing formula would vary on a case-by-case basis. Even if we set a pricing formula for UPAs, this still would not bind a future Tribunal or guarantee that an agreement may not be overruled.

Our 2016 Determination defines the customers that could enter into a UPA as a non-residential **property** that is serviced by one or more individual meters, where that property has annual metered water consumption greater than 7.3 ML.[113] We acknowledge that some customers may have multiple properties where, combined, the water usage of the multiple properties would exceed 7.3ML annually, but no individual property would have that level of water usage.

We sought feedback on whether this definition should be expanded to include customers with multiple properties, with combined usage that exceeds 7.3ML per annum. Both Hunter Water and Sydney Water supported the expansion of the definition – with Hunter Water finding this could add 25 to 30 customers to be eligible to enter a UPA (or about an extra 10% compared to the current definition).[114] We have incorporated this into the Determination.

Sydney Water identified scope for three different thresholds – one based on water use, one on wastewater discharge amount, and a hybrid of the two.[115] We consider that there may be merit in exploring this approach, but acknowledge that there have been barriers identified that impact the take-up of UPAs. We will work with Sydney Water and Hunter Water as part of our usual quarterly engagement between reviews to see what other barriers exist to UPAs and suggest they do so with their customers. We intend to revisit this issue in the 2024 price reviews.

13.5 Managing contingent project risks

As part of the concurrent review of Water NSW's bulk water prices to Sydney Water, Water NSW proposed a number of options to manage its cost risks. Our decisions on these options are discussed in detail in Chapter 8 of the Water NSW Greater Sydney Final Report.

In summary, we outlined a number of options to manage the risk of a contingent project that arises during the Determination period. If the materiality of a contingent project is sufficiently large, the utility can seek a preliminary assessment from IPART on the efficiency of a contingent project that arises during a Determination period, which could provide it with a level of comfort that the capital expenditure will be rolled into the RAB at the next price determination. And if the unanticipated cost impost is large, the utility can also request a resetting of the determination.

We also note that Sydney Water has identified a number of drought risks that could arise in the 2020 Determination period. We have:

- Addressed the additional operating expenditure costs, and the impact of water restrictions on water consumption, during drought, as part of our water usage price uplift.
- Addressed the potential costs that Sydney Water might face from an expansion of SDP, through a cost pass-through to the water service charge.

113 And that property does not receive joint water supply/sewerage services.
114 Hunter Water, *Response to IPART's Hunter Water Draft Decisions*, 9 April 2020, p 7.
115 Sydney Water, *Response to IPART's Sydney Water Draft Report and Determination*, 27 April 2020, p 131.

13.6 We will undertake a comprehensive review of our regulatory framework for water prices before our next review of Sydney Water's prices

We have decided to comprehensively review our form of regulation and will undertake this in a broad consultative process before our next review of Sydney Water's prices. This will seek to identify ways we can improve the framework and our approach, to strengthen incentives for the water utilities to innovate and be efficient, and to enhance outcomes for customers – drawing on stakeholder views and the approaches and experiences of other economic regulators.

Typically, we have reviewed elements of our framework both:

- Outside of price reviews (eg, prices for recycled water, WACC), and
- Within a price review (eg, dynamic water usage prices). To some degree, this is inevitable under the propose-respond model (ie, where a utility has proposed a changed methodology, we will respond in making our final decisions).

During this current review, we have identified issues that would benefit from more in-depth reviews that are best addressed separate to a price review period and we highlight these throughout the report.

For example, as part of the concurrent review of Hunter Water's prices, Hunter Water presented its vision of a 'regulatory roadmap', highlighting areas that it considered could be subject to review and have potential to evolve, and regulatory frameworks adopted by other regulators.[116] It also noted that reviewing the framework on a separate timeline to the price review allows for better engagement than within the price review process. Other stakeholders also supported having a separate review of the framework.[117]

We will work with all stakeholders to identify ways we can improve our regulatory framework in the long-term interests of consumers.

116 Hunter Water, Pricing Proposal, 1 July 2019, Technical Paper 3.

117 PIAC, Submission to IPART Issues Paper, *Submission to IPART's Issues Paper – Review of prices for Hunter Water Corporation from 1 July 2020*, October 2019, p 8.

14 Output measures

This chapter presents our decisions on output measures for the 2020 determination period, and summarises Sydney Water's performance against its 2015 – 2020 IPART Operating Licence requirements and Environment Protection Licences (EPLs) issued by the Environment Protection Authority (EPA).

As with operating and capital expenditure, we engaged Atkins to review Sydney Water's performance against its requirements and to recommend 'output measures' for the 2020 determination period.

We have set a small number of output measures to track Sydney Water's performance in delivering:

- capital expenditure on discretionary and drought-related projects, and
- performance in relation to water conservation, leakage and water recycling. Sydney Water's water conservation and leakage performance is an area where the utility's performance has declined in recent years and there are increased community expectations, particularly given recent drought conditions.

14.1 Our decisions

We decided:

55 To apply the output measures on discretionary and drought-related capital projects detailed in Table 14.1, for reporting to IPART in the pricing proposal for the next Determination.

56 To apply the output measures on water conservation, leakage and water recycling detailed in Table 14.2, for quarterly reporting to IPART.

Our decisions are to set output measures to track three key elements of our review of Sydney Water's services:

1. **Discretionary expenditure**. We have set one measure for each of Sydney Water's two discretionary projects, and a third measure to ensure Sydney Water adequately informs its customers of the discretionary expenditure.
2. **Drought-related expenditure**. We have included one drought-related output measure, to track a network upgrade if the Sydney Desalination Plant (SDP) is expanded, to be publicly reported in Sydney Water's next pricing proposal (July 2024).
3. **Water conservation activities**. We have set five new measures relating to leakage, water recycling and water conservation activities, with quarterly reporting to provide visibility of short-term performance against targets to monitor the success of water conservation activities.

Previously, we set output measures that were focussed more on the 'inputs' used to deliver aspects of Sydney Water's capital program, rather than being outcomes-focused on Sydney Water's performance, or the delivery of key projects. We have removed reporting requirements for 'business-as-usual' capital programs, because these measures may send the wrong signal to stakeholders about the need to complete a certain quantum of renewals, and they impose a small regulatory burden on the utility. Sydney Water supports this decision.[118]

Table 14.1 Output measures on discretionary and drought-related capital projects

No.	Project description	Measure	Target
1	A discretionary project to divert untreated wastewater ocean outfalls at Vaucluse-Diamond Bay.	The amount of wastewater released from the three outfalls (Vaucluse, Diamond bay 1, and Diamond bay 2) during dry weather.	Zero wastewater released from the three outfalls during dry weather, by 30 June 2024.
2	A discretionary project – Waterway Health Improvement Program (WHIP)**a**	Report annually on the: ▼ Tonnes of gross pollutants removed ▼ Tonnes of nutrients removed ▼ Area of native vegetation planted due to the WHIP.	Report on progress against Sydney Water's targets annually.
3	Informing customers of its delivery of discretionary expenditure, and the bill impact of discretionary expenditure	Evidence of how Sydney Water has provided this information to its customers.	Report to customers at least annually on progress and bill impacts of customer supported projects.
4	A drought related capital project to upgrade the network to enable the expansion of SDP (subject to the Government's decision to expand SDP).	A network upgrade to distribute the additional 250ML/day, or such other volume as determined by Government, from an expanded SDP to the wider Prospect network.	Project completed and commissioned prior to the SDP expansion being operational.

a The Waterway Health Improvement Program has four target outcomes. The first outcome was an increased length of waterways in good health. The other three outcome measures included increased native vegetation planting, additional recreational facilities and removal of rubbish and litter.

[118] Sydney Water, Submission to IPART Draft Report – Public, p132.

Table 14.2 Output measures on water conservation

No.	Project description	Measure	Target
1	**Water demand management**	Report the percentage reduction in demand from a defined base which Sydney Water currently uses, compared with target reductions during periods of water restrictions.	Whilst in drought: meet the demand reduction and water conservation targets as agreed with the NSW Government
2	**Water demand management**	Report on expenditure for water wise behaviours campaigns and enforcement of water restrictions.[a]	That Sydney Water invests in water demand management activities to a level that is consistent with the value of water.
3	**Leakage**	The rolling annual average leakage in ML/day at the end of the quarter compared with the Economic Level of Leakage (ELL)	Rolling annual average leakage is at the ELL, within an allowance to reflect the 'band of uncertainty'
4	**Leakage**	The quarterly average leakage value in ML/d compared with target for the last five years	Leakage is consistent with the ELL
5	**Water recycling**	The volume of recycled water produced (ML/d) against capacity from each of the S16a plants at Rosehill-Camelia and the St Mary's plant	Increase the utilisation of recycled water at the Rosehill-Camelia plant and achieve average environmental flows at the St Mary's plant of 43.3ML/day.

a Note that Sydney Water already reports on the costs and water saved from its 'Water-fix' and 'Plumb assist' demand management activities annually in its Water Conservation Report. This information would also be provided on a quarterly basis.

14.2 Reasons for our decisions

14.2.1 Track the delivery of discretionary and drought projects

Our decision is to track the discretionary projects being delivered by Sydney Water over the 2020 determination period. This is because the expenditure approved is a new approach, the utility's performance is not tracked through its Operating License as it is not to deliver mandated service requirements, and customers are being asked to pay more for a better service.

Our decision is to also track the drought project to upgrade Sydney Water's network, subject to the Government's decision to upgrade SDP. This is a discrete project being funded as a cost pass-through. We consider there is a benefit in scrutinising whether the additional costs paid by consumers have also been accompanied by the delivery of the project.

We have accepted Sydney Water's proposed amendments, to our output measures on discretionary and drought-related capital projects, in response to our Draft Report. We agree with Sydney Water that its amendments would make these measures more meaningful to customers.

14.2.2 Performance on water conservation, leakage and calculating the value of water

Our consultants found that Sydney Water has not been meeting its leakage targets, as detailed in Box 14.1.

Therefore, in addition to the capital expenditure output measures, our expenditure consultants recommended new measures relating to leakage, recycled water and water conservation. We accepted our consultant's recommendations.

As an interim step, we have asked Sydney Water to report on our five recommend output measures in Table 14.2.

Sydney Water accepted the majority of these measures, but requested two changes:

- It does not support having a target for Rosehill-Camelia recycling plant, arguing that it is operated by an external party and hence a target on Sydney Water is not appropriate. However, we have decided to retain the measure, as increasing the utilisation of the plant is certainly something for Sydney Water to aim for, and given this is a target and not a regulatory requirement, it will not be penalised should it not be met.
- It is also not supportive of quarterly reporting of leakage performance as it does not consider this will be an effective incentive, and instead plans to address performance issues through improved internal reporting of lead indicators and effective governance. However, we feel that more frequent public reporting would reduce the lag of these indicators and show that Sydney Water is progressing in addressing its leakage problem, so therefore have decided to keep this measure unchanged.

In Section 14.3, we outline our proposal that Sydney Water's Reporting Manual, tied to its operating licence, could instead capture information on Sydney Water's water conservation activities.

Box 14.1 Our consultant's findings on Sydney Water's performance

Performance against IPART performance standards

Sydney Water's operating licence 2015-2019 includes performance standards for water quality, systems performance and water conservation. Atkins found Sydney Water's performance against its operating licence requirements to be mixed. In particular, Atkins found that leakage significantly increased over the last three years and is over 20% above Sydney Water's ELL, and Sydney Water did not meet all the requirements of its EPLs.

Performance on water conservation

Sydney Water's current reporting on water conservation through the Reporting Manual (which accompanies the Operating Licence) does not provide an adequate level of detail to calculate the value of water used by Sydney Water to determine the efficient level of water conservation (ELWC) expenditure. Our current understanding of Sydney Water's calculation of the value of water is detailed in Box 14.2.

Atkins recommend five measures to track quarterly performance. Our decision, detailed in Table 14.2, is to accept Atkins recommendation and request Sydney Water provide more information on the method it uses to determine water conservation spending.

Environmental performance

Atkins also found that Sydney Water did not meet all the requirements of its EPLs. A particular area of concern is Sydney Water has not met the EPL requirements for dry weather wastewater overflows. In particular, there have been seven dry weather failures in the last three years, and 15 of 23 systems show deteriorating performance. Further:

- Sydney Water has been subject to increased regulatory oversight by the EPA. The EPA considers that there are systemic shortcomings in Sydney Water's response to dry weather overflows. The EPA has inserted a special clause into Sydney Water's EPLs that requires it to appoint an independent expert to investigate its response.
- Atkins found that there is a need for Sydney Water to increase its activity to address deteriorating performance in the short to medium term, as evidenced by an increase in dry weather overflows to waterways.

Sydney Water's discretionary expenditure projects on waterway health and wastewater outflow seek to improve the utility's environmental performance. In the case of discretionary projects, the utility's performance is not tracked through its Operating Licence or any other regulatory instruments, and as such there is benefit in having output measures on these projects scrutinising whether additional costs paid by consumers have also been accompanied by the delivery of the project.

We, and our consultants, consider that Sydney Water's leakage problem is two-fold:

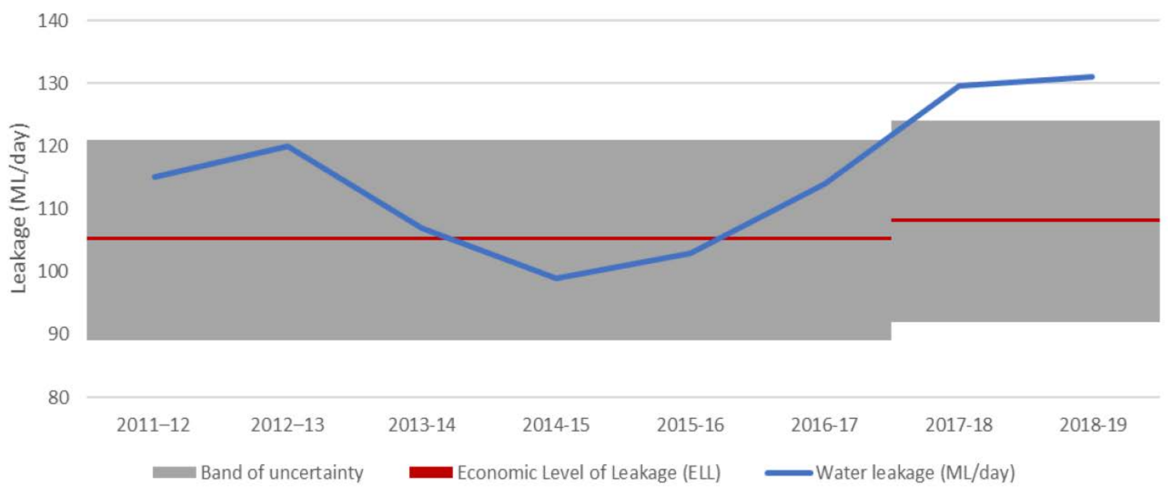
1. Sydney Water is exceeding its ELL. That is, the level of leakage from Sydney Water's network is too high.
2. The efficient level of leakage that Sydney Water has calculated could be too high because Sydney Water's estimate of the value of water may be too low. An explanation of Sydney Water's calculation of the value of water is explained in Box 14.2.

Sydney Water's leakage has been rising for the last four years. This is largely driven by drought conditions leading to more leaks in the system.

In 2018-19 Sydney Water lost an average of 131 ML/day, or 9% of total water supplied, to leakage. For comparison, this is just over half of what the Sydney Desalination Plant generates each day.

This is above the range specified in the ELL (108±16 ML/day). While it is clearly not efficient to eliminate all leakage, Sydney Water has exceeded the ELL for six out of the last eight years, and beyond the ELL 'band of uncertainty' for the most recent two years, as detailed in Figure 14.1.

Figure 14.1 Sydney Water actual leakage vs ELL over time



Source: Sydney Water, Water Conservation Report, 2018-19.

In its most recent water conservation report, Sydney Water estimated a short-run value of water of $1.85/kL in early July 2019. This is despite the Sydney region entering Level 1 water restrictions on 1 June 2019, which would intuitively suggest the value should be higher.

The short-run value of water is important as it is used by Sydney Water to calculate the suite of water conservation measures for the next five years (2019-20 to 2023-24) (see Box 14.2).

We are concerned that Sydney Water could be undervaluing water, and therefore underperforming on water conservation and leakage performance. In our Draft Report, we asked Sydney Water to provide further information on the calculation of the ELWC and ELL. In response, Sydney Water explained how the ELWC calculation takes into account the probability of future dam levels to land on an *expected value* of water. For example, even if dam levels are currently low, if historical experience suggests they are more likely to return towards full capacity than continue to decline, the short-run value of water might not be high. This explains the low short run value of water in July 2019.

While Sydney Water has correctly applied the ELWC methodology in estimating the value of water, we consider that the methodology needs review. It is important that Sydney Water's leakage levels are in line with community expectations, and the current ELWC methodology is producing a value of water consistent with these expectations. Sydney Water has flagged that it is open to a review of this process, and the Department of Planning, Industry and Environment noted it intends to undertake such a review, in consultation with IPART and Sydney Water.

Box 14.2 Sydney Water's value of water calculation and ELWC

The short-run value of water is calculated as follows:

$$Value\ of\ water = Direct\ water\ supply\ cost + Drought\ response + Scarcity\ value + Externalities$$

Sydney Water estimates the value of water for each project based on the total benefits achieved from water conservation activities. Projects with a life of under five years use the short-run value of water, projects with a life over 20 years use the long-run value, and projects with a life in between using a weighted average of the two. The long-run value is the water usage price set by IPART, on the basis that this reflects the long-run marginal cost of supply.

This value is then multiplied by the probability of different future dam levels to calculate an 'expected value of water'. The expected value of water is a key input into the calculation of the ELWC and ELL.

In order to establish which conservation projects will go ahead each year, Sydney Water calculates the ELWC. The methodology requires Sydney Water to complete water conservation activities up until the point that doing so is more expensive than the value of water saved. A project will go ahead so long as the levelised cost of the project is less than the value of water saved by the project. For example, with a lower ELWC value, fewer projects go ahead.

$$Project\ levelised\ cost = \frac{PV(Project\ delivery\ cost) - PV(Avoided\ costs) - PV(Externalities)}{PV(Water\ saved)}$$

Leakage performance

Our consultants assessed Sydney Water's performance on leakage with other water utilities.

The Infrastructure Leakage Index (ILI) is an international measure performance indicator of leakage for water utilities.

$$ILI = \frac{Current\ Annual\ Real\ Losses}{Unavoidable\ Annual\ Real\ Losses}$$

It aims to measure the ratio of actual leakage (current annual real losses) to a minimum level of unavoidable losses (unavoidable annual real losses). The closer the ratio is to 1, the better the utility is performing.

The index for Sydney Water is 1.63 (see Figure 14.2).[119] This equates to being in the top performing band (utilities with a score less than 2) for developed countries, and according to

119 Sydney Water, Pricing Proposal July 2019, p23.

Sydney Water rates in the top 10% of water utilities globally.[120] By way of comparison, Hunter Water reports its ILI at 1.15.[121]

However, Atkins analysis suggests that Sydney Water may not be in the top 10%. Analysis against water utilities in the UK suggests it may be more middle of the pack when it comes to leakage (Figure 14.2), though it is possible that the UK utilities are all very high performers. Sydney Water is depicted in the middle of the chart (meaning its leakage is relatively high), while its ELL is shown in the bottom left (far lower leakage). Given the recent severity of drought conditions in Sydney, we believe Sydney Water's leakage performance could be better, particularly given how far it is from its ELL.

Figure 14.2 Comparison of leakage levels across water utilities

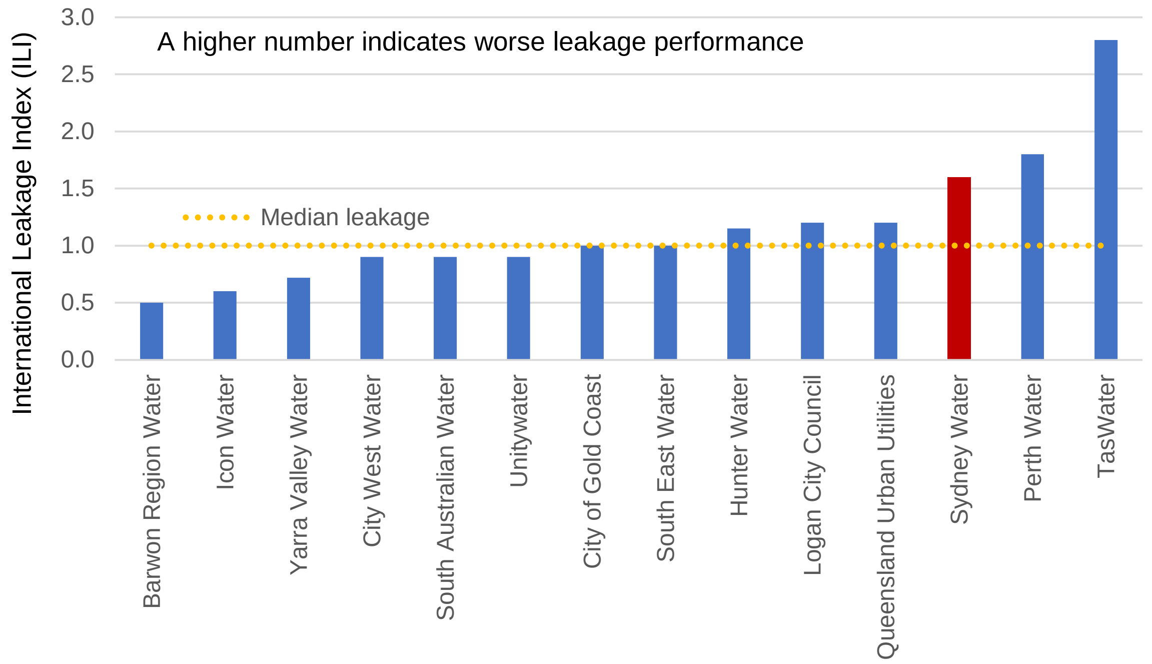
Source: Atkins/Cardno, Final Report – Expenditure Review of Sydney Water.

Furthermore, when compared to other major urban water utilities in Australia, Sydney Water's leakage performance is below the median level (as measured by the ILI, Figure 14.3).

120 Ibid.

121 Hunter Water, Compliance and Performance Report September 2019, p38.

Figure 14.3 Sydney Water's leakage in 2018-19 compared to other large Australian water utilities



Source: Bureau of Meteorology, National Performance Report, 2018-19

Atkins considers that a contributing factor is that Sydney Water does not have the flow monitoring and leakage detection systems that most other frontier companies normally use. This results in delays in locating leakage at an early stage. Leaks are mainly reported when water has reached the surface, and as a result total leakage is well above the economic level (as specified by Sydney Water). The water lost from the system imposes a cost on society, as it reduces the supply of the resource available. Further, the cost of repairs over the 2016 period was higher than it should have been, which has inflated Sydney Water's proposed costs on maintenance over the 2020 period (see Chapter 4 for further discussion). It is important that leakage is kept at the efficient level, and we will work with Sydney Water to provide the appropriate incentives for it to improve on its performance (see Section 14.3).

14.2.3 Revising our existing output measures

In general, we have previously adopted a number of output measures to track the inputs used to deliver business-as-usual expenditure programs (typically asset renewals). The measures, at the most:

- Provide a starting point (or 'peg in the ground') for the ex-post assessment of capital expenditure, and any deviation from targets established for a price review, however the ex-post review seeks significantly more information.
- Can indicate a deficiency in the planning and delivery of capital projects if there are repeated failures to meet output measure targets.

Sydney Water initially proposed 23[122] capital expenditure output measures for the 2020 determination period, the majority being measures that relate to its ongoing capital programs, and have been carried forward from the 2016 determination period (with revised targets). These are summarised in Appendix G.

However, tracking the inputs used to deliver renewals programs can also send an inefficient signal to utilities and stakeholders that the inputs themselves are the target, rather than the outcomes of the programs. For instance, an 'under-delivery' of the actual input (eg, the number of water mains replaced) against a fixed target does not necessarily mean that the utility has underperformed.[123] This may send the wrong signal to stakeholders about the need to complete a certain quantum of renewals, even though it may no longer be the most efficient use of capital.

Furthermore, the utilities' operating licences mandate minimum levels of performance ('output') and impose reporting obligations against these requirements. Collecting additional information through output measures imposes a regulatory burden on the utility.

In response to our Draft Report, Sydney Water supported our draft decision to transition to outcomes-based measures, and to remove the existing output measures.

Therefore, we have decided to remove the existing output measures, as we do not consider that these particular measures add to the robustness of our regulatory framework.

14.3 Enhancing Sydney Water's reporting obligations on water conservation in the Reporting Manual

Sydney Water's Operating Licence contains a number of reporting obligations with which Sydney Water must comply. The Reporting Manual outlines all of Sydney Water's reporting requirements under the Licence and, with respect to those requirements, identifies when, what and how Sydney Water is to report information.

Sydney Water's Reporting Manual includes reporting obligations relating to water conservation and planning.[124]

In our Draft Report, we proposed that the Reporting Manual could be amended:

- To capture more data on Sydney Water's water conservation activities, specifically those measures detailed in Table 14.2, and
- To require Sydney Water to provide more information on the methodology used to determination the ELWC, specifically how the short run value of water estimate published in its Water Conservation Report is derived.

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122 At the time of submission, Sydney Water noted that some of their output measures relating to treatment (of wastewater, recycled water treatment, water filtration etc) were subject to change pending any deferral of capital projects from the 2016-20 program, due to risk assessment by management. Since the review, our consultants have recommended to remove these output measures as they have limited value. We agree with our consultants that we don't require these output measures.

123 For example, in the Sydney Water expenditure review, our consultants identified a significant number of output measures were 'under-delivered' in the 2016 determination period, that is the actual outputs were less than the specified 'targets'. However, this 'under delivery' was mostly a result of efficiencies achieved by Sydney Water to deliver the same service level performance at a lower cost.

124 IPART, *Sydney Water Reporting Manual – Operating Licence 2019-2023*, November 2019, Pp 5-6.

Ofwat (which regulates water utilities in the UK) provides financial incentives and penalties to incentivise leakage performance. By contrast, we provide Sydney Water with efficient funding to manage leakage. However, we are open to considering more explicit financial incentives (similar to Ofwat) for Sydney Water, in addition to increased reporting requirements.

While Sydney Water did not support these changes,[125] both the Public Interest Advocacy Centre[126] and the City of Sydney[127] made submissions in favour of such a change. Both strongly support increased reporting requirements on conservation. Given community expectations, we will work with Sydney Water to improve its reporting of the performance of its water conservation activities.

125 Sydney Water, Submission to IPART Draft Report – Public, p2137.
126 PIAC, Submission to IPART Draft Report, p5-16.
127 City of Sydney, Submission to IPART Draft Report, p2.

15 Impacts of prices

This chapter outlines the impact of our pricing decisions on Sydney Water's customers and Sydney Water. We consider the impacts of these decisions on:

- The affordability of water, sewerage and stormwater services for various residential and non-residential customer groups.
- Sydney Water's service standards
- Sydney Water's financeability
- General inflation, and
- The environment.

Appendix A further discusses the implications of our pricing decisions on other matters we must consider under Section 15 of the IPART Act. We are satisfied that the Final Determination achieves an appropriate balance between these matters.

We compare the prices that we have set and the impact on customers' bills to Sydney Water's proposed prices, in $2020-21. We compare the current prices customers pay to what customers would pay from 1 July 2020, with the prices and bills in future years of the Determination increasing by inflation. That is, the prices customers would pay, from 2021-22, would increase by CPI.

Figure 15.1 summarises the impacts of the prices that we set.

Figure 15.1 The impacts of the prices that we set

15.1 Impacts on Sydney Water customers

We assessed the bills arising from our recommended prices against current price structures; the prices of other utilities; and as a share of average household income. We compared prices under drought, and non-drought periods, given our decision to have a higher water usage price in drought periods.

Our assessment is that our water usage prices are affordable for customers, even in drought conditions. This is summarised in Table 15.1. Customers are also able to estimate what their bill will be with our interactive bill calculator, which is available on our website.

Table 15.1: Bill impacts for residential and non-residential customers under IPART's prices

	Residential customers	Non-residential customers
Non-drought prices	Bills will be lower for nearly all households (all households consuming less than 500kL per year) Bills for a typical pensioner will increase at about the rate of inflation.	Bills will be lower for low and medium users of water, but will be slightly higher for large consumers.
Drought prices	Bills will be lower for small users of water (those using less than 120kL per year), and will be higher for medium and large users of water (for example, bills would be 14% higher for households using 300kL per year). Without a change to the current rebate, pensioners will experience a larger bill increase in their bills under drought conditions. This is because pensioners receive a large discount on their fixed service charges, and therefore their bills mostly comprise water usage. In our Draft Report, we asked the Government to consider restructuring the pensioner rebate to manage the bill impacts of drought prices for pensioners. The Treasury, Department of Planning, Industry and Environment, and Sydney Water have stated they will ensure that pensioners are not made worse off by our dynamic water usage prices.	Low-usage *industrial* customers will experience a slight fall in their bills, medium-usage and large-usage customers will experience significant increases in their bills; all *commercial* customers will experience an increase in their bills, with substantial increases for medium-usage and large-usage customers.

Water usage charges will make up a larger share of bills, particularly in drought. This provides customers with more control over their bills, to reduce what they pay by conserving water.

Currently, dam levels are above 80% and the non-drought water usage price will apply from 1 July 2020. This provides households and business an opportunity to prepare for the impact of future drought conditions, before they arrive.

Further, the bill impacts we present in drought assume that households and businesses make no changes to their level of water consumption. Given that drought prices will most likely complement water restrictions, most households and businesses complying with water restrictions would see a reduction in their usage in periods of drought, offsetting the impact of the higher drought prices on water bills.

Table 15.2 shows the savings that a typical household using 200kL of water each year may realise in their annual water bill if they economise on their water usage by 10%, 20% or 30%, under the prices we have set under drought conditions.

Table 15.2: Water Usage Bills under Sydney Water's proposed and IPART's prices – savings from economising

Water Usage (kL/year)	Savings from economising ($2020-21)	
	@ Sydney Water's proposed drought prices	@ IPART's final drought prices
200	-	-
180	60	64
160	120	127
140	179	191

15.1.1 Residential customers

In general, *in non-drought conditions*, households of all types will benefit from lower bills under IPART's recommended charges, with small users of water realising the greatest cost reductions. In *drought conditions*, bills will be higher than current bills for medium and large users of water.

In this section, we present and discuss why we consider bills for all customer groups will remain affordable, by analysing bills for:

- A typical household consuming 200kL/year
- A large household consuming 300kL/year
- A small household consuming 100kL/year
- Renters that are responsible for paying water usage charges, and
- Pensioners, who receive a subsidy on the fixed water, wastewater and stormwater service charges.

Before stepping through this analysis, the next subsection summarises two key reasons why our pricing approach provides a more equitable bill outcome than an Inclining Block Tariff (IBT) for small users of water and large households.

A single water usage price provides a more equitable bill impact than an Inclining Block Tariff

As outlined in Chapter 7, we decided to retain a single water usage charge to all customers, and to increase the share of revenue recovered from the usage charge (and reduce fixed charges). We also decided to recover the costs of managing drought through an increase in the water usage charge in these periods. We found that this approach, compared to an IBT, would have two key advantages in managing bill impacts for customers:

1. All customers face the same water usage price, regardless of household size. All customers will also receive savings relative to the existing bills if they save water, whether in drought or outside of drought.

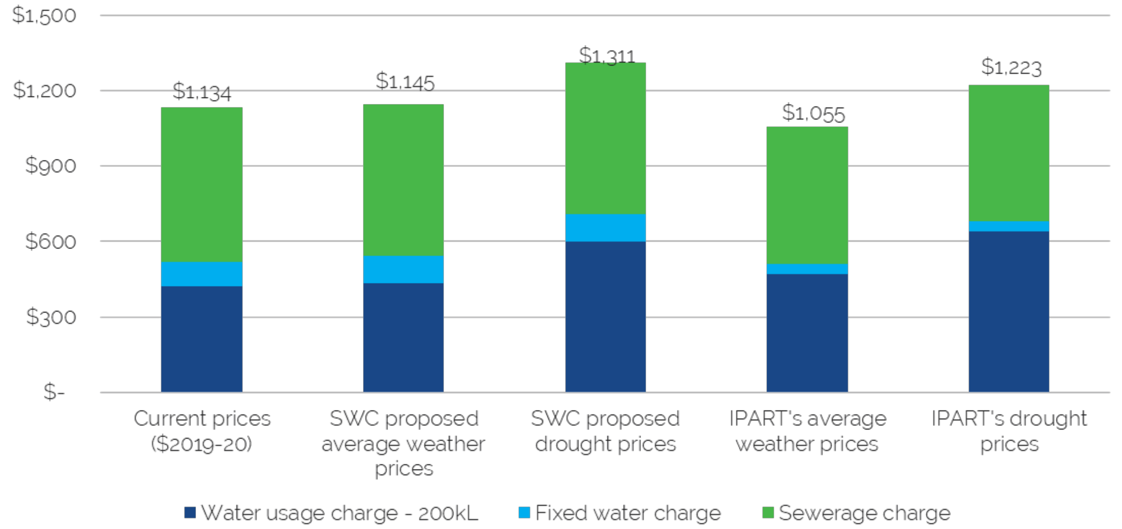
2. In particular, as outlined in Appendix L, we consider that an IBT would tend to disadvantage larger households, as household size is the key driver of water consumption. In effect, a large household with the same water usage patterns (on a per capita basis) as a small household could face a higher water usage price.[1]
3. Our decision to apply a higher water usage price to all water consumption provides a larger reward to small users of water who conserve water.

As recognised below, our prices would result in an increase in water usage charges for the renters that are responsible for paying water usage charges. This is to reflect our best estimate of the value of the water that has been consumed. The analysis below, however, shows that the price increases are affordable, and are consistent with the prices charged for water across other major water utilities in Australia.

Bill impacts for a typical household

Figure 15.2 compares bills for a typical household consuming **200kL/year**, under both non-drought and drought conditions, to current prices and Sydney Water's proposed prices in response to our Draft Report.

Figure 15.2 Estimated bills for residential customers using 200kL/year, under various scenarios ($ per annum, 2020-21)



Note: These are Sydney Water's proposed bills in response to our Draft Report

Sources: Sydney Water, IPART calculations

A typical residential household receiving water and sewerage services and consuming **200kL** of water per year would receive an annual bill of:

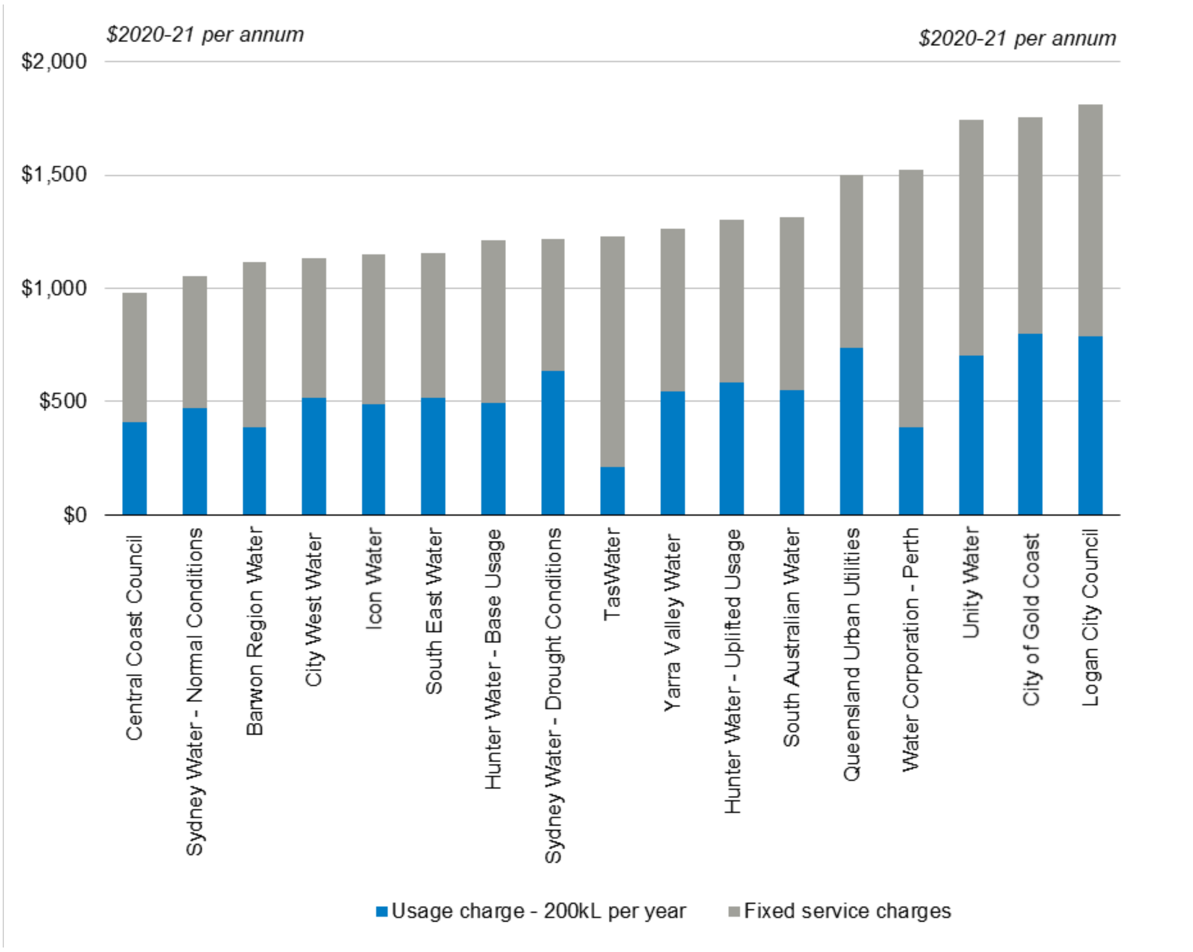
- $1,055 per year under non-drought conditions (a 7.0% reduction from current prices), and
- $1,223 per year under drought conditions if there is no change in water consumption.

[1] This disadvantage is exacerbated if the per unit charge for water consumption above the threshold is increased to offset the reduction in revenue from the lower water usage price below the threshold.

However, this household would pay $1,125 per year under drought conditions if they reduced their consumption by 15% (a 0.7% reduction from current prices).

Figure 15.3 shows that under average conditions our proposed bills for a user of 200kL of water per year are the second lowest out of the 15 utilities, while under drought conditions our proposed bills for a user of 200kL of water per year are the sixth lowest.

Figure 15.3 Combined water and wastewater bills for households with 200kL of usage



Data source: IPART Secretariat

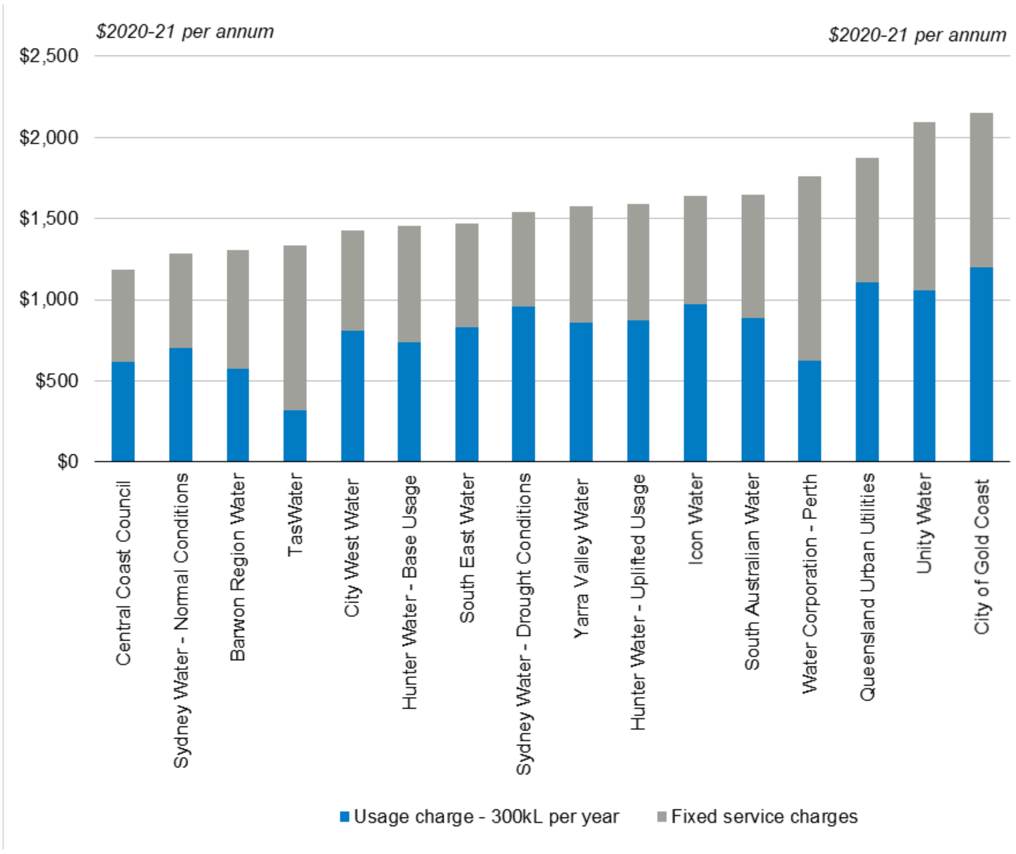
A large household, consuming 300kL of water per year, would receive an annual bill of:

- $1,289 per year under non-drought conditions (a 4.1% reduction), and
- $1,541 per year under drought conditions if there is no change in water consumption.

However, this household would pay $1,396 per year under drought conditions if they reduced their consumption by 15% (a 3.8% increase). To reduce their bills to current levels, these households would need to reduce their annual water consumption by around 20%, or 60kL.

Figure 15.4 shows that under average conditions our proposed bills for a user of 300kL of water per year are the second lowest out of the 15 utilities, while under drought conditions our proposed bills for a user of 300kL of water per year are the sixth lowest of the utilities.

Figure 15.4 Combined water and wastewater bills for households with 300kL of usage



Data source: IPART Secretariat

Bill impacts for a small household

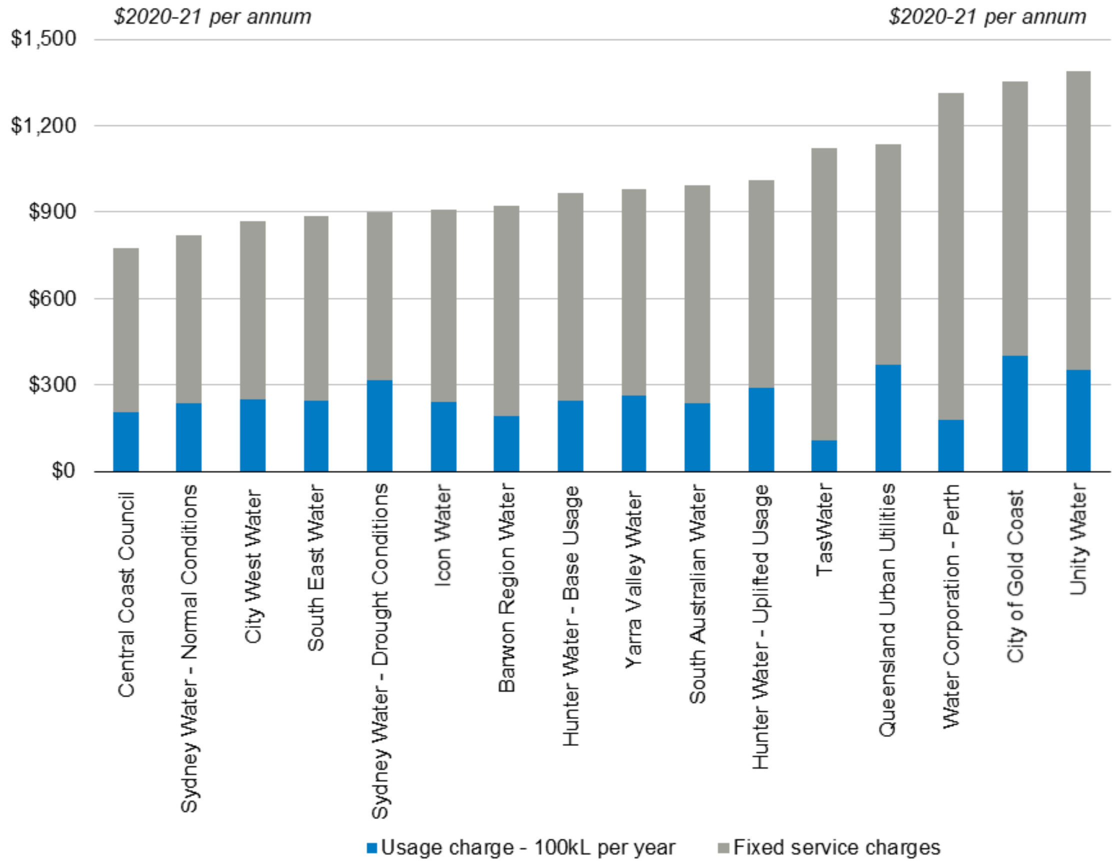
In this section we present bill impacts for a household that consumes 50% less than a typical household, which is broadly representative of a small one-to-two person household with little to no discretionary usage. A residential household receiving water and sewerage services and consuming **100kL** of water per year would receive an annual bill of:

- $819 per year under non-drought conditions (an 11.2% reduction from current prices), and
- $903 per year under drought conditions if there is no change in water consumption.

In other words, small users of water will pay less than they currently do under all conditions, even without making a change to their consumption patterns. This outcome reflects the greater reward that our decisions provide to customers who already take steps to minimise their water consumption.

Figure 15.5 shows that, under 'average' conditions, our proposed bills for a user of 100kL of water per year are the second lowest out of the 15 utilities, while under drought conditions our proposed bills for a user of 100kL of water per year are the fourth-lowest out of the 15 utilities.

Figure 15.5 Combined water and wastewater bills for households with 100kL of usage



Data source: IPART Secretariat

Renters who are responsible for paying water usage

Renters who live in a property with a standalone meter (generally, a freestanding house or a newer apartment) and, if the property meets water efficiency standards, may be asked by their landlord to pay for the water that they consume.[128]

A typical household that rents and consumes **200 kL** of water per year currently pays $422 per year for their water usage. Under our decisions, they would receive an annual bill of:

- $470 per year under non-drought conditions (an 11.4% increase from current prices, or an increase of about $1 per week), and
- $636 per year under drought conditions if they make no adjustment to their water consumption. If they reduce their consumption by 15%, their bill would be $541 (a 29% increase from current prices).

We acknowledge that this is an increase from what renters currently pay. However, the increase in the water usage charges reflects the value of the water that is being consumed. Renters, and customers who own their home, are both being asked to pay the same increase in water usage prices in all periods. The larger percentage bill increases for renters, compared

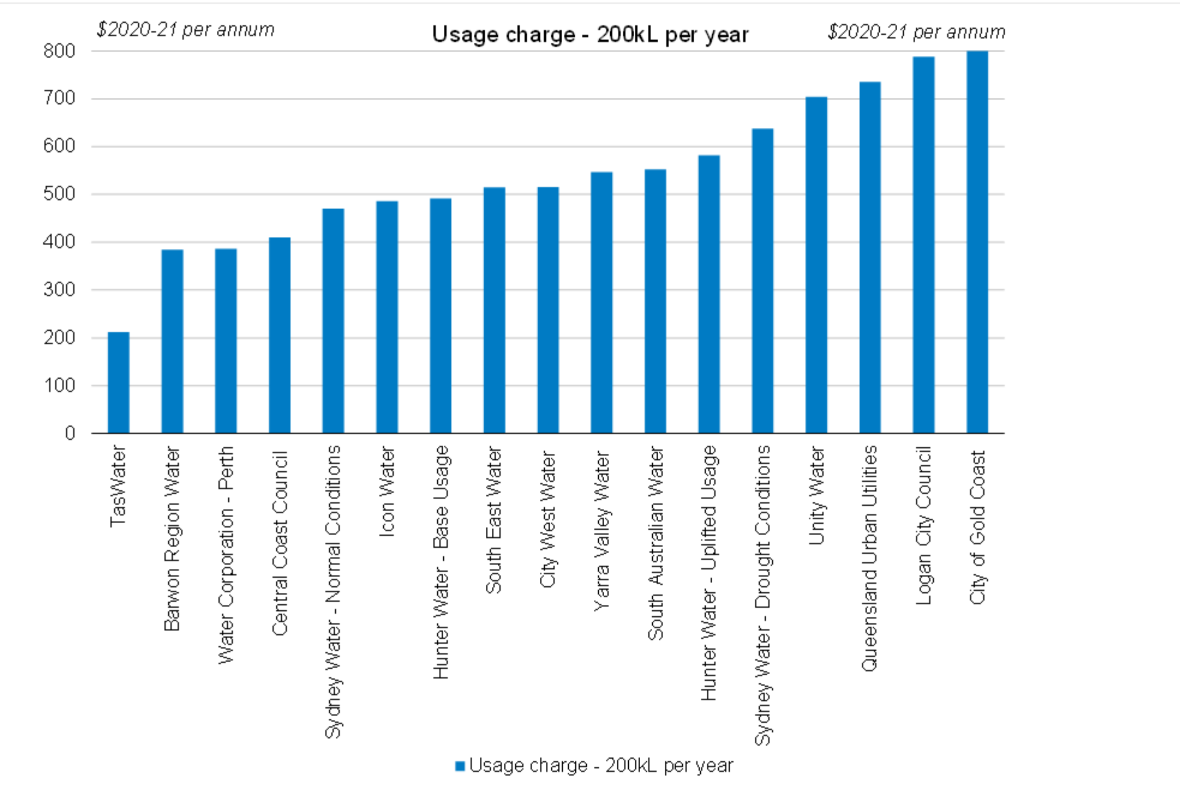
128 For more information, please see: https://www.fairtrading.nsw.gov.au/housing-and-property/renting/during-a-tenancy/Water,-electricity-and-gas-in-rental-properties

to home-owners, reflect that renters do not directly pay the fixed charges for water, wastewater and stormwater services (these are paid by the landlord).

The higher price during drought reflects that the costs of producing water are higher in these periods, and our view that it is more equitable and provides a stronger signal to conserve water by reflecting these costs in a higher water usage charge, rather than an increase in the fixed charge. As outlined above, reflecting the costs of drought in a higher fixed charge would place upwards pressure on rents, as landlords seek to recover these costs from tenants.

Furthermore, we compared bills for renters who live in Sydney to what they would pay in other parts of Australia (Figure 15.6). What we found is that is a typical renter consuming 200kL a year would pay between $400 and $800 a year for water across Australia, and our final prices are consistent with the water usage charges of other major Australian water utilities.

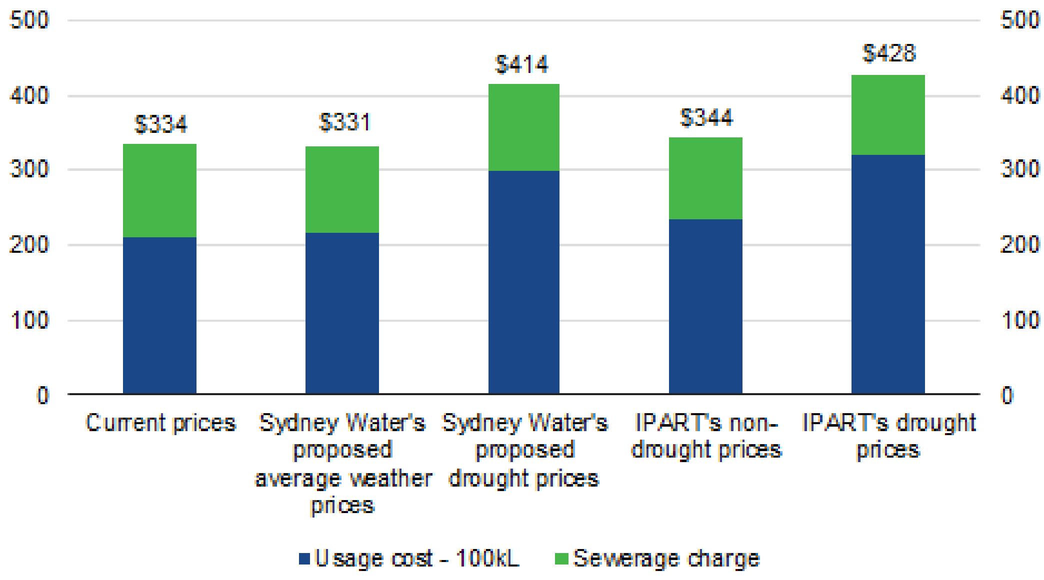
Figure 15.6 Annual water bills for renters with 200kL of usage



Pensioner households

Figure 15.7 compares bills for a **typical pensioner household consuming 100kL/year**, under both non-drought and drought conditions, to current prices and Sydney Water's proposed prices in response to our Draft Report.

Figure 15.7 Estimated bills for pensioner customers using 100kL/year, under various scenarios ($ per annum, 2020-21)



Data source: IPART Secretariat

Under non-drought conditions, a typical pensioner would receive an annual bill of $344 per year in 2020-21, a $10 or 3% increase from current prices. In other words, under non-drought conditions they would pay less than $1 per day for water and wastewater.

Without changes to the current pensioner rebate, under drought conditions (and with no reduction to how much water they consume in drought), a typical pensioner household would receive an annual bill of $428 per year in 2020-21, a $114 or 28% increase over current prices. This increase reflects the uplift in the water usage price from $2.35/kL to $3.18/kL in drought.

Sydney Water currently applies a rebate to service prices, calculated as a percentage of the water, wastewater and stormwater service price (Table 15.3).

Table 15.3 How are rebates set for pensioners?

Charge	How is the rebate set?
Water service charge	100% of the quarterly service charge to a maximum of $24.30
Water usage charge	No rebate
Wastewater service charge	80% of the quarterly service charge
Stormwater charge (if applicable)	50% of the quarterly charge

Source: https://www.sydneywater.com.au/SW/accounts-billing/paying-your-bill/pension-rebates/index.htm

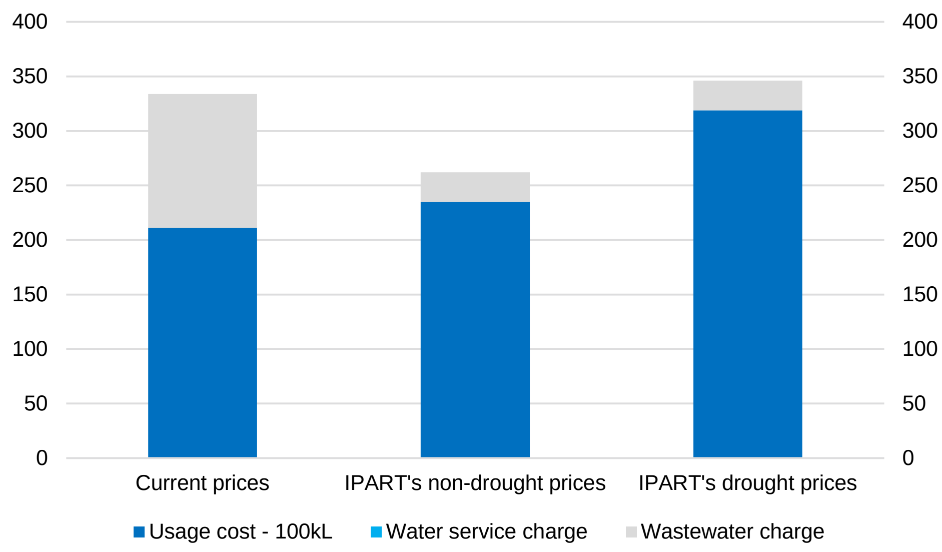
We have increased the water usage price, and reduced service prices. With the current way pensioner rebates are set, this means that pensioners benefit relatively less from the reduction in service prices, and the increase in the water usage price therefore leads to a larger percentage increase in bills.

Following the release of our Draft Report, we met with officers in the NSW Government and Sydney Water to discuss how the rebates could be restructured to manage bill impacts for pensioners, for example, to increase the share of service charges that are rebated in drought conditions. In response to our Draft Report, submissions from the Department of Planning, Industry and Environment (DPIE) and Sydney Water both stated that they will work to adjust pensioner rebates to ensure pensioners are not disproportionately disadvantaged by our dynamic water usage prices.

Given the reduction in service charges, a restructuring of the pensioner concession could potentially deliver an equitable outcome for both pensioners and the government. For example, if the pensioner concession rebated 95% of the service charges for wastewater, then:

- pensioner households consuming 100kL of water per year would experience a 22% reduction in their bills in 'average' weather conditions, partially offset by a 3% increase in drought periods, and
- the size of the subsidy payment from Treasury to Sydney Water would be slightly lower than the current subsidy, as the reduction in overall service charges results in a smaller total rebate per household.

Figure 15.8 Estimated bills for pensioner customers using 100kL/year, under the scenario of an increase in the pensioner rebate to 95% ($ per annum, 2020-21)



Data source: IPART Secretariat

15.1.2 Water bills are low relative to customers' income

We compared our bills for a typical Sydney Water residential customer consuming 200kL of water per year ($1,077) under average, and drought, conditions as a share of median household income. This is shown in Table 15.4, with bills as a share of average incomes for customers of Hunter Water and the Central Coast Council shown for comparison. A typical bill represents 1.2-1.4% of median household income in 2020-21.

Table 15.4 Indicative bill estimates as a proportion of median household income

	Average/typical household bill 2019-20 ($2019-20)	% of household income	Average/typical household bill 2020-21 ($2020-21)	% of household income
Hunter Water				
No drought	$ 1,318	1.8%	$ 1,270	1.7%
Drought	$ 1,318	1.8%	$ 1,353	1.8%
Central Coast Council	$ 854	1.3%	$ 879	1.3%
Sydney Water[a]				
No drought	$ 1,212	1.3%	$ 1,132	1.2%
Drought	$ 1,212	1.3%	$ 1,299	1.4%

Note: Bills for combined water, wastewater and stormwater services, for a household consuming 200kL (in Sydney) and 189kL (in the Hunter) of water per year.

Source: ABS 2016 Census QuickStats, our draft prices and bills, 2019 Final Report bill impacts for Central Coast Council, 2020 Final Report bill impacts for Hunter Water, and IPART analysis.

15.1.3 Non-residential customers

The bill impacts for non-residential customers are more mixed than for residential customers, as they are also influenced by meter-size and discharge factors, in addition to usage patterns.

In general:

- Under non-drought conditions, non-residential users of water, wastewater and stormwater services which use up to around 2,000kL of water per year will see their bills fall, while those using more than this will see some increase in their bills, with the largest increases being experienced by the most intensive users.
- Under drought conditions, only small non-residential users of water, wastewater and stormwater services (100-200kL of water use per year) will see their bills fall, while those using more than this will see some increase in their bills, with, again, the largest increases being experienced by the most intensive users.

Across a representative sample of non-residential customers, our final prices result in bill impacts in 2020-21 that range from -24.7% to 7.8% in average conditions, and from -17.7% to 35.5% in drought conditions. [129]

129 Excluding the impacts of trade waste charges.

In comparison, Sydney Water's proposed prices in response to our Draft Report would result in price changes of between -10% to 5% for non-residential customers in average conditions. Under drought conditions, non-residential customers would see bill increases (compared to bills in average weather) ranging from about 12% to 15% for low to medium water users to more than 25% for larger users.

In drought, large consumers of water will experience a large increase in prices if they don't conserve water. We consider this increase is appropriate. Firstly, it only applies when water is relatively scarce, and reflects the increased costs of providing water. Secondly, we would expect businesses that are large consumers of water to do what they can to curb their consumption in drought, or face higher bills. The higher water usage price also provides a stronger incentive for these customers to seek out opportunities to use recycled water, where feasible. Furthermore, the shift to drought pricing would be precipitated by a gradual reduction in dam levels towards the 60% dam storage trigger. This will give heavy users of water time to make the changes needed to economise on their water usage.

Appendix D contains detailed information regarding the bill impacts for various types of residential and non-residential customers under non-drought conditions.

15.1.4 The COVID-19 pandemic may affect affordability for some customers

In its submission to our Draft Report, Sydney Water notes an increase in the number of its customers who are experiencing financial hardship.[130] Section 6.4 of Sydney Water's Operating Licence (2019-2023) requires Sydney Water to assist customers in financial difficulty and provide payment plans and other assistance schemes. Chapter 5 of Sydney Water's Customer Contract provides details of hardship provisions and assistance options. Sydney Water has put in place measures to assist their customers, including:

- longer term payment extensions for customers with capacity to pay
- extension of financial assistance for residential customers experiencing payment difficulty
- expanded Contact Centre hours
- ceasing of debt recovery activities after reminder notices, including not charging late payment fees or accrual of interest on overdue accounts, and
- ceasing disconnection of services for non-payment.[131]

130 Sydney Water, *Keeping Sydney liveable, productive and thriving for a sustainable future: Response to IPART's Draft Report and Determination*, 27 April, 2020, p.159.

131 Sydney Water, *Keeping Sydney liveable, productive and thriving for a sustainable future: Response to IPART's Draft Report and Determination*, 27 April, 2020, p.150.

15.2 Impacts on Sydney Water's financeability

In the November update to its pricing proposal, Sydney Water raised concerns about its financeability if IPART did not accept its proposed additional costs and pass-through mechanisms for drought. Sydney Water raised further concerns around its financeability in response to our Draft Report.

We undertake a financeability test to assess how our price decisions are likely to affect Sydney Water's financial sustainability, and ability to raise funds to manage its activities (ie, whether the proposed prices would enable it to raise finance consistent with an investment grade-rated firm), over the upcoming regulatory period. In 2018, we reviewed the financeability test we use as part of our price determination process.

To assess financeability, we look at three indicators in both a benchmark and an actual test:

- Interest coverage ratio
- Funds from operations (FFO) over debt, and
- Gearing.

Our target ratios for the benchmark and actual tests are shown in Table 14.5.

Table 15.5 IPART target ratios for the benchmark and actual test

	Benchmark test (real cost of debt)	Actual test (actual cost of debt)
Interest cover	>2.2x	>1.8x
FFO over debt	>7.0%	>6.0%
Gearing	<70%	<70%

Source: IPART, Review of our financeability test – Final Report, November 2018, p 3.

When setting prices, we consider the financial sustainability of the business resulting from our pricing decisions. To do this, we undertake a financeability test to assess how our price decisions are likely to affect the business's financial sustainability and ability to raise funds to manage its activities, over the upcoming regulatory period. The financeability test is based on the approach outlined in the 2018 Review of financeability test (2018 Financeability Review).[132]

We assessed Sydney Water's financeability over the 2020 Determination by analysing its forecast financial performance, financial position and cash flows for both the *benchmark* and *actual* business. We then forecast financial ratios for both tests and assessed Sydney Water's financial ratios compared to our target ratios.

Table 15.7 below provides the financeability test results for this price review against target ratios.

a [132] IPART, *Review of our financeability test*, November 2018.

Table 15.7 Financeability test results based on our final prices

	Target ratios	2020-21	2022-23	2022-23	2023-24
Interest cover					
Benchmark test	>2.2x	4.0	4.0	4.1	4.1
▼ Does it meet the target?		✓	✓	✓	✓
Actual test	>1.8x	2.8	2.9	3.0	2.8
▼ Does it meet the target?		✓	✓	✓	✓
FFO over debt					
Benchmark test	>7.0%	6.6%	6.6%	6.7%	6.8%
▼ Does it meet the target?		×	×	×	×
Actual test	>6.0%	5.9%	5.9%	6.1%	6.0%
▼ Does it meet the target?		×	×	✓	✓
Gearing					
Benchmark test	<70%	60%	60%	60%	60%
▼ Does it meet the target?		✓	✓	✓	✓
Actual test	<70%	57%	57%	57%	57%
▼ Does it meet the target?		✓	✓	✓	✓

Source: IPART analysis

Given that Sydney Water's benchmark ratios for the FFO over debt ratio are slightly below the target, we reviewed Sydney Water's financeability in detail in Appendix J.

After conducting this analysis, we found that Sydney Water's FFO over Debt ratio does not reflect a financeability concern for the 2020 determination period, for a combination of reasons:

- The trend in the benchmark FFO over Debt ratio improves over the 2020 period towards the target ratio. In our 2018 Financeability Review, we emphasised that:

  If the trends [in the financial ratio] show a significant improvement, then we would assess that the business may not have a financeability concern.[133]

- The ICR ratios indicate that it will have cash flows that more than cover its annual interest payments.
- We have provided a record capital expenditure allowance to Sydney Water in the 2020 determination period. In a competitive market, it would not be unreasonable for a business to inject additional equity as it embarks on a large investment program to increase the size of its asset base.
- Since we established these target ratios in our 2018 Financeability Review, we have introduced regulatory mechanisms that help Sydney Water and other water utilities further manage/mitigate their cost and revenue risks (discussed below).

We did not identify a financeability concern for Sydney Water that needs to be addressed in this review. It is our view that it can remain financially sustainable and continue to provide sustainable services over the determination period.

133 IPART, *Final Report: Review of our financeability test*, November 2018, pp 59.

Our regulatory framework provides revenue stability

We have followed the well-established principles of our building block framework when reviewing and setting Sydney Water's prices and revenue allowances over the 2020 determination period. The transparency of the regulatory framework and the revenue stability and predictability it provides supports Sydney Water's long-term financial sustainability.

In particular, we have put in place a number of regulatory mechanisms that reduce financial risks to Sydney Water. These include:

- A demand volatility adjustment mechanism for Sydney Water, which addresses the risk of errors in water sales forecasts (which firms operating in a competitive market would not enjoy).
- Dynamic water usage pricing for all three utilities, which reduces both cost and revenue risks related to drought conditions.
- The trailing average cost of debt approach, which addresses refinancing risk.
- A range of operating cost pass-throughs (such as SDP and Shoalhaven Transfer Scheme pass-throughs), which directly and fully pass-through cost changes to customers (in a competitive market, these might only be reflected in prices over the longer term).

These mechanisms materially reduce downside revenue and cost risks for the utilities. Not all other regulators apply these mechanisms, so they are not fully embedded in the benchmark financial ratios of credit ratings agencies. Importantly, we have introduced dynamic usage prices in the current water reviews, and this decision is not reflected in our current target financeability ratios (which were included in our 2018 Financeability Policy).[134]

15.3 Implication for general inflation

Under Section 15 of the IPART Act, we are required to consider the effect of our determinations on general price inflation.

To generate the national consumer price index (CPI), the Australian Bureau of Statistics (ABS) collects data on the capital-city prices of various items of household expenditure, including 'water and sewerage'. The weighting given to water and sewerage in the CPI for Sydney is 0.69 out of 100, meaning that a 1% change in the price of water and sewerage services in Sydney would result in a 0.0069% change in the CPI for Sydney, which is not large.[135]

134 IPART, *Final Report: Review of our financeability test*, November 2018.

135 Australian Bureau of Statistics, *Information Paper: Introduction of the Consumer Price Index Weight Update, 2019 (cat. no. 6470.0.55.002)*, 18 December 2019; Table 2, CPI weights, September quarter 2019; Utilities, Water and sewerage.

Further, the water and sewerage measure for the Sydney CPI contributes 22.0% to the national measure of water and sewerage[136], which has a weighting in the national measure of 1.03 out of 100[137]. This means that a 1% change in the price of water and sewerage services in Sydney would result in a 0.0023% change in the national CPI, which is negligible.

With these weightings in the CPI, it would require an increase in the prices of water, wastewater and stormwater services in Sydney that is much larger than under our final decisions to have significant impact on either the Sydney CPI or the national CPI.

15.4 Implications for Sydney Water's service standards

We expect Sydney Water to achieve both operating and capital efficiency savings. We are satisfied that Sydney Water can achieve these savings, and thus generate sufficient revenue to achieve service standards at or above those expected by customers and required under its operating licence.

Sydney Water is licensed under the *Sydney Water Act 1991* (NSW). The Act requires Sydney Water to hold an operating licence that is issued by the Minister and reviewed annually by IPART. This licence contains a number of standards that Sydney Water must meet, or risk facing penalties associated with a breach of licence conditions. Sydney Water's pricing submission identified the expenditure required for it to meet its obligations under both its operating and environmental licences. The operating licence also includes performance indicators against which Sydney Water's performance is reviewed as part of the annual audit of its compliance with the licence.

Compared to the 2016 determination period, our final decisions are to broadly maintain Sydney Water's operating expenditure, excluding the impact of inflation, and to approve a large increase in capital expenditure.

15.5 Implications for the environment

Sydney Water's environmental impacts are regulated by relevant Commonwealth, NSW and local environmental legislation, regulation and regulatory bodies.

For example, DPIE Water regulates Sydney Water's extraction of water from the natural environment, and the Environment Protection Authority (EPA) regulates Sydney Water's discharges from its sewage treatment plants and recycling plants and reticulation systems.

Our expenditure review consultants:

- reviewed Sydney Water's performance against the requirements in the Environment Protection Licences (EPLs) issued by the EPA requirements over the 2016 Determination period

136 Australian Bureau of Statistics, *Information Paper: Introduction of the Consumer Price Index Weight Update, 2019 (cat. no. 6470.0.55.002)*, 18 December 2019; Table 3, Capital city percentage contribution to the Weighted average of eight capital cities, September quarter 2019; Utilities, Water and sewerage.

137 Australian Bureau of Statistics, *Information Paper: Introduction of the Consumer Price Index Weight Update, 2019 (cat. no. 6470.0.55.002)*, 18 December 2019; Table 1, CPI weights, September quarter 2019; Utilities, Water and sewerage.

- recommended the efficient costs associated with delivering the required EPL outcomes over the 2020 determination period, and
- considered the implications of the EPA's 2024 (and beyond) regulatory framework on Sydney Water's 2020 expenditure.

Based on the advice of our consultants, we consider that our decisions on efficient capital and operating expenditure should allow Sydney Water to continue to meet its environmental standards over the 2020 determination period. For example, under our decisions, we have:

- Included an allowance for wastewater capital expenditure that is 60% higher than Sydney Water's estimated spend in the current determination, which would allow Sydney Water to meet its environmental obligations. It is for Sydney Water to decide how it prioritises expenditure within its overall envelope to meet all of its obligations.
- Included a separate allowance of about $80 million for two discretionary projects – the Vaucluse Diamond-Bay and Waterways Health Improvement Programs – which would deliver environmental outcomes above mandated standards.
- Accepted Sydney Water's proposed expenditure on the Hawkesbury Nepean Offset Scheme (HNOS) to manage the level of nutrient discharge from treated wastewater into the Hawkesbury Nepean River, as population growth occurs in surrounding areas.

APPENDICES

A Requirements under the IPART Act

This appendix explains how we have considered certain matters we are required to consider under the *Independent Pricing and Regulatory Tribunal Act 1992* (the IPART Act).

A.1 Matters under Section 15 of the IPART Act

IPART is required under Section 15 of the IPART Act to have regard to matters set out in Figure A.1 below.

Figure A.1 Matters for IPART to consider

Table A.1 outlines the sections of the report that address each matter.

Table A.A.1 Consideration of Section 15(1) matters by IPART

Section 15(1)		Report reference
a)	Cost of providing the services	Chapter 5 sets out Sydney Water's total efficient costs to deliver its regulated services over the determination period. Further detail is provided in Chapters 3 and 4, and Appendix G on efficient historical and forecast capital expenditure.
b)	Protection of consumers from abuses of monopoly power	We consider our decisions would protect consumers from abuses of monopoly power, as they reflect the efficient costs Sydney Water requires to deliver its regulated services and meet mandated requirements. This is addressed throughout the report, particularly in Chapters 3 and 4 (where we establish the efficient historical and forecast expenditure) and Chapters 7-12 (where we set out our pricing decisions).
c)	Appropriate rate of return and dividends	Chapters 5 and 6 outline that we have allowed a market-based rate of return on debt and equity which would enable a benchmark business to return an efficient level of dividends to shareholders. Appendix J provides further detail.
d)	Effect on general price inflation	Chapter 15 outlines our estimate that the impact of the prices we set on general inflation is negligible.
e)	Need for greater efficiency in the supply of services	Chapters 3 and 4 set out our decisions on Sydney Water's efficient historical and forecast expenditure. These decisions would promote greater efficiency in the supply of Sydney Water's regulated services.
f)	Ecologically sustainable development	Chapters 3 and 4 efficient historical and forecast expenditure that allows it to meet all of its regulatory requirements, including its environmental obligations. Our decision to implement a drought water usage price (Chapter 7) would encourage water conservation in periods of drought.
g)	Impact on borrowing, capital and dividend requirements	Chapters 5, 6 and 15 explain how we have provided Sydney Water with an allowance for a return on and of capital and Appendix K includes our assessment of Sydney Water's financeability.
h)	Impact on pricing policies of any arrangements that the government agency concerned has entered into for the exercise of its functions by some other person or body	Chapters 3 and 4 determine the prudent and efficient cost of construction and operational contracts that Sydney Water has entered into and costs associated with these over the next period.
i)	Need to promote competition	In determining efficient costs, we have been mindful of relevant principles such as competitive neutrality (eg, we have included a tax allowance for Sydney Water as set out in Chapter 5).
j)	Considerations of demand management and least cost planning	Chapters 3 and 4 outline how we have assessed Sydney Water's efficient historical and forecast expenditure required to deliver its regulated services at least cost. Chapter 7 outlines how we have set prices to reflect efficient costs, including the usage price to reflect the approximate estimate of marginal cost of supply – such cost-reflective prices promote the efficient use and distribution of resources (all else being equal).
k)	Social impact	Chapter 15 considers the potential impact of our decisions on Sydney Water, its customers and the NSW Government (on behalf of the broader community).
l)	Standards of quality, reliability and safety	Chapters 3 and 4 detail our consideration of Sydney Water's efficient historical and forecast expenditure so that it can meet the required standards of quality, reliability and safety in delivering its services.

A.2 Matters under Section 14A of the IPART Act

IPART is required under Section 14A of the IPART Act to have regard to the following matters:

a) The government agency's economic cost of production

b) Past, current or future expenditures in relation to the government monopoly service

c) Charges for other monopoly services provided by the government agency

d) Economic parameters, such as discount rates, or movements in a general price index (such as CPI), whether past or forecast

e) A rate of return on the assets of the government agency

f) A valuation of the assets of the government agency

g) The need to maintain ecologically sustainable development (within the meaning of Section 6 of the Protection of the Environment Administration Act 1991) by appropriate pricing policies that take account of all the feasible options available to protect the environment

h) The need to promote competition in the supply of the service concerned

i) Considerations of demand management (including levels of demand) and least cost planning.

Table A.2 outlines the sections of the report that address each matter.

Table A.A.2 Consideration of Section 14A(2) matters by IPART

Section 14A(2)	Report reference
a) Government agency's economic cost of production	Chapter 5 sets out Sydney Water's total efficient costs to deliver its regulated services over the determination period. Further detail is provided in Chapters 3 and 4 on efficient historical and forecast expenditure.
b) Expenditures in relation to the government monopoly service	Chapters 3 and 4 set out our decisions on Sydney Water's efficient historical and forecast expenditure.
c) Charges for other monopoly services	Chapter 12 sets out our decisions on Sydney Water's prices for other monopoly services.
d) Economic parameters, such as discount rates, or movements in CPI	Chapters 5, 6 and Appendix H set out how we have indexed Sydney Water's regulatory asset base to account for inflation. Chapter 5 explains how we have set prices to raise revenue that recovers efficient costs over the determination period in net present value terms.
e) Rate of return on the assets of the government agency	Chapter 5, Appendix I and Appendix J outline that we have allowed a market-based rate of return on debt and equity which would enable a benchmark business to return an efficient level of dividends.
f) Valuation of the assets	Chapter 5 and Appendix H set out the value of Sydney Water's assets on which we consider it should earn a return on capital and an allowance for regulatory depreciation.
g) Ecologically sustainable development	Chapters 3 and 4 set out Sydney Water's efficient historical and forecast expenditure that allows it to meet all of its regulatory requirements, including its environmental obligations. Our decision to implement a drought water usage price (Chapter 7) would encourage water conservation in periods of drought.

Section 14A(2)	Report reference
h) Need to promote competition	In determining efficient costs, we have been mindful of relevant principles such as competitive neutrality (eg, we have included a tax allowance for Sydney Water as set out in Chapter 5).
i) Considerations of demand management and least cost planning	Chapters 3 and 4 outline how we have assessed Sydney Water's efficient historical and forecast expenditure required to deliver its regulated services at least cost. Chapters 7, 8 and 9 outline how we have set prices to reflect efficient costs, including the usage price to reflect the approximate estimate of marginal cost of supply – such cost-reflective prices promote the efficient use and distribution of resources (all else being equal).

A.3 Matters under Section 16 of the IPART Act

The determination which accompanies this report increases a maximum price for a government monopoly service, or determines a methodology which would or might increase such a price.

Setting Sydney Water's prices below the maximum price that we set would likely result in a reduced dividend from Sydney Water, thus having a negative impact on Treasury's consolidated fund. Chapter 15 provides further information.

A.4 Section 16A directions

In the 2006 Metropolitan Water Plan, the NSW Government committed to increasing the amount of recycled water in Sydney to 70 billion litres a year by 2015. In support of this commitment, the NSW Government directed Sydney Water, under Section 20P of the State Owned Corporations Act 1989 (NSW), to complete two recycled water projects:

- the Rosehill-Camellia Recycled Water Scheme (formerly known as the Camellia Recycled Water Scheme)
- the St Marys Recycled Water Project (formerly known as the Replacement Flows Project).

At the same time, a Ministerial direction under Section 16A of the IPART Act required IPART to include the efficient costs of complying with the Section 20P directions in Sydney Water's prices.

Pursuant to Section 16A(1) of the IPART Act, the portfolio Minister for a government agency may direct IPART, when it makes a determination of the maximum price for a government monopoly service provided by the agency, to include in the maximum price an amount representing the efficient cost of complying with a specified requirement imposed on the agency.

For Sydney Water price review, we have assessed the efficiency of the above (2) recycled water projects. Our findings are in Chapter 11.

The below section shows our Section 16A directions.

A.4.1 NSW Government directions to IPART

New South Wales

The Hon Nathan Rees MP
Minister for Emergency Services
Minister for Water Utilities

RECEIVED
20 MAR 2008
INDEPENDENT PRICING & REGULATORY TRIBUNAL

SW Ref: 003187

Dr Michael Keating AC
Chairman
Independent Pricing and Regulatory Tribunal
PO Box Q290
QVB POST OFFICE NSW 1230

12 MAR 2008

Dear Dr Keating

My letter to the Tribunal directing it to include the efficient costs of the desalination plant in Sydney Water's prices foreshadowed a similar direction in relation to the Rosehill (Camellia) Recycled Water Project.

The Government's intention is that potable water prices should include some of the costs incurred by Sydney Water in undertaking the Rosehill (Camellia) Recycled Water Project. The costs to be included in potable water charges represent the difference between the charges paid by Sydney Water to the owner of the Rosehill (Camellia) Recycled Water infrastructure and distribution pipelines, and the revenue received by Sydney Water from the sale of recycled water to customers.

I have directed Sydney Water, under section 20P of the *State Owned Corporations Act 1989*, to undertake the Rosehill (Camellia) Recycled Water Project. Pursuant to section 16A of the *Independent Pricing and Regulatory Tribunal Act 1992*, I direct the Tribunal, when it determines the maximum price for government monopoly services provided by Sydney Water, to include in that price an amount representing the efficient cost of complying with the requirements imposed on Sydney Water to undertake the Rosehill (Camellia) Recycled Water Project, which includes:

- entering into agreements for the supply of recycled water to foundation customers;
- purchasing recycled water from a private recycled water supplier for supply to customers; and
- arranging for the private recycled water supplier to finance, construct, operate and maintain recycled water infrastructure, initially capable of supplying around 4.3 billion litres of recycled water per year, and the necessary distribution pipelines

Yours sincerely

Nathan Rees MP
Minister for Water Utilities
Minister for Emergency Services

Level 25, 9 Castlereagh Street, Sydney NSW 2000
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New South Wales

The Hon Nathan Rees MP
Minister for Emergency Services
Minister for Water Utilities

RECEIVED
23 AUG 2007
INDEPENDENT PRICING

SW Ref: SD 002243

Dr Michael Keating AC
Chairman
Independent Pricing and Regulatory Tribunal
PO BOX Q290
QVB POST OFFICE NSW 1230

17 AUG 2007

Dear Dr Keating

I refer to the Premier's request under section 12 of the *Independent Pricing and Regulatory Tribunal Act 1992* (IPART Act) that the Tribunal make a new pricing determination for Sydney Water Corporation.

As you are aware, the Government's intention is that the new determination will consider a range of projects that Sydney Water is undertaking to address the ongoing drought conditions and to secure Sydney's long term water supply.

I have directed Sydney Water, under section 20P of the *State Owned Corporations Act 1989*, to construct, operate and undertake the Western Sydney Recycled Water Initiative Replacement Flows Project. The project consists of;

- an Advanced Water Treatment Plant with interconnecting systems from Penrith, St Marys and Quakers Hill Sewage Treatment Plants;
- associated infrastructure and a pipeline from the treatment plant; and
- a pilot plant at St Mary's Sewage Treatment Plant and associated infrastructure.

Pursuant to section 16A of the IPART Act, I direct the Tribunal, when it determines the maximum price for Government monopoly services provided by Sydney Water, to include in that price an amount representing the efficient cost of complying with the Direction, including the ongoing operating costs of the project.

As you are aware, it is also the Government's intention for costs relating to the Camellia Recycled Water scheme be included in the Tribunal's determination. Sydney Water is finalising the tenders for this project and once this process has concluded I intend to issue a direction to Sydney Water under section 20P of the SOC Act and to the Tribunal under section 16A of the IPART Act.

Yours sincerely,

Nathan Rees MP
Minister for Water Utilities
Minister for Emergency Services

Level 25, 9 Castlereagh Street, Sydney NSW 2000
Telephone (02) 9228 5050 Facsimile (02) 9228 5099
reception@rees.minister.nsw.gov.au

B How we set prices

We set the maximum prices Sydney Water can charge its customers for its monopoly services, to recover the efficient costs needed to deliver its water, wastewater and stormwater services. We also consider the structure of the prices we set and how to encourage efficient consumption and investment decisions.

The sections below briefly explain how we approach the major elements of the review. This includes:

1. Estimating Sydney Water's efficient costs and 'notional revenue requirement' (NRR) (Section B.1),
2. Adjusting the NRR for any other revenue and costs (Section B.2),
3. Determining the forecast water sales and customer numbers (Section B.3),
4. Setting prices to recover the adjusted NRR (Section B.4);
5. How long to set prices for (Section B.5), and
6. Other IPART reviews (Section B.6).

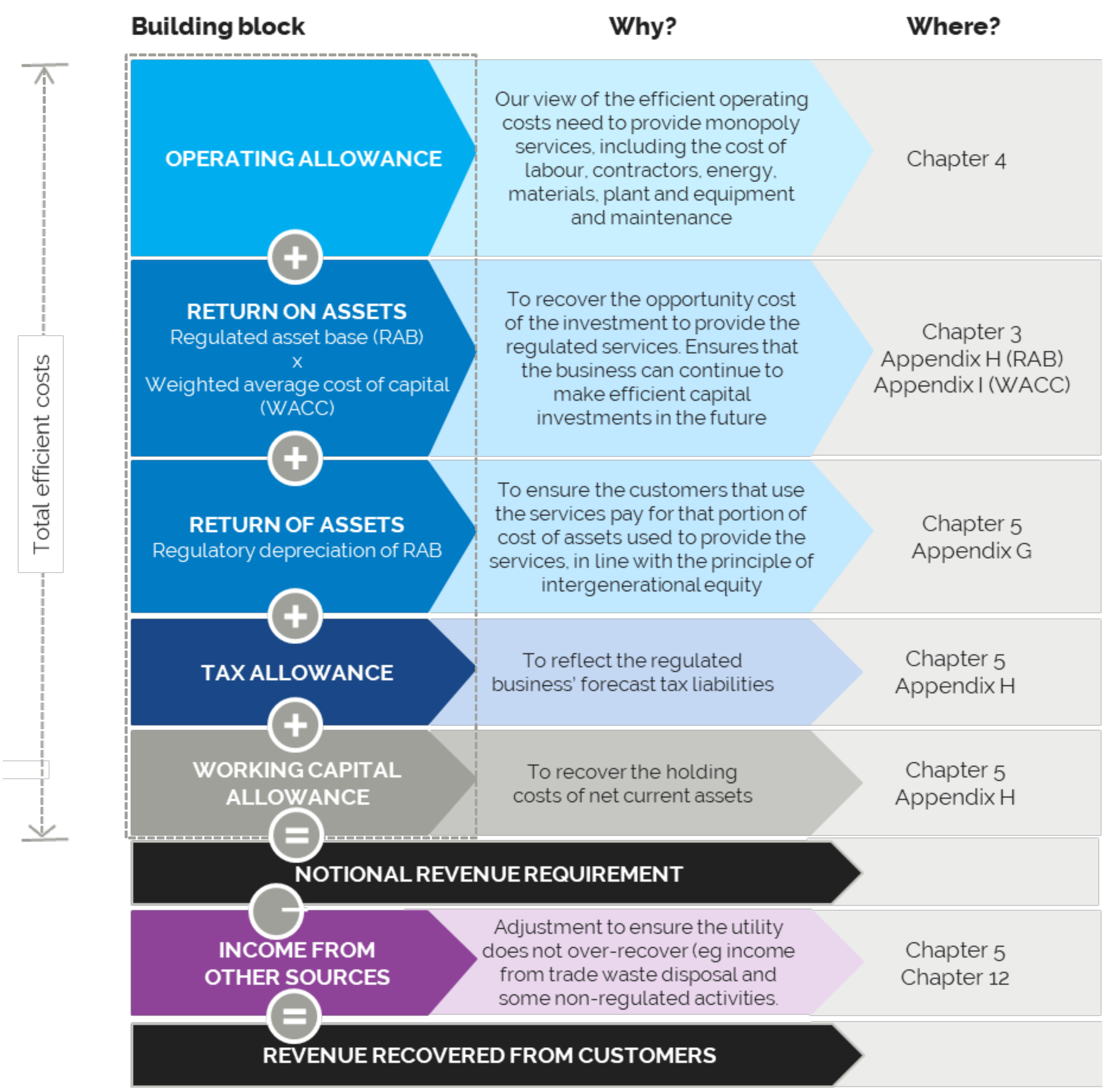
B.1 Estimating the efficient costs

Our first step in determining prices is to calculate the NRR, which represents our view of the total efficient costs for Sydney Water to provide regulated services in each year of the determination period.

As in previous reviews, we have used a 'building block' method to calculate the NRR, which represents our view of the efficient costs for Sydney Water to deliver its regulated services. Figure B.1 provides a brief explanation of each building block allowance within the NRR. We generally set prices to recover the utility's NRR.

The sections below provide more detail on how we calculated each component of the building block, and where in the report you can find more detail.

Figure B.1 Building block approach to calculating notional revenue requirement (NRR)



Note: The building block components of NRR in the figure above are not to scale and are for illustrative purposes only.

B.1.1 Operating expenditure

The allowance for operating expenditure in the building block reflects our view of the efficient level of operating costs required to deliver Sydney Water's services to its customers over the determination period. These costs include the costs of labour, service contractors, energy, materials, and plant and equipment.

We engaged expert consultants to assess the efficiency of Sydney Water's proposed operating expenditure and to examine whether the expenditure represents the most cost effective way of delivering regulated services. Our efficiency test is presented in Chapter 4.

B.1.2 Capital allowance - Return on assets and regulatory depreciation

After operating expenditure, the two largest allowances in the NRR are for a **return on assets** and **regulatory depreciation**, both of which are related to Sydney Water's existing assets and capital expenditure.

The capital expenditure is also subject to the same efficiency test as operating expenditure. As explained in Box B.1 above, we apply our efficiency test to **actual** capital expenditure incurred over the current period (2016 determination period), and the proposed expenditure for the upcoming determinations period (ie, 2020 determination period), to determine how much efficient capital expenditure should be added to the value of the RAB. We then use the updated value of the RAB to calculate the allowances for a return on assets and regulatory depreciation.

Box B.2 below explains how capital expenditure affects prices, and the return on assets and regulatory depreciation are both explained further below.

Box B.1 How capital expenditure affects prices

Under our building block model, we do not include up-front capital costs in prices. Instead, we add capital costs to the RAB to calculate capital-related allowances to be included in the NRR and recovered via prices. Capital expenditure is thus recovered via two allowances:

1. **Allowance for a return on assets.** This is the RAB value multiplied by the weighted average cost of capital (WACC). We have a standard methodology to calculate the return on assets (WACC methodology) and we do not propose any changes.
2. **Allowance for regulatory depreciation**, whereby the total cost of an asset is recovered over its life. Importantly, in this review we have used different asset lives to those used in previous determinations.

Return on assets

The return on assets allowance represents our assessment of the opportunity cost of the capital invested to provide the regulated services. Our approach ensures that the business can continue to make efficient capital investments in the future.

To calculate this allowance, we multiply the value of the RAB in each year of the determination period by an appropriate rate of return, which we calculate as the WACC. In 2018, we revised our standard methodology to calculate the WACC (available on our website). We discuss our decisions on the return on assets in Chapter 5 on NRR. Further detail on how we calculate the value of the RAB and the WACC is set out in Appendices H and I.

We note that we are in an environment of low returns on capital, which mitigates the impact of RAB increases in the 2020 determination period. However, assets paid for through capital expenditure remain in the RAB for the duration of their lives, and we also recognise that the WACC could increase in future, which means that Sydney Water's proposed capital expenditure increases for the 2020 period could place upward pressure on prices over time.

Regulatory depreciation

The building block model includes an allowance for a return **of** assets (regulatory depreciation). We typically use straight line depreciation to calculate this allowance, which means that the value of the asset is returned to the utility evenly over the asset's economic life. That is, the value of an asset is divided by its assumed life in years to determine the annual allowance for depreciation for that asset.

It is important that the asset lives we use in calculating Sydney Water's depreciation allowance are accurate – ie, they reasonably reflect the consumption of its assets. If they are too short, today's customers will pay too much (ie, they will pay for future customers' consumption of the assets). If they are too long, today's customers will pay less but future customers may pay for assets that they don't use, and the utility may also face financeability concerns for a period of time.

In practice, we do not divide every asset's value by its specific life. Some form of aggregation is required – eg, dividing the RAB by the weighted average life of assets in the RAB, or dividing parts of the RAB by the weighted average life of assets in each part.

B.1.3 Allowance for tax

We include an explicit allowance for tax, because we use a post-tax WACC to estimate the return on assets in the NRR.[138] This allowance reflects what Sydney Water's tax liabilities would be under our regulatory settings.

Our tax allowance is not intended to recover Sydney Water's actual tax liability over the determination period. Rather, it reflects the liability that a comparable commercial business would be subject to. Including this allowance is consistent with our aim to set prices that reflect the full efficient costs a utility would incur if it were operating in a competitive market (including if it were privately owned). It is also consistent with the principle of competitive neutrality, that is, that a government business should compete with private business on an equal footing and not have a competitive advantage due to its public ownership.

We calculate the tax allowance for each year by applying the relevant tax rate, adjusted for the value of imputation credits (the 'gamma')[139], to the business's taxable income. For this purpose:

- Taxable income is the NRR (excluding tax allowance) less operating cost allowances, tax depreciation, and interest expenses.
- We require the business to provide forecast tax depreciation, which we may adjust to reflect the Tribunal's decisions on capital expenditure and assets free of charge (AFOC).

138 Sydney Water pays tax equivalents to NSW Treasury under the National Tax Equivalents Regime (NTER). The regulatory tax allowance we set is not intended to match Sydney Water's actual tax equivalent payments. It is derived using our assessment of efficient expenditure, the regulatory gearing ratio (ie, debt to equity ratio) and our decision on the WACC and cost of debt.

139 Under a post-tax framework, the value of franking credits (gamma) enters the regulatory decision only through the estimate of the tax liability.

- Other items such as interest expenses are based on the parameters used for the WACC, and the value of the RAB[140] and working capital.

B.1.4 Return on working capital

The working capital allowance component of the NRR represents the return the business could earn on the net amount of working capital it requires each year to meet its service obligations. It ensures the business recovers the costs it incurs due to the time delay between providing a service and receiving the money for it (ie, when bills are paid).

In 2018, we developed a standard approach to calculate the working capital allowance, which can be found on our website.[141] In summary, we:

1. Calculate the net amount of working capital the utility requires, using the formula:

   working capital = receivables - payables + inventory + prepayments

2. Calculate the return on this amount by multiplying it by the nominal post-tax WACC.

B.2 Adjusting the NRR

After we have estimated the efficient costs, we need to determine whether we should make any reductions to the NRR, before using the NRR to set water, wastewater and stormwater prices. For Sydney Water, the NRR reductions relate to revenue that should be shared between its water customers and its shareholders. We discuss our decisions on revenue that should be adjusted for non-regulated income in Chapter 5 and Appendix H.

B.2.1 Non-regulated income

Non-regulated income is revenue earned from services not subject to IPART's price determination (ie, non-monopoly services) but which are delivered using regulated assets. That is, it is derived from assets in the RAB, which are also used to deliver monopoly services. We generally share a portion of this with customers, and remove that amount from the NRR.

B.2.2 Demand volatility adjustment mechanism (DVAM)

We can adjust the revenue to account for over- or under-recovery in the previous period, where the over- or under-recovery is related to material variations between forecast and actual water sales (for instance, exceeding +/-5% over the whole determination period).

If we assess that the utility has over-recovered in the previous period, then this revenue can be returned to customers in the next period by reducing the NRR before setting prices, or vice-versa.

140 The nominal cost of debt is the sum of the nominal risk-free rate and nominal debt margin.
141 IPART, Working Capital Allowance Policy Paper, November 2018.

B.2.3 Revenue from other services

Sydney Water also receives revenue from trade waste services and miscellaneous services related to the water, wastewater and stormwater services. These are priced separately, but can share the assets and resources used to provide other services (for instance, trade waste is managed through wastewater treatment plants). To ensure that the utility does not over-recover, we subtract the expected revenue from trade wasted and miscellaneous services from the NRR before setting prices.

B.3 Forecasting water sales, wastewater demand and customer numbers

A key step in our price setting process is to decide on Sydney Water's forecasts for water sales and customer numbers. These forecasts are used to determine the price levels necessary to recover its NRR. If the forecasts are too high or too low, it would lead to an under- or over-recovery of the NRR. (If material over- or under-recovery occurs, we can amend revenue in the next period by applying a DVAM, see B.2.2 above.)

Our decisions on forecast water sales and customer numbers are discussed in Chapter 7.

B.4 Setting prices to recover the adjusted NRR

We generally set prices to recover the adjusted NRR (ie, the NRR after reductions to account for other sources of revenue and any adjustments to account for over/under recovery in the previous period– as outlined above).

In structuring prices, we aim to find a balance between the principle that customers should pay for the costs they create, thus sending appropriate price signals; and having a relatively simple and easy to understand framework.

In assessing Sydney Water's proposed price structures, we considered the appropriate pricing principles that should be applied as well as price stability, affordability and managing revenue risk for the utility. Box B.3 outlines our principles in setting prices.

Box B.3 outlines our principles in setting prices.

Box B.2 Our pricing principles

In setting maximum prices for regulated water businesses, our overarching principle is that prices should be cost-reflective. This means that:

- Prices should only recover sufficient revenue to cover the prudent historical and efficient forecast costs of delivering the monopoly services. Prices for individual services should reflect the efficient costs of delivering the specific service.
- Price structures should match cost structures:
  - Usage charges reference an appropriate estimate of marginal cost (ie, the additional cost of supplying an additional unit of water or sewerage services). We generally favour LRMC when setting usage prices, because it signals the full operating and capital costs associated with additional usage. Exceptions to this include situations where there is less need for strong price signals and situations where LRMC pricing is not practical.
  - Fixed service charges recover the remaining costs.
- Customers imposing similar costs on the system pay similar prices.

Through the signals they send, cost-reflective prices promote the efficient use and allocation of resources, which ultimately benefits the whole community. The sum of the fixed and usage prices customers pay reflects the total cost of the services provided. By reflecting the revenue needed to efficiently provide the services, cost-reflective prices also ensure efficient investment in water infrastructure and service provision.

Other factors we generally consider when deciding on price structures include whether prices are transparent, easy for customers to understand and Sydney Water to administer, and customer preferences.

B.4.1 How we set prices

We set prices to recover the utility's adjusted NRR in net present value (NPV) terms over the determination period across its customer base. Before we set prices, we will decide on how long the determination period should be. The factors we consider in setting the determination period are discussed at B.5 below, and our decision on the length of the 2020 determination period is in Chapter 13.

For Sydney Water, we generally work within a postage stamp pricing framework, consistent with Government policy.[142] A key consideration for setting prices is how to balance the share of revenue that should be recovered from fixed charges against variable (or usage) charges for water and wastewater services. We often set the usage charge with reference to the marginal cost of supply, with fixed (or service) charges set to recover the remaining revenue requirement.

Chapters 7, 8 and 9 include more information on price structures for water, wastewater and stormwater services, and the prices we set.

142 Postage stamp pricing means that customers pay the same for a service regardless of where in the utility's area of operations they are located. That is, we generally cannot set location-based prices.

B.4.2 Non-residential large water users have the option to opt-out of the prices we set

In our 2016 reviews, we decided to allow Hunter Water and Sydney Water to enter into unregulated pricing agreements (UPAs) with large non-residential customers. Neither utility entered a UPA during the 2016 determination period. We have decided to maintain the option in the 2020 determination period (see Chapter 12).

How do unregulated pricing agreements work?

We continue to set maximum prices for monopoly services. However, if Sydney Water and a large non-residential customer enter into a pricing agreement, they would opt-out of the prices we set, and be subject to the agreement instead (for water supply and sewerage services only). Key feature of this pricing option are that:

- UPAs are optional and are only entered into voluntarily if the agreement is mutually beneficial to the utility and the large non-residential customer. If the foreseen benefits do not outweigh the costs, then parties should not enter the agreement. The additional, administrative burden to negotiate, manage and ring-fence the agreement should be factored in when considering an agreement.
- The costs and revenues associated with the customer would have to be ring-fenced from the broader cost and revenue base, to ensure that the broader customer base does not subsidise the costs of servicing a large customer.
- The customer would not be able to opt back in to regulated prices within the determination period, and should factor this in to its consideration.

B.5 How long to set prices for?

For each water pricing review, we decide on the length of the determination period. In general, this can be between one and five years.

We decide the appropriate determination length a case-by-case basis, and in doing so, we consider the range of factors outlined in Box B.3.

Box B.3 Factors we consider in deciding the length of a determination

In general, the factors we consider when deciding the length of a determination period are the:

- Confidence we have in the utility's forecasts.
- Risk of structural changes in the industry.
- Need for price flexibility and incentives to increase efficiency.
- Need for regulatory certainty and financial stability.
- Timing of other relevant reviews.
- Views of stakeholders.

Longer determination periods have several advantages over shorter periods. For example, a longer period:

- provides greater stability and predictability (which may lower a utility's business risk and assist investment decision making), and
- creates strong incentives for a utility to increase efficiency; and reduces regulatory costs.

However, longer determination periods also have disadvantages. These include:

- increased risk associated with using inaccurate data to set prices
- possible delays in customers benefitting from any efficiency gains, and
- the risk that changes in the industry will impact the effectiveness of the determination.

B.6 Other IPART reviews

Other reviews that we have undertaken recently or concurrently may interact with the decisions we made in either estimating the required revenue, setting Sydney Water's prices, or considering the form of regulation. These reviews are listed in Box B.4, along with a weblink to the relevant documents on our website.

Box B.4 Other related IPART reviews we consider when setting prices

We concurrently reviewed the prices for Hunter Water and Water NSW Greater Sydney, which follow a similar framework.

We periodically review parts of our approach to setting water prices. Related reviews include:

- How we calculate the weighted average cost of capital (Review of our WACC method, February 2018)
- How we assess the utility's financeability (Review of our financeability test, November 2018)
- How we calculate the working capital allowance (Working Capital Allowance Policy Paper November 2018)
- How we treat any asset disposals (Asset Disposals Policy Paper, February 2018)
- How developer charges should be priced (Developer charges and backlog sewerage charges for metropolitan water agencies, October 2018)
- The conditions in Sydney Water's operating licence (Review of Sydney Water's operating licence November 2019)
- How recycled water services should be funded and priced, including recycled water developer charges (Review of pricing arrangements for recycled water and related services, July 2019)
- How wholesale customers, ie, *Water Industry Competition Act 2006* (WICA) licensees purchasing water and/or wastewater services from Hunter Water, should be charged (Prices for wholesale water and sewerage services, June 2017)

For each of these reviews, relevant documents are available on our website.

C Context

IPART is the principal economic regulator in New South Wales. Our main functions are set out in the IPART Act. Among other responsibilities, we determine the maximum prices for declared government monopoly services provided by water utilities under the *Sydney Water Act 1991*, and in accordance with the matters under Section 15 of the *Independent Pricing and Regulatory Tribunal Act 1992* (IPART Act, see Appendix A).[143, 144]

Sydney Water is Australia's largest water utility, serving around 5.1 million residential and non-residential customers with water, wastewater and stormwater drainage services in the Sydney, Illawarra and Blue Mountains areas.

- Sydney Water primarily purchases bulk water from Water NSW Greater Sydney. It also purchases water from the Sydney Desalination Plant (SDP) when Water NSW's dam levels fall below 60% of total dam storage.[145] Sydney Water then treats this water before delivering it to its customers. In addition, Sydney Water provides some customers with raw water, recycled water and bulk water. In total, Sydney Water delivers around 1,500 million litres of water per day to its customers.
- Sydney Water operates 30 separate wastewater systems including 16 wastewater treatment plants. It collects around 1,500 million litres of wastewater each day from its customers, treats it through its treatment plants and then either reuses or discharges treated sewage (or wastewater) into waterways such as rivers or the ocean. The biosolids produced by this treatment are then sold by Sydney Water to industry for use in agriculture, composting and land rehabilitation.
- Sydney Water owns and maintains over 454 kilometres of stormwater channels, which service about 633,000 properties.

Sydney Water's service charges are different for the different services that it provides.

- Users of drinking water are charged a fixed service charge and a usage charge.
- Residential users of wastewater services are charged a fixed service charge, which includes a deemed usage component that reflects the average customer wastewater discharge (or discharge allowance) into the wastewater network. Non-residential customers are charged both a fixed service charge and a usage charge if they discharge more wastewater than the discharge allowance.
- Stormwater charges are applied to about 25% of properties that are within Sydney Water's declared stormwater catchment areas.

143 Under s 11(1) of the IPART Act, we investigate and report on each of the declared monopoly services provided by these utilities which fall within the scope of the *Independent Pricing and Regulatory Tribunal (Water Sewerage and Drainage Services) Order 1997* (NSW).

144 We are also concurrently reviewing prices for Water NSW's provision of bulk water, and Hunter Water's water, sewerage and stormwater drainage services from 1 July 2020. Information on these reviews is available on our website: https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Metro-Pricing

145 SDP's operating rules are set out in the New South Wales Government's *2017 Metropolitan Water Plan*.

C.1 Our review process

This review sets the maximum prices that Sydney Water can charge its customers for water, wastewater, stormwater and other miscellaneous and ancillary services.[146] We also monitor prices that Sydney Water charges customers for recycled water.

IPART generally sets these prices every four years. We use a propose-respond regulatory model for this review. The model operates via a two-step process:

- In the first step, Sydney Water submits its pricing proposal, which includes its proposed prices, operating and capital costs and preferred approach to setting prices for the four years from 1 July 2020. Sydney Water submitted both a pricing proposal to IPART for review on 1 July 2019, and an update to that proposal on 12 November 2019.
- In the second step, IPART responds to Sydney Water's proposal, determining Sydney Water's efficient costs, our pricing framework, and how we can set the best incentives for Sydney Water to become more efficient over time. IPART responded to Sydney Water's proposal in September 2019 with an Issues Paper.[147]

  Figure C.1 sets out the two-step process.

Figure C.1 Our process for setting prices under a propose-respond regulatory model

We have now completed our final assessment of:

- Sydney Water's efficient costs of supplying its services, and
- The appropriate prices and price structures to recover these.

In doing so, we have taken into account a broad range of issues, consistent with the matters we must consider under the IPART Act. Our response to these matters is provided in Appendix A.

C.2 What drives Sydney Water's costs?

We set prices to recover the efficient cost of Sydney Water to deliver its monopoly services. Sydney Water's costs can be allocated into five broad categories, which are the costs:

- to meet its existing service standards and **regulatory obligations**, including any new or amended standards or obligations

146 These are the monopoly services that we review under Section 11 of the *Independent Pricing and Regulatory Tribunal Act 1992 (NSW)* (the *IPART Act*).

147 These documents can be found on IPART's website.

- to deliver its monopoly services to new development areas ('**growth costs**')
- of **discretionary** projects, where Sydney Water shows its customers are willing-to-pay to receive services above its regulated standards
- of implementing any long-term plans under the **Metropolitan Water Plan**, and
- to comply to **Government Directions** issued to Sydney Water to complete projects in the public interest.

C.2.1 Regulatory obligations

Sydney Water is a statutory corporation established under the *Sydney Water Act 1994*. Under the Act it has three principal objectives:

- To be a successful business and, to this end:
  - to operate at least as efficiently as any comparable businesses, and
  - to maximise the net worth of the State's investment in the Corporation, and
  - to exhibit a sense of social responsibility by having regard to the interests of the community in which it operates.
- To protect public health by supplying safe drinking water
- To protect the environment by conducting operations in compliance with the principles of ecologically sustainable development.

To meet these objectives, Sydney Water must comply with standards set by a number of regulators. The cost to Sydney Water to deliver its monopoly services consistent with its regulatory obligations, such as its environmental licences and operating licence (which determines its service standards), have accounted for 58% of Sydney Water's total proposed operating and capital costs.[148] Sydney Water is regulated by:

- **IPART**, which monitors and reports on Sydney Water's compliance with its **operating licence**, which includes Sydney Water's obligations in relation to customer service, water quality, and system performance. We also periodically review the licence.
  - Tied to the Operating Licence is Sydney Water's Customer Contract. Under its Customer Contract, Sydney Water may charge its customers a late payment fee for overdue bills and a dishonoured or declined payment to Sydney Water. IPART regulates these charges under Section 12A of the IPART Act.
- **The NSW Environment Protection Authority** (EPA), which issues Environment Protection Licences[149] for Sydney Water's wastewater network, pumping stations and treatment systems, and monitors and regulates Sydney Water's environmental performance.
- **NSW Health,** which regulates the quality and safety of Sydney Water's drinking water.

148 This is the percentage amount proposed by Sydney Water in its pricing proposal for the 4-year period from 2020-21 to 2023-24.

149 Under the Protection of the Environment Operations Act 1997 (NSW).

- **The Department of Planning Industry and Environment (DPIE),** which regulates Sydney Water's extractions from the Hawkesbury-Nepean River. These extractions are used by the North Richmond water filtration plant to provide drinking water supply for the Hawkesbury area.

Sydney Water's regulatory obligations are subject to periodic review by each respective regulator, which results in changes over time. Changes in its regulatory obligations can increase (or decrease) the costs Sydney Water must incur to comply with these obligations. Sydney Water's existing operating licence was reviewed and amended in 2018-2019, with the new version applying from November 2019. Included in the amended licence (which is not a requirement in the existing licence) is the requirement for Sydney Water to implement an economic level of water conservation. The costs to comply with this new requirement are included in Sydney Water's proposed operating expenditure and discussed in more detail in Chapter 4 of this Report.

C.2.2 Discretionary spending

Discretionary expenditure is expenditure to deliver service levels or outcomes above those mandated by regulatory requirements. Sydney Water proposed including about $80 million of capital costs over the four year period (2020-21 to 2023-24) for discretionary expenditure. Chapter 10 discusses our decisions on this expenditure.

C.2.3 Investments to service growth

As the population grows, Sydney Water's area of operations continues to expand as development spreads into greenfield areas, and it will incur additional costs as it augments its existing network to cope with increased density in established areas. This requires Sydney Water to build and operate new water, wastewater and stormwater infrastructure.

C.2.4 The Metropolitan Water Plan

The NSW Government's Metropolitan Water Plan (MWP) is the Government's long-term water plan for Sydney. It outlines the mix of supply augmentation and demand management measures that ensure Sydney, the Illawarra and the Blue Mountains meet water needs now and into the future.

The elements in the MWP that can impact on Sydney Water's costs and prices are:

- Water demand and supply projections and identifying options for future supply augmentations, which can impact on estimates of the Long Run Marginal Cost (LRMC) of water supply (which are a key factor we consider when setting water usage prices).
- The Drought Response Strategy, which includes:
  - transfers of bulk water from Shoalhaven to Sydney when total dam storages fall below 75%
  - the imposition of water restrictions at specified dam storage levels, which impacts water sales volumes

- – the operation of the Sydney Desalination Plant (SDP) to deliver bulk water to Sydney Water when total dam storages fall below 60%, and
- – the expansion of SDP when total dam storages fall below 35%.
- Any costs for Water NSW in terms of general supply augmentation and drought response, which would flow through to Sydney Water's bulk water costs.

The MWP is reviewed periodically. It was first developed in 2004 in response to severe drought, and revised in 2006 and 2010. The most recent MWP, released in 2017, is currently being reviewed by the NSW Government to take into account changes in water demand and supply and new data and research. It is due to be released in 2020.[150]

The Government is developing the Greater Sydney Water Strategy (GSWS) to replace the Metropolitan Water Plan. The GSWS will explore an integrated water cycle approach for managing water, wastewater and stormwater in Sydney and how water and land use planning can be more integrated to ensure that Sydney's future water needs for growth and drought can be met over the long term. Although details of the GSWS are not yet available, this strategy is expected to be developed during the current determination period (ie, from 2020-21 to 2023-24) and will be an important component of the Government's strategic vision for a productive, sustainable and liveable Sydney.[151]

C.2.5 Government Directions under S16A of the IPART Act

The Government can issue directions for Sydney Water to complete projects in the public interest, which may not be in the shareholders' interest.[152] At the same time, it can direct IPART (with the Minister's approval) under Section 16A of the IPART Act to include the efficient costs of complying with specified requirements in Sydney Water's prices.[153] This can take the form of either:

- a 'standing direction' (which applies whenever IPART makes a determination in relation to a particular government monopoly service), or
- a 'one-off direction' (which applies when IPART makes a particular pricing determination).

For this review, three Ministerial directions pursuant to Section 16A of the IPART Act (Section 16A directions) apply. These relate to:

- **Stormwater works at Green Square.** This was issued to IPART in January 2014. It directs IPART to pass-through in prices Sydney Water's efficient costs of complying with requirements to undertake stormwater amplification works and construct interconnected stormwater infrastructure in connection with the Green Square development.

150 NSW Government, Planning for Sydney, https://www.planning.nsw.gov.au/About-Us/Sydney-Metropolitan-Water/Planning-for-Sydney, access on 20 August 2019.

151 NSW Department of Planning, Industry and Environment, *Submission to IPART's Draft Report – Review of prices for Sydney Water from 1 July 2020,* May 2020, p 6.

152 Typically through a direction given under Section 20P of the SOC Act.

153 Under Section 16A(3) of the IPART Act a specified requirement may only be a requirement imposed by or under a licence or authorisation, a requirement imposed by a ministerial direction under an Act, or some other requirement imposed by or under an Act or statutory instrument.

- **The Rosehill (Camellia) Recycled Water Project.** This was issued to IPART in March 2008. It directs IPART to pass-through in prices the difference between the charges paid by Sydney Water to the owner of the Rosehill (Camellia) Recycled Water infrastructure and distribution pipelines, and the revenue received by Sydney Water for the sale of recycled water to customers.
- **The Replacement Flows Project.** This was issued to IPART in August 2007. It directs IPART to pass-through in prices Sydney Water's efficient costs of construction and ongoing operation of the St Mary's Advanced Water Recycling Plant.

D Impacts of final prices

D.1.1 Indicative bill impacts for residential customers

Almost all residential customers' bills include water services and wastewater services. About 25% also include stormwater services.

We have undertaken analysis of the customer base to assess affordability and bill impacts for various customers at different usage levels under our drought, and non-drought water prices (Tables D.1 through D.4). These show the estimated bill impacts for the above services, including discretionary expenditure, for several customer categories, including:

- House - small household – water usage 100 kL/year.
- House – typical household – water usage 200 kL/year.
- House – large household – water usage 300 kL/year.
- Apartment – typical apartment – water usage 160 kL/year.
- Pensioner – typical household – water usage 100 kL/year.
- Industrial users – low usage (150 kL/year), medium usage (5,800 kL/year), high usage (26,000 kL/year).
- Commercial users – low usage (310 kL/year), medium usage (6,700 kL/year), high usage (21,000 kL/year).
- Public hospitals – medium usage (20,000 kL/year) and high usage (33,000 kL/year).
- Private schools – low usage (7,700 kL/year), medium usage (24,000 kL/year), high usage (35,000 kL/year).
- Commercial strata units – low usage (130 kL/year), medium usage (180 kL/year), high usage (2,100 kL/year).
- Industrial strata units – low usage (75 kL/year), medium usage (90 kL/year), high usage (32,000 kL/year).

We have also taken an estimated the value of a typical household's bill as a proportion of median household income in Sydney.

Residential

For residential customers:[154]

- Under non-drought conditions, bills would be lower for most households (for households that consume less than 500kL per year), with small users of water realising the greatest percentage cost improvements (Table D.1). Bills for pensioners would increase by about 3%, without any changes to how the rebate is set.

[154] These bills include discretionary expenditure charges and are with and without stormwater charges, as appropriate.

- Under drought conditions, bills would be lower for lower users of water (those using less than 120kL per year), and would be higher for medium and large users of water (for example, about 13-14% higher for households using 300kL per year; see Table D.2). Bills for a typical pensioner household would increase by about 25% without a change to how the rebate it set. However, as outlined in Chapter 14, the Government and Sydney Water have both stated they will ensure that pensioners are not made worse off by our dynamic water usage prices.

Table D.1 Bill impacts for residential customers – by household size/type ($2020-21) – non-drought conditions

Residential property type	2019-20	2020-21	2021-22	2022-23	2023-24	% change 2019-20 to 2023-24
House - including stormwater - (small household)	1,001	896	896	896	896	-10%
House - excluding stormwater - (small household)	923	819	819	819	819	-11%
House - including stormwater - (typical household)	1,212	1,131	1,131	1,131	1,131	-7%
House - excluding stormwater - (typical household)	1,134	1,054	1,054	1,054	1,054	-7%
House - including stormwater - (large household)	1,423	1,366	1,366	1,366	1,366	-4%
House - excluding stormwater - (large household)	1,345	1,289	1,289	1,289	1,289	-4%
Pensioner household – including stormwater (typical)	373	384	384	384	384	3%
Pensioner household – excluding stormwater (typical)	334	345	345	345	345	3%
Apartment – including stormwater (typical)	1,074	985	985	985	985	-8%
Apartment – excluding stormwater (typical)	1,049	960	960	960	960	-9%

Notes: Water consumption assumed to be 200 kL per year for “typical” households, 100 kL per year for “small” households, 300 kL per year for “large” households, 100 kL per year for pensioners, 160 kL per year for apartments. Bill impacts include discretionary expenditure.
Source: IPART analysis using our prices and 2015 IPART Household Survey data

Table D.2 Bill impacts for residential customers – by household size/type ($2020-21) – drought conditions

Residential property type	2019-20	2020-21	2021-22	2022-23	2023-24	% change 2019-20 to 2023-24
House - including stormwater - (small household)	1,001	979	979	979	979	-2%
House - excluding stormwater - (small household)	923	902	902	902	902	-2%
House - including stormwater - (typical household)	1,212	1,297	1,297	1,297	1,297	7%
House - excluding stormwater - (typical household)	1,134	1,220	1,220	1,220	1,220	8%
House - including stormwater - (large household)	1,423	1,615	1,615	1,615	1,615	13%
House - excluding stormwater - (large household)	1,345	1,538	1,538	1,538	1,538	14%
Pensioner household – including stormwater (typical)	373	467	467	467	467	25%
Pensioner household – excluding stormwater (typical)	334	428	428	428	428	28%
Apartment – including stormwater (typical)	1,074	1,117	1,117	1,117	1,117	4%
Apartment – excluding stormwater (typical)	1,049	1,093	1,093	1,093	1,093	4%

Notes: Water consumption assumed to be 200 kL per year for "typical" households, 100 kL per year for "small" households, 300 kL per year for "large" households, 100 kL per year for pensioners, 160 kL per year for apartments. Bill impacts include discretionary expenditure.
Source: IPART analysis and 2015 IPART Household Survey data

Non-residential

For non-residential customers:

- Under non-drought conditions, bills would be lower for low users of water, but would be slightly higher for medium and large consumers (Table D.3), and
- Under drought conditions, bills would be higher for almost all types of users, with the heaviest users of water experiencing the most significant increases in their bills (Table D.4).

Table D.3 Bill impacts for a sample of non-residential customers ($2020-21) – non-drought conditions

Non-residential property type and water usage	kL pa	2019-20	2020-21	2021-22	2022-23	2023-24	% change 2019-20 to 2023-24
Industrial – low	150	1,069	938	938	938	938	-12%
Industrial – medium	5,800	19,654	20,627	20,627	20,627	20,627	5%
Industrial – high	26,000	83,864	88,556	88,556	88,556	88,556	6%
Commercial – low	310	1,538	1,479	1,479	1,479	1,479	-4%
Commercial – medium	6,700	24,172	25,055	25,055	25,055	25,055	4%
Commercial – high	21,000	73,690	76,956	76,956	76,956	76,956	4%
Public hospital – medium	20,000	72,915	75,844	75,844	75,844	75,844	4%
Public hospital – high	33,000	119,444	124,481	124,481	124,481	124,481	4%
Private school - low	7,700	27,494	28,630	28,630	28,630	28,630	4%
Private school – medium	24,000	84,022	88,041	88,041	88,041	88,041	5%
Private school – high	35,000	122,411	128,069	128,069	128,069	128,069	5%
Commercial strata unit – low	130	1,015	859	859	859	859	-15%
Commercial strata unit – medium	180	1,448	1,275	1,275	1,275	1,275	-12%
Commercial strata unit – high	2,100	9,042	9,015	9,015	9,015	9,015	0%
Industrial strata unit – low	75	899	677	677	677	677	-25%
Industrial strata unit – medium	90	1,249	967	967	967	967	-23%
Industrial strata unit – high	32,000	96,484	103,947	103,947	103,947	103,947	8%

Note: Bill impacts include discretionary expenditure charges but exclude trade waste charges.

Source: IPART analysis

Table D.4 Bill impacts for a sample of non-residential customers ($2020-21) – drought conditions

Non-residential property type and water usage	kL pa	2019-20	2020-21	2021-22	2022-23	2023-24	% change 2019-20 to 2023-24
Industrial – low	150	1,069	1,063	1,063	1,063	1,063	-1%
Industrial – medium	5,800	19,654	25,441	25,441	25,441	25,441	29%
Industrial – high	26,000	83,864	110,136	110,136	110,136	110,136	31%
Commercial – low	310	1,538	1,737	1,737	1,737	1,737	13%
Commercial – medium	6,700	24,172	30,616	30,616	30,616	30,616	27%
Commercial – high	21,000	73,690	94,386	94,386	94,386	94,386	28%
Public hospital – medium	20,000	72,915	92,444	92,444	92,444	92,444	27%
Public hospital – high	33,000	119,444	151,871	151,871	151,871	151,871	27%
Private school - low	7,700	27,494	35,021	35,021	35,021	35,021	27%
Private school – medium	24,000	84,022	107,961	107,961	107,961	107,961	28%
Private school – high	35,000	122,411	157,119	157,119	157,119	157,119	28%
Commercial strata unit – low	130	1,015	966	966	966	966	-5%
Commercial strata unit – medium	180	1,448	1,424	1,424	1,424	1,424	-2%
Commercial strata unit – high	2,100	9,042	10,758	10,758	10,758	10,758	19%
Industrial strata unit – low	75	899	739	739	739	739	-18%
Industrial strata unit – medium	90	1,249	1,042	1,042	1,042	1,042	-17%
Industrial strata unit – high	32,000	96,484	130,507	130,507	130,507	130,507	35%

Note: Bill impacts include discretionary expenditure charges but exclude trade waste charges.

Source: IPART analysis

E How we set an efficient expenditure allowance

This appendix sets out our approach to the assessment of Sydney Water's efficient operating and capital expenditure. It discusses:

- Our objective in setting an efficient expenditure allowance at a point in time,
- How we assessed Sydney Water's past and forecast expenditure, aided by the advice of our expenditure review consultant, Atkins.

In response to our Draft Report, we received a detailed submission from Sydney Water questioning aspects of our methodology and our consultant's approach. We discuss these, in turn, in the following sections.

Appendix F details how we set the continuing efficiency adjustment for the Sydney Water review.

E.1 Our objective for expenditure and the utility's incentives

Our assessment of Sydney Water's expenditure proposal, undertaken with the assistance of Atkins/Cardno[155], tests whether the level of expenditure that Sydney Water has made, or proposes to make, is efficient. This includes testing whether the 'need' for investment was properly articulated, that the full range of options and sensitivities were considered, and the processes for assessing, procuring and delivering projects were consistent with best practice, including whether delivery and financial risks are appropriately managed (Box E.1). In addition, we test – primarily with reference to large projects – whether the utility sufficiently re-prioritises its activities as circumstances evolve.

Our objective is for the expenditure that is factored into prices to:

- be of a level that is consistent with the least cost provision of a given quantity and quality of service, and
- include projects to expand the quantity or quality of service where the benefits to customers exceed the cost – but, consistent with the objective above, the projects are delivered at least cost.

If we set prices to exactly match Sydney Water's actual costs then there would be no incentive for Sydney Water to spend efficiently. This is why we provide an expenditure allowance and have capped prices for the 2020 determination period so that Sydney Water retains the benefit from spending less, and bears the cost from spending more, until prices are next reviewed.

155 In June 2019 we appointed the Atkins/Cardno consortium to carry out a detailed review of Sydney Water Corporation's operating and capital expenditure, and forecast water sales ('demand').

However, there are limits to the effectiveness of such financial incentives. Sydney Water, along with other regulated businesses, would be incentivised to overstate the forecast expenditure requirements in the period ahead. This is because the business benefits when it spends less than was forecast – hence raising the forecast raises the benefit. Therefore, we need to assess Sydney Water's past and forecast expenditure prior to permitting those costs to be recovered through regulated prices.[156]

Box E.1 Efficiency test

The efficiency test examines whether a utility's operating and capital expenditure represents the best and most cost-effective way of delivering monopoly services to customers.

Broadly, the efficiency test considers both how the investment decision is made, and how the investment is executed, having regard to, amongst other matters, the following:

- Customer needs, subject to the utility's regulatory requirements.
- Customer preferences for service levels, including customers' willingness to pay.
- Trade-offs between operating and capital expenditure, where relevant.
- The utility's capacity to deliver planned expenditure.
- The utility's expenditure planning and decision-making processes.

The efficiency test is applied to:

- historical capital expenditure, and
- forecast capital and operating expenditure

that is included in the utility's revenue requirement, for the purposes of setting regulated prices.

The efficiency test is based on the information available to the utility at the relevant point in time. That is:

- For forecast operating and capital expenditure, we assess whether the proposed expenditure is efficient given currently available information.

For historical capital expenditure, we assess whether the actual expenditure was efficient based on the information available to the utility at the time it incurred the expenditure (ie, whether the utility acted prudently in the circumstances prevailing at the time it incurred the expenditure).

E.2 How we assessed Sydney Water's past and forecast expenditure

We received two proposals from Sydney Water, in July 2019 and in November 2019 (in response to worsening drought conditions). Taking the two proposals together and seeking additional information on particular programs, as well as undertaking detailed expenditure interviews with select staff from Sydney Water, we sought to assess the efficiency of the historical expenditure incurred and proposed expenditure from 1 July 2020.

156 We review the operating expenditure incurred by the utility in the previous price period with reference to setting an efficient allowance for the following period.

In doing so, we commissioned expert consultants Atkins/Cardno to assist us with the expenditure review. Atkins/Cardno (Atkins) has considerable experience working with us on expenditure reviews, asset management reviews, operational audits and other review assignments. Atkins has a deep understanding of the New South Wales regulatory environment, our role and the expectations on the regulated businesses.

Our review of expenditure, assisted by Atkins, comprised the following three elements:

A strategic review of Sydney Water's long-term investment plan and asset management systems and practices

A review of Sydney Water's historical operating expenditure and a detailed review of its proposed operating expenditure for efficiency

A detailed review of Sydney Water's historical and proposed capital expenditure for efficiency

Review of long-term investment planning and asset management practices and processes

Our assessment included a review of Sydney Water's long-term investment plan and supporting asset management systems and processes. We considered whether the long-term capital investment strategy is the most efficient and whether this is supported by effective and best practice capital planning and delivery processes. We then considered the medium-term expenditure proposals in relation to the long-term investment plans. The asset management processes are important, as the water utilities have significant capital assets, which require ongoing maintenance, upgrades and expansions over time, to ensure the effective delivery of its services.

A key aspect of our review was to assess whether Sydney Water has robust processes in place to manage the whole life of assets. We required Atkins/Cardno to assess whether Sydney Water's process were consistent with efficient agencies at the efficiency 'frontier'.

To do so, Atkins reviewed a sample of projects in the water, wastewater and stormwater services to assess Sydney Water's business and asset management processes, inform the efficiency analysis and identify any systemic deficiencies in business-wide processes, or idiosyncratic issues from their application to specific projects or programs.

Detailed review of operating expenditure

Our review of Sydney Water's operating expenditure program was undertaken with reference to the following key questions:

1. Is the operating expenditure proposed by Sydney Water for the price review period commencing 1 July 2020 efficient in delivering the service outcomes to customers?
2. Is the assumed level of risk in delivering performance measures evenly balanced between Sydney Water and its customers?

Detailed review of capital expenditure

In line with our review of operating expenditure, our review of Sydney Water's capital expenditure program was undertaken with reference to the following key questions:

1. Has capital expenditure since 1 July 2015 been efficient? To what extent should it be incorporated into the regulatory asset base (RAB)?
2. Is the capital expenditure proposed for the period commencing 1 July 2020 efficient?

Our review built up a good understanding of the overall operation of Sydney Water, through extensive review of information including business cases, strategic plans and in-depth expenditure interviews with key personnel at Sydney Water over the course of the 10-month expenditure review. Our understanding of the business extends to its administration and support functions, the day-to-day operation of the water business and the planning and management of future capital and operating requirements.

E.3 Our consideration of the impact of COVID-19

Our decision is to defer the application of a continuing efficiency factor on Sydney Water's expenditure by one year until 2021-22, given the uncertainty of COVID-19 in the short term. A 1-year pause recognises the immediate economic shock from COVID-19. Importantly, it responds to the business's concerns they will be unable to pursue technological investments and innovations while dealing with COVID-19 impacts. This is explained in detail at Appendix F.

We reached this decision informed by the advice of our consultant Atkins who considered the impacts of COVID-19 across Sydney Water's expenditure, water sales and customer growth numbers.

Atkins concluded there is considerable uncertainty created by COVID-19 and consequent lockdown measures, but no clear evidence to justify large changes to our expenditure decisions.

F Continuing efficiencies

We have decided to apply a continuing efficiency adjustment to Sydney Water's expenditure. This adjustment reflects that ongoing productivity improvements should reduce costs gradually over time. It represents the scope for a top performing or 'frontier' company to continue to improve efficiency over time as innovation and new technologies enable firms to do more with less inputs.

We found that a sustained average annual MFP improvement[157] of 0.8% per year is achievable in Australia.[158] Therefore, we have decided to apply an annual, cumulative continuing efficiency factor of 0.8% to expenditure in years 2, 3, and 4 of the determination period. We decided not to apply the efficiency factor in year 1 in acknowledgment of the disruption to productivity and supply systems caused by the COVID-19 pandemic. We have applied this to the three price reviews concurrently undertaken – Sydney Water, Hunter Water and Water NSW.

This appendix presents our assessment of the continuing efficiency adjustment and addresses the key matters raised by each of the utilities in their submissions to our Draft Reports. The expenditure chapters in this report, and the Final Reports for the other two reviews also contain more information specific to each utility's expenditure.

F.1 We have decided to not apply a continuing efficiency adjustment in year 1 of the determination period

In response to our Draft Reports, all three utilities noted that economy-wide capital and labour productivity, and investment, were likely to decrease in the short term, especially in response to the COVID-19 pandemic. As such, if a continuing efficiency adjustment was to be applied, it should be materially lower than what was proposed in the Draft Report.[159]

At the time of writing, the impacts of the COVID-19 pandemic world-wide are highly uncertain. We looked at multi-factor productivity (MFP) data from previous economic downturns in Australia to understand the potential effect of COVID-19 on MFP over the next few years. Our analysis indicated that MFP growth could decline during the downturn. However, it could also bounce back quickly in the recovery phase. Further, average MFP growth over the downturn/recovery cycle could be close to long-term averages (see Table F.1).

157 We consider that MFP is a more useful productivity indicator than labour productivity for a public water utility, which must make substantial capital investments efficiently.

158 Productivity Commission (2019) *PC Productivity Bulletin* May 2019.

159 Water NSW, *Submission to IPART's Draft Report – Review of prices for Water NSW Greater Sydney from 1 July 2020,* April 2020, p 36; Hunter Water, *Submission to IPART's Draft Report – Review of prices for Hunter Water from 1 July 2020,* April 2020, p 12; Sydney Water, *Submission to IPART's Draft Report – Review of prices for Sydney Water from 1 July 2020,* April 2020, p 10.

Table F.1 Changes in MFP over previous economic downturns in Australia

	Ave MFP growth during downturn	Ave MFP growth during recovery	Ave MFP over the 4 year cycle
1980s recession	-0.5% pa (1981-82 to 1982-83)	2.1% pa (1983-84 to 1984-85)	0.8% pa
1990s recession	0.1% pa (1990-91 to 1991-92)	1.8% pa (1992-93 to 1993-94)	1.0% pa
GFC (no recession)	-0.2% pa (2007-08 to 2008-09)	-0.1% pa (2009-10 to 2010-11)	-0.1% pa

Source: Productivity Commission, *2019 Productivity Bulletin*, May 2019, Figure 1.6; IPART analysis.

We acknowledge that during the first year of the determination period, there will likely be an increase in activity of the utilities in reaction to the changed circumstances arising from COVID-19. This may impact MFP if output does not also increase at the same rate. It is reasonable to assume that after 12 months, the utility would have adjusted to the new operating circumstances and further refined its systems. At that point, the impact of COVID-19 on productivity should be small, as the utilities would have had time to adjust inputs to more efficiently produce the new level of output.

On this basis, we have decided not to apply the efficiency factor in year 1 of the determination period. Given the efficiency adjustment accumulates over time, setting a 0.0% adjustment in the first year reduces the 'weighted-average' adjustment to around 0.5% over the four years.

Previous downturns have been followed by strong productivity growth in the recovery phase. Our estimate of continuing efficiency (0.8% per year) is a long term average of MFP. We will examine how productivity changes over the 2020 determination period, and whether there is any recovery that offsets or exceeds the temporary impacts of COVID-19. This may be reflected in the continuing efficiency adjustment we apply for future price reviews.

F.2 We based our continuing efficiency adjustment on historical productivity improvements in the market sector of the economy

Our objective is to establish a measure of long term average productivity growth for the Australian economy as a proxy measure of the expected efficient frontier shift over the upcoming determination period.

Our decision to apply a 0.8% annual continuing efficiency adjustment is based on MFP data sourced from the Productivity Commission. It represents the **average for the market sector of the economy** represented by the 12 selected industries identified by the Productivity Commission **over 40 years** (see Box F.1)**.** The utilities raised a number of issues with our application of this data. We have reviewed these comments and do not consider there to be a case to change our approach. We address these in turn in the sections below.

In the Draft Report, we looked at both economy-wide and market sector data, which indicated a range of 0.6% and 0.8% per year was consistent both with recent and much longer-term productivity averages in these sectors. We have since revised this approach for the Final Report, focusing on the market sector data. The other components of the whole economy are the non-market sector (eg, public administration), which we do not regard as being relevant to a utility that sells private goods such as water and wastewater services.

We note that the Productivity Commission states the most accurate estimates of productivity are for the market sector industry groups — where prices are set and therefore easier to value output. It is more difficult to measure outputs for the industries in the non-market sector.

Box F.1 Industry groupings

Market sector (12 industries)

Agriculture, forestry & fishing

Mining

Manufacturing

Electricity, gas, water & waste services

Construction

Wholesale trade

Retail trade

Accommodation & food services

Transport, postal & warehousing

Information media & telecommunications

Financial & insurance services

Arts & recreation services

Market sector (16 industries)

Market sector (12 industries) plus

Rental, hiring & real estate services

Professional, scientific & technical services

Administrative & support services

Other services

Non-market sector (4 industries)

Public administration & safety

Education & training

Health care & social assistance

Ownership of dwellings

Source: Productivity Commission, *Productivity Bulletin*, May 2019, Box A.1, p 49.

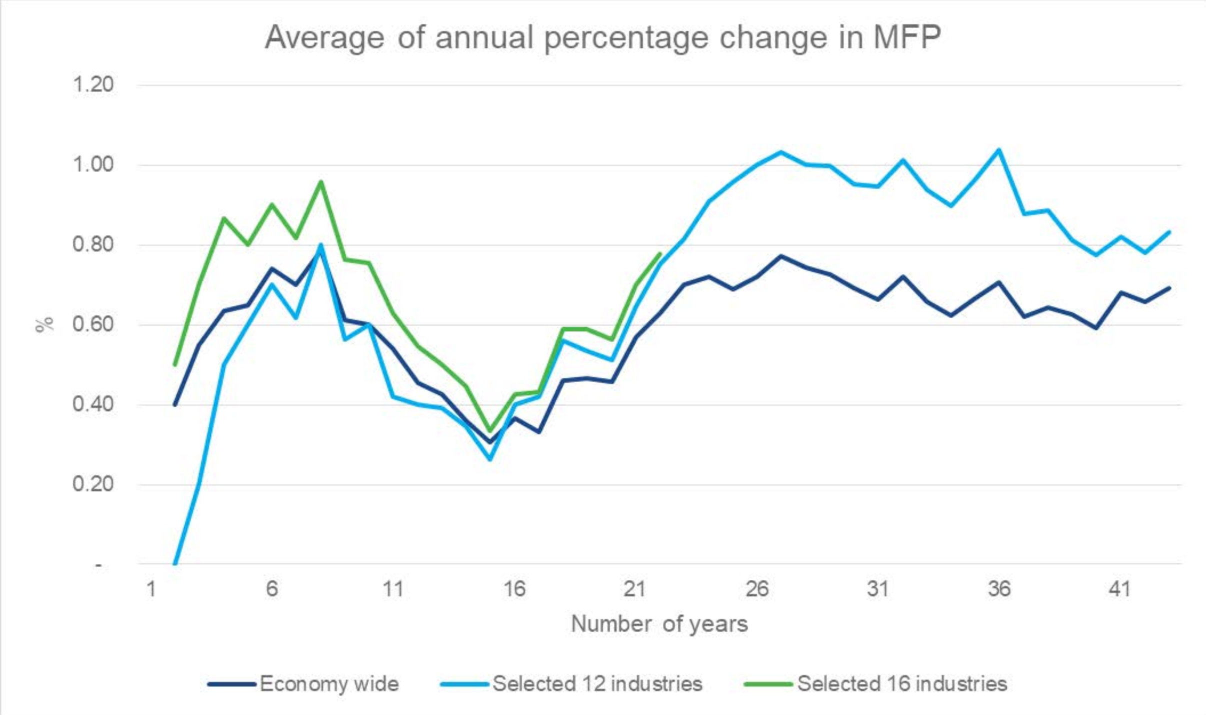
Evidence from the Productivity Commission

The Productivity Commission's 2019 Productivity Bulletin presents MFP estimates for the Australian economy for approximately 40 years, from 1975-76 to 2017-18. We consider that MFP is a more appropriate indicator of the potential productivity improvements for a water utility than labour productivity. MFP captures the effect of capital productivity as well as labour productivity. Both are important to capital intensive businesses like water utilities.

Figure F.1 shows the arithmetic averages of the annual percentage changes in MFP over various time periods ending in 2017-18. That is, one-year, 2-year average, 3-year average, and so on. It shows that the average economy-wide MFP growth rate was between 0.4% and 1.0% per year over the most recent six years. Then that average dropped to around 0.3% per year going back to 2006-07, before returning to the range 0.6% to 1.0% per year when examining averages over 23 years or more.

In the graph below, on the horizontal axis, 1 corresponds to the 2017-18 year only, 11 corresponds to the eleven-year period 2006-07 to 2017-18, and so on.

Figure F.1 Average of annual MFP changes (%)



Data source: Productivity Commission, *PC Productivity Bulletin 2019 – Charts,* May 2019; IPART analysis.

F.2.1 Market sector data is a better reflection of potential efficiency gains than the utilities sector

We consider it is appropriate to base the continuing efficiency factor on market sector data rather than data specific to the utilities sector. Our selected 0.8% annual frontier shift represents the long-term average for the market sector of the economy represented by the 12 industries identified by the Productivity Commission. Broadly, this is because productivity initiatives affect all sectors of the economy, including water utilities and their supply chains.

While the utilities sector seems similar in profile to the water utilities, the negative rates of productivity growth shown in Table F.2 below are probably not reflective of an efficient frontier. Rather, they likely reflect the particular issues that have been experienced in Australia over these time frames, especially in the energy sector, which has seen significant restructuring and is not considered to be performing well.

Table F.2 MFP growth, selected industries, selected time periods (average annual %)

Industry	8 years – 2003-04 to 2011-12	6 years – 2011-12 to 2017-18	2017-18
'Utilities' - Electricity, gas, water and waste services	-3.83	-0.42	-1.74
All industries	0.01	0.7	0.44

Note: The all industries line item is using data from the 16 selected industries in the market sector. Comparable data was not available for the 12 selected industries in the table. However, we have observed similar averages in MFP growth between these industry groupings.
Source: Productivity Commission, *2019 Productivity Bulletin*, May 2019, Figure 1.7; IPART analysis.

Submissions argued that economy-wide data was not a suitable proxy for water utilities' MFP growth

In response to our Draft Report, Sydney Water commented that economy-wide MFP was not a suitable proxy for water utility productivity despite the energy sector depressing the utility-specific estimates.[160] Hunter Water added that the water sector had not seen high levels of productivity growth in the past, and some industries have experienced greater efficiency from technology. It also noted that Productivity Commission suggested caution in using MFP cycles for the aggregate market sector to analyse industry MFP over time.[161]

Our view is that using economy-wide data (and focusing on the market sector of this data set) represents the efficiencies that could be available to utilities, through internal initiatives or incorporated through supply chains. For instance, productivity initiatives like better logistics through operations research, and ICT systems replacing paper-based systems have affected all sectors of the economy, including water utilities. Wastewater and water treatment plant technology can continue to improve the performance on energy, labour, raw material and even land utilisation. New pipe-making technology continues to deliver pipes that are cheaper to buy and that perform better.

We agree with Hunter Water that the economy-wide data may include industries with higher productivity gains than water utilities. However, it also includes some industries with lower productivity, such as labour-intensive services industries.

Finally, we note there may be little competition in the water sector at this stage (ie, large segments are monopolies) – which may be a factor in why productivity gains have not been as great as in other sectors (as observed by Hunter Water). However, our regulation is aimed at replicating the efficiency effects of competitive markets, which is why we are basing the continuing efficiency adjustment on market sector data.

160 Sydney Water, *Submission to IPART's Draft Report – Review of prices for Sydney Water from 1 July 2020,* April 2020, pp 110-111.
161 Hunter Water, *Submission to IPART's Draft Report – Review of prices for Hunter Water from 1 July 2020,* April 2020, pp 10, 12.

F.2.2 A 40-year time frame is appropriate to analyse MFP growth

Hunter Water submitted that the 40-year the time period we used was too long. MFP data from 40 years ago no longer reflected the current environment for productivity growth.[162]

We maintain that our approach provides the most objective measure of long term average productivity growth in the Australian economy. We consider the sample needs to be sufficiently long to include a full business cycle (and it has been over 25 years since the last recession in Australia). Any decision to truncate the available data would be subjective.

In addition, we consider that 0.8% per year is broadly consistent both with recent averages and much longer-term productivity averages. Table F.3 below presents average annual MFP growth over various time horizons ending with 2017-18.

Table F.3 Annual MFP growth, economy-wide, selected averaging periods to 2017-18 (%)

	5 years	10 years	20 years	40 years
Selected 12 industries	0.70	0.42	0.65	0.82
Economy wide	0.74	0.54	0.57	0.68

Source: Productivity Commission, *PC Productivity Bulletin 2019 – Charts,* May 2019; IPART analysis.

We observed similar averages for the economy-wide MFP growth, and the MFP growth for the 12 selected industry and 16 selected industry market sector groups presented in the Productivity Commission's bulletin. The 12 industry group has a longer historical data series available than the 16 selected industry group.

This also includes periods of low productivity growth

Submissions to our draft decision commented that our MFP analysis selectively ignored recent trends of low productivity growth, and that it was inappropriate to exclude periods of low productivity from 2003 to 2012.[163]

We did not exclude any years from our assessment. Figure F.1 includes every available annual data point. We examined why the 10-year averages shown in Table F.3 are so much lower than averages over shorter and longer periods. The reason is that the 10-year averages give greater weight to the low productivity years in the period before and immediately after the Global Financial Crisis.

Further, Table F.2 indicates that between 2003-04 and 2011-12, average annual MFP growth was only 0.01%. This period of low productivity growth may reflect turmoil in financial markets rather than the productivity that would be expected in more normal circumstances.

162 Hunter Water, *Submission to IPART's Draft Report – Review of prices for Hunter Water from 1 July 2020,* April 2020, p 10.

163 Sydney Water, *Submission to IPART's Draft Report – Review of prices for Sydney Water from 1 July 2020,* April 2020, p 111; Hunter Water, *Submission to IPART's Draft Report – Review of prices for Hunter Water from 1 July 2020,* April 2020, pp 11-12.

F.2.3 Our approach could be conservative for a frontier company

Our decision to use 0.8% per year (ie, the average of the market sector) is conservative when trying to emulate a frontier company. We consider that this data is the best available and use it as a proxy for the potential efficiency gains.

Hunter Water and Sydney Water commented that this MFP data set includes utilities that are not on the 'frontier', so it is not clear why this should reflect potential 'ongoing' efficiency by a frontier company.[164] Sydney Water added that IPART had not demonstrated how utilities could achieve higher productivity growth than the Australian economy as a whole (ie, 0.7%).[165]

Of course, the economy as a whole includes the non-market sector, which we have excluded for the reasons stated above. We are not asking the utilities to achieve higher productivity growth than the 0.8% per year achieved by the market sector.

It is correct that the data includes non-frontier industries, including firms from all market sectors—not just frontier companies. Our productivity target therefore includes some firms which fall behind the efficient frontier. Only focusing on frontier companies would likely result in an even higher continuing efficiency adjustment.

We consider the utilities are best-placed to identify specific productivity measures that they should take. We are identifying a productivity benchmark and requiring utilities that are not otherwise subject to competitive disciplines to meet that benchmark in the longer term. As noted, it is possible that a frontier company could exceed this benchmark and achieve greater efficiency gains.

F.3 A continuing efficiency adjustment should apply to both operating and capital expenditure

The continuing efficiency adjustment is important to ensure that water utilities continue to innovate and deliver efficiency benefits to customers. By putting a quantitative target in place, we establish an expectation of continuous improvement.

For any capital intensive business, some of the most important opportunities for productivity gain are in its capital program. Some of the activities carried out in delivering its services such as project cost estimation, capital program planning, procurement and delivery of capital works are areas where innovation and process improvements provide scope for efficiency gains.

164 Sydney Water, *Submission to IPART's Draft Report – Review of prices for Sydney Water from 1 July 2020*, April 2020, p 111; Hunter Water, *Submission to IPART's Draft Report – Review of prices for Hunter Water from 1 July 2020*, April 2020, p 10.

165 Sydney Water, *Submission to IPART's Draft Report – Review of prices for Sydney Water from 1 July 2020*, April 2020, p 10.

In its submission to our Draft Report, Sydney Water stated that a regulator in the UK only applied the continuing efficiency factor to capital maintenance. We considered Sydney Water's comment and upon further investigation understand that Ofwat (the economic regulator of the water sector in England and Wales) applied a 1.1% per annum frontier shift to 86% of **total expenditure**, and not just to capital maintenance expenditure.[166]

We consider an ongoing adjustment for productivity improvements is justified and it should be applied to both operating and capital expenditure.

F.4 On balance, our approach appropriately addresses the impact of input price inflation

In its submission to our Draft Report, Sydney Water stated that our MFP analysis does not take into account the countervailing effects of input price inflation when estimating the continuing efficiency factor.[167] We understand Sydney Water, through its commissioned consultant report from NERA, is of the view that: assuming a utility's input prices rise faster than its output prices (ie, that we index to CPI), to remain viable, the business will need to achieve efficiencies in line with the differential between input price inflation and output price inflation.[168] If this is the case, the MFP derived frontier shift should be reduced by an amount equivalent to this differential so that there is no double counting of efficiencies.

We accept Sydney Water's conceptual argument that some input prices may increase faster than CPI.

In practice, we consider our final decision on the continuing efficiency adjustment is appropriate.

Firstly, we analysed historical trends in the most relevant ABS PPI indices to the water industry (particularly the *3020 Non-residential building* and *3101 roads and bridges* sub-indices, which have been accepted by audit offices for the purposes of statutory valuation), and we found no clear evidence that, over the long-term, major input costs have increased at a rate that is different to CPI.

Secondly, Sydney Water provided no specific evidence to support this contention or provide a concrete adjustment to its proposed expenditure. Our view is that the appropriate place to discuss, with supporting evidence, input price 'pressures' is in Sydney Water's expenditure proposal which can be reviewed through the expenditure interview process. For example, the forecast difference between electricity prices and consumer prices is generally reviewed by expenditure consultants.

166 Atkins/Cardno, Supplementary Report – Expenditure Review of Sydney Water, June 2020, p. 6.
167 Sydney Water, *Submission to IPART's Draft Report – Review of prices for Sydney Water from 1 July 2020*, April 2020, p 10.
168 Sydney Water, *Submission to IPART's Draft Report – Review of prices for Sydney Water from 1 July 2020*, April 2020, Attachment 1.

G Capital expenditure decisions

This appendix details how we made our decisions on Sydney Water's capital expenditure for the 2016 determination period and 2020 determination period, and the asset lives we apply when including capital expenditure in the Regulated Asset Base (RAB). It describes how we considered Atkins' observations and recommendations on Sydney Water's capital expenditure program.

G.1 Capital expenditure over the 2016 determination period

Overall, Atkins found Sydney Water's capital expenditure in the 2016 determination period to be prudent, subject to minor adjustments totalling $52 million. These include:

1. A $31.7 million adjustment to the Prospect to Macarthur Link program, to reflect our view that further water planning is required and the resilience portion of the total expenditure (about 50%) is not prudent.
2. A write-off of $14.7 million to historical IT expenditure on the BxP IT project as a result of changes to program actual expenditure over the 2016 period,
3. A $2.6 million adjustment to correct a water service program code, and
4. A $2.7 million adjustment to wastewater expenditure, reprofiled over 2020-24.[169]

G.1.1 Reduced expenditure in 2019-20 on the Prospect to Macarthur Link (ProMac)

In November 2019 Sydney Water proposed costs in 2019-20 of $76.7 million for ProMac. We consider that Sydney Water has not provided justification for proceeding with the resilience elements of the scheme estimated at $31.7 million (around 40% of the proposed costs). We discuss our rationale for this decision in Section G.4 of this appendix. The evidence reviewed by our consultant Atkins, following Sydney Water's submission to our Draft Report, suggests that it would not be cost-beneficial to proceed with the resilience portion of this project. Deferral of this expenditure will provide opportunity for a robust Long-Term Integrated Drought Management Plan to be developed to ensure effective and cost-beneficial solutions are implemented.

We consider that there is a stronger case for the growth elements of the scheme as significant development is expected in the areas to be served.

Our decision is to reduce expenditure on ProMac by $31.7 million in 2019-20.

169 Atkins/Cardno, Supplementary Report – Expenditure Review of Sydney Water, June 2020, p. 45.

G.1.2 Reduced expenditure reflecting write-off of $14.6 million to the BxP IT project

Sydney Water has declared $14.6 million as written off in the 2016-20 determination period as this expenditure did not add to the productive capital base, due to changes to its IT program and scope. We agreed with Atkins' finding and Sydney Water's decision (subsequent to its pricing proposal) to treat the expenditure in this way.

Atkins challenged Sydney Water to demonstrate that $14.6 million is the appropriate amount to write off and that it should not be higher. Sydney Water explained that the financial statements have been through the annual audit process by the Auditor-General for New South Wales and have been signed off as giving a true and fair view of the financial position and financial performance for 2017, 2018 and 2019. The corresponding documentary evidence was supplied to Atkins. Whilst the Independent Auditor's Report is a high level document and it does not reference a level of detail relating to individual items of expenditure such as this write-off, Atkins found that Sydney Water has acted in good faith by recognising some expenditure has been imprudent and in its own words is making "a self-imposed prudency adjustment".

We accepted Atkins' recommendation.

G.2 Capital expenditure over the 2020 determination period

Sydney Water proposed $5,087 million in base capital expenditure for the 2020 determination period. This represents an increase of $1,937 million (60%) from Sydney Water's actual/forecast expenditure over the 2016 determination period, and an increase of $2,714 million (110%) over the allowance we set for the same period.[170]

Sydney Water also proposed $368 million in cost pass-through expenditure over the 2020 determination for network upgrades as a result of a potential expansion of the Sydney Desalination Plant.[171]

Our draft decision was to accept Atkins recommendations[172] and reduce Sydney Water's base capital expenditure by $935.4 million to $4,151.8 million. Our draft decision was to accept Sydney Water's proposed cost pass-through expenditure of $368 million.

Sydney Water made a submission to our Draft Report and contested the majority of our draft decisions on capital expenditure where they related to reductions. We, with the assistance of Atkins, reviewed Sydney Water's submission and undertook a further expenditure review. We sought additional, new information from Sydney Water, and undertook expenditure interviews with key staff from across the business.

Following our review process, we decided to:

- Set an allowance of $4,585.7 million for Sydney Water's base capital expenditure over the 2020 determination period, based on the analysis of Atkins.
- Accept Sydney Water's proposed cost pass-through expenditure.

170 IPART analysis.
171 Sydney Water update to 1 July Price Proposal, 12 November 2019, p 19.
172 Atkins/Cardno, Addendum to Final Report – Expenditure Review of Sydney Water, Table 3-2.

Our decision over the 2020 determination period by service is shown in Table G.1. Our rationale for these adjustments are described in the following sections. No adjustment has been made to the corporate service, other than for continuing efficiency improvements.

Table G.1 Our decision on base efficient capital expenditure for the 2020 determination ($2019-20, $million)

	2020-21	2021-22	2022-23	2023-24	Total
Sydney Water's base proposal	1,533	1,201	1,205	1,149	5,087
Scope adjustments by service					
▼ Water	-212	-39	-78	-16	-345
▼ Wastewater	61	1	-13	-89	-40
▼ Stormwater	2	-4	-3	-4	-9
▼ Corporate	-	-	-	-	-
Total before efficiency targets	-149	-42	-93	-110	-398
Efficiency					
Catch up efficiency	-	-	-29	-27	-56
Continuing efficiency	-	-9	-17	-24	-51
Total efficient base capital expenditure					
Total	**1,384**	**1,149**	**1,065**	**988**	**4,586**
% Variance	*-9.7%*	*-4.3%*	*-11.6%*	*-14.0%*	*-9.9%*

Note: Totals may not add due to rounding.
Source: Atkins/Cardno, Supplementary Report – Expenditure Review of Sydney Water, June 2020, Table 4-16; IPART calculations.

G.3 Efficiency adjustment – our decision

As with operating expenditure, we have previously considered applying efficiency factors to utilities' forecast capital expenditure where appropriate. This includes:

- **Catch-up efficiency** - this is the efficiency 'gap' between an individual company within the industry and the efficiency frontier.
- **Ongoing efficiency** – this represents the frontier shift, the efficiency savings that even a perfectly efficient firm would make with assumed productivity gains over time.

In reviewing Sydney Water's efficiency, Atkins:

1. Took a broader analysis of the business, combining the insights from its review of specific programs, with benchmarking of comparable firms. This benchmarking focused on regulated Australia water utilities, but to the extent possible, included the UK water sector. After this analysis, it decided whether to apply a 'catch-up efficiency adjustment'. In this case, Atkins only recommended two catch-up adjustments to wastewater capital expenditure.
2. Applied a continuing efficiency adjustment. This reflects that a business operating at the efficient frontier would continuously become more efficient over time. Atkins recommended a 0.8% per annum efficiency adjustment to operating and capital expenditure.

As discussed in Chapter 3, and in Appendix F, we have applied an adjustment of 0.8% per annum consistently across operating and capital expenditure. In arriving at this figure, we have weighed our assessment of short and long-term productivity in Australia, and Atkins' assessment that Sydney Water has been fairly efficient.

One of our considerations in deciding on a 0.8% efficiency factor was multi-factor productivity (MFP) in the Australian economy. As MFP includes all inputs, including both operating and capital costs, we consider that this factor should apply to capital expenditure, as well as operating expenditure. As such, our decision is to apply a 0.8% per annum efficiency factor to Sydney Water's capital expenditure program over the 2020 determination period, except in 2020-21 in recognition of the disruption to businesses due to the impact of COVID-19.[173]

Table G.1 details the impact of a 0.8% annual continuing efficiency adjustment applied to Atkins recommended efficient capital expenditure allowance for Sydney Water, with a total reduction of $51 million over the 2020 determination period.

G.4 Water service – specific adjustments

Sydney Water proposed $1,399 million in capital expenditure over the 2020 determination period for its water services, which represents an increase of 101% compared to its estimated spend in the current determination period.[174]

Our decision is to approve expenditure of $1,044 million, based on the advice of our consultant's Atkins, which represents an increase of $238 million compared to our draft decision.

Following receipt of Sydney Water's submission to our Draft Report, we asked Atkins to review the comments made and additional information available since our Draft Report.

Atkins undertook a supplementary in-depth review of the three material reductions contested by Sydney Water within the water service capital expenditure program:

- General growth
- Prospect to Macarthur
- Reservoir renewals and reliability

The following table details each of the adjustments over the 2020 determination period and the following sections provide detailed analysis of Atkins' findings.

We decided to accept Atkins' recommendations.

173 Our rationale is detailed further in Appendices E and F on how we set an expenditure allowance and the continuing efficiency adjustment.

174 Sydney Water Sydney Water update to 1 July Price Proposal, 12 November 2019; Sydney Water, Annual Information Return to IPART, November 2019, Total Capex for Water projects and programs.

Table G.2 Water service – our decision on specific adjustments to capital expenditure for the 2020 determination ($2019-20, $million)

	2020-21	2021-22	2022-23	2023-24	Total
Sydney Water's base proposal	632.1	261.3	293.3	212.6	1,399.3
Adjustments					
▼ General growth	-6.0	-8.0	-7.9	-6.1	-27.9
▼ Prospect to Macarthur	-200.5	-17.8	-62.0	0	-280.2
▼ Water pumping station renewal	-4.1	-4.2	-3.0	-2.8	-14.1
▼ Reservoir renewals and reliability	0	-7.6	-3.4	-6.0	-16.9
▼ Metering adjustment	-1.5	-1.5	-1.5	-1.5	-6.0
Total adjustments	-212	-39	-78	-16	-345
Efficiency					
Continuing efficiency	-	-1.8	-3.4	-4.7	-9.9
Total efficient base capital expenditure – *Water service*					
Total	**420.1**	**220.5**	**212.0**	**191.6**	**1,044.2**

Source: Atkins/Cardno, Supplementary Report – Expenditure Review of Sydney Water, June 2020, Table 4-12.

General growth adjustment

Rates of new development in the 2016-20 period have been at unprecedented levels. Sydney Water sets out in Attachment 8 of its submission a number of reasons why development is expected to be lower than current levels. These reasons include declining dwelling approvals and housing-related lending. Despite this, Sydney Water has:

- projected a very similar average number of new connections in the 2020 determination period as during the current period, and
- proposed a significantly large growth program of $642.7 million over the 2020 determination period, which represents a 108% increase in average water growth expenditure compared to its expenditure in the 2016 period.

Sydney Water stated in its submission to our Draft Report that the increase in growth expenditure is partly because the share of growth taking place in "greenfield areas" will be higher than in previous periods, and the cost of servicing properties in these areas is higher than compared to infill development.

We asked Atkins to undertake a supplementary review of its recommended reduction taking on board the comments made by Sydney Water. Atkins did not find that Sydney Water has robust top-down empirical justification against major cost drivers to validate a reversal of our draft decision adjustment. However, Atkins did recognise that it is reasonable to assume that greenfield growth will form a higher proportion of growth in future and that servicing greenfield development is likely to entail higher initial unit costs than servicing infill.

Our decision is to accept Atkins' recommendation and reinstate half of the expenditure adjustment we made in our draft decision. This results, over the 2020-24 period, in a total expenditure of:

- $276 million to service growth for water services.

Prospect to Macarthur adjustment

In our Draft Report, we considered the impact of recent rainfall on the need in the 2020-24 determination period for the drought capital investment projects detailed in Sydney Water's update to its 1 July 2019 price proposal (the update), submitted on 12 November 2019. The update proposed an additional $525 million of capital expenditure for two water supply system resilience and drought response schemes, namely:

- The Prospect to Macarthur Link (ProMac), and
- The Blue Mountains Cascade Supply Scheme.

We asked Atkins to provide advice on the need for this capital investment. Atkins submitted an addendum to its final report detailing its recommendations on the prudency of each drought scheme. Our draft decision was to approve the proposed costs for the Blue Mountains Cascade Supply Scheme but not to approve any of the costs of the Prospect to Macarthur Link (ProMac).

We received a number of submissions on our decision to not approve the ProMac project, including from Sydney Water and other stakeholders. Sydney Water and the NSW Government, and other stakeholders, are supportive of the investment on the basis of preparing for future drought and the impact the recent drought had on the depletion of the southern dams. Other submissions, largely from individuals, opposed the investment on the basis that it does not create a new supply of water and additional development in the Macarthur region is not desired.

We asked Atkins to review the submissions we received, including new information that was made available since our draft decision. Following its supplementary review, Atkins concluded that Sydney Water has provided justification for proceeding with the growth element of the project (about 50%) but not for the resilience element which accounts for the balance of the project.

Our decision is to therefore maintain our approval of the Blue Mountains Cascade Supply Scheme and to approve costs for the growth element of ProMac of:

- $205 million of expenditure over the 2020-24 period.

Deferral of the resilience element of ProMac will provide opportunity for the robust Long-Term Integrated Drought Management Plan to be developed to ensure effective and cost-beneficial solutions are implemented.

Water pumping station renewal scope

Sydney Water's proposed expenditure on its water pumping station renewals program over the 2020 determination is above long term averages from 2012.

Atkins found that the available performance information and asset risk information does not provide justification for such a large increase in expenditure on water pumping station renewal from 2012 into the forward period. Therefore, Atkins recommend that expenditure for water pumping station renewal be reduced to be in line with average annual expenditure from 2016 – 2020.

We decided to accept Atkins' recommendations.

Reservoir renewals and reliability

The program is a continuation of the 2016-20 program which involves the renewal of reservoir roofs, relining of walls and renewal of some mechanical / electrical equipment including re-chlorination facilities, valves, mixers and instrumentation. The program over the 2020-24 determination period also includes major project works at Erskine and Potts Hill reservoirs.

Atkins found Sydney Water's investment prioritisation process for reservoirs does not appear to follow the established consequence of failure (CoF) and condition assessment analysis and appears to be at a lower level of maturity overall than other asset classes.

Atkins have partially accepted Sydney Water's proposed increased expenditure. Atkins accepted the need to increase expenditure beyond current levels due to the significant Potts Hill renewal project that is planned to be undertaken, and recognised the expenditure for 2021 has been largely agreed and committed so have maintained this at the level of Sydney Water's proposed with some expenditure deferred to enable prioritisation of work.

However, Atkins took a portfolio level assessment to recommend subsequent expenditure on reservoir renewals is maintained at current levels. Atkins also recommend the ongoing risk-based approach to prioritisation of expenditure be applied to this program.

Sydney Water in its submission to our Draft Report contested our decision and Atkins' recommendation to apply a scope adjustment to this program. We asked Atkins to undertake a supplementary review of their recommended reduction. Atkins advised that there has been no additional information provided within Sydney Water's response to our Draft Report on these programs. Proposed expenditure in these areas is at record levels and there has been no new asset performance or condition information provided for us to adjust our recommended expenditure.

We decided to accept Atkins' recommendations.

Metering adjustment

Atkins found that the new and replacement meter program is appropriate and conventional procurement has been used to seek market costs. It questions the achievability of the increased proactive replacement program given the contractual difficulties experienced in the 2016 determination period and the near 30% increase in activity proposed by Sydney Water. Atkins found a more realistic program would be to continue at the current rate plus 10%. This corresponds to a $6.0m ($1.5m per annum) reduction in expenditure spread equally over the four years, based on the proactive replacement rates.

We decided to accept Atkins' recommendations.

G.5 Wastewater service – specific adjustments

Sydney Water proposed $3,103 million in capital expenditure over the 2020 determination period for wastewater services, which represents a 67% increase compared to its estimated spend in the current determination period.[175]

Our decision is to approve expenditure of $2,972 million, based on the advice of our consultant Atkins, which represents an increase of $191 million compared to our draft decision. Following receipt of Sydney Water's submission to our Draft Report, we asked Atkins to review the comments and additional information available since our Draft Report.

Atkins undertook a supplementary in-depth review of the four material reductions contested by Sydney Water within the water service capital expenditure program:

- Critical and non-critical mains renewals
- Wet weather overflow abatement
- General growth
- Wastewater treatment plant renewals

The following table details each of the adjustments over the 2020 determination period and the following sections provide detailed analysis of Atkins' findings. We accepted Atkins' recommendations.

Table G.3 Wastewater service – our decision on specific adjustments to capital expenditure for the 2020 determination ($2019-20, $million)

	2020-21	2021-22	2022-23	2023-24	Total
Sydney Water's base proposal	721.5	766.2	791.2	824.3	3,103.1
Adjustments					
▼ General growth	-23.0	-21.2	-28.1	-17.9	-90.1
▼ Critical and Non-Critical Mains Renewals	-10.0	-9.5	-9.0	-8.6	-37.1
▼ Wastewater treatment plant renewals	-18.0	11.1	7.3	-19.2	-18.8
▼ Richmond/North Richmond Amplification		-4.1			-4.1
▼ Quakers Hill and St Marys WWTP	14.1	-	-	-	14.1
▼ Wastewater pumping station civil works	5.0	5.0	5.0	5.0	20.0
▼ Upper South Creek Expenditure	93.2	19.4	12.1	-48.9	75.9
Total adjustments	61.3	0.7	-12.6	-89.5	-40.1
Efficiency					
Catch-up: Wet weather overflow abatement	-	-	-10.9	-9.5	-20.4
Catch-up: Critical and non-critical mains	-	-	-18.0	-17.9	-35.9
Continuing efficiency	-	-6.1	-11.9	-16.8	-34.9
Total efficient base capital expenditure – ***Wastewater service***					
Total	**783**	**761**	**738**	**691**	**2,971.8**

Source: Atkins/Cardno, Supplementary – Expenditure Review of Sydney Water, Table 4-13.

175 Atkins/Cardno, Addendum to Final Report – Expenditure Review of Sydney Water, Table 3-2; Sydney Water, Annual Information Return to IPART, November 2019, Total Capex for Water projects and programs.

General growth adjustment

Similar to water service expenditure, Sydney Water is projecting a very similar average number of new connections in the 2020 determination period as during the current period.

We consider it likely that efficient 'general' growth expenditure will be higher than in the current period because of higher rates of greenfield development with greater initial unit cost to service. However we do not consider, on the basis of Atkins advice, that Sydney Water has robustly justified the level of increase it has asked for. In particular, Atkins consider that higher level analysis and presentation of key outturn cost drivers is required for such a significant increase in expenditure.

As such, Atkins have recommended an adjustment to proposed wastewater expenditure of $90.1 million.

We decided to accept Atkins recommendations.

Critical and Non-Critical Mains Renewals scope and efficiency

Sydney Water's forward program for renewals was largely based on a bottom-up build-up of activities costed through historic unit rates. These bottom-up programs of work have been subject to a top-down efficiency challenge.

There is a significant variance in how Sydney Water applied efficiency challenges across its major capital programs. While most programs are clustered around the average level efficiency challenge of 18%, no efficiency was applied to the critical sewers program. Atkins notes that this program is only in its infancy and that greater efficiencies are likely to be realised in less mature programs such as this.

We recognise the environmental performance and compliance risks that Sydney Water is working towards improving, but consider it important to separate out compliance risk and the risk of delivering efficiently. Atkins accept the need to address compliance risk and that expenditure needs to be adjusted to reflect this risk and apparent deteriorating performance. We do not agree that addressing this risk extends to achieving efficient delivery.

Further, Atkins observed that Sydney Water has spent considerable time moving towards a new procurement model that it has designed to deliver the forward program efficiently. During expenditure interviews with Atkins, Sydney Water also outlined that it considers that there is adequate market capacity to deliver the increased program. Atkins states that the critical sewer renewals program is also non-complex technically, repeatable and an area in which new innovations are emerging. Thus, Atkins cannot see a reason for why Sydney Water would not be able to, or should not aim to, achieve the same level of efficiencies it expects to achieve in other areas of its program.[176]

However, Sydney Water in its submission to our Draft Report, contested Atkins' finding and our draft decision to apply an 18% efficiency challenge to this program. We asked Atkins to review the comments made by Sydney Water and additional information provided.

176 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 206.

Atkins undertook a supplementary review and recommended that an efficiency challenge of 18% is still to be applied to this program.

Atkins stated that:

> The use of an average efficiency is not to detract from the program specific work that Sydney Water has undertaken in arriving at its efficiency challenges. It is only to identify an estimate of the efficiencies that Sydney Water consider achievable from the capabilities at its disposal. This efficiency adjustment is not to diminish the importance of the compliance risk, it acknowledges the potential for delivery efficiencies in achieving compliance.[177]

However, acknowledging the scale of the short-term task in front of Sydney Water, Atkins has not recommended this 18% efficiency in the first two years of the forward period; it is recommended from year three onwards.

We decided to accept Atkins recommendations.

Wet Weather Overflow Abatement program efficiency

Sydney Water and the Environmental Protection Authority (EPA) are in agreement that addressing wet weather overflow risk through source control presents good value for money to the community and can drive significant environmental improvement over large geographic areas. This will be the focus of the 2020-24 period across three priority catchments. After Sydney Water had submitted its July 2019 pricing proposal, the EPA has outlined their intent to impose a more stringent improvement level which would require additional funding and source control work to occur across five catchments, instead of three.

Sydney Water proposed total expenditure of $172 million in its July 2019 pricing proposal which was based on an internally approved business case finalised in June 2019. At the time of the June submission three priority catchments were identified with source control projects chosen as the primary focus of abatement. These projects corresponded to 40 EPA credit points for investment which manages environmental impact through an offset regime. These projects involved $141 million expenditure out of the total $172 million ($31 million is for other wet weather overflow abatement activities). Subsequent to submitting its July 2019 pricing proposal and following further discussions with the EPA, it was mandated that Sydney Water are required to achieve 60 credit points within the 2020-24 regulatory period.

In its November update to its pricing proposal, Sydney Water detailed that an additional $52 million of capital expenditure would be required to achieve the additional 20 credit points.

Atkins reviewed the cost and benefit 'credit points' of the 40 point and 60 point programs. Specifically, Atkins challenged Sydney Water regarding the decreasing marginal cost of addressing the wet weather overflows – the additional 20 points are only three-quarters of the cost of the first 40 points, ($2.6 million per point compared with $3.5 million per point). The implication is that the initially proposed 40 point program is less value for money than the revised program 60 point. Sydney Water responded that the 40 point program was focused on larger catchments which were prioritised because of their size. Initial work has since provided better estimates of the costs of abatement works which has led to the estimates of the revised program.

177 Atkins/Cardno, Supplementary Report – Expenditure Review of Sydney Water, June 2020, p 39.

Our draft decision was to accept Atkins recommendation that a program level efficiency adjustment of 18% be applied to bring the efficiency challenge in line with other major programs. Our draft decision did not suggest any changes in scope, outputs or increase in performance risk sharing by Sydney Water.

However, Sydney Water in its submission to our Draft Report, provided additional documentation and progress of the program overall. We asked Atkins to undertake a supplementary review of its recommendation following Sydney Water's submission.

Atkins recommended that the extent of the previous efficiency challenge should now be moderated for the early years of the period with a program level catch-up efficiency challenge maintained for the latter years of the period. This recognises the advancement of projects and the urgency to progress with delivery as soon as possible to meet the obligations set by the EPA and referred to by the EPA in its submission.

We decided to accept Atkins' recommendation and:

- Reduce expenditure on the Wet Weather overflow abatement program by $20.4 million.

Wastewater treatment plant renewals

Atkins found that renewals expenditure for this asset class has been significant over the last ten years and Sydney Water have demonstrated performance improvements across a range of measures. As a result, Atkins do not see a need to increase expenditure over and above levels in the current determination period.

Atkins formed the view that the proposed increased expenditure in the 2020 determination period does not appear to be delivering any greater performance benefits. As such, Atkins recommend a programme level adjustment to smooth the expenditure profile, and maintain expenditure in line with the current period.[178]

Sydney Water in its submission to our Draft Report contested our decision and Atkins' recommendation to apply a scope adjustment to this program. We asked Atkins to undertake a supplementary review of their recommended reduction. Atkins advised that there has been no additional information provided within Sydney Water's response to our Draft Report on these programs. Proposed expenditure in these areas is at record levels and there has been no new asset performance or condition information provided for us to adjust our recommended expenditure.

We decided to accept Atkins' recommendations.

Richmond/North Richmond Treatment Capacity Increase

This project relates to increasing the wastewater treatment capacity in Richmond and North Richmond in the North West of Sydney to deal with growth in the catchment and to improve the quality of the treated effluent.

178 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, pp 198-199.

An options appraisal was completed in 2015 but is currently being revisited in the light of the Hawkesbury Nepean Nutrient Framework (HNNF) which means that treated effluent will need to achieve lower nutrient levels.

The proposed project consists of two stages:

- **Stage 1** – capacity upgrade, which involves decommissioning the existing North Richmond WWTP, a transfer from North Richmond WWTP to Richmond WRP and amplification of Richmond WRP. The GSIP envisages completion in 2022.
- **Stage 2** – which is to upgrade the quality of the treated effluent to meet load limits by upgrading the tertiary denitrification process. It is envisaged this will be complete in 2023.

The total proposed capital expenditure over the 2020 determination period is $96.6 million. However, the project is at a reasonably early stage of definition. Atkins observed that a technology comparison has not yet been done for the plant. Sydney Water is preparing an options analysis business case.

Atkins was informed by Sydney Water during expenditure interviews that the costing in the 2017 needs analysis business case is based on the 2012 cost estimation tool, with escalation applied and scope added for Stage 2. Atkins did not find a clear reason for why the proposed capex ($96.6 million) is greater than the capex in the needs analysis business case (NABC - $92.5M). Atkins recommend an adjustment of $4.1 million to the expenditure to match the NABC.[179]

We decided to accept Atkins' recommendation.

Quakers Hill and St Marys wastewater treatment plant variation

Atkins reviewed the Delivery Approval Business Case (DABC) against the financial information provided by Sydney Water in its July 2019 pricing proposal and observed that the forecast for this program was underestimated.

As such, Atkins have proposed a 30% proportional adjustment **increase** in expenditure ($14.1 million in 2020-21) to reflect the shortfall not included within the 1 July pricing submission and efficiencies that may yet be realised within the overall program.[180]

We decided to accept Atkins' recommendation.

Wastewater pumping station civil works

Sydney Water's proposal includes no expenditure for civil works (dry wells and wet wells) across its wastewater pumping station (WWPS) assets. Atkins found this very surprising given the likelihood that some of these assets would fail or be near failure during the forward period. When challenged by Atkins, Sydney Water expressed its view that the better information it has gained since responding to a failure of a Northmead pumping station suggests that expenditure on WWPS civil asset is highly likely in the forward period.

179 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, pp 213-214.
180 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 194 and Table 6-39.

Atkins found that the emergent need for Level 2 condition inspections (and possibly Level 3) and the highly likely scope of civil works arising undermines Sydney Water's stated understanding of it risk across the WWPS asset class. Given better information on the condition of the civil assets and comparing to the long term trend, Atkins state it is likely that a different program would have been proposed reflecting a step change in expenditure.

Atkins recommend an adjustment to Sydney Water's expenditure forecasts for the forward period of $5 million per annum to account for the works arising from the more detailed condition assessments.[181]

We decided to accept Atkins' recommendations.

Upper South Creek Expenditure

Sydney Water is proposing to build a single treatment plant to service the Upper South Creek growth area. Atkins found that the total proposed capital expenditure of the Upper South Creek project is similar to Sydney Water's previous proposal to construct two separate treatment plants. Sydney Water is also now proposing to bring the expenditure forward significantly; increasing the proposed spend in the 2020 determination period by $143.1 million.

Atkins' review found that at this stage, and subject to ongoing monitoring of outturn development in the areas to be serviced, the proposal to construct a new treatment facility is efficient. However, the project is at an early stage and the need to pass-through Infrastructure NSW's gateways means that Atkins was not convinced that expenditure will be undertaken on the timescales proposed by Sydney Water.

Atkins have made a number of adjustments to reflect this view, including:

- Land purchase happens in 2021 rather than 2020.
- Some of the construction of the 42Mld tertiary treatment takes place in 2026 rather than completing in 2025.
- A third of the RO treatment and brine transfer takes place in 2025 rather than 2024.
- Effluent transfer capex takes place a year later than forecast by Sydney Water in 2025 and 2026.[182]

We decided to accept Atkins' recommendations.

G.6 Stormwater service – specific adjustments

Sydney Water proposed $185.2 million in capital expenditure over the 2020 determination period for its stormwater services, which represents an increase of 85% compared to its estimated spend in the current determination period.[183]

181 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 199.
182 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 212.
183 Sydney Water Sydney Water update to 1 July Price Proposal, 12 November 2019; Sydney Water, Annual Information Return to IPART, November 2019, Total Capex for Water projects and programs.

Atkins reviewed Sydney Water's stormwater service capital expenditure program and found $173.8 million to be an efficient allowance. This represents an increase of around 72% compared to Sydney Water's estimated spend in the current determination period.[184]

Atkins made specific adjustments to two programs within the stormwater service capital expenditure program:

- Stormwater renewals, and
- Waterway health.

The following table details each of the adjustments over the 2020 determination period and the following sections provide detailed analysis of Atkins' findings.

Our decision is to accept Atkins' recommendations.

Table G.4 Stormwater service – our decision on specific adjustments to capital expenditure for the 2020 determination ($ million, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Sydney Water's base proposal	40.1	53.7	43.3	48.0	185.2
Adjustments					
▼ Stormwater Renewals	-	-5.8	-4.6	-5.4	-15.8
▼ Waterway health	1.6	1.6	1.6	1.6	6.5
Total adjustments	1.6	-4.1	-3.0	-3.8	-9.3
Efficiency					
Continuing efficiency	-	-0.4	-0.6	-1.1	-2.1
Total efficient base capital expenditure – ***Stormwater service***					
Total	**41.7**	**49.2**	**39.7**	**43.2**	**173.8**

Source: Atkins/Cardno, Supplementary Report – Expenditure Review of Sydney Water, June 2020, Table 4-14

Stormwater renewals

Total stormwater expenditure on renewals to meet existing mandatory standards was $68 million in the 2016 determination period. Sydney Water proposed expenditure of $154 million in the 2020 determination period representing a 127% increase on total expenditure in the current determination period. Atkins found that Sydney Water had underspent on renewals to meet existing mandatory standards in the current period by around $31 million; due to delays reaching agreement with councils and works reprioritisation.

Atkins formed the view that, overall, expenditure levels as in the 2020 period should be increased to a certain extent, particularly for at risk projects. Atkins observed that Sydney Water's prioritisation of expenditure has worked effectively in the current period and maintaining a focus on project prioritisation should be continued into the future period and risk reprioritisation undertaken periodically to efficiently deploy resources.

184 Atkins/Cardno, Supplementary Report – Expenditure Review of Sydney Water, June 2020, Table 4-14; Sydney Water, Annual Information Return to IPART, November 2019, Total Capex for Water projects.

Atkins supported increasing expenditure relative to the current period to reduce the asset risk profile and recommended including committed expenditure for projects in the active phase as well as some expenditure for minor renewals projects and planning. Atkins had some reservations over the efficiency of all of the proposed investment, particularly in the later years of the program where projects are less well defined or scoped, and recommended deferring some expenditure and commensurate outputs into the next determination period. Overall, Atkins recommended a 10% reduction to the capital expenditure proposed by Sydney Water between 2021 and 2024, a total reduction of $15.8 million.[185]

Sydney Water in its submission to our Draft Report contested our decision and Atkins' recommendation to apply a scope adjustment to this program. We asked Atkins to undertake a supplementary review of their recommended reduction. Atkins advised that there has been no additional information provided within Sydney Water's response to our Draft Report on these programs. Proposed expenditure in these areas is at record levels and there has been no new asset performance or condition information provided to adjust our recommended expenditure.

We decided to accept Atkins' recommendations.

Waterway health

The primary driver for the Waterway Health Program is to improve the health of waterways managed by Sydney Water. The 2019-23 operating licence makes specific reference to Sydney Water having authority, but not being required, to manage the impacts of stormwater on waterway health.

Sydney Water's customers have indicated a willingness to pay for improved waterway health, in a willingness to pay study undertaken by Sydney Water specific to the activities and outcomes of the waterway health program. While this WTP study was undertaken, it did not inform the final level of investment in the waterway health program. Instead, the program was subject to a 40% reduction as part of the overall top-down "efficiency" challenge. Sydney Water stated that the wider results of this study were not used to set the total level of investments because the results were not available in sufficient time to inform the program and the trade-offs in between benefits and costs between the waterway health program and other programs could not be undertaken with sufficient rigour.

Atkins found it surprising, notwithstanding the time constraint, that Sydney Water has selected a lower level of investment than apparently supported by its customers, and stated that[186]:

> Sydney Water will miss an opportunity to deliver value to its customers.

Atkins formed the view that reducing the level of investment appears incongruous with the 'options analysis' in the program business case which tested the impact of a reduction in the proposed scope of the program by 10%. The options analysis by Sydney Water concluded that this adjustment would result in increased risks to the environment and reputation and an

185 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 219.
186 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 220.

overall move in the risk profile from 'medium' in the base case (program as proposed) to 'high' under the option of a 10% reduced scope.

Atkins found that the nature of this 'efficiency' challenge is also different to what has been applied to other programs. The efficiency challenge here includes a scope reduction through deferral. The efficiency challenge for other projects and programs are intended that the same scope be delivered net of the efficiency challenge to the estimated expenditure.

Atkins recommend that the $6.5 million of expenditure deferred by Sydney Water be considered prudent in the 2020 determination period, representing an increase in expenditure on this program relative to Sydney Water's proposal.[187]

Our decision is to accept Atkins' recommendations. Given the customer support for this program and Sydney Water's greater confidence in the costs and benefits of delivery gained in the current period, we consider that the deferral of expenditure is not justified. As discussed further in Chapter 11, we consider there is an opportunity for Sydney Water in future determinations to expand its Waterways health investments to reflect the community's willingness to pay for improved environmental outcomes.

G.7 Asset lives

Table G.5 outlines our proposed asset lives for existing and new assets.

187 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 221.

Table G.5 Sydney Water's proposed and IPART asset lives

	Expected lives of new assets[a]		Remaining lives of existing assets[b]	
	Our decision	Sydney Water proposed	Our decision	Sydney Water proposed
Corporate				
Civil	67.6	67.6	59.0	59.6
Electrical	10.0	10.0	8.4	8.4
Mechanical	8.0	8.0	3.1	3.3
Electronic	10.0	10.0	5.1	6.3
Water (excluding Recycled Water)				
Civil	135.1[c]	140.0/40.0/80.0[d]	93.5	94.2
Electrical	28.8[c]	30.0/12.0/21.0[d]	19.6	20.5
Mechanical	36.5[c]	40.0/15.0/21.0[d]	29.7	30.1
Electronic	15.0[c]	15.0/5.0/15.0[d]	6.4	6.4
Wastewater				
Civil	90.0	90.0	77.7	78.5
Electrical	25.0	25.0	15.6	16.8
Mechanical	25.0	25.0	14.6	16.0
Electronic	15.0	15.0	8.7	10.3
Stormwater				
Civil	150.0	150.0	122.2	120.7
Electrical	25.0	25.0	na	na
Mechanical	25.0	25.0	na	na
Electronic	15.0	15.0	na	na

[a] Including capital expenditure for finance lease assets.

[b] Excluding finance leases, which are depreciated on a straight-line basis from 1 July 2016 at the 2016 depreciation rates.

[c] Weighted average of expected lives for finance lease assets and other assets (weighted by forecast capital expenditure).

[d] Expected lives for non-finance lease capital expenditure and the two finance leases with capital expenditure, ie Macarthur and Prospect.

Note: The 15 year asset life for electronic water assets is consistent with the weighted average of Sydney Water's proposed assets lives for water and water finance lease assets. The apparent inconsistency arises due to rounding.

Source: Sydney Water's Pricing Proposal, July 2019 and IPART calculations

We agreed with Sydney Water's proposal to continue to use the 2016 determination expected asset lives for new assets. To incorporate capital expenditure for finance leases into the water RAB, we have calculated a weighted average expected life for the water asset categories (weighted by forecast capital expenditure).

Treat finance leases consistently with other RAB assets

Sydney Water's finance lease assets were incorporated into a separate RAB at the 2016 price review. The opening RAB values for two of the four leases (the Prospect and Macarthur WFPs) incorporated estimated amounts of capital expenditure for upgrades. (That is, historical RAB values included future capital expenditure forecasts for the 2016 determination period.) Sydney Water has revised capital expenditure for actual capital expenditure over the 2016 determination period, and the revised amounts have been included in Atkins' expenditure review.

Our decisions are to:

- Accept Sydney Water's proposed 1 July 2016 opening values for finance lease capital expenditure.
- Adopt common asset lives for all future capital expenditure, as asset ownership – ie, whether an asset is leased or not – should not affect the asset lives we apply to capital expenditure.
- Include the capital expenditure, recommended by our consultants, in Table G.6 below, for capital expenditure on WFP upgrades.

Table G.6 Sydney Water's proposed and Atkins' recommended capital expenditure on finance lease assets ($ million)

	2016-17 nominal	2017-18 nominal	2018-19 nominal	2019-20 nominal	2020-21 $2019-20	2021-22 $2019-20	2022-23 $2019-20	2023-24 $2019-20
Sydney Water proposed								
Macarthur WFP	-	0.3	4.1	16.7	1.2	-	-	0.1
Prospect WFP	2.3	5.3	3.0	28.2	46.1	76.9	59.5	18.5
Total	**2.3**	**5.6**	**7.1**	**44.8**	**47.4**	**76.9**	**59.5**	**18.5**
Our decision								
Macarthur WFP	-	0.3	4.2	16.7	1.2	-	-	0.1
Prospect WFP	2.3	5.3	3.6	14.1	13.2	43.4	58.8	43.4
Total	**2.3**	**5.6**	**7.7**	**30.8**	**14.5**	**43.4**	**58.8**	**43.4**

Note: Totals may not sum due to rounding.

Source: Sydney Water Annual Information Return July 2019 and IPART calculations

H NRR inputs

This appendix outlines how we calculated some inputs to the NRR. It explains our decisions on:

- The value of the RAB.
- The tax allowance.
- The working capital allowance.
- Adjustments to the NRR.

H.1 Value of the regulatory asset base (RAB)

The RAB represents the value of Sydney Water's assets on which we consider it should earn a return on capital and an allowance for regulatory depreciation.

In calculating the opening RAB, we rolled forward the RAB we set in the last determination period and carried this forward to include our decisions on capital expenditure and depreciation. The steps we took were to:

- Add prudent and efficient capital expenditure (see Chapter 3)
- Deduct cash capital contributions (explained below)
- Deduct the regulatory value of asset disposals (explained below)
- Deduct the regulatory depreciation we allowed at the 2016 Determination and for the next period, and
- Added the annual indexation of the RAB.

Our decisions on the RAB are set out in Table H.1 and Table H.2 below, with a comparison of our decision on the RAB values that Sydney Water proposed.

We present our analysis and decisions regarding the treatment of historical cash contributions and asset disposals below the tables.

Table H.1 Decision on RAB roll-over for 2015-16 and the 2016 determination period (nominal $millions)

	2015-16	2016-17	2017-18	2018-19	2019-20
Opening RAB	**14,825.9**	**15,357.9**	**16,490.5**	**17,264.3**	**18,023.7**
Plus: adjustment[a]	0.0	527.0	0.0	0.0	0.0
Plus: capital expenditure	674.7	602.0	776.8	823.9	924.5
Less: cash capital contributions (net of tax)[b]	0.0	0.6	1.0	7.3	0.0
Less: asset disposals	17.5	9.4	39.0	0.6	1.9
Less: allowed regulatory depreciation[c]	276.6	293.8	317.1	339.4	360.1
Plus: Indexation	151.5	307.4	354.0	282.8	184.8
Closing RAB	**15,357.9**	**16,490.5**	**17,264.3**	**18,023.7**	**18,771.0**
Sydney Water's proposal (closing)	15,360.0	16,496.9	17,275.7	18,039.9	19,103.9
Difference ($)	-2.1	-6.4	-11.4	-16.2	-332.9
Difference (%)	0.0	0.0	-0.1	-0.1	-1.7

a The adjustments include the addition to the RAB of the four finance lease ($501 million) and an amount for the Rouse Hill capital expenditure ($26 million).

b At the 2016 determination the Tribunal decided to subtract cash capital contributions net of tax instead of including tax on these contributions in the tax allowance

c Allowed depreciation from the 2016 determination, adjusted for inflation

Note: Totals may not add due to rounding.

Source: Sydney Water, Pricing Proposal 2020-24, July 2019; and IPART calculations

Table H.2 Decision on RAB for the 2020 determination period ($2019-20 $millions)

	2020-21	2021-22	2022-23	2023-24
Opening RAB	**18,771.0**	**19,752.5**	**20,494.8**	**21,145.9**
Plus: adjustment[a]	0.0	0.0	0.0	0.0
Plus: capital expenditure	1,389.8	1,185.4	1,123.8	1,031.3
Less: cash capital contributions (net of tax)[b]	2.2	2.2	2.2	2.2
Less: asset disposals	1.9	1.9	1.9	1.9
Less: allowed regulatory depreciation[c]	404.2	439.0	468.5	488.3
Plus: Indexation	0.0	0.0	0.0	0.0
Closing RAB	**19,752.5**	**20,494.8**	**21,145.9**	**21,684.7**
Sydney Water's proposal (closing)	20,287.4	21,133.2	21,943.1	22,628.3
Difference ($)	-534.9	-638.4	-797.2	-943.6
Difference (%)	-2.6	-3.0	-3.6	-4.2

a This represents our decision on the efficient level of capital expenditure. Chapter 4 for details on how we assessed this.

Note: Totals may not add due to rounding.

Source: Sydney Water, Pricing Proposal 2020-24, July 2019; and IPART calculations

H.1.1 Cash capital contributions

Cash capital contributions that a utility receives from third parties towards its capital expenditure, such as government grants, are netted off capital expenditure (ie, they do not enter the RAB). This ensures that customers do not pay a return on assets or regulatory depreciation for capital expenditure that the utility has already had funded from other sources.

However, utilities would normally need to pay tax on capital contributions. We deduct the cash contributions net of tax from the capital expenditure allowance, effectively capitalising the tax impact on capital contributions into the RAB.

Historical cash capital contributions

Prior to 2008, the main source of cash capital contributions for Sydney Water was from developer charges. However, on 17 December 2008, the NSW Government set water and sewerage developer charges to zero for both these utilities. As a result, the amount to be deducted from capital expenditure due to cash capital contributions is minor.

Sydney Water reported $8.8 million in cash capital contributions[188] for the 2016 determination period. We have adjusted the RAB for the cash capital contribution amounts shown in Table H.3.

Table H.3 Decision on historical cash capital contributions deducted from the RAB ($million, nominal)

	2015-16	2016-17	2017-18	2018-19	2019-20	Total
Cash contributions (gross of tax)	0.0	0.8	1.4	10.4	0.0	12.6
Cash capital contributions (net of tax)	0.0	0.6	1.0	7.3	0.0	8.8

Note: The table presents the total cash contributions for water, sewerage and stormwater.

Source: Sydney Water 2018-19 Annual Information Return, July 2019.

In its response to our Draft Report, Sydney Water noted that we had erroneously deducted a total of $7 million ($2019-20) across the 2016-17 to 2018-19 years. This amount represented historical stormwater capital expenditure relating to Green Square HAF cash contributions (net of tax). This amount had already been deducted in 2014-15. We have since corrected the error.

Future cash contributions

Given the Government's policy of zero developer charges for Sydney Water and Hunter Water, the amounts of cash capital contributions is forecast to be small. For the 2016 Sydney Water price review, we used the historical average over a 4-year period as our forecast of cash capital contributions. Our decision is to continue to adopt this methodology for the 2020 determination period.

188 Net of applicable tax allowance, $nominal.

For the 2016 determination period, Sydney Water forecast zero cash capital contributions but in fact received $12.6 million. Sydney Water has forecast zero cash capital contributions for the 2020 determination period. Given the experience over the 2016 determination period, we consider it more appropriate to use the 4-year historical average (2015-16 to 2018-19) as the forecast.

Using the historical average over the 2015 16 to 2018-19 period amounts to an annual cash capital contribution of $3.2 million ($2019-20). Our decision is to use the forecast cash capital contributions presented in Table H.4.

Table H.4 Decision on forecast cash capital contributions for Sydney Water ($ million, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Cash contributions (gross of tax)	3.2	3.2	3.2	3.2	12.8
Cash contributions (net of tax)	2.2	2.2	2.2	2.2	8.9

Note: The table presents the total cash contributions for water, sewerage and stormwater. Total may not sum due to rounding.

Source: Sydney Water 2018-19 Annual Information Return, IPART calculations.

H.1.2 Adjustments for asset disposals

Asset disposals can include asset sales, write-offs and write-downs. The value of any regulatory assets Sydney Water disposed of during the 2016 determination period, as well as any assets it proposes to dispose of during the 2019 determination period, are deducted from the RAB. This ensures customers are not charged a return on assets or regulatory depreciation for assets that are no longer used to provide regulated services.

We applied our 2018 asset disposals policy[189] in this review to deduct asset disposals from the RAB. Under this policy, we regard disposals as significant if they attract capital gains tax or account for more than 0.5% of the opening RAB value of the relevant service in the year in which the disposal occurred. The key principles of our disposal policy are provided in Box H.1.

189 IPART's asset disposal policy – for water businesses, February 2018.

Box H.1 IPART's asset disposal policy

Under IPART's asset disposal policy, we categorise asset sales and asset write-offs into significant or non-significant disposals. Significant disposals represent more than 0.5% of opening value of the RAB in the year in which the disposal occurs. For example, if a water asset is sold for more than 0.5% of the opening RAB for water assets, it would be considered a significant asset disposal.

- Significant asset write-offs are assessed on a case by case basis.
- The treatment of significant asset sales depends on whether the assets are pre line-in-the sand or post line-in-the-sand.
  - Pre-line-in-the-sand: regulatory values to be deducted from the RAB are estimated by multiplying the sale values by the RAB to DRC (depreciated replacement costs) ratio at the time the initial RAB value is established.
  - Post-line-in-the-sand: we estimate the regulatory value of the assets sold, based on the information available to us. For example, by tracking actual capex.
- For non-significant asset write-offs, we do not deduct any value from the RAB, except as deemed necessary on a case by case basis.
- For non-significant sales, we deduct the sales values from the RAB, net of efficient sales costs.

Our policy on significant pre line-in-the sand disposals also states that, as default position, we would remove the regulatory value of all pre line-in-the-sand assets from the RAB when they are sold. However, if a business can make a convincing case that an asset was clearly non-operational when the line-in-the-sand RAB was established, then, on an exception basis, we would not adjust the RAB for that asset sale.

Historical asset adjustments

Table H.5 provides a summary of our deductions from Sydney Water's RAB for historical asset disposals.

Table H.5 Decision on values to be removed from Sydney Water's RAB for the 2016 determination period ($ million, nominal)

	2015-16	2016-17	2017-18	2018-19	2019-20 [a]	Total
Non-significant disposals	0	0	0	0	0	0
Significant sales	17.2	9.1	13.2	0.6	1.9	42.1
Significant write-offs	0.3	0.3	25.8	0	0	26.4
Total	**17.5**	**9.4**	**39.0**	**0.6**	**1.9**	**68.5**

Note: The table presents the total asset sales for water, wastewater and stormwater.

a 2019-20 is a forecast.

Source: Sydney Water 2018-19 Annual Information Return (October) and IPART calculations

How we determined the values for non-significant disposals, significant sales and write-offs is detailed below.

Non-significant disposals

We accepted Sydney Water's nil non-significant asset disposals over the 2016 determination period.

Significant historical asset sales

Within Sydney Water's fixed asset register, properties are categorised as either operational or non-operational and as surplus[190] or non-surplus land assets. The surplus land assets are made available for sale or alternative use.[191]

All of Sydney Water's historical asset disposals to be deducted from the RAB are sales of surplus land. Sydney Water forecast that the proceeds from operational land sales net of sales cost is $103 million and compares to $237 million of total asset disposals forecast for the period 2015-16 to 2019-20 for the 2016 price determination (presented in Table H.6). This represents a 57% reduction of land sales over that period.

Table H.6 Sydney Water's land sales for the 2016 determination period ($ million, $2019-20)

	2015-16	2016-17	2017-18	2018-19	2019-20	Total
Total forecast land sales for 2016 price determination	97.1	73.7	21.9	21.9	21.9	236.5
Total actual land sales (net of costs)	48.1	20.9	27.6	1.5	4.6[a]	102.6
Difference	-49.0	-52.8	5.7	-20.5	-17.4	-133.9

Note: The table presents the total asset sales for water, wastewater and stormwater.

a 2019-20 is a forecast.

Source: Sydney Water 2018-19 Annual Information Return (October) and IPART calculations

Sydney Water has proposed that actual land sales with regulatory value of $8.4 million not be deducted from the RAB on the grounds that the land was non-operational on 1 July 2000. In response to IPART's request for further information, Sydney Water has provided satisfactory evidence that, of the $8.4 million in land sales, $3.9 million was non-operational when the RAB was established on 1 July 2000. These (non-operational) sites contained assets that had been decommissioned before 1 July 2000 and have been vacant since then.

In line with our 2018 asset disposals policy, the intention is that, for regulatory purposes, 'non-operational' land means the land was surplus to both existing *and planned future* requirements on 1 July 2000. Our decision is not to remove from the RAB $3.9 million of non-operational land.

Table H.7 presents our decision on the land sales values to be removed from the RAB for the 2016 determination period.

190 Sydney Water states that surplus land assets are "assets which we own but are not integral to the delivery of our services." Sydney Water's Pricing Proposal, July 2019, Attachment 11: Proposed revenue requirement, p23.

191 Such as for bio banking.

Table H.7 Decision on land sales values to be removed from the RAB for the 2016 determination period ($ million, nominal)

	2015-16	2016-17	2017-18	2018-19	2019-20	Total
Sydney Water proposal	15.4	8.5	39.0	0.3	0.8	64.0
Add RAB value of operational land disposed in 2016 period	2.1	0.9	0.0	0.4	1.2	4.5
Our decision	17.5	9.4	39.0	0.6	1.9	68.5

Note: Totals may not sum due to rounding

Source: Sydney Water confidential information, Sydney Water's Pricing Proposal, July 2019 and Sydney Water's update to 1 July Price Proposal, November 2019 and IPART calculations

Significant historical asset write-offs

Sydney Water has a large asset write-off in 2017-18 of $25.8 million ($2017-18) for its Customer Management System (CMS).[192] This is considered a significant write-off under our policy,[193] which means it is assessed on a case-by-case basis. This write-off was considered at the 2016 Sydney Water Price Review by Cardno Atkins. It recommended that the corporate electronic assets RAB, in 2017-18, be reduced by $24.8 million ($2015-16). Sydney Water's proposed asset write-off, and the value of this write-off, is consistent with our final decision in the 2016 Review.

Forecast asset adjustments

Sydney Water forecasts no non-significant disposals and no asset write-offs over the 2020 determination period. Its forecast asset disposals are all significant asset sales.

Sydney Water predicts that the majority of its surplus land will be sold by July 2020. It has therefore forecast a general property disposal amount of $5 million ($2019-20) per annum (or $4.6 million of net sales) for the 2020 determination period.[194] Sydney Water assumes that this is the amount of operational assets that will become surplus and available for sale each year. Applying our asset disposal policy, the amount to be deducted from the RAB is $1.9 million ($2019-20) per annum (which is $4.6 million x 42%[195]).

We consider this forecast reasonable and our decision is to adopt this value for the 2020 determination period (see Table H.8). The forecast asset disposals will be amended for the actual disposals for the period at the next price review.

192 Sydney Water's Pricing Proposal, July 2019, Attachment 11: Proposed revenue requirement, p25.
193 This write-off accounts for about 3.8% of the average corporate RAB value for 2017-18.
194 Sydney Water's Pricing Proposal, July 2019, Attachment 11: Proposed revenue requirement, p26.
195 Under our asset disposal policy for Sydney Water pre-line in the sand assets, the regulatory value of an asset is assumed to equal 42% of the sale value.

Table H.8 Decision on values to be removed from Sydney Water's RAB for the 2020 determination period ($ million, $2019 20)

	2020-21	2021-22	2022-23	2023-24	Total
Non-significant disposals	0	0	0	0	0
Significant sales	1.9	1.9	1.9	1.9	7.7
Significant write-offs	0	0	0	0	0
Total	**1.9**	**1.9**	**1.9**	**1.9**	**7.7**

Note: Totals may not sum due to rounding

Source: Sydney Water 2018-19 Annual Information Return (October); IPART analysis

H.1.3 Allowed regulatory depreciation

Regulatory depreciation aims to recover the cost of an asset over its useful life. To calculate the regulatory depreciation, we typically divide the value of assets by their expected lives. For simplicity, we do this at an aggregated level.

We have applied a straight line depreciation and the asset lives set out in Appendix F to calculate the allowed regulatory depreciation.

H.2 Return on capital

Our return on assets allowance is equal to the value of the RAB in each year of the determination period multiplied by an appropriate rate of return. As for previous reviews, we have determined the rate of return using an estimate of the WACC.

For the WACC decision, we applied our published methodology. Appendix I sets out the parameters that we used.

Our decisions have resulted in lower return on capital than Sydney Water had proposed. This partly follows from our decisions that resulted in a lower RAB but mostly reflects a lower WACC.

Table H.9 Comparison of our decision on return on assets, and Sydney Water's proposal ($millions, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Sydney Water's proposal	741.7	780.2	811.7	840.1	3,173.7
Our decision	**650.8**	**680.2**	**704.0**	**724.2**	**2,759.2**
Difference ($)	-90.9	-100.0	-107.7	-115.9	-414.5
Difference (%)	-12.3	-12.8	-13.3	-13.8	-13.1

Note: Totals may not sum due to rounding

Source: Sydney Water 2018-19 Annual Information Return (October); IPART analysis

H.3 Allowance for tax

Our tax allowance is not intended to recover Sydney Water's actual tax liability over the determination period. Rather, it reflects the liability that a comparable commercial business would be subject to. Including this allowance is consistent with our aim to set prices that reflect the full efficient costs a utility would incur if it were operating in a competitive market (including if it were privately owned). It is also consistent with the principle of competitive neutrality, that is, that a government business should compete with private business on an equal footing and not have a competitive advantage due to its public ownership.

We applied our standard methodology to set the tax allowance. We calculate the tax allowance for each year by applying the relevant tax rate, adjusted for the value of imputation credits (the 'gamma'), to the business's (nominal) taxable income. For this purpose, taxable income is the notional revenue requirement (excluding tax allowance) less operating cost allowances, tax depreciation, and interest expenses. As part of calculating the appropriate tax allowance, the business is required to provide forecast tax depreciation for the determination period. Other items such as interest expenses are based on the parameters used for the WACC, and the value of the RAB.[196]

The tax allowance is one of the last building block items we calculate, due to its dependence on other items such as operating cost allowances and WACC parameters.

To establish the tax allowance, we:

- Adopted a 30% tax rate, because the NRR for Sydney Water is above the small business tax threshold of $50 million per annum.
- Accepted Sydney Water's forecast tax depreciation but updated it to reflect our decisions on capital expenditure.
- Accepted Sydney Water's forecast non-cash contributions (or AFOC).

Our tax allowance is slightly higher than Sydney Water's proposed tax allowance. Table H.10 presents our decision on the tax allowance.

Table H.10 Comparison of our decision on tax allowance and Sydney Water's proposal ($millions, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Sydney Water proposal	79.1	64.5	64.5	77.6	285.7
Our decision	**80.6**	**66.4**	**73.3**	**84.0**	**304.4**
Difference ($)	1.5	1.9	8.8	6.4	18.7
Difference (%)	1.9	3.0	13.7	8.2	6.5

Source: Sydney Water 2018-19 Annual Information Return (October); IPART analysis

196 The nominal cost of debt is the sum of the nominal risk free rate and nominal debt margin.

H.3.1 Forecast tax depreciation

Tax depreciation is an input into the tax calculation. IPART's policy for businesses that pay tax or tax equivalents is to use the tax deprecation amounts forecast by the businesses when we calculate the tax allowance.[197] This approach means that our tax depreciation reflects actual business practice (eg, actual tax depreciation rates and depreciation methods).

Sydney Water's forecast tax depreciation amounts incorporate depreciation on:

- Existing assets
- Forecast capital expenditure (excluding finance leases), and
- Assets free of charge (AFOC).

In its response to our Draft Report, Sydney Water revised its forecasts based on its proposed capital expenditure amounts. We have reviewed Sydney Water's revised proposal and accepted its approach to forecasting tax depreciation with the exception that we have amended the depreciation on forecast capital expenditure (excluding finance leases) to reflect our decision rather than Sydney Water's proposed amount. This is presented in Table H.11.

Table H.11 Comparison of Sydney Water's proposed tax depreciation and our decision ($ millions, nominal)

	2020-21	2021-22	2022-23	2023-24	Total
Sydney Water's proposal	497.2	567.7	622.1	624.0	2,311.0
Our decision	**487.3**	**551.4**	**575.1**	**574.3**	**2,188.2**
Difference ($)	-9.9	-16.2	-47.0	-49.7	-122.9
Difference (%)	-2.0	-2.9	-7.6	-8.0	-5.3

Source: Sydney Water', *Response to IPART's Draft Report and Determination*, 27 April 2020, p63 and IPART calculations

H.3.2 Forecast assets free of charge (AFOC)

Assets Free of Charge (AFOC) (also known as non-cash capital contributions) are assets that utilities receive for free. AFOC does not affect the RAB, and utilities do not earn a return on or of those assets. Utilities, however, are required to pay tax equivalents on the value of AFOC. As such, we need to include forecast AFOC as revenue in the calculation of the regulatory tax allowance building block.

Sydney Water has forecast annual AFOC for the 2020 determination period as the actual annual average over the 2015-16 to 2018-19 period (indexed for inflation) plus an amount to recoup the holding costs of the differences between forecast and actual AFOC over the 2016 determination period. This is consistent with the approach adopted by IPART for the 2016 determination period (see Box H.2).

In its response to our Draft Report, Sydney Water proposed that we amend our calculation to:

- Exclude AFOC in 2019-20, on the grounds that this is a forecast amount.

197 IPART, *The-incorporation-of-company-tax-in-price-determinations, Other Industries – Final Decision*, December 2011, pp 17-18.

- Use a pre-tax real WACC instead of a post-tax real WACC.

We agree with Sydney Water's proposal, and consequently have increased the value of holding costs by $1.9 million since the Draft Report.

Box H.2 Sydney Water's AFOC for the 2016 determination period

In 2012, Sydney Water indicated that accurate forecasts of AFOC were difficult, given its unpredictability. Sydney Water proposed to use the average of the previous five years of actual AFOC, adjusted for inflation, for its forecasts. We accepted Sydney Water's proposal.

In its 2016 pricing proposal, Sydney Water changed in the way it forecast AFOC. Its new approach was based on two components; one for urban development (ie growth) and the other for major infrastructure (based on available information on scheduled projects by private companies and government agencies). However, the Secretariat had concerns with Sydney Water's AFOC forecast methodology including that it effectively predicted more AFOC lots than new connections.

As a result, the Tribunal decided to use a forecast AFOC based on a four year historical average, to coincide with the length of the regulatory period. Further, the Tribunal decided to pass-through the holding costs of differences between actual and forecast AFOC over the 2016 determination period, at the next determination period. This approach ensures that Sydney Water recovers its AFOC related tax obligations, albeit with a lag.

The Tribunal undertook to "test Sydney Water's (2016) forecast methodology more thoroughly at the 2020 determination".[a] However, for the 2020 determination period Sydney Water has adopted the Tribunal's 2016 methodology.

a IPART *Review of prices for Sydney Water Corporation, From 1 July 2016 to 30 June 2020, Water — Final Report* June 2016, p135.

Table H.12 shows Sydney Water's proposed forecast AFOC, totalling $789.7 million, for the 2020 determination period. Our decision is to accept Sydney Water's proposed AFOC.

Table H.12 Assets free of charge for Sydney Water ($million, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Water	71.0	60.4	60.4	60.4	252.1
Wastewater	147.1	120.9	120.9	120.9	509.9
Stormwater	8.8	6.3	6.3	6.3	27.6
Total	**226.9**	**187.6**	**187.6**	**187.6**	**789.7**

Source: Sydney Water's Pricing Proposal, July 2019 and Sydney Water's update to 1 July Price Proposal, November 2019

H.4 Allowance for working capital

The working capital allowance ensures Sydney Water recovers the costs it incurs due to the time delay between providing a service and receiving the money for it (ie, when bills are paid). To calculate this allowance, we applied our standard approach. In summary, this involves:

1. Calculating the net amount of working capital the business requires, using the formula:

Net working capital = receivables – payables + inventory + prepayments

2. Calculating the return on this amount by multiplying it by the nominal post-tax WACC.

More information on our standard approach can also be found in our working capital Policy Paper on our website.[198]

Table H.13 below provides a comparison of our decision with Sydney Water's proposal.

Table H.13 Comparison of our working capital allowance to Sydney Water's proposal ($2019-20, $million)

	2020-21	2021-22	2022-23	2023-24	Total
Sydney Water's proposal	7.5	9.9	10.3	11.0	38.7
Our decision	**9.4**	**11.1**	**11.6**	**12.3**	**44.3**
Difference ($)	1.9	1.2	1.3	1.3	5.6
Difference (%)	25.1	12.0	12.3	11.5	14.5

Note: Totals may not sum due to rounding

Source: Sydney Water 2018-19 Annual Information Return (October); IPART analysis

The sections below details the parameters applied to calculate our allowance for working capital.

H.4.1 Parameters for receivables

The value of receivables depends on the average number of days between providing a service and receiving payment for that service, which we calculate with reference to:

- The net number of days that access and usage charges are billed in arrears, which in turn depends on
  - the number of days in the billing cycle
  - the average number of days that access charges are billed in advance of services being delivered,[199] and
  - the proportion of revenue derived from access charges (if billed in advance).
- The number of days of delay between reading the meter and receiving payment.

Sydney Water has a three monthly billing cycle and the majority of its customers pay access charges in advance. Based on this information, Sydney Water proposed a 91 day billing cycle and an average of 63 days of access charges billed in advance (and 28 days in arrears). We consider these proposals are reasonable.

198 IPART, *Working Capital Allowance: Policy Paper*, November 2018 available at https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/investigation-administrative-sea-review-of-working-capital-allowance/legislative-requirements-review-of-working-capital-allowance/policy-paper-working-capital-allowance-november-2018.pdf.

199 Usage charges are always billed in arrears, after the meter has been read. Many utilities, including Water NSW also bill access charges in arrears.

We have considered and adjusted Sydney Water's proposed:

- proportion of revenue from access charges, and
- 'days of delay' between reading the meter and receiving payment.
- We discuss the reasons for our decisions below.

Revenue derived from access charges

Sydney Water proposed that we apply a uniform 56% of revenue derived from access charges to water, wastewater and stormwater, rather than the proportion applicable to each service individually (eg, about 15% for water and 100% for stormwater). The benefit of their proposed approach is that it avoids negative working capital for stormwater.[200] However, it means that the working capital allowance is 'averaged' across the services and does not reflect the working capital requirements of each service individually. Our decision is to calculate the proportion of revenue derived from access charges separately for each service, based on forecast revenue.

Days of delay

In its July 2019 pricing proposal and again in its response to our Draft Report, Sydney Water proposed 36 'days of delay', comprised of the following four items:

1. a 21 day notice period for bill payment
2. two days of delay in bank payments being transferred to Sydney Water's account
3. seven days before the late payment fee is applied, and
4. six[201] days to account for customers on payment plans or who are not on payment plans but pay their bills late due to financial difficulties and for whom penalty charges are waived (eg, late payment fees and interest on overdue accounts). Sydney Water estimates that this applies to about 10% of customers, who have an average repayment period of 87 days.

We consider items 1, 2 and 4 are reasonable, but disagree with item 3 because, by including the seven additional days before the late payment fee is applied, Sydney Water is (implicitly) assuming that all customers pay only seven days after the notice period. We have maintained our draft decision to not include any additional days to account for this seven day grace period because:

- many customers pay by direct debit on the due date, and
- some of the remaining customers are likely to pay before the due date, offsetting customers who pay up to seven days after the due date.

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200 Working capital for stormwater will be negative because customers provide working capital in their upfront payments, and creditors (ie, suppliers) provide working capital because the utility receives services before the paying its suppliers (payables).

201 In its original proposal, Sydney Water had double counted the days of delay between when the meter is read and when payment is due for customers granted extended payment periods without penalty. In response to a query by IPART, Sydney Water has revised down its proposed 'days of delay' by three days (from nine to six).

In its response to the Draft Report, Sydney Water also asked that we consider including additional days of delay to cover the costs of hardship measures in response to the COVID-19 pandemic. It did not include any additional days in its proposed working capital allowance, but for modelling purposes assumed that the number of customers who pay their bills late would increase by 20% to 40% and that the number of days of delay would increase by between 10 and 21 days.[202]

Recent information from Hunter Water indicates the problem of late payment is far less severe than had originally been anticipated– only 2% of its customers had been unable to pay their bills on time due to the COVID-19 pandemic instead of the anticipated 20% to 30%. It noted that its response to the Hunter Water Draft Report was developed in mid to late March before stimulus packages such as the JobKeeper/JobSeeker program had been announced.[203]

There is still uncertainly around how many customers will pay their bills late, or for how long the problem will last, due to the possibility of a second wave of COVID-19, the winding back of stimulus measures and the economic impact of the pandemic. In recognition of the ongoing uncertainty and after taking into account Hunter Water's recent experience, our decision is to include an additional 2 days of delay. This amount is equivalent to 10% of customers paying their bills on average 90 days late, spread over the determination period.[204]

Table H.14 sets out Sydney Water's proposal and our decision on the average number of days of delay between reading the meter and receiving payment.

Table H.14 Sydney Water's proposal and our decision on days of delay

	Sydney Water's proposal (days)	Our decision (days)
Notice period for bill payment	21	21
Delay in bank payments being transferred to Sydney Water's account	2	2
Days (after notice days) before late payment fee is applied	7	0
Additional delay due to late payment due to financial difficulty without late payment penalty under normal conditions	6	6
Additional delay due to late payment due to financial difficulty without late payment penalty due to the COVID-19 pandemic	0	2
Total days of delay between reading the meter and receiving payment	**36**	**31**

Source: Sydney Water', *Response to IPART's Draft Report and Determination*, 27 April 2020, p64 and IPART calculations

202 Sydney Water', *Response to IPART's Draft Report and Determination*, 27 April 2020, p64.
203 Email from Hunter Water, 14 May 2020.
204 For example, 8% and 2020-21 and 2% in 2021-22 and 0% in the remaining two years.

H.4.2 Parameters for payables

We calculate payables using a benchmark number of days of delay between receiving a good or service and making a payment. Sydney Water proposed 30 days, which is the standard contract period and which we use as our default number of days.

H.4.3 Parameters for inventory

We set inventory to be a constant real dollar amount over the forecast period, based on efficient business practice.

Sydney Water's proposed inventory amount of $16.6 million ($2019-20) is based on their "improved stock take processes"[205] and is similar to their actual inventory in 2017-18. We consider this reasonable and our decision is to accept Sydney Water's proposed inventory amount.

H.4.4 Parameters for prepayments

We set prepayments to be a constant real dollar amount over the forecast period. However, we set the value to zero unless the business can demonstrate that the pre-payments are prudent and efficient.

Sydney Water proposed a prepayment of $9.6 million per year ($2019-20) based on efficient business practice, including prepaid IT licences and maintenance, insurance, rent and land tax. The proposed amount is similar to actual pre-payments in 2018-19 as reported in the AIR. We consider this reasonable and our decision is to accept Sydney Water's proposed prepayment amount.

H.5 Revenue adjustments for non-regulated revenue

We encourage water utilities to seek ways to generate revenue in ways other than from traditional services, for instance, through renting some of its land. Where it does this by using assets that have been paid for by the customers of the traditional services, we typically share this revenue with the customers that have paid for the asset.

Sharing the revenue encourages the utilities to pursue non-regulated revenue while ensuring customers also benefit from the arrangements because they pay for the assets. In the past, we have typically applied a 50:50 sharing ratio of the revenue.

205 Sydney Water, *Pricing proposal 2020-24*, *Appendix 11A Working capital allowance,*1 July 2019, p6.

Our decision on customers' share of non-regulated revenue is shown in Table H.15 below.

Table H.15 Decision on Sydney Water's revenue adjustments ($ million, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Blue Mountains CSO	0.1	0.1	0.1	0.1	0.2
Recycled water revenue[a]	2.2	2.2	2.2	2.2	8.8
Customer share (50%) of rental income	5.0	4.6	4.4	4.4	18.4
Customer share (10%) of Biodiversity Offset Scheme income	1.0	0.4	0.2	0.5	2.1
Total amount deducted from NRR	**8.2**	**7.3**	**6.8**	**7.1**	**29.5**

a This is revenue from s16A recycled water schemes and includes the additional $50,000pa to Sydney Water to reflect the 50% share of the revenue from its least cost recycled water schemes (see Chapter 11).

Note: The table presents the total NRR deductions for water, wastewater and stormwater. Totals may not sum due to rounding.

Source: Sydney Water 2018-19 Annual Information Return (October) and IPART calculations.

Our decision is to continue to share 50% of non-regulated revenue with customers, with the exception of the two sources of revenue below:

- Revenue from least-cost recycled water schemes where the recycled water displaces potable water (See Chapter 11).
- Revenue from bio banking credits (explained below).

In both its pricing proposal and response to the Draft Report, Sydney Water proposed sharing 10% of its non-regulated revenue from rental income with customers. However our decision is to maintain our standard 50% policy for this item. We also discuss this below.

How we treat revenue from bio-banking credits

In its proposal, Sydney Water's forecast revenue from bio-banking credits is $20.8 million over the 2020 determination period, and proposes to share 10% of this revenue with customers.[206] The Scheme aims to offset impacts of development and land clearing by securing and managing offsetting sites, which generate biodiversity credits which can then be purchased by developers to offset their biodiversity impacts.

The Property Council of Australia supported a non-regulated revenue sharing ratio of 10% with customers from Sydney Water's participation in the Biodiversity Offset Scheme.

Our treatment of revenue from participation in the bio-banking scheme differs from our usual approach to non-regulated revenue. Comparatively, a smaller proportion is shared with customers. This recognises that Sydney Water would bear non-negligible scheme participation costs (such as setup and ongoing costs) and responsibilities of the scheme that create increased revenue risk. Scheme participation requires set up costs, as well as enters the business into perpetual agreements with ongoing costs and responsibilities. A biodiversity Conservation trust is established and funded through the first sales of biodiversity credits.

206 Sydney Water's Pricing Proposal, July 2019, Attachment 11: Proposed revenue requirement, p32

In May 2018, we communicated to Sydney Water about its participation in Biodiversity Offset Schemes. Our response covered three items, as follows:

- **Treatment of the land in the RAB**: If the land was operational at the RAB creation in 2000, but had since become non-operational, then its value should be removed from the RAB. Alternatively, if the land either is still operational, or if was non-operational in 2000, then there would be no change to the RAB.
- **Costs recovered through the scheme, or avoided because of participation in the scheme**: Operational costs, common corporate overheads, or land tax associated with the managing the land should no longer be recovered from customers, as these should either be recovered through annual repayments through the Biodiversity Conservation Trust, or are avoided by entering the Scheme (eg, land tax). We would remove these costs from the regulated cost base where identification is simple, and the utilities should provide an estimate of these costs.
- **Revenue from selling credits**: The utility could retain 90% of the revenue from credit sales due to the additional costs from participating in the scheme, such as setup and ongoing costs and responsibilities that create increased risk for the utility. 10% of the revenue should be shared with customers, by removing it from the NRR when setting prices.

Our decision for this review, is that to assess the efficient costs of participating in the Scheme, and then calculate the net revenue to be shared with customers, would be an unnecessary burden on the business and on IPART (particularly given we do not regulate this service). Thus, as long as the costs of Sydney Water participating in the scheme are ring-fenced from customers, we accept Sydney Water's proposal to share 10% of the revenue with customers.

Rental income

Sydney Water proposed to share 10% of non-regulated revenue from rental income with customers, justifying the decision by claiming it creates 'consistent' treatment across its non-regulated revenue income. This proposal is a deviation from our historical 50:50 rental income sharing ratios.

In its response to our Issues Paper and Draft Report, Sydney Water reiterated its opposition to a 50:50 sharing ratio for rental income, citing the economic principles from our 2008 decision and subsequent regulatory decisions in the Asset Disposals and Biobanking policies.[207] The two policies outline that customers should be made no worse off by the generation of non-regulated revenues, and should (at minimum) be compensated equal to the incremental costs of providing the non-regulated services using the regulated assets paid for by customers through prices. In Sydney Water's view, according to these principles, so long as a customer is fully compensated, they bear no risk associated with the non-regulated service and should not share in non-regulated revenues.

207 In our Final 2008 decision, we decided to adopt a 50:50 sharing ratio for rental income (having previously subtracted all the revenue from rental income from the NRR in our decision). Our 2008 decision highlighted that a 50:50 sharing ratio balances providing an incentive for Sydney Water to pursue rental income opportunities, against passing some of the benefits to customers. See IPART, *Review of prices for Sydney Water Corporation's water, sewerage, stormwater and other services*, June 2008, pp 36-37.

Sydney Water claims that applying a sharing ratio to total incremental revenue is a poor efficiency incentive, meaning it bears all the risk if incremental costs are more than incremental revenue.

Conceptually, we acknowledge Sydney Water's concern that a 50:50 revenue sharing ratio with customers does not protect it from the risk that costs may account for greater than 50% of the revenue generated. However, in the case of rental activities, we consider it highly unlikely that significant incremental costs would be incurred in earning this revenue, and our decision is to maintain a 50:50 revenue sharing ratio. In addition, a 50:50 sharing ratio provides a protection to customers should any costs or asset depreciation arising from rental activities be inadvertently recovered from Sydney Water's future costs.

In its response to the Draft Report, Sydney Water argued that a 50:50 revenue sharing ratio would in fact result in the utility receiving only 20% of the revenue, as it would have to pay tax on all the revenue received (at a rate of 30%). We disagree. Under our price setting methodology, the revenue allowance includes tax on non-regulated revenue shared with customers.

Other adjustments

In addition to the adjustments outlined above, Sydney Water has two other adjustments to the NRR: for the Blue Mountains customer service obligation (CSO) and recycled water revenue. Some unsewered properties in the Blue Mountains receive a subsidy from Sydney Water for a septic pump-out service and Sydney Water receives full funding from the Government for this subsidy. Because Sydney Water has included the cost of this service and of Section 16A recycled water schemes in its regulated expenditure, we deduct these items from the NRR before setting prices.[208] We have also provided an additional $50,000pa to Sydney Water to reflect 50% share of the revenue from its least cost recycled water schemes (see Chapter 11).

208 That is, our treatment of Section 16A recycled water revenue and expenditure ensures that the broader customer base funds the difference between the efficient cost of the scheme, and the revenue generated from customers of the scheme.

I Weighted average cost of capital

This appendix shows the parameters we used to calculate the weighted average cost of capital (WACC) for the Final Report, and explains our decision about how to treat annual changes in the WACC with regard to customer prices.

I.1 Our WACC estimate

Our WACC estimate is set out in Table I.1 below. In keeping with our standard WACC method, we adopted current market observations for the cost of debt, inflation and the market risk premium. We adopted the following industry-specific parameters:

- A gearing ratio of 60%, and
- An equity beta of 0.7.

I.2 Change from the Draft Report

In our Draft Report we sampled market observations at end of January 2020 and estimated a post-tax real WACC of 3.2%. Since January 2020 there has been a small decrease in the current observation of the risk free rate (from 1.2% to 0.9%) which was offset by larger increases in the current debt margin (from 1.8% to 2.5%) and in the current MRP (from 8.8% to 9.7%). These changes have increased our post-tax real WACC estimate to 3.4% for our final decision.

Table I.1 Sydney Water WACC for final report

	Step 1		Step 2 – Final WACC range		
	Current market data	Long term averages	Lower	Midpoint	Upper
Nominal risk free rate	0.90%	3.10%			
Inflation	2.30%	2.30%			
Implied Debt Margin	2.50%	2.60%			
Market Risk premium	9.7%	6.0%			
Debt funding	60%	60%			
Equity funding	40%	40%			
Total funding (debt + equity)	100%	100%			
Gamma	9.7%	6.0%			
Corporate tax rate	30.0%	30.0%			
Effective tax rate for equity	30.0%	30.0%			
Effective tax rate for debt	30.0%	30.0%			
Equity beta	0.70	0.70			
Cost of equity (nominal post-tax)	7.7%	7.3%			
Cost of equity (real-post tax)	5.3%	4.9%			
Cost of debt (nominal pre-tax)	3.4%	5.7%			
Cost of debt (real pre-tax)	1.1%	3.3%			
Nominal Vanilla (post-tax nominal) WACC	5.1%	6.3%	5.1%	5.7%	6.3%
Post-tax real WACC	**2.8%**	**3.9%**	**2.8%**	**3.4%**	**3.9%**
Pre-tax nominal WACC	6.0%	7.2%	6.0%	6.6%	7.2%
Pre-tax real WACC point estimate	3.6%	4.8%	3.6%	4.2%	4.8%

I.3 Gearing and beta

In selecting proxy industries, we consider the type of business the firm is in. If we can't directly identify proxy firms that are in the same business, then we would consider which other industries exhibit returns that are comparably sensitive to market returns.

We adopted the standard values of 60% gearing and an equity beta of 0.7. We undertook preliminary proxy company analysis on several different types of industries with risk profiles that appear similar to water utilities. The results for the electric utilities industry and the multiline utilities activity support continuing to use an equity beta of 0.7 when 60% gearing is used. While some other industries and activities analysed suggest a higher beta, the sample sizes for those proxy groupings are too small to warrant making what would be a major change from the status quo.

I.4 Sampling dates for market observations

We sampled market observations for the current year to the end of March 2020, which is the last available whole month. For earlier years in the trailing average calculation of the historic cost of debt we also sampled to the end of March in each year.

I.5 Tax rate

We assume that the Benchmark Equivalent Entity is a large public water utility. The scale economies that are important to firms of this type suggest that the Benchmark Equivalent Entity would be likely to be well above the turnover threshold at which a firm becomes eligible for a reduced corporate income tax rate. Therefore, we use a tax rate of 30%.

I.6 Regulatory period

We adopt a standard four year regulatory period for Sydney Water.

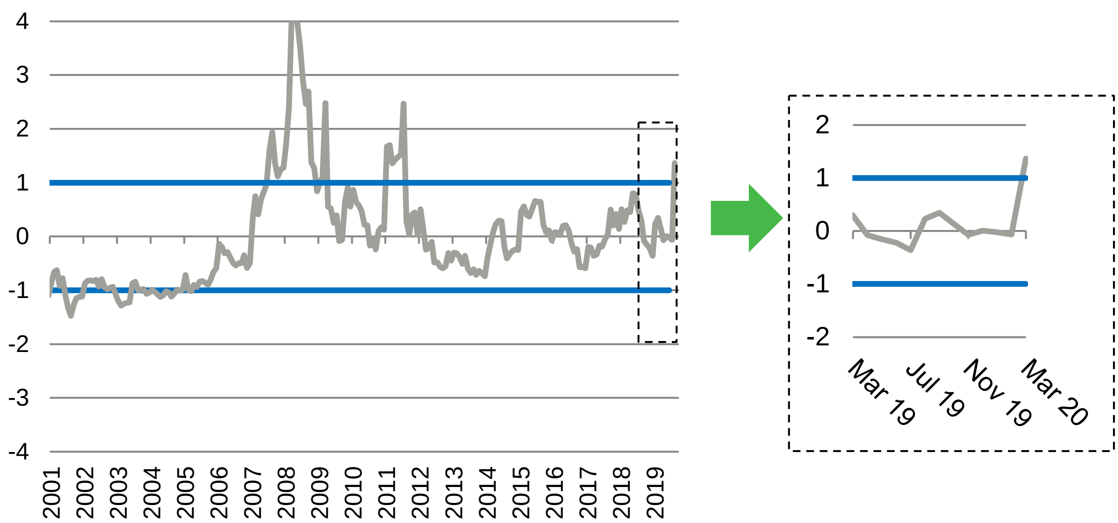
I.7 Application of trailing average method

Our 2017 WACC method introduced a decision to estimate both the long-term and current cost of debt using a trailing average approach, which updates the cost of debt annually over the regulatory period. As foreshadowed in our 2017 review of the WACC method, we employ a transition to trailing average in the calculations presented above.

I.8 Uncertainty index

We tested the uncertainty index for market observations to the end of March 2020. The uncertainty index was outside of the bounds of plus and minus one standard deviation of the long term mean value of zero. The uncertainty index is shown in Figure I.1.

Figure I.1 IPART's uncertainty index



Data source: Thompson Reuters, Bloomberg and IPART calculations.

If the uncertainty index was within the bounds of plus and minus one standard deviation of the long term mean value of zero we would maintain the default 50% – 50% weighting between current and historic market estimates of the cost of debt and the cost of equity.

However, if the uncertainty index is more than one standard deviation from its historic average, our current approach is to exercise our discretion about whether to move from the midpoint. In exercising that discretion, we consider the value of the uncertainty index and financial market information.

We consulted stakeholders on the weighting that should apply, given the uncertainty index result from March. We summarise that consultation below. In short, stakeholders did not support departing from 50% – 50% weights for the cost of debt. While some stakeholders recommended placing higher weight on current measures of the cost of equity, we did not find their arguments convincing, as noted below. Therefore our final decision is to maintain the 50% - 50% weighting between current and historic market estimates of the cost of debt and the cost of equity.

I.8.1 Stakeholders supported our maintaining a 50-50 weighting for the cost of debt

Sydney Water Corporation (SWC) and Sydney Desalination Plant (SDP) submitted that the 50 – 50 weight should be retained for the cost of debt. Citing that IPART's standard approach reflects the prudent and efficient approach to debt management that could be implemented by a regulated business.[209] This is the prudent and efficient approach outlines in our 2018 WACC method.

Neither Hunter Water nor Water NSW commented specifically on the temporal weights that the Tribunal should use.

We agree with SWC and SDP that firms would likely have based their borrowing strategies on the 2018 IPART WACC method. By following the trailing average approaches for current and long-term debt set out in that final report, a firm can actually borrow money at the average interest rate allowed by IPART, even when market conditions are volatile.

Thus, even when the uncertainty index is out of range, there is no need to modify the 50 – 50 weights for the cost of debt.[210] Moreover, any departure from the 50 – 50 weights for the debt portfolio would probably create problems for the firms that have borrowed on the assumption that those weights will continue.

I.8.2 Stakeholders proposed that we give greater weight to the current cost of equity

SWC and SDP submitted that the Tribunal should consider giving greater weight to the current market cost of equity, but did not suggest particular weights.[211] Neither Hunter Water nor Water NSW commented specifically on the temporal weights that the Tribunal should use.

Both Sydney Water and SDP argued that the temporal weights should be adjusted for the cost of equity only, and that the reweighting should give more weight to current observations and less to long-term observations.

Both these stakeholders made the argument that the current cost of equity is responding as expected to the COVID-19 pandemic, but our estimate of the long-term cost of equity is responding in a perverse and implausible way to this crisis. They say that the crisis is making the risk-free rate fall, and adding a constant long-term MRP to that results in a falling cost of equity at a time when they say it should be rising.

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209 SDP submission to IPART consultation on debt margins, April 2020, pp 2-3 and Sydney Water, *Keeping Sydney liveable, productive and thriving for a sustainable future – response to IPART's Draft Report and Determination*, April 2020, p 127.

210 Our uncertainty index policy was introduced in our 2013 WACC review. At that time we did not have a trailing average cost of debt. Since the 2018 introduction of the trailing average, firms have been substantially protected from any refinancing risks, even in times of market uncertainty. This development has reduced the importance of adjusting temporal weights to deal with abnormal market conditions. At the same time, it has increased risks to the firms from any change to the temporal weights for debt, as noted by SDP and Sydney Water's submissions.

211 SDP submission to IPART consultation on debt margins, April 2020, pp 3-4 and Sydney Water, *Keeping Sydney liveable, productive and thriving for a sustainable future – response to IPART's Draft Report and Determination*, April 2020, pp 125-127.

Their arguments misunderstand the role of long-term market observations in the WACC and misstate the impact of COVID-19 on our estimation of the long-term cost of equity. There is no doubt that the current financial crisis is having significant short-term effects. These are captured in the current cost of equity. The purpose of the long-term cost of equity is to provide stability in times of what may turn out to be temporary uncertainty. Thus, the long-term cost of equity would not serve its purpose if it was highly reactive to short-term events. The fact that it is not highly reactive does not mean, as they assert, that the method is flawed. It means that the method is working as intended.

Both submitters are incorrect in asserting that current financial conditions are driving the long-term cost of equity lower. We calculate the long-term cost of equity by adding the long-term MRP to a ten-year trailing average of the risk-free rate. Whatever movements there have been in the spot risk-free rate since this crisis began only receive 10% weight in the long-term risk-free rate. That means that our estimate of the long-term cost of equity has been quite stable.

It is true that the long-term cost of equity has been falling for many years as interest rates have declined, but that has nothing to do with COVID-19. All the observed changes to the long-term cost of equity are driven by events and processes that were well in train and widely observed at the time we conducted our 2018 WACC review. At that time, SDP, Sydney Water and all other stakeholders were supportive of our approach. Nothing relevant to the long-term cost of equity has changed since then.

For these reasons, we do not agree with the suggestions from Sydney Water and SDP to depart from 50 – 50 weight for the cost of equity. We consider that 50 – 50 weights appropriately balance short-term and long-term equity market dynamics. Despite the current COVID-19 pandemic, equity investors would still be considering both the current and longer term returns.

I.9 Annual WACC adjustments

Our 2017 review of the WACC method introduced a trailing average cost of debt. One consequence is that the WACC changes every year, as new tranches of debt are introduced to the trailing averages and the oldest tranches drop out.

We considered two options to adjust price to account for annual WACC changes:

1. To store the present value of the revenue adjustments caused by the changing WACC and apply a true-up at the next regulatory period.
2. Annual real price changes to reflect the changing WACC.

Our decision is to use an end of period true-up approach. This is consistent with our Draft decision and was supported by Sydney Water in its submission to our Draft Report.[212]

212 Sydney Water, *Keeping Sydney liveable, productive and thriving for a sustainable future – response to IPART's Draft Report and Determination*, April 2020, p 128.

J Inflation and the WACC

Sydney Water argued that our estimate of inflation expectations is too high, and therefore the real-WACC is too low, impacting on their financeability. This appendix provides further analysis of the issue.

J.1 Analysis of inflation expectations

In Chapter 6, we assessed three options to estimate inflation expectations:

1. Our **current** approach
2. To use the **RBA's** longer term guidance on inflation
3. To use **BEI's** (break-even inflation rates) and inflation swaps

In Table J.1, we provide a summary of our analysis of the data and how they apply to the three options. Table J.1 also discusses the merits of a true-up to account for the difference between actual and expected inflation. Further analysis is below.

Table 14.2 Key analysis of recent data

Factor	Implication
We are trying to establish what agents in the economy **expect** inflation will be at a point in time (not correct for actual out-turn inflation).	▼ Actual inflation may be a good proxy for inflation expectations, if we assume that the two will be equal over time (which requires rational expectations). ▼ A NERA report (commissioned by Sydney Water) highlights that all measures of inflation forecasts (RBA, surveys of economists, and market-based measures) underpredicted actual inflation in recent years. While unobservable, this suggests that the true inflation expectation in recent years was above actual inflation outcomes. ▼ This suggests that our approach in previous periods was reasonable, and that the utilities have not been disadvantaged in the past. It also suggests that a true-up approach is not inherently superior to other approaches.
There is substantial evidence that the bond market expectations are biased downwards in periods of financial stress.	▼ During the GFC, and the most recent crisis, inflation linked bonds were highly illiquid, leading to a large decrease in implied inflation rates. ▼ The RBA's recent decision to engage in unconventional monetary policy (and purchase nominal bonds) may reduce the accuracy of bond market inflation forecasts going forwards. ▼ The recent experience corroborates our findings in the 2018 WACC review that the market information is not reliable in periods of financial stress (which are also periods of increased economic uncertainty).

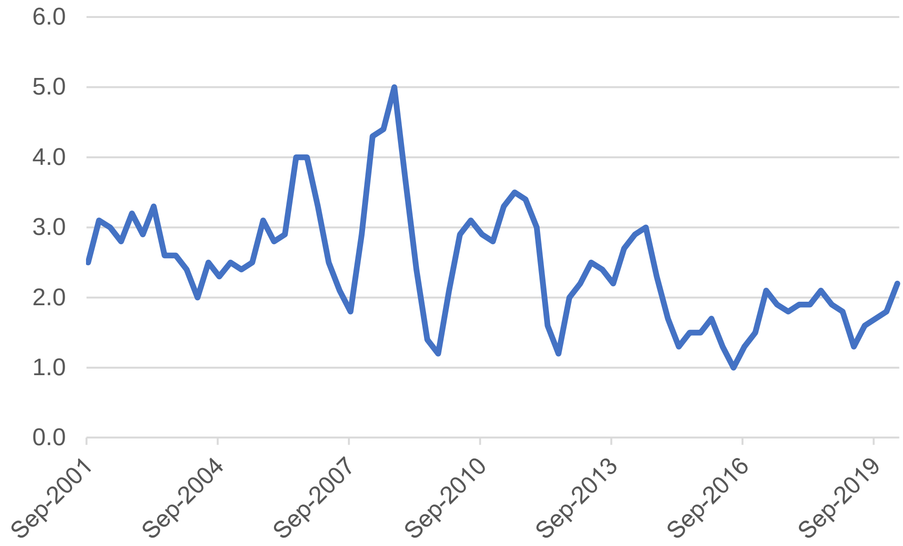
Factor	Implication
Before the recent crisis, bond market expectations had not materially changed since July 2019	▼ Prior to the COVID-19 pandemic, the market-based expectation for the next four years was about 1.6-1.7% per year. The 0.65% per year estimate, as suggested by Sydney Water in its response to our Draft Report, was substantially affected by market illiquidity and likely does not represent an accurate estimate of inflation expectations. ▼ If anything, bond market expectations were slightly lower than this 1.6-1.7% expectation at the beginning of the price review process.
Inflation expectations are relatively well anchored, even though CPI inflation has been below 2.5% for some years	▼ The RBA's long-term research suggests that long-term inflation expectations remain close to 2.5%. Since the introduction of the GST, CPI averaged 2.9% over the period 2001-2011. Over the period 2012-2020, it has averaged 1.9%. ▼ Our longer-term analysis suggests that the utilities have not been structurally over- or under-compensated for inflation.
While inflation is currently weak, in the medium-term the RBA's Quantitative Easing is aimed at reducing the real WACC – depressing bond and equity yields and stimulating inflation.	▼ The 'efficient' real rate of return is currently low.

Recent trends in inflation

As shown in Figure J.1, inflation has been below 2.5% over the past 5-6 years. Since the introduction of the GST:

- Inflation averaged 2.9% over the period 2001 and 2011
- Inflation averaged 1.9% over the period 2012 to 2020

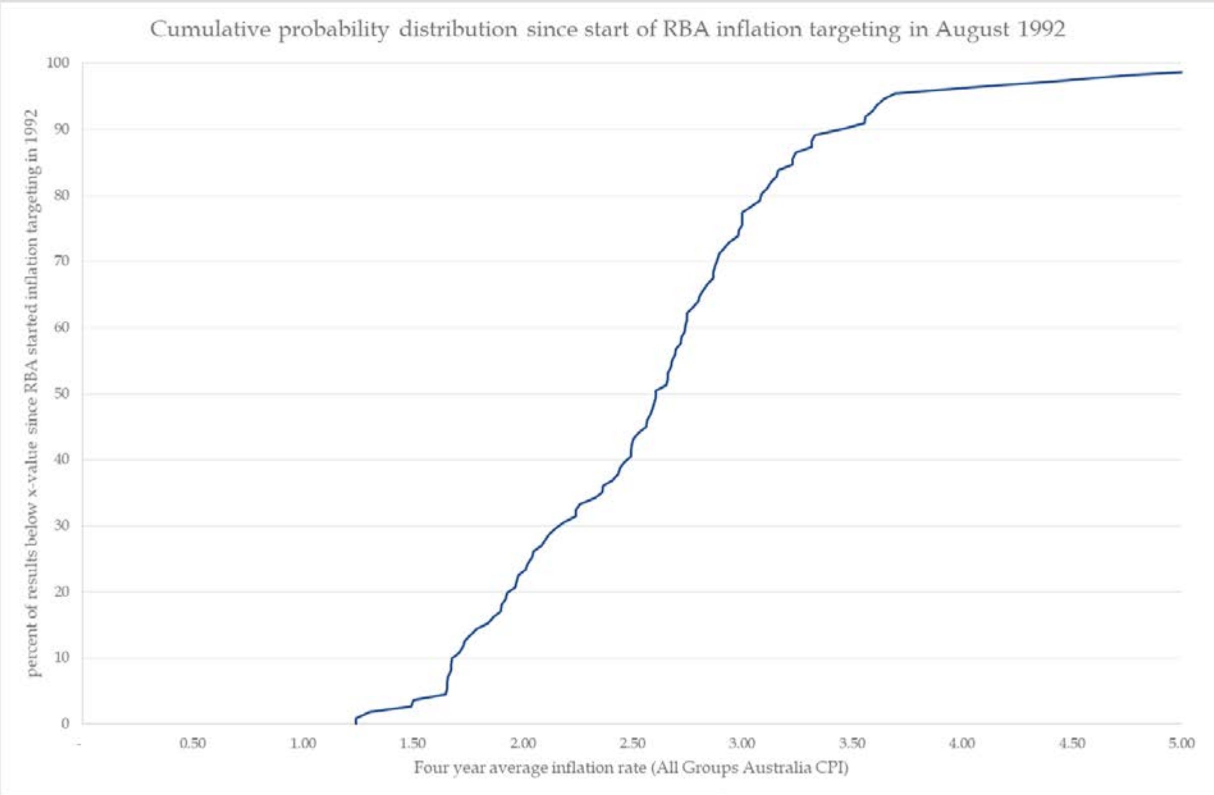
Figure 15.13 Consumer price inflation



Data source: ABS

To use this data to generate statistically meaningful inflation scenarios, we used historical CPI inflation to calculate the cumulative probability distribution of four-year average inflation over the inflation targeting era (since 1992). Figure J.2 shows that distribution.

Figure 14.3 Cumulative probability distribution of four-year average inflation



Source: ABS 6401.0, IPART analysis. Inflation rates higher than 5% not shown.

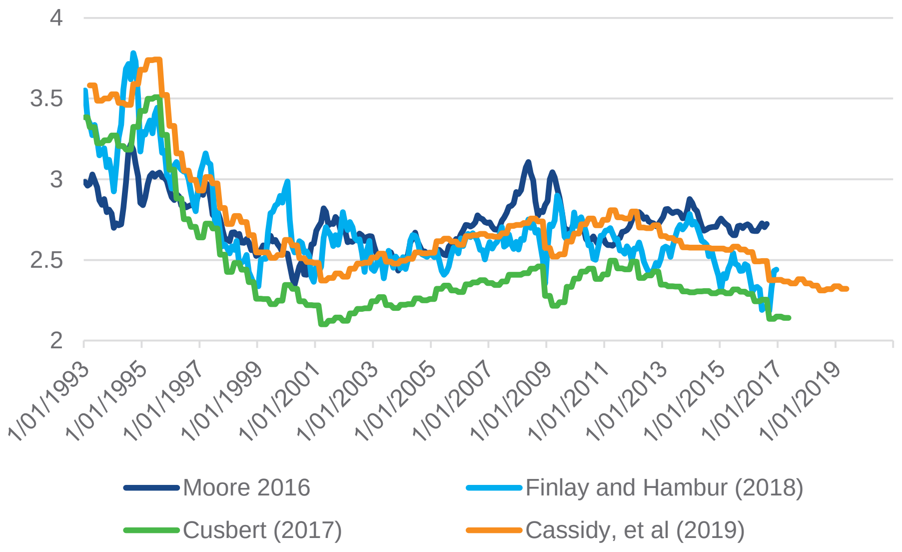
Over the 28 years of the inflation targeting period, the median value of four-year average inflation was 2.61%. The value was below the top of the RBA's target band 77% of the time and below the bottom of the target band 23% of the time (implying it was within the target band 54% of the time). Ten percent of four-year average inflation results were below 1.68%. Five percent were below 1.65% and one percent were below 1.25%. No four-year average inflation results were below 1.24%.

Four-year average inflation was below our estimate of inflation expectations of 2.3% only 34 percent of the time, and below the March 2020 actual value of 2.2% only 31 percent of the time.

RBA research on inflation expectations

Figure J.3 shows previous published research by the RBA, which suggests that long-term inflation expectations – derived from financial market data or surveys of households and businesses – have remained relatively well-anchored towards the middle of the RBA's 2-3% inflation target band, with the most recent estimate including data to March 2019.

Figure 14.4 5-year and long-term inflation expectations in Australia

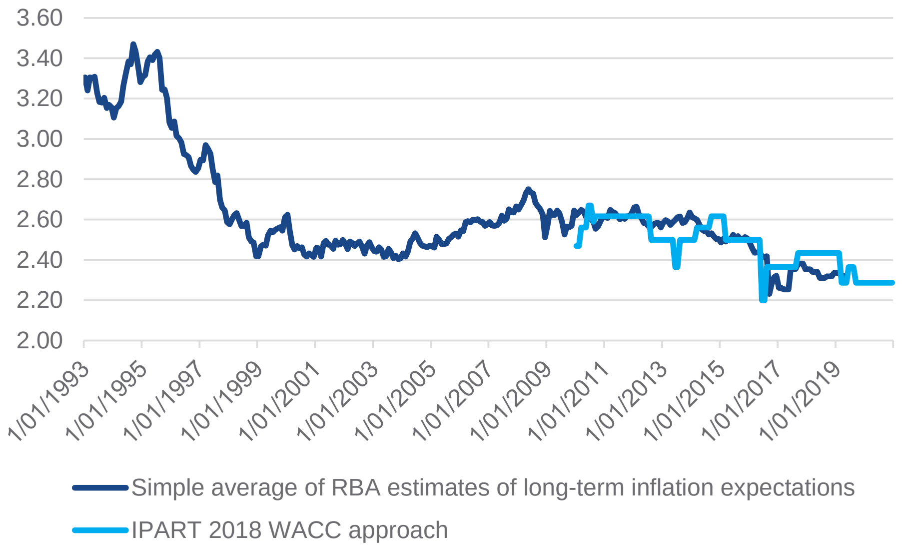


Note: The Moore (2016) and Finlay and Hambur (2018) estimates are of 5-year inflation estimates; the Cusbert (2017) and Cassidy, et al (2019) estimates are of long-term inflation expectations

Data source: Various RBA published research

A simple average of the RBA's previous estimates is very close to our current method for estimating inflation (Figure J.4).

Figure 14.5 RBA estimates of 5-year and long-term inflation expectations against our current approach



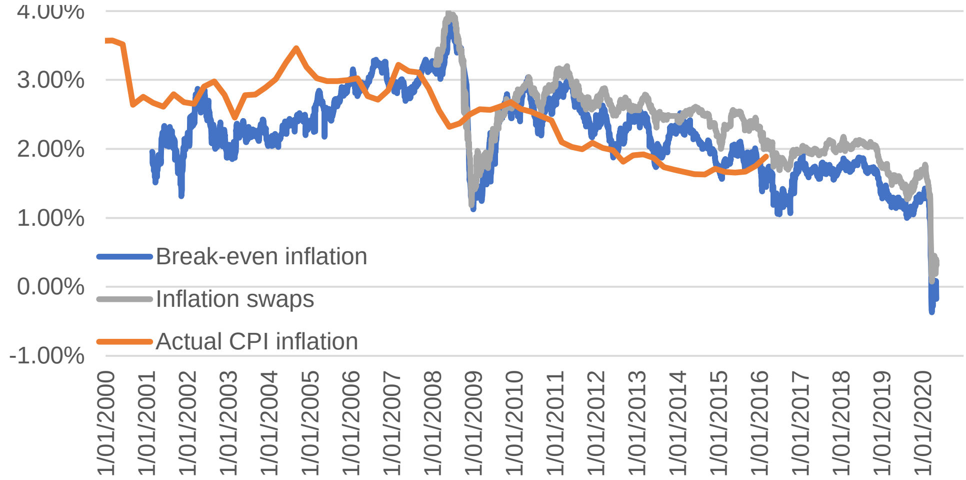
Data sources: RBA, IPART analysis

Market-based measures of inflation

In our view, market-based estimates of expected inflation are biased downwards in periods of financial stress. In our 2018 WACC review, we provided a detailed review of the risk premia that affect break-even inflation rates and inflation swap data.[213] More recently, the Final Determination for SA Water by ESCOSA provides an update on these premia.[214]

Figure J.5 plots our estimates of break-even inflation, and inflation expectations from inflation swaps, over the past 20 years. In particular, there were two periods of considerable volatility during the GFC and the recent COVID-19 crises.

Figure 14.6 Four-year inflation expectations from market data



Data source: Bloomberg

In both periods, there was a large reduction in implied inflation from these market instruments. During the GFC, this was not associated with a drop in actual CPI outcomes.

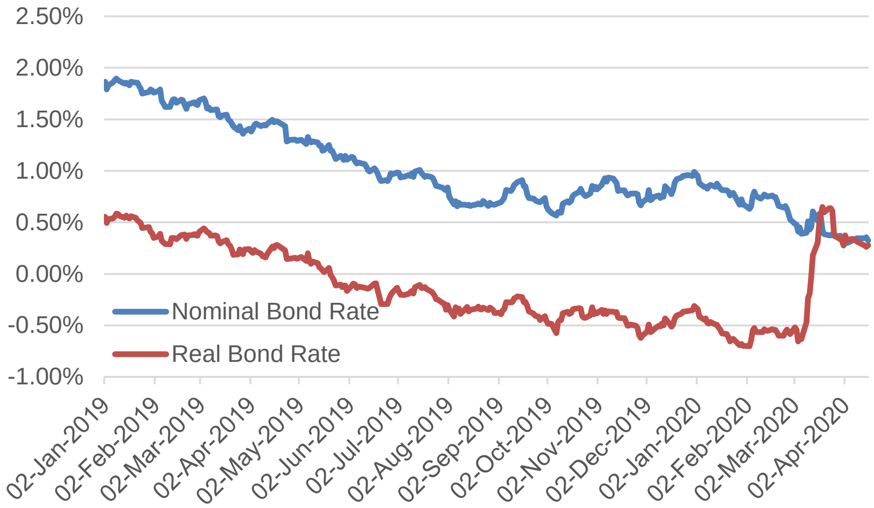
Instead, our view is that this volatility reflects that these instruments are relatively illiquid in periods of financial stress, reflecting that turnover in inflation-linked bonds is only about 5% of nominal bond turnover.

Our view is best presented by Figure J.6. To calculate break-even inflation, we use the Fisher equation to subtract a real interest rate (from inflation-linked bonds) from a nominal interest rate (the yield on a nominal bond). Figure J.6 shows that over the recent period, there was a slight reduction in the nominal bond yield (which is a relatively large and liquid pool of assets), consistent with recent reductions in the RBA cash rate and the RBA's announcement that it would begin purchasing Government bonds. In contrast, there was a very large spike in inflation-linked bond rates, which implied a 1-2% reduction in inflation expectations over the next four years. The magnitude of the spike in inflation-linked bond yields suggests that it was not purely a function of a shift in inflation expectations.

213 See IPART, 2018, *Review of our WACC method*, Chapter 7 (particularly section 7.4)

214 See ESCOSA, June 2020, *SA Water Regulatory Determination 2020*, Final Determination: Statement of reasons, Appendix 3, section A.3.6

Figure 14.7 Four-year bond rates



Data source: Bloomberg

Before the recent crisis, bond market expectations were around 1.6-1.7%, and had not materially changed since July 2019. If anything, bond market inflation expectations had crept up marginally since the water reviews began.

Box 14.3 A note on break-even inflation

As outlined in the text above, we can use the difference between the nominal bond yield and the inflation-linked bond yield to calculate a "break-even" inflation rate that would make an investor indifferent between the two bonds. For example, we can take the yield on a nominal 4-year bond, and an inflation-linked 4-year bond to estimate expected inflation over the next four years.

However, there is limited information on inflation-linked bond yields.

Since 1985, the Federal Treasury/the AOFM has issued 15 inflation linked bonds, with a range of maturity dates. This is a limited set to estimate a "4-year" or "5-year" inflation expectation.

In particular, the AOFM has structured its bond issuance so that at least one nominal bond matures each year – so there is always a nominal bond yield at each 'year' in the curve. However, it only has two inflation linked bonds maturing over a 5-year period.

For example, there are currently inflation linked bonds maturing in 2022 and 2025. What this means is that we have to impute a 4-year inflation-linked bond yield from a 2-year bond and a 5-year bond. This involves a degree of judgement, particularly when yield curves are not flat.

The RBA's most recent guidance on inflation

We acknowledge that recent inflation outcomes have been particularly low, and that current circumstances are extremely uncertain. The utilities have been particularly assertive of this in their submissions.

This suggests that it is appropriate to give more weight to the RBA's most recent guidance on inflation. However, the RBA's most recent guidance on inflation does not provide a compelling case for IPART to deviate from an inflation forecast of 2.3% (Box J.12).

Box 14.4 What does the RBA's May SMP say about expected inflation?

Table J.2 summarises the inflation forecasts that we derived from the May SMP. The top row shows that the RBA forecasts a rebound in CPI in the first year of the determination, as some of the current price freezes, or reductions, are partially unwound. In the second year of the determination, the RBA forecasted an inflation rate of 1.5%.

Table 14.3 CPI inflation forecasts

	Year 1 2020-21	Year 2 2021-22	Year 3 2022-23	Year 4 2023-24	Geometric average
RBA's May 2020 forecasts	2.75	1.5			
Inflation forecast under "RBA approach"	2.75	1.5	2. 5	2.5	2.3

In the short-term, inflation is expected to be somewhat subdued

The RBA's inflation forecasts are that the "deflationary effects from the spare capacity in the labour market and in the economy more generally" are expected to more-than-offset "supply disruptions to production that will increase inflationary pressures".

The RBA did not provide a clear medium term view on inflation

The May SMP did not provide any explicit guidance on what it expects will happen to inflation beyond the second year of the determination (ie, after 2022).

In its baseline forecasts, the RBA expects "inflation expectations remain anchored to pre-existing levels". It also notes, that

> Long-term survey-based measures of inflation expectations are little changed around 2-2½ per cent and remain consistent with the Bank's medium-term inflation target.

Market-based measures of inflation are not reliable

The RBA also noted:

> Both short- and long-term market-based measures of inflation expectations have declined since the widespread outbreak of COVID-19 in early 2020; however, it is difficult to interpret the magnitude of these declines because functioning in these markets has been significantly impaired recently.

We considered a more gradual return to 2.5% inflation

Even though the RBA did not provide clear guidance on medium-term inflation, we also considered a scenario where inflation was 2.25% in Years 3 and 4 of the determination, to account for a more gradual return to the target band. However, when coupled with inflation forecasts of 2.75% and 1.5% in Years 1 and 2 of the Determination period, this approach only yielded an inflation forecast of 2.2%, and relied on making assumptions about how quickly inflation would increase.

The RBA's CPI forecast for 2020-21 supports synchronising our WACC parameters

The RBA's 1-year ahead forecast of 2.75% is above the midpoint of its 2-3% target band.

However, this outcome reflects that RBA expects CPI inflation to be -1% over the year to June-2020. The outbreak of COVID-19 will lead to lower inflation for many components of the CPI such as fuel and rents, and "a number of government policies will lead to temporarily lower prices for some services, most notably child care has been made temporarily free". Then, over the following year to June-2021, some of these policies are expected to be reversed, which leads to a higher inflation expectation of 2.75%.

Technically, the inflation expectation we set at the beginning of the 2016 Determination period did not anticipate the COVID-19 crisis (and the weak June-2020 CPI), reflecting in a difference between actual and expected inflation over the 2016 period. Symmetrically, the cost of debt in the WACC we set for the 2016 Determination also did not anticipate the reductions in the cost of debt over this period.

Provided the financial inputs are sampled at the same time, the 1-year ahead expectation of inflation will be reflected in the nominal interest rates we sample. This supports maintaining our 2018 WACC method, which synchronises when we sample financial market information in setting the real WACC.

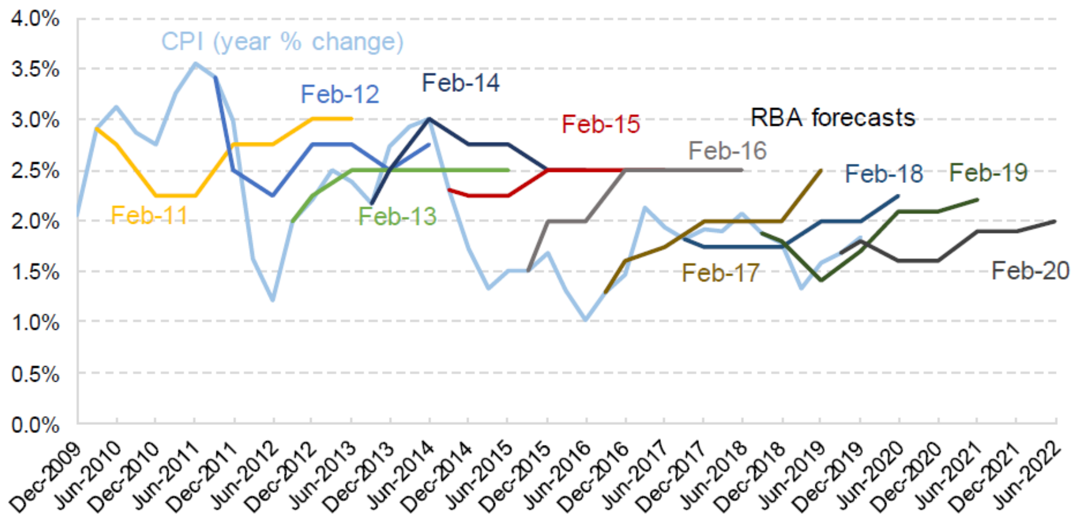
Actual inflation does not equate to inflation expectations

As outlined in the body of the report, we are setting a real WACC by deflating the nominal WACC by our best estimate of inflation *expectations*.

The NERA report, commissioned by Sydney Water, suggests that all measures of forecast and expected inflation (the RBA, inflation swaps, BEIs and market economists) over-predicted actual inflation over the past last 10 years.[215] This is important, because together it suggests that the "true" inflation expectation of the market in recent years was higher than actual inflation. And, it suggests that although IPART's 2018 WACC method would also have overestimated actual inflation, that this is not automatically an error (ie, IPART's WACC method may have overestimated actual inflation, but this does not necessarily mean that it overestimated inflation expectations embedded in the nominal WACC).

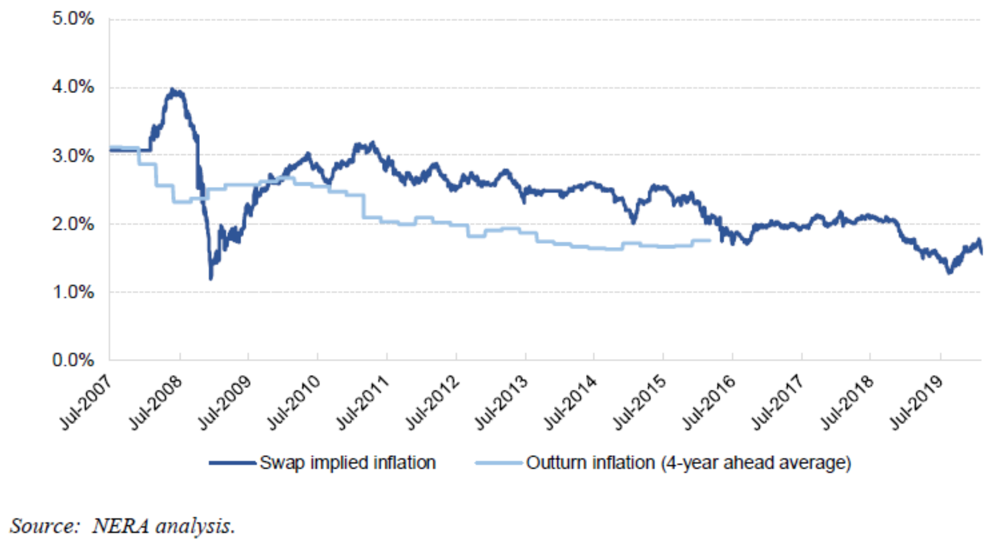
215 NERA Economic Consulting, April 2020, *Inflation forecasting and recovery of efficient debt costs*, A report for Sydney Water, Chapter 4.

Figure 14.8 NERA's analysis of RBA forecasts



Data source: NERA Economic Consulting, April 2020, *Inflation forecasting and recovery of efficient debt costs*, A report for Sydney Water.

Figure 14.9 NERA's analysis of Inflation-swap forecasts



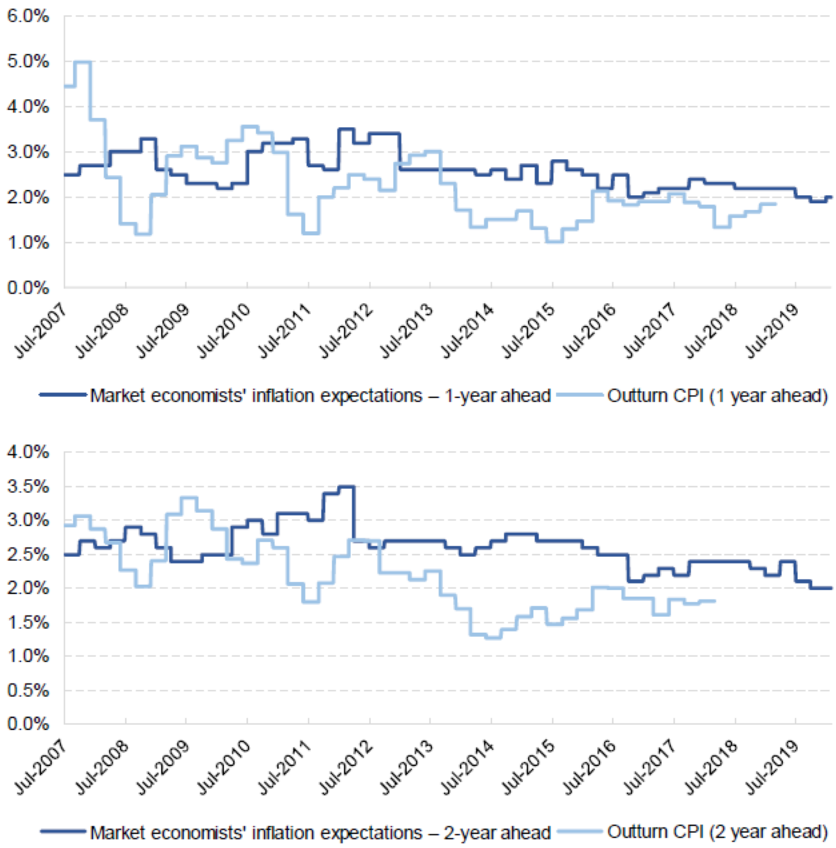
Data source: NERA Economic Consulting, April 2020, *Inflation forecasting and recovery of efficient debt costs*, A report for Sydney Water.

Figure 14.10 NERA's analysis of Break-even inflation expectations

Source: NERA analysis.

Data source: NERA Economic Consulting, April 2020, *Inflation forecasting and recovery of efficient debt costs*, A report for Sydney Water.

Figure 14.11 NERA's analysis of market economists' expectations



Source: RAB, NERA analysis.

Data source: NERA Economic Consulting, April 2020, *Inflation forecasting and recovery of efficient debt costs*, A report for Sydney Water.

What are the current estimates of inflation expectations?

Our summary of the data suggests the following range of inflation expectations:

- The information published by the RBA suggests that long-term inflation expectations are between 2.0 to 2.5%.
- Market-based inflation expectations before the recent crisis were 1.6% to 1.7% over the next four years
- The RBA's May guidance suggests inflation will be weak over the next two years, but there are countervailing effects with some factors putting upward pressure on prices.
- We have not closely examined the forecasts provided by professional economists, as these have been widely discounted (including in the NERA report). Our view is that the RBA provides a superior estimate of inflation expectations (in part, because it considers the 'economist survey' forecasts in preparing its views).

J.2 Broader factors which support our real WACC estimate

In this section we consider a range of other important factors which suggest our real WACC is producing a sufficient cashflow to the utilities.

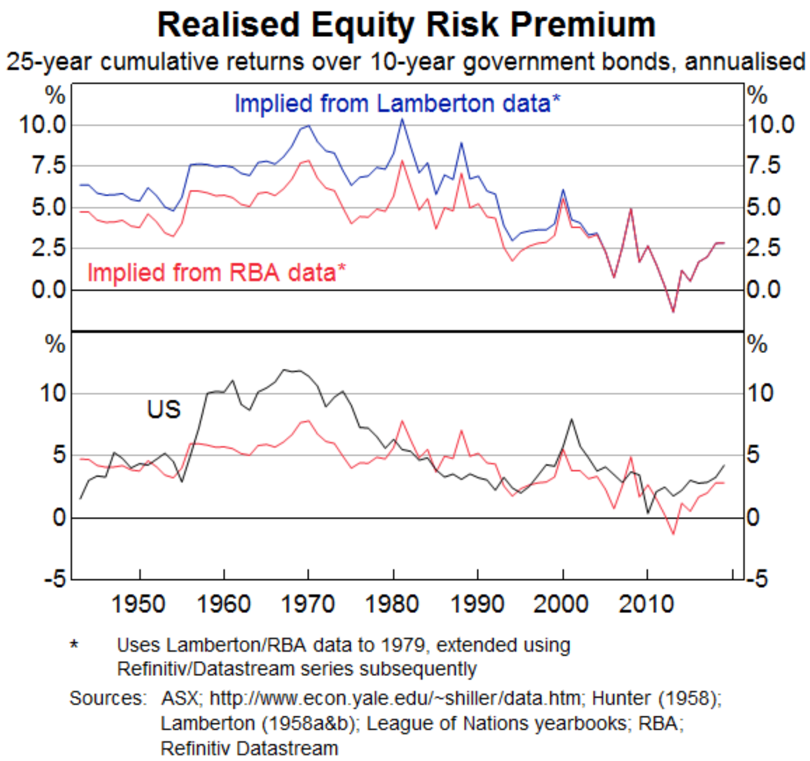
Recent RBA evidence suggests the market risk premium is lower than in our WACC

An RBA bulletin article, published in 2019, analysed Australian equity returns over the past century.[216] The article emphasises that the data "provide new evidence that historical returns on Australian equities – and therefore the equity risk premium – are lower than previously thought".

Our equity risk premium (ie, market risk premium) is the equity return above the risk-free rate – and is calculated as the average of a long-term estimate of 6% (based on a 100-year average), and a short-term estimate which has been between 9-10% in recent times.

The RBA article finds that the implied equity risk premium in Australia was actually around 4% for the past 100 years (Figure J.11), and well below our current estimate of between 9-10%.

Figure 14.12 The RBA's analysis of the MRP



Data source: RBA

216 Matthews, T., June 2019, *The Australian Equity Market over the Past Century*, RBA Bulletin article.

Broader macroeconomic trends support a low real rate of return

In March 2020, the RBA begun Quantitative Easing.[217] In particular, it is now purchasing Government bonds to target a yield on 3-year Australian Government bonds of 0.25%. This 'unconventional monetary policy' is aimed at reducing the cost of finance (the WACC) to stimulate economic activity and to manage inflation within the RBA's target. Additionally, the Federal Government's total support for the economy is about $260 billion, excluding the significant stimulus from State Governments.[218] This program should be expected to support inflation in the medium term.

217 RBA, March 2020, *Monetary Policy Decision*, Media Release
218 Treasury, *Economic Response to the Coronavirus.* Available at: https://treasury.gov.au/coronavirus, accessed 11 June 2020.

K Financeability test results

When setting prices, we consider the financial sustainability of the business resulting from our pricing decisions. To do this, we undertake a financeability test to assess how our price decisions are likely to affect the business's financial sustainability and ability to raise funds to manage its activities over the upcoming regulatory period.

This appendix summarises our approach and outcomes of our financeability assessment.

K.1 2018 Review of our financeability test

In 2018, we reviewed the financeability test we use as part of our price regulation process (2018 Financeability Review).[219] In this review, we decided to:

- Broaden the test by calculating financeability tests for both the benchmark and actual business
- Adjust the target ratios we use to assess financeability
- Clarify the process to identify any financeability concerns, and
- Tailor the remedy for a financeability concern based on its source.

To assess Sydney Water's financeability over the 2020 Determination, we analysed its forecast financial performance, financial position and cash flows for both the *benchmark*[220] and *actual*[221] business. We then forecast financial ratios for both tests and assessed Sydney Water's financial ratios compared to our target ratios. The three financial ratios we include in our financeability test, and the target ratios, are summarised in Table K.1.

Table J.1 Target ratios for the benchmark and actual test

Ratios	Benchmark test (real cost of debt)	Actual test (actual cost of debt)
Interest cover	>2.2x	>1.8x
Funds from operations (FFO) over debt	>7.0%	>6.0%
Gearing	<70%	<70%

219 IPART, *Review of our financeability test*, November 2018, p 1.

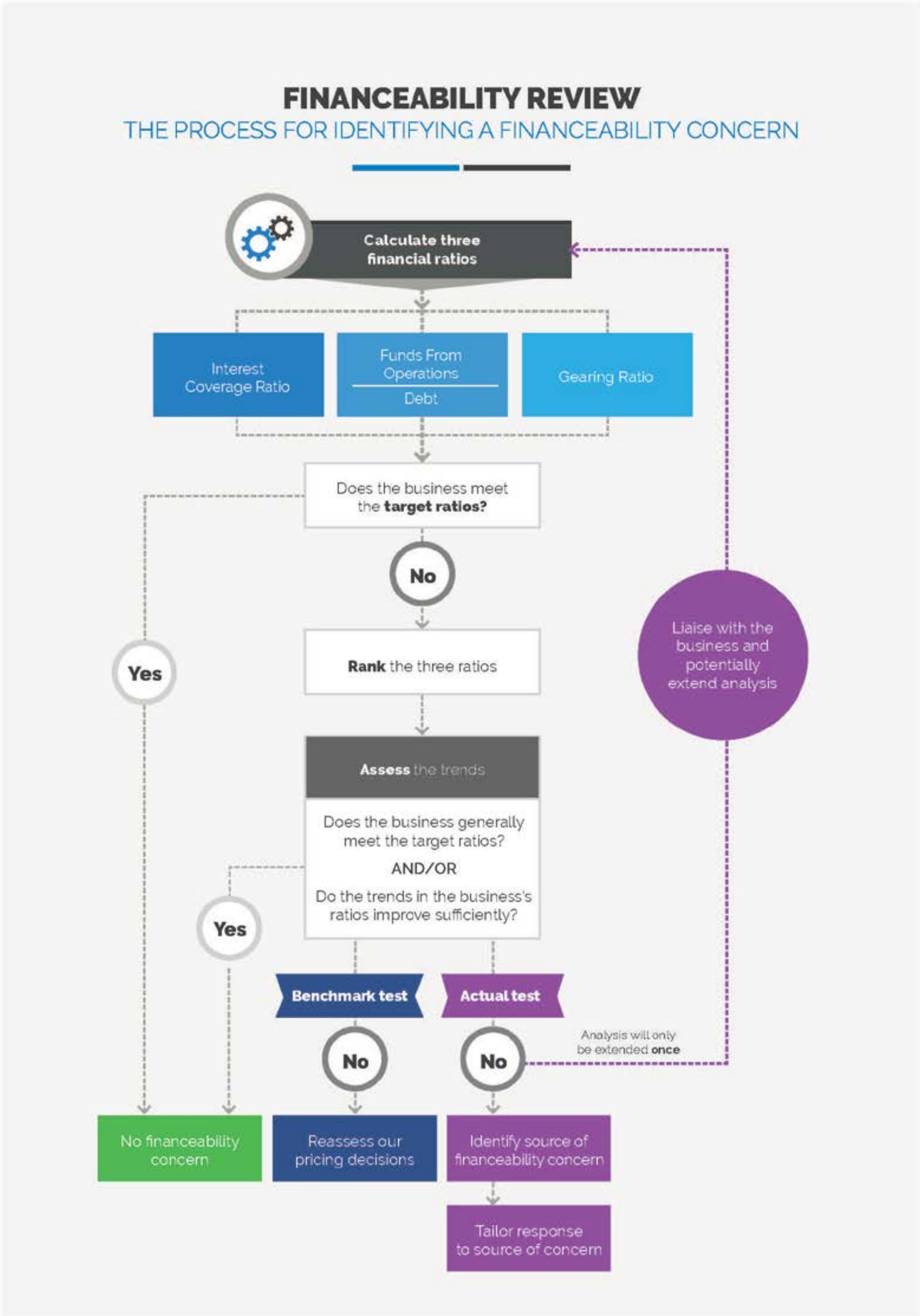
220 The benchmark test ensures our pricing decisions would allow an efficient investment grade rated business to raise finance and remain financeable during the regulatory period. Conducting the benchmark test on the benchmark business would identify any estimation and cash flow impacts arising from our building block approach. When we calculate our financial ratios for the benchmark business, we will use a real cost of debt.

221 The actual test assesses whether the actual business would be financeable during the regulatory period using the business's actual cost of debt. Conducting the test on an actual business would indicate whether the business might face a financeability concern.

K.2 How we assess a utility's financeability

In the 2018 Financeability Review, we outlined our process (see Figure K.1) for identifying a financeability concern.

Figure K.1 Our process for identifying a financeability concern



Source: IPART, *Review of our financeability test*, November 2018, p 57.

K.3 Financeability assessment

Step 1: Calculate our standard financial ratios

Table K.2 below shows our financeability analysis for Sydney Water. For the actual test, we used a cost of debt of 3.4%. We originally estimated Sydney Water's actual cost of debt as 4.9%, based on the financial data it provided to us in November 2019. However, we requested updated information on its cost of debt in May 2020 because rates have fallen since original submission date, and after considering this information, we now estimate Sydney Water's actual cost of debt at 3.4%.

This lower actual cost of debt also appears reasonable when compared to our nominal cost of debt assumed in the WACC.

Table J.22 Financeability test results based on our final prices

	Target ratios	2020-21	2022-23	2022-23	2023-24
Interest cover					
Benchmark test	>2.2	4.0	4.0	4.1	4.1
▼ Does it meet the target?		✓	✓	✓	✓
Actual test	>1.8	2.8	2.9	3.0	2.8
▼ Does it meet the target?		✓	✓	✓	✓
FFO over debt					
Benchmark test	>7.0%	6.6%	6.6%	6.7%	6.8%
▼ Does it meet the target?		✗	✗	✗	✗
Actual test	>6.0%	5.9%	5.9%	6.1%	6.0%
▼ Does it meet the target?		✗	✗	✓	✓
Gearing					
Benchmark test	<70%	60%	60%	60%	60%
▼ Does it meet the target?		✓	✓	✓	✓
Actual test	<70%	57%	57%	57%	57%
▼ Does it meet the target?		✓	✓	✓	✓

Source: IPART analysis

The benchmark test results show that Sydney Water is forecast to be slightly below the target for real FFO over Debt ratio. Given that it is forecast to not meet all target ratios for the benchmark test, below we step through Step 2 of the financeability test where we assess these ratios more closely.

Step 2: Analyse the trends in the financial ratios over the 2020 regulatory period

In the 2018 Financeability Review, we indicated that we would rank the three ratios to place more emphasis on the ICR and the FFO over Debt ratios, and place less emphasis on the Gearing ratio.[222] These two ratios are both measures of whether the business generates sufficient cash flows to remain financeable. Our view is that focusing on the cash flows of the business is very important in assessing financeability. Placing less emphasis on the Gearing ratio is also consistent with Moody's methodology to the extent that they place a lower weight on the Gearing ratio than cash flow ratios.[223]

The following sections analyse the trends for the ICR and FFO over Debt ratios in the benchmark and actual tests.

Benchmark test - Real interest cover ratio

Sydney Water is expected to **meet the target** for real interest cover ratio ICR (ICR) of 2.2x over the 2020 determination period. By consistently meeting the target, this indicates that it can comfortably meet its annual interest expense. Meeting interest expense is critical for any business.

In addition, Sydney Water is forecast to have **a minimum headroom of 1.8x** from the target real ICR. By having headroom, this indicates that it has relatively strong cash flows that can withstand a large financial shock (eg, increase in borrowing rates) before it is unable to meet its annual interest expense (or default on its debt obligations).

The **current low WACC environment** primarily contributes to this benchmark result. In our calculations, we use a real cost of debt of 2.2% (real, pre-tax), which is partially derived from current low borrowing interest rates.

Benchmark test – Real FFO over Debt

Sydney Water is forecast to be **slightly below target by 0.3 percentage points on average** and has an upward trend over the 2020 determination period.

For Sydney Water, the slight underperformance is **driven by lower returns on assets and that those assets have long asset lives and are mostly funded with debt**.

- The FFO[224] is primarily affected by the current low WACC rate environment. We note that the increase in the real WACC from 3.2% in the Draft Report[225] to 3.4% in the current approach[226] resulted in some improvement, but not enough to offset the other two factors discussed below.
- For Sydney Water, the record increase in capital expenditure that we have allowed places downward pressure on its financeability ratios (particularly for the actual test).

222 IPART, *Review of our financeability test*, November 2018, p 49.
223 IPART, *Review of our financeability test*, November 2018, p 49.
224 In our *Review of our financeability test*, November 2018, p 74, we defined FFO as:
FFO = NRR – Operating expenditure – Tax – Changes in Working Capital – Return on Debt (ie, RAB x cost of debt)
225 IPART, *Review of prices for Sydney Water from July 2020 – Draft Report*, March 2020, p 64
226 IPART, *Review of prices for Sydney Water from July 2020 – Final Report*, June 2020

- In addition, the utilities are investing in assets with long economic lives, which generally results in a lower depreciation allowance.
- The combined effect of these factors has put a slight downward pressure on the FFO over Debt ratio.

Whilst Sydney Water does not meet the targets in the short-term, this **does not necessarily mean that there is a medium-term financeability concern**.

Furthermore, the trend in the benchmark FFO over Debt ratio improves over the 2020 period towards the target ratio. In our 2018 Financeability Review, we emphasised that:

> If the trends [in the financial ratio] show a significant improvement, then we would assess that the business may not have a financeability concern.[227]

We note that the regulatory framework for these utilities allows them to refinance debt over the life of the asset. In particular, the trailing average cost of debt addresses refinancing risk. We consider it less important to fully repay debt within a timeframe that is shorter than the life of the assets, and therefore there is less of a concern for these utilities.

Actual test – ICR

Sydney Water is expected to **meet the target** for ICR of 1.8x over the 2020 determination period.

In addition, it is forecast to have **a minimum headroom of 1.0x** from the target over the 2020 determination period. In comparison to the benchmark test results, the headroom for the actual test is smaller because the actual cost of debt is higher than the real cost of debt of 2.2%.

Actual test – FFO over Debt

Sydney Water is forecast to meet the target on average over the 2020 determination period.

It is forecast to be 6% (on target) on average with an upward trend over the 2020 determination period.

Step 3: Conclusion

Overall, we did not identify a financeability concern for Sydney Water that needs to be addressed in this review. It is our view that it can remain financially sustainable and continue to provide sustainable services over the determination period.

Below we outline a range of other factors that support Sydney Water's financeability over the 2020 Determination Period.

227 IPART, *Final Report: Review of our financeability test*, November 2018, p 59.

Regulatory mechanisms that moderate financial risks to Sydney Water

We have put in place a number of regulatory mechanisms that reduce financial risks to Sydney Water. These include:

- A demand volatility adjustment mechanism for Sydney Water, which addresses the risk of errors in water sales forecasts (which firms operating in a competitive market would not enjoy).
- Dynamic water usage pricing for all three utilities, which reduces both cost and revenue risks related to drought conditions. Importantly, this is a new pricing mechanism that addresses the risks of future climate conditions, and is not considered within the standard financeability ratios developed by the credit ratings agencies.
- The trailing average cost of debt approach, which addresses refinancing risk.
- A range of operating cost pass-throughs (such as SDP and Shoalhaven Transfer Scheme pass-throughs), which directly and fully pass-through cost changes to customers (in a competitive market, these might only be reflected in prices over the longer term).

These mechanisms materially reduce downside revenue and cost risks for the utilities. Not all other regulators apply these mechanisms, so they are not fully embedded in the benchmark financial ratios of credit ratings agencies. Importantly, we have introduced dynamic usage prices in the current water reviews, and this decision was not reflected in our current target financeability ratios (which were included in our 2018 Financeability Policy).[228]

Further, these mechanisms are significant and reduce the idiosyncratic risk of the utilities – and we argue would be applied irrespective of the ownership structure of the water utility. In our view, these mechanisms, along with the stability of our regulatory regime in general, should provide the water utilities some room to be below the target financeability ratios that we, and the ratings agencies, have set, and still be financeable.

Transparent and predictable regulatory framework results in revenue predictability

We have followed the well-established principles of the building block framework when reviewing and setting Sydney Water's prices and revenue allowances over the 2020 determination period. The visibility of future cash flows generated by the regulatory framework provides Sydney Water with an opportunity to implement counter measures to protect its credit risk profiles. These counter measures could include finding efficiency savings, re-profiling expenditure, seeking equity injections or using retained earnings and/or dividends to pay down debt.

The significant headroom in ICR offsets the slightly low FFO over Debt

Under the benchmark test, Sydney Water is forecast to have real interest coverage ratios (ICR) well above target ie, an average of 4.0x compared to a target of 2.2x over the 2020 determination period. This indicates that Sydney Water could still comfortably meet its interest payments, even if interest rates increase significantly over the determination period, under our benchmark assumptions.

228 IPART, *Review of our financeability test*, November 2018, p 50.

FFO over Debt measures how much free cash a business generates (ie, after covering its operating costs, interest expense and tax) relative to the size of its total borrowings. For the benchmark test, the target of real FFO over Debt ratio is 7% (less than 7% is considered below target). Sydney Water is forecast to have an average FFO over Debt of 6.7%, which is marginally below the target.

We do not consider that Sydney Water's FFO over Debt ratios represent a financeability concern for the 2020 determination period, as the ICR ratios indicate that it will have cash flows that more than cover its annual interest payments and for the other reasons listed above.

L Stakeholder views on water usage prices

We received several submissions about water usage prices in response to our Draft Report, some of which expressed concerns about our drought pricing or dynamic usage pricing mechanism. In this appendix we summarise and address some of these concerns.

While there is strong agreement that the current pricing method needs updating, some submissions supported an Inclining Block Tariff (IBT) over our dynamic water usage price. The Public Interest Advocacy Centre (PIAC), and Cate Faehrmann, a NSW Greens MP, preferred an IBT over a dynamic price.[229] Although stakeholders support IBT for a number of reasons, broadly speaking this is because IBT sends a permanent signal, not just during drought, about the cost of water and the benefits of water saving. We have looked at this issue very carefully and have responded to the specific concerns of each stakeholder's submission below.

We also received one submission arguing for a combined water and wastewater tariff based on a customer's local government area (see Box L.1).

Our view remains that our dynamic pricing approach is preferable. This is because it doesn't penalise large users of water who may be low income earners yet it still sends price signals when water is scarce. Customers who wish to conserve water at all times (even when dams are full) can still do so and will save more money than before. Even outside of drought, the water usage price remains higher than before while the fixed charge (water service charge) has been reduced.

PIAC argues that an IBT is more equitable than dynamic pricing

PIAC argues that an IBT is more appropriate for a number of reasons (presented in the table below).

Table 14.3 IPART response to PIAC's arguments for an IBT

PIAC argument for IBT[230]	IPART response
More clearly aligns water pricing structures with business and community expectations that there be price signals related to higher water use that encourage and support conservation expectations.	We have not seen evidence that a dynamic price is any less aligned with community expectations.
It responds to customer preferences that pricing be weighted towards volumetric usage charges and improves a household's ability to reduce its bills by managing flexible or discretionary, rather than essential usage.	Our dynamic pricing approach increases the water usage price relative to the fixed service charge and so achieves this objective.

229 These submissions are available on the IPART website: https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Metro-Pricing/Prices-for-Sydney-Water-Corporation-from-1-July-2020?qDh=2

230 Public Interest Advocacy Centre submission to IPART Draft Report, 27 April 2020, pp 6-7.

PIAC argument for IBT[230]	IPART response
It recognises that at higher levels of usage, units of water: ▼ have a higher cost to the community, related to the increasing impact of usage on finite water resources particularly during periods of scarcity, and ▼ contribute disproportionately to the need for expansion and operation of desalination, which is a higher cost means of providing water.	We agree that water becomes more valuable during times of scarcity, hence the dynamic price tied to water supply levels. However, at any given dam level, a single water usage price provides the appropriate opportunity cost of consuming an extra unit of water (including the extent to which additional water consumption imposes a cost on society by 'bringing forward' the need for capital investment). We set prices with reference to the system cost of delivering water, as opposed to assigning water an intrinsic value that changes with availability.
It creates a simple, transparent framework that can incorporate long and short-term cost and supply signals into a signal that households can understand. This flexibility is crucial given the uncertainty of climate change impacts combined with population growth.	We do not agree that an IBT is simpler than the dynamic price we have designed. In each case there are two possible prices for water, and circumstances determine which price is appropriate. The problem with an IBT is that we cannot set two prices for water at the same time without making at least one of those prices inefficient. We also cannot simply design an IBT for non-residential users without opening up opportunities for arbitrage.
It recognises scarcity is a long-term issue that needs to be signalled on a permanent basis not just during the incidence of extreme conditions. Short term scarcity pricing is considered punitive by water users, and has limited impact as it provides signals at a time when there is little scope for reduced demand to have a material impact. Once storages are depleted, only expensive 'supply augmentations' can be employed, at a time where implementation is at its most expensive.	We set the water usage price with reference to the long run marginal cost of water supply (LRMC). If calculated correctly, the LRMC will signal the costs of supply meeting demand over the long-term. We recognise, however, that estimating LRMC is inherently uncertain and imperfect – which is one of the reasons we are erring on the 'higher usage price side' and adding costs incurred during drought to the water usage price. We can see merit in the suggestion that 'drought' costs could be averaged and recovered in all periods. Overall, we consider an uplift that is only recovered during drought has the key advantages: ▼ It is more responsive to climate change. If climate is drier and dam levels fall, the true long-run cost of water is closer to the drought price as more investments will be needed to secure future water supply. ▼ It openly acknowledges that we cannot predict how often we will be in drought, and avoids the risk of structurally over- or under- pricing water if these costs are averaged based on historical information. ▼ It promotes efficient revenue recovery. Our drought price recovers efficient costs from customers as they are incurred. ▼ It provides a more targeted signal to customers. Sending a stronger price signal to customers, in periods of relative scarcity, is appropriate.

PIAC argument for IBT[230]	IPART response
It can be better integrated with waste and recycled water services pricing so as to better enable their efficient implementation. This is crucial as currently wastewater re-use and recycled water schemes are often not able to demonstrate an economic case.	PIAC has not made clear how this would work, but as outlined below, we believe our dynamic price promotes, and can be easily integrated with, recycled water.
It better allocates the burden of risks and costs among parties.	PIAC argues a dynamic price results in households carrying most of the risks and costs of scarcity, rather than Sydney Water, but does not explain how. We do not agree that risks have been unfairly allocated, as explained below.
It creates less bill volatility for households.	An IBT would provide more bill certainty in that households know their allocated water allowance, and the point that prices jump. However, our modelling shows that there will not be much volatility in bills because we will not often flip between drought and non-drought periods. Further, any drought significant enough to warrant the change in price would have been well advertised, and households would be unlikely to be taken by surprise.
It provides an incentive to conserve water in the long term.	Our dynamic price provides a more appropriate incentive to conserve water when in drought. It doesn't apply when dams are full and water is plentiful. However, the design of our dynamic pricing means customers which save water even outside of drought receive a reduction in their bill. This is because we have increased the base usage price that applies outside of drought and decreased the fixed charge or service charge.
It is more equitable than a dynamic price which operates regressively. An IBT ensures that discretionary use is priced higher than essential use.	Our evidence shows that the number of people in a household is the main driver of water use, as opposed to household wealth or anything else. An IBT would penalise larger households which may in fact have lower incomes. Further, we do not think it is appropriate that we make value judgements on what water is 'essential' and what is 'discretionary' when the product (water) and cost to the system is identical regardless of the end use.

EWON is more concerned with the bill impacts of the new regime for vulnerable customers

EWON identified that pensioners, renters, and large households could be disadvantaged and rebates are only available to pensioners. For instance, some renters will see an increase in their bills given the reweighting from fixed to variable charges.[231] That is, renters who are individually metered, and where the landlord is allowed to pass these costs to the tenant (eg, if the property has dual flush toilets). Theoretically, this should correct itself in the long term as the rental market adjusts to changes in costs. Regardless, we consider that the change will not make bills unaffordable, given that water bills make up a very small portion of household expenditure (particularly in Sydney where rents are high).

231 Energy & Water Ombudsman NSW submission to IPART Draft Report, March 2020, p 2.

EWON notes that when an IBT was in place in 2004, a rebate was available to large families and considers that this rebate should be brought back, given that large families have higher non-discretionary water use, and are less able to cut down when prices are high.[232] Further, it argues that the pensioner rebate should be extended to Health Care Card holders (as is currently the case in the energy space).[233] We can see merit in this proposal, however, IPART is not responsible for setting rebates and subsidies.

The Greens consider an IBT encourages water conservation

Ms Faehrmann does not mention equity, but rather favours an IBT because of the longer term price signal it sends to conserve water in all circumstances.[234] We note this, but we are providing a stronger incentive to conserve water when it is most needed, and setting a price based on the long-run cost of providing water in non-drought periods. However, the design of our dynamic pricing means customers who conserve water at all times (even outside of drought) will receive a reduction in their bill. It provides a stronger incentive for all users all of the time, with an additional incentive during drought. This is because we have increased the base usage price that applies outside of drought and decreased the fixed charge or service charge.

The NSW Government is concerned about the impacts of dynamic prices

The NSW Government did not discuss implementing an IBT, however it raised some concerns with our proposed dynamic pricing approach.

Firstly, it considered increases in water bills under drought prices (compared to average weather prices) will represent a higher proportion of the income of low-income households compared with higher income households.[235]

This may be true, however, it overlooks the need to recover Sydney Water's additional drought costs. Also, when assessing the impact on bills, we expect that customers would lower their consumption in response to restrictions. The alternative to higher usage prices (which somewhat skew costs towards larger and higher income households) is to increase fixed service charges, which would also be regressive and would not provide a reward to customers who reduce their water usage in drought.

Secondly, the Government argues increasing prices during drought may not have the intended outcome when combined with restrictions and conservation programs. Customers will not see a proportionate decrease in bills compared to their reduction in water use under restrictions. Customers are likely to expect a benefit proportional to the cost imposed.[236]

We have in part already addressed this concern by assuming a lower price elasticity of demand when determining the impact of drought prices on already restricted demand. We argue the increased price also provides a stronger incentive to save water, and that customers can understand the increased scarcity value of water during drought periods.

232 Energy & Water Ombudsman NSW submission to IPART Draft Report, March 2020, p 3.
233 ibid p 4.
234 Cate Faehrman MLC submission to IPART Draft Report, 5 May 2020, pp 3-4.
235 NSW Government submission to IPART Draft Report, 11 May 2020, p 4.
236 ibid p 4.

Overall, we consider our dynamic pricing **complements** water restrictions and water conservation program and aids the compliance message especially when conservation methods cannot easily be enforced.

Box L.1 Combined water and wastewater pricing

In response to our issues paper, Professor Peter Coombes and Michael Smit submitted a novel approach to water usage pricing in Sydney. They proposed eliminating water and wastewater service charges and instead charging customers a combined water and wastewater usage charge based on geographical location (i.e. local government area).

Their model is based on the assumption that costs to supply water to customers in eastern Sydney are higher than western Sydney, while it is cheaper to treat wastewater in eastern Sydney than western Sydney. As a result, total costs should level out across the city, creating a combined price between $5/kL and $6/kL, depending on council area.

This approach provides a very strong price signal for water usage. However, we have some concerns with this approach.

- The NSW government's postage stamp pricing policy prohibits locational pricing.
- Our analysis indicates the marginal costs of wastewater services are highly localised by catchment and cannot be generalised on an east/west divide.
- It would not be a practical approach for non-residential customers, or high use residential customers with diverse water and wastewater usage characteristics.
- A customer with high water usage may not have high sewerage discharge, especially for large non-residential customers. For example a plant nursery in western Sydney with high water usage but low wastewater usage would be paying an artificially high price for water to pay for an assumed wastewater service it does not need.
- The price does not allow customers to respond to different marginal price signals for water and wastewater augmentations.

Source: Peter Coombes and Michael Smit submission to IPART Issues Paper, February 2020.

We still consider our dynamic pricing is a better approach

Our drought prices are affordable and represent a $3 per week increase for a typical household

As outlined in Chapter 7, water prices – even in drought – benchmark favourably to other water utilities across Australia.

For a typical household consuming 200kL/year, the $0.83/kL uplift in the water usage price would add $3 per week to a water bill compared to non-drought periods – assuming that this household makes no reduction to their water consumption.

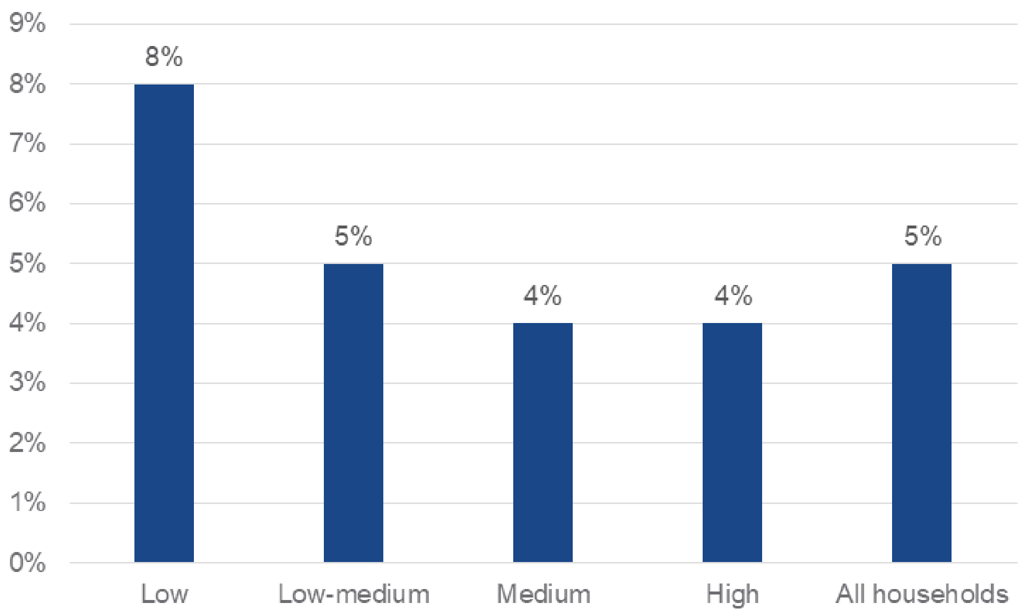
Even for the subset of renters who pay for water usage – compared to the value of rent – this price increase is not large.

An IBT is not equitable to large households

We used the 2015 IPART household survey to analyse the relationship between income and water consumption. The survey contains information on over 2,000 Sydney households' annual water consumption, and divides these households' income into one of four income brackets (low income, low-medium, medium and high income).

Our analysis shows that while there is a relationship between household income and water consumption, there is also a relationship between household income and number of people in a household (in that higher income households also tend to have more people). When this is accounted for (by taking a per capita view of water consumption), there is very little relationship between income and water use (Figure M.1).

Figure M.1 Proportion of households in 'high per capita water consumption' bracket, by household income

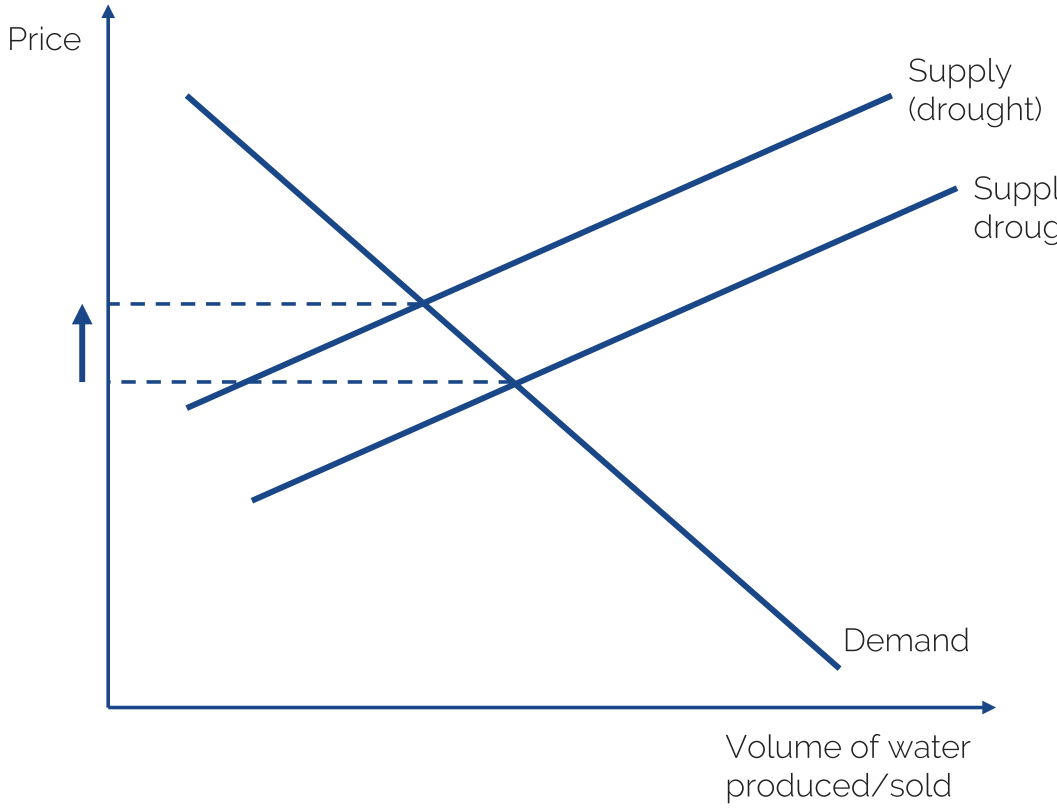


Data source: IPART 2015 Household Survey analysis

As IBTs are generally set on a per household basis rather than a per capita basis, the differential prices would be unlikely to accurately target discretionary and non-discretionary uses, respectively. Larger low-income households would incur a higher charge to meet their basic water needs, with smaller high-income households paying a lower charge to meet their discretionary needs. Therefore, an IBT could result in socially inequitable outcomes because large, low income households would not be protected from high prices, while small, high income households would be.

A drier climate would mean higher costs of providing water in the short- and long-term

Our approach acknowledges that the costs of providing water is asymmetric – that is, the cost of supplying water is structurally higher in periods of drought, than it is in other periods. And that if Sydney is moving towards a more variable and/or drier climate, these costs will persist over the long-term.



However, this does not mean Sydney Water does not bear risk. Instead, within periods of ‘drought’ and ‘non-drought’ Sydney Water – rather than the customer – is bearing cost risk. For example, in a severe drought, the costs of maintenance, particularly for the wastewater system, could be higher than under our drought pricing.

We consider that Sydney Water is best placed to manage drought within its system, and plan for the future, and in our framework it is still encouraged to do so. Under its proposal, too many of the drought costs were directly passed-through to customers, reducing the incentive for Sydney Water to manage these costs. Our dynamic pricing approach provides a broad envelope of funding within drought, and provides a better incentive for Sydney Water to operate efficiently within drought to the long-term benefit of consumers.

However, we consider it appropriate – and efficient – for customers to face a signal that reflects the fact that costs are structurally different in drought and non-drought, and the difference in climate conditions cannot be managed away by the utilities.

Our pricing balances risks between all customers and the utilities

PIAC has argued that "[i]n not providing enduring signals, but simply passing through costs of scarcity unmitigated, it leaves all of the risk with consumers who have limited ability to manage the scarcity risks."[237]

Firstly, as shown above, our framework encourages Sydney Water to pursue efficiencies in responding to drought, when compared to a simple cost pass-through framework.

Secondly, and importantly, all customers and businesses have an important role to play in managing scarcity risks. A dynamic price encourages customers to respond more in the short-run, while supporting long-term decisions in the face of an uncertain climate:

- Many water consumption decisions can be made in the short-run, and can result in non-trivial changes in water consumption. For example, the crops or plants that a family decides to plant in a garden can be made at a 3-6 month horizon, and decisions to conserve additional water in periods of scarcity such as taking shorter showers or re-using greywater in the garden can be made dynamically.
- Provided it is understood by customers, a dynamic water usage price encourages efficient long-term pricing decisions in the face of uncertainty. Consumers can weigh up the risk of higher prices and reduced supply certainty in drought when comparing different investments (eg, comparing a simple garden hose to a smart irrigation system). There is an important role for Sydney Water and IPART to play in communicating this price structure change to customers.
- It is difficult to develop an appropriate IBT for non-residential customers given the variability in water usage and needs. If not applying the IBT to non-residential customers, the signalling effect therefore doesn't apply to some of the biggest water users. Comparatively, the dynamic price applies to all customers and all usage.

LRMC signals the opportunity cost that 'discretionary' water usage imposes on 'essential' water usage

PIAC has argued that the underlying 'value' of water is not priced within our framework[238], and implied more broadly that the marginal social cost of providing water is higher than a simple LRMC calculation.

We do not debate these points, rather, we emphasise that they do not support an IBT.

To the extent there are marginal social costs – or benefits – that are quantifiable, we will strive to incorporate them into an efficient water usage price (for potable water, or for alternatives like recycled water).

237 Public Interest Advocacy Centre submission to IPART Draft Report, 27 April 2020, p 4.
238 Public Interest Advocacy Centre submission to IPART Draft Report, 27 April 2020, p 4.

However – if estimated accurately – LRMC-based prices combined with the building block approach:

- Provide the correct signal to customers and businesses about the cost their additional usage places on society.
- Ensure that these costs are allocated equitably among customers.

The PIAC submission implies that if everyone consumes less water, then water will be cheaper for everyone, and therefore that larger users of water are imposing a cost on lower consumers of water.

However, the water usage price recovers the additional short-run operating costs, and long-term capital costs to expand supply, generated by an additional unit of water. And therefore, the water usage price provides the appropriate 'penalty' – or opportunity cost – imposed on society of an additional unit of water consumption.

The building block framework then ensures that customers only pay for the total efficient costs of supplying water at a point in time. Large consumers of water pay more than small users of water, by virtue of the water usage price, with the water usage charge reflecting the additional long-term cost pressures they place on the supply system.

The remaining costs of providing water – which are currently quite small – are recovered through fixed charges based loosely on the 'size' of the property.

Our pricing promotes, and would respond to, future recycled water schemes

PIAC has suggested that an IBT is better suited to encouraging recycled water. We disagree.

Sending the right signals for recycled water is important, but we should consider all the potential uses of recycled water. Other countries such as the USA and Singapore safely recycle and treat water so that it can be put back into the dams and storages and then further treated, so it is of equal or better quality to traditional water supply. Exploring these options makes sense going forward. It will give us more options for increasing water supply, and saves us the cost of running two sets of pipes to every house. An IBT, where essential use is priced very low, would discourage exploring recycled water as a potential alternative.

If recycled water is used as a substitute for potable water, then dynamic pricing can provide a stronger incentive to adopt water recycling. To the extent that the cost of providing recycled water is more stable in periods of drought – and is a more stable source of supply – compared to potable water, our dynamic pricing encourages risk-averse households and businesses to adopt recycling. The incentive to take up recycling becomes stronger in prolonged periods of drought.

If recycled water is integrated into the drinking water system, then its impacts on the cost of supplying water in drought would be captured by our drought usage price – as it would influence the likelihood of the drought price being applied, and the extent of additional costs for the utility to respond to drought as we respond to updated information.

M Dynamic water usage pricing triggers

Since our Draft Report we have refined the triggers for when to start and finish drought pricing periods. We decided on a "rolling" trigger where the drought water usage price will apply from 31 days after water storage levels fall below 60%. Drought pricing will end 31 days after water storage levels exceed 70%. We preferred this trigger design because:

- It provides Sydney Water time to adjust its billing system and advertise price changes,
- It better aligns the drought pricing period to dam level changes, and
- It better aligns with the trigger for SDP to begin production.[239]

We evaluated several alternative triggers, which are described in Table M.1 below. We originally proposed basing the trigger on quarterly reports of dam storage levels.[240] Sydney Water considered this would be too difficult to implement in its billing system and would not provide adequate time to advertise the change.[241] We didn't receive any other submissions on the design of the triggers.

We also simulated how prices would have interacted if applied to historical dam storage data. We present these simulations below.

239 Under its operating licence, SDP enters start up mode when dam levels go below 60%.
240 See Chapter 6 of our Draft Report.
241 Sydney Water submission to IPART Draft Report, 27 April 2020, pp 72-3.

Table 14.4 Possible drought triggers

Trigger option	Design	Pros	Cons
1. **Quarterly trigger (Original IPART proposal)**	The price applied is based on dam levels in the last week of the previous quarter. For example, if dam levels were 59% in the last week of March, drought prices would be in place from 1 April. Then, if dam levels were above 70% in the last week of June, the non-drought price would apply from 1 July; if not the drought price would remain in place.	Prices are closely related to dam levels. Trigger is easy to understand.	Hard to implement and may not provide warning to customers of price changes.
2. **Lagged quarterly trigger without a fixed calculation date (Sydney Water preferred)**	If dam levels fall below 60% or rise above 70% **at any point during** first the two months of a quarter (or the final month of the previous quarter) the change would apply in the next quarter. The trigger could only be calculated once, so for example if dam levels went below 60% and then above 60% in the same month the drought price would still apply in the next quarter.	Can be easily implemented and well-advertised. Aligns with quarterly demand forecasts for calculating the DVAM.	Creates a potential mis-match between drought conditions and the recovery of revenue. Creates the possibility of conditions suddenly changing between the trigger and the implementation of a new price, especially if the trigger is activated early in the quarter.
3. **Rolling 1 month lagged trigger (recommended)**	Prices will change dynamically at any time the dam level trigger is activated, at a one month lag. For example if the trigger is activated on 15 April the price would change on 15 May.	Very closely relates prices to dam levels. Minimises the impact of sudden changes in dam levels to only one month rather than three.	Potential to create price volatility (though we believe this would be unlikely and would be smoothed by the quarterly billing cycle). Could be difficult to advertise and provides a less effective short-term price signal. However, our historical analysis indicates most drought pricing events last at least three months, so over the long term, the timing effects of these triggers should be similar.
4. **Lagged quarterly trigger with fixed calculation date**	The price that is applied is based on dam levels at the end of the second month of the previous quarter. For example, the price of 1 July is determined by the dam level on 31 May.	Fairly closely relates dam levels with prices. Easily implementable. Easy to understand and advertise.	Creates a risk of implementing an incorrect price if large rainfall events occur in the last month of a quarter.

Our historical analysis indicates all triggers would have similar pricing impacts over the long-term

Our simulation using historical data indicated there would be minimal difference between the triggers over the long-term, in terms of the total duration of drought pricing periods (36% of the time over a 28 year period for all four triggers). Differences between the triggers tended to occur at the start and end of drought pricing periods based on the timing of rainfall events. Typically, the rolling approach was slightly better at tracking dam levels.

Option 4 could provide a simpler and more effective short-term price signal

Under option 4, drought prices would be in place for a minimum of three months, and would likely remain in place for a short period after dam levels returned to above 70%. This provides customers with a fixed window in which they would need to adjust usage behaviour to minimise costs.

Many of Sydney Water's drought additional costs, especially water conservation projects, cannot be scaled down immediately if the drought period proves to be short lived, which could leave Sydney Water exposed to short-term opex shortfalls under a rolling trigger. Although this may also encourage Sydney Water to scale and target its response to drought efficiently and proportionately.

Option 3 reduces the risk of perverse pricing outcomes and is more responsive in borderline scenarios

Our greatest concern with option 4 is the risk of heavy rainfall bringing an end to the drought between the trigger date and the implementation of the drought price (the extreme version of the scenario would see customers paying a drought price while dams are spilling). The rolling trigger in option 3 doesn't eliminate this risk, however it ensures that undesirable drought pricing periods are limited.

Although our historical analysis indicates that all triggers will have roughly equivalent long-term pricing impacts, we noted option 3 was generally more reactive to changes in dam levels. It generally turned on marginally faster in response to slowly falling dam levels and turned off soon in response to sudden rainfall events. This meant it was marginally better at aligning the drought pricing window with actual dam levels.

Option 3 also aligns the drought pricing trigger with the current trigger for restarting SDP under its operating licence.

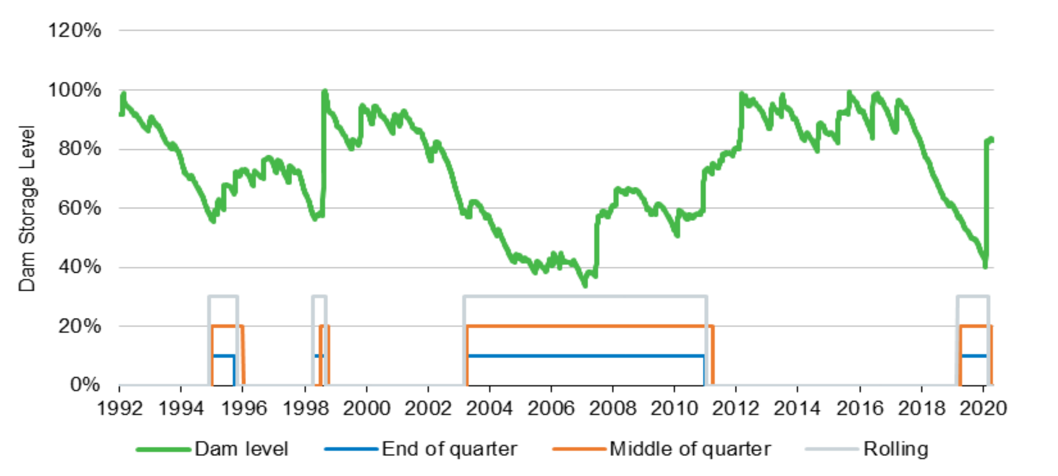
Historical data supports the choice of the rolling monthly trigger

In order to understand the potential impacts of different triggers, we simulated how dynamic pricing would operate if applied in historical drought periods. Based on this analysis, we concluded the rolling monthly trigger appears to be more responsive to drought.

In order to understand the potential impacts of different triggers, we simulated how dynamic pricing would operate if applied in historical drought periods. We used water storage data from 1992 to 2020 (the green line in Figure 1), which included four periods where dam levels were below 60% including two severe droughts (the Millennium Drought and the 2017-2020 drought).

We analysed three possible triggers: our original "end of quarter" trigger (option 1), a rolling daily trigger with a one month lag (option 3) and a lagged "middle of quarter" trigger (option 4). As shown in Figure M.1, the three triggers performed broadly the same over the simulation period, leading to broadly similar lengths of drought pricing periods.

Figure 14.2 Application of drought pricing triggers to historical water storage data



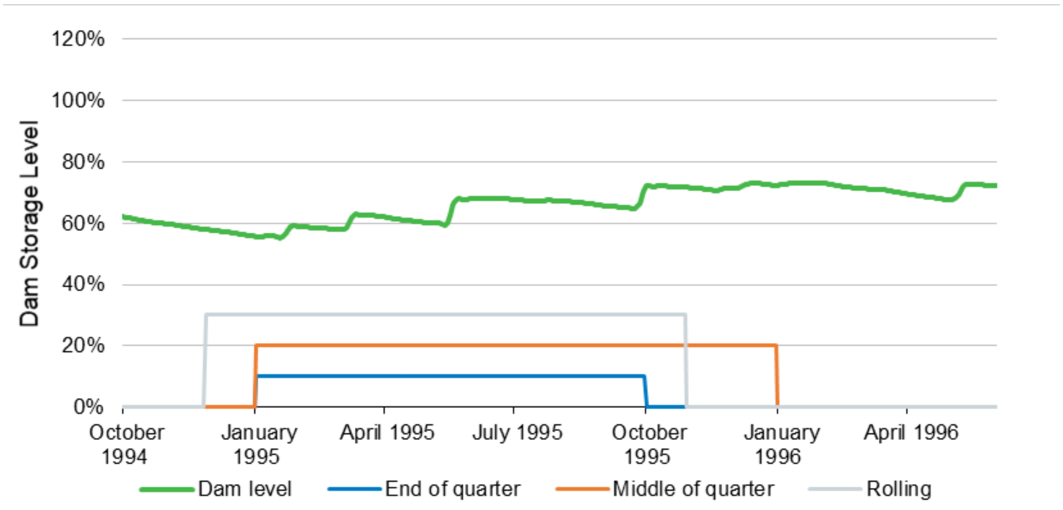
Note: The blue, orange and grey lines at the bottom of the graph show the "windows" where the drought price would be in effect under the three different triggers.

In the mild drought of 1994-96 (Figure M.2a), where dam levels were briefly below 60% and then slowly rose over several months, all three triggers performed similarly, with drought pricing starting around the same time and remaining in place for between 9 and 12 months.

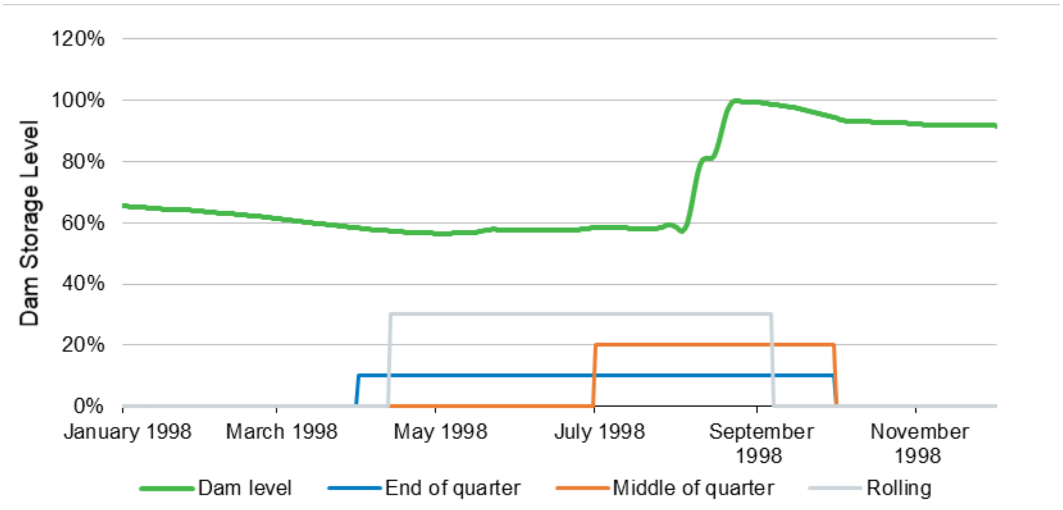
During another short dry period in 1998 (Figure M.2b), the "middle of the quarter" trigger produced a drought pricing window that was three months shorter compared to other options, because of the timing of the trigger date.

Figure 14.3 Performance of drought pricing triggers applied to the 1994-96 and 1998 dry periods

a



b

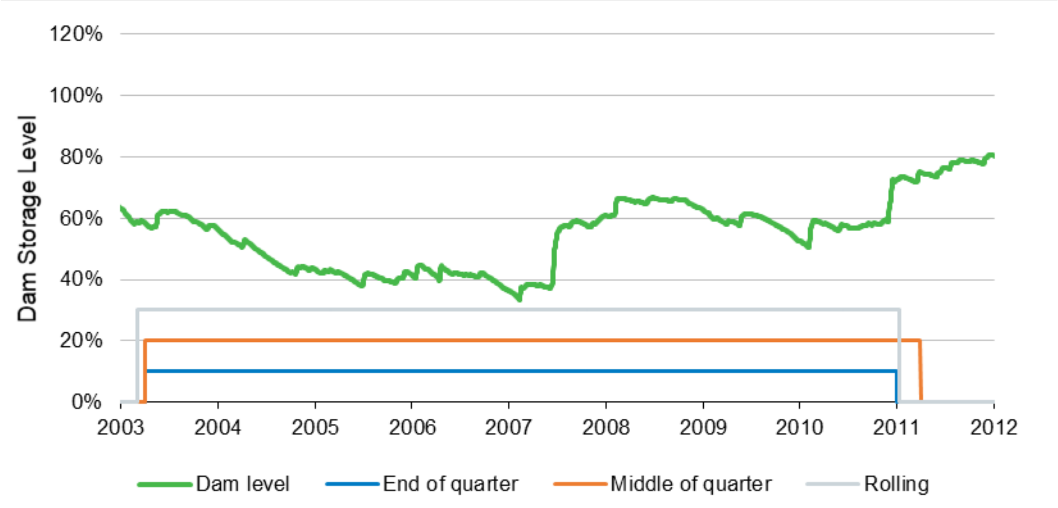


During the Millennium Drought (Figure M.3a), all three triggers would have performed similarly. The rolling trigger was activated around a month earlier than the other triggers. The "middle of quarter" trigger would have extended drought prices for one quarter longer, as it "missed" a large rainfall event in December 2010, which would have been after the trigger date for Q1 2011.

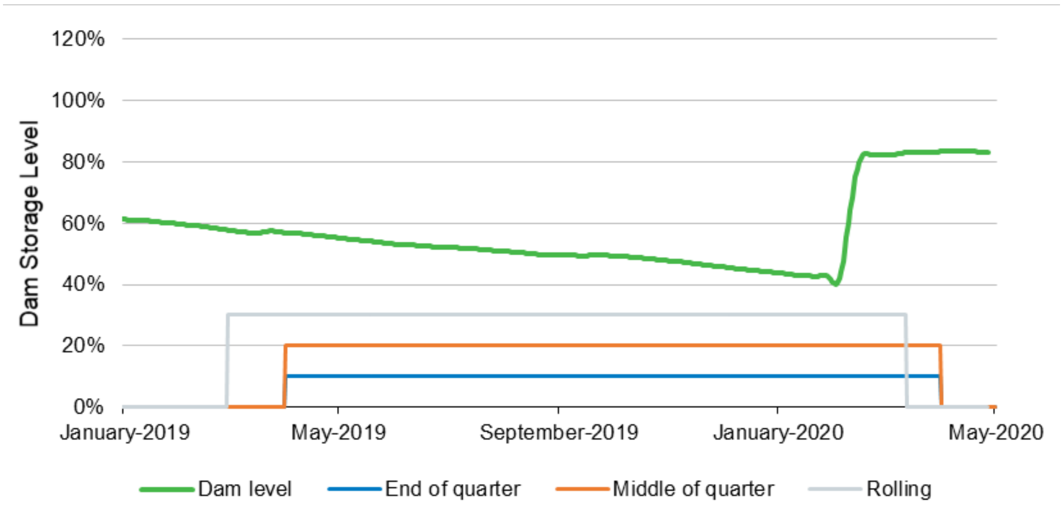
During the most recent drought (Figure M.3b), dam levels dropped very quickly over the course of 2018 and 2019 and then recovered very suddenly in February 2020. Here again the rolling trigger would have introduced drought prices around a month sooner and ended prices around half a month sooner than the other triggers.

Figure 14.4 Performance of drought pricing triggers applied to the Millennium drought and 2017-2020 drought

a



b



N Water sales forecasts

In this appendix we present more information on our water sales forecasts, Sydney Water's forecasting model, and how we estimated the elasticity of demand under drought, and non-drought conditions.

N.1 Our base water sales scenario is based on Sydney Water's forecasts

Sydney Water forecasted future water sales using an econometric model originally developed in 2011 and updated for the 2016 and 2020 price reviews. As outlined in the following section, Sydney Water predicts water sales to increase by 1.0% between 2019-20 and 2020-21 and then to grow by 1.2% a year on average between 2020-21 and 2023-24.

Our expenditure review consultants, Atkins/Cardno (Atkins), also reviewed Sydney Water's demand forecasts, and recommended accepting its forecasts, assuming no change in the water usage price. They found that – as a baseline projection – Sydney Water's residential demand forecasts are robust and well-evidenced. They identified that Sydney Water's non-residential demand forecasts were not as sophisticated, and recommended:

- Accepting Sydney Water's forecasts for the 2020 determination period, in the absence of better information, and
- That Sydney Water should work to develop better estimates for the next determination.[242]

We agree with Atkins recommendations, and have accordingly based our water sales forecasts on Sydney Water's forecasts.

However, given Sydney Water's modelling assumed the water usage price would remain constant in real terms, we applied an elasticity adjustment to Sydney Water's water sales forecast to account for the increase in the base usage charge from $2.11/kL to $2.30/kL (in $2019-20 terms). This elasticity adjustment is based on Sydney Water's estimates, and is discussed in more detail below. The elasticity adjustment reduces water sales by about 1.7% per year.

242 Atkins/Cardno, *Sydney Water Corporation Expenditure and Demand Forecast Review*, Final Report, 5 February 2020, p 92.

Table 15.14 Non-Drought water sales forecast for the 2020 determination period (ML/year)

	2019-20	2020-21	2021-22	2022-23	2023-24
Sydney Water	511,644	516,984	523,758	530,148	538,141
Atkins		517,568	524,342	530,732	538,727
Less elasticity adjustment		-7,999	-8,401	-8,491	-8,609
IPART base demand forecast		509,569	515,941	522,241	530,118

Source: Atkins/Cardno, *Sydney Water Corporation Expenditure and Demand Forecast Review*, Final Report, 5 February 2020; IPART analysis.

Sydney Water's water demand forecasting method has three parts:

1. Historical information is used to determine what factors influence water consumption. To do this, Sydney Water divided its customer base into 34 segments based on factors such as dwelling or business type, lot size and whether the property was built under the BASIX system.
2. An econometric model is estimated for each segment based on historical customer usage. The parameters of this model quantify the impact on demand of the factors that influence water consumption within each group, such as price elasticity, weather and seasonality.
3. Forecasting demand in the 2020 period by applying the forecast growth in customer numbers in each customer segment, climate projections, and estimates of system water losses and price elasticity, to the parameters estimated in the econometric model.

The model was tested using "hind casting"— forecasting demand over the 2016 period with historical inputs and comparing the output to actual water sales. The model was able to estimate historical demand over the 2016 period to within 1%.

Sydney Water's forecasts assumed long-term average rainfall

Rainfall can have a significant impact on water sales. Customer demand tends to be lower in wet years, or if water restrictions are in place.

Sydney Water's water sales forecast assumed long-run average rainfall (ie, no water restrictions) over the 2020 determination period. It considered this was a reasonable assumption, despite ongoing drought conditions at the time, because it was not possible to accurately predict climatic conditions over a four year period.

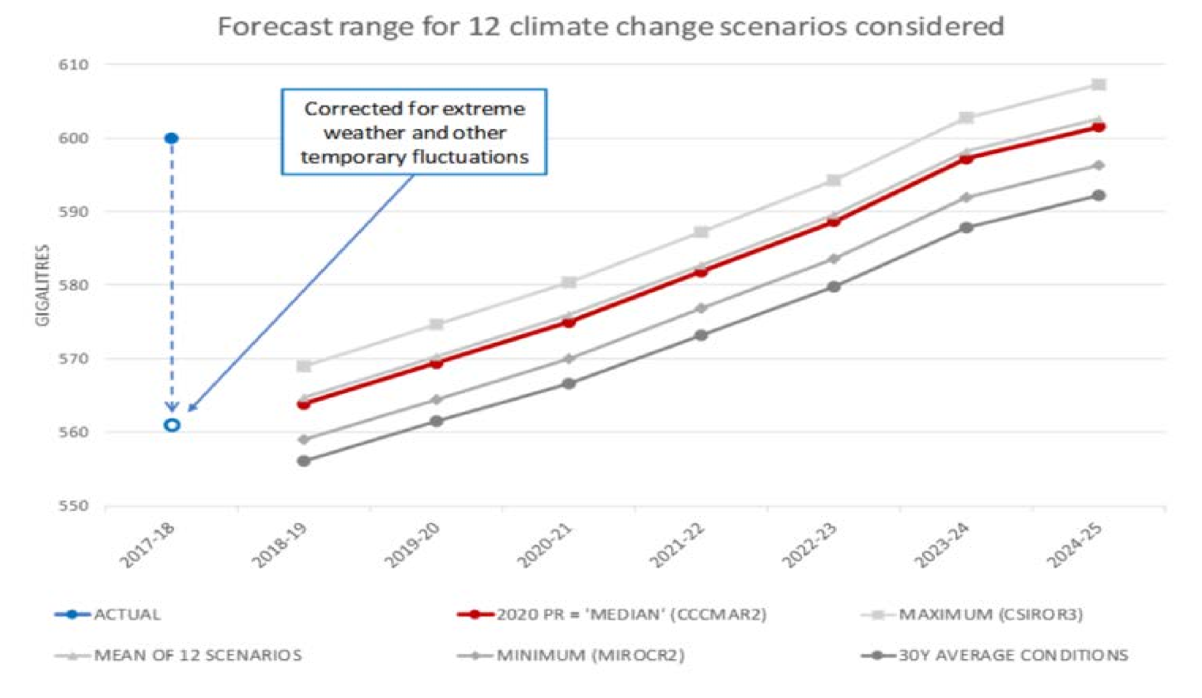
We agree that baseline water forecasts should assume average rainfall in the absence of more compelling estimates. However, we consider this approach creates unnecessary revenue uncertainty if water restrictions are implemented again in the 2020 determination period. Our dynamic pricing approach manages the risk of water restrictions without needing to predict rainfall patterns.

Sydney Water's forecasts included adjustments for climate change

Climate change has the potential to impact water demand through changes in rainfall patterns and higher temperatures. To address this, Sydney Water considered the impact of 12 climate change scenarios across four climate models for the period 2020-2040.[243] As shown in Figure N.1, the difference between the highest and lowest forecast was about 10 GL per year; mainly caused by forecasting uncertainty about future rainfall patterns.

Sydney Water adjusted its water sales forecast based on the median of 12 forecasts. This is about 8 GL/year or 1.4% higher than its original forecast based on average rainfall patterns observed over the last 30 years.

Figure N.1 Range of forecasts produced for different climate change projections



Source: Sydney Water pricing proposal-Appendix 8A, July 2019, p 10.

Our consultants reviewed Sydney Water's forecasts

We consider Sydney Water's demand forecasting model is robust and performs well when validated using hind-casting. However, we asked our consultants Atkins to review Sydney Water's proposed demand forecasts and comment on their underlying assumptions.

Atkins had confidence in Sydney Water's residential demand modelling but acknowledged that there is underlying uncertainty in government growth forecasts for Sydney. It also noted Sydney Water was forecasting historically low per capita demand for both residential and non-residential customers.[244] However they did not suggest any specific adjustments.

243 Sydney Water used modelling prepared as part of the NSW and ACT Regional Climate Modelling Project (NARCLiM). For more information see https://climatechange.environment.nsw.gov.au/Climate-projections-for-NSW/About-NARCliM.

244 Atkins/Cardno, *Sydney Water Corporation Expenditure and Demand Forecast Review*, Final Report, 5 February 2020, Table 4-8.

N.2 Estimating the impact of higher usage prices on demand

Water is generally quite "price inelastic", as customers do not change their behaviour very much in response to price changes.

Previous studies have provided a broad range of estimates for the price elasticity[245] for Sydney Water's customers from -0.11 to -0.35.[246,247] In its July 2019 price submission, Sydney Water provided us with updated estimates of its residential elasticities of -0.218 for houses and -0.063 for apartments. In our 2016 determination we used price elasticities of -0.249 for houses, -0.049 for apartments, and -0.264 for non-residential customers.[248]

We expect that water restrictions would tend to reduce the demand response to a change in price (as restrictions reduce discretionary demand). That is, water restrictions would lead to an inwards shift in the demand curve, as well as an increase in the 'slope' of the curve. To account for this effect, we have assumed that price elasticities would be reduced by half in a "drought" scenario.

Table N.2 Elasticities for a price increase in our demand forecast

	Proportion of water sales 2016-17 to 2018-19	Non-drought elasticity	Drought elasticity
Houses	51%	-0.218	-0.109
Apartments	23%	-0.063	-0.032
Non-residential	26%	-0.264	-0.132
Weighted average		**-0.194**	**-0.097**

Note: Water sales proportions exclude vacant land, mixed residential customers and unfiltered water customers.

N.3 Impact of COVID-19 on water sales

Atkins has not recommended any changes to its forecasts of customer numbers and demand, which we accepted as a basis for our Draft Report. Sydney Water did not raise any major concerns with Atkins' approach in response.

Atkins considered the impact of COVID-19 on these forecasts. It examined the short-term impact of COVID-19 on "per capita" water demand, and agreed with Sydney Water that the short-term impact of COVID-19 on water sales "was well within the range of variability expected from fluctuations in weather".[249]

Longer-term, Atkins considered the impact of reduced migration/weak economic conditions on the growth in customer numbers. It concluded that under a low-impact or medium-impact

245 Price elasticities are given as a ratio of how much less of a product customers will demand for a given price increase, so for example an elasticity of -0.1 means for each 1% the price increases, demand will decrease by 0.1%.

246 Warner, R. 1996. Water Pricing and the Marginal Cost of Water. Sydney Water Corporation.

247 Grafton, R.Q. and Kompas, T. (2007), 'Pricing Sydney Water', Australian Journal of Agricultural and Resource Economics, 51, 227–41.

248 IPART, *Prices for Sydney Water Corporation from 1 July 2016*, May 2016, p 143.

249 Atkins/Cardno, *Sydney Water Corporation Expenditure and Demand Forecast Review*, Supplementary Report, 9 June 2020, p 53.

COVID-19 scenario, customer numbers would be "within the range of estimation variance already experienced in the current [2016] Determination period".[250]

Based on this advice we maintained our draft forecasts of water sales and customer numbers.

N.4 Drought Water Sales forecasts

We developed our drought water sales by taking our non-drought forecasts and:

- Reduced water sales forecasts by 15% to reflect the impact of water restrictions, and
- Included an adjustment to account for the demand response to the higher water usage price.

Table 14.7 Build-up of drought water sales forecasts (ML)

	2020-21	2021-22	2022-23	2023-24
Atkins non-drought forecast	517,568	524,342	530,732	538,727
Less 15% reduction from water restrictions	-79,940	-81,202	-82,142	-83,331
Less price elasticity	-17,076	-17,331	-17,582	-17,887
IPART forecast	420,551	425,809	431,008	437,509

We assumed a 15% reduction in water sales as a result of water restrictions

Atkins forecast the likely impact of water restrictions on water sales over the 2020 determination period if drought conditions continued at 2019-20 severity. They recommended a 15% reduction in total demand relative to Sydney Water's non-drought demand forecast (based on a weighted average of the forecast water savings for Level 2 and Level 3 restrictions[251]). They also applied similar reductions to non-revenue demand components such as recycled water top ups and firefighting.

This recommendation is broadly consistent with:

- The water savings achieved during the Millennium Drought. Figure N.2 shows that Sydney Water achieved a permanent 20% reduction in per capita demand over the period of the Millennium Drought.
- The recent drought experience, where Sydney Water noted a 9.3% reduction in demand for the first six months of Level 1 water restrictions. [252]

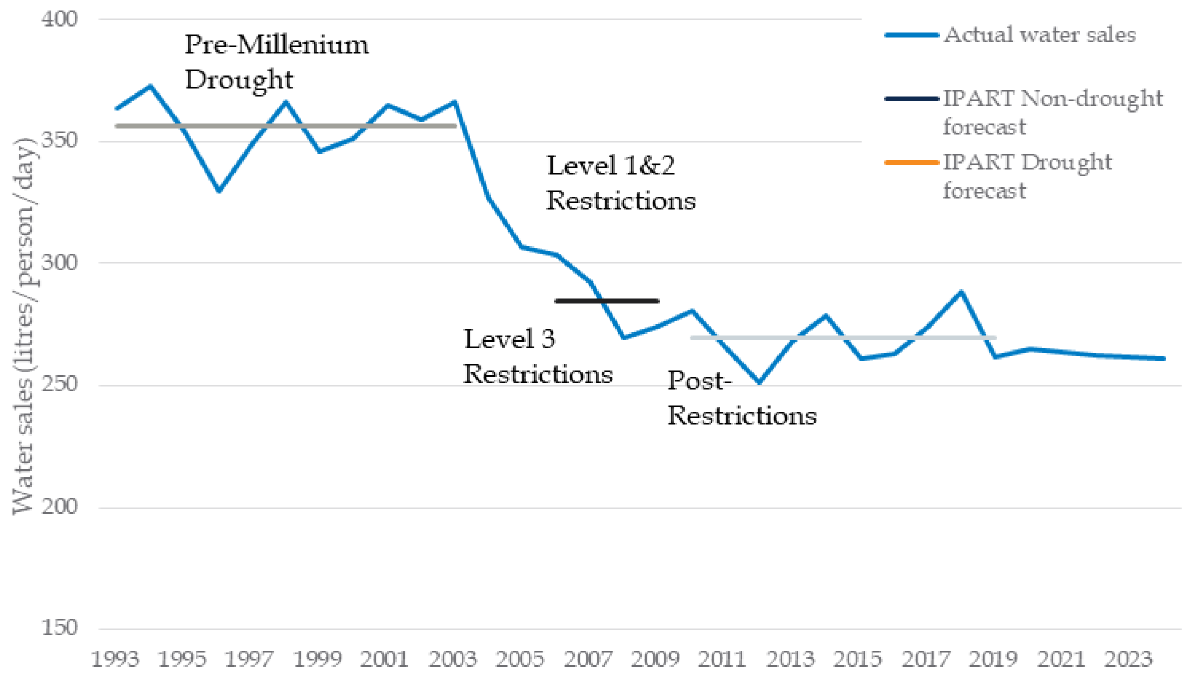
250 ibid p 54.

251 Atkins estimated Level 2 restrictions to be in place for 20% of the determination period and Level 3 restrictions to be in place 80% of the period. Targeted reductions for Level 2 restrictions are based on Sydney Water's targets and Level 3 reductions were based on the mid-point of water reductions during the Millennium Drought. Atkins/Cardno *Sydney Water Corporation Expenditure and Demand Forecast Review-Final Report*, 5 February 2020, p 96.

252 IPART analysis of Sydney Water data.

- Sydney Water's drought forecasts, which assume an 18.7% reduction in demand during Level 3 water restrictions).[253]
- Sydney Water's response to our Draft Report it agreed that estimating demand under such conditions is very challenging and that IPART had regard to appropriate evidence and references in developing these estimates.[254]

Figure 15.28 Per capita water sales actuals and IPART forecasts



Note: Horizontal lines through actuals show multi-year averages. IPART forecasts include elasticity adjustments to account for price increases.

Source: November 2019 AIR and IPART analysis

We acknowledge that there is degree of uncertainty in forecasting the impact of restrictions on water demand. We consider Atkins forecasts are reasonable, if somewhat conservative, given the inherent forecasting uncertainty.

We reduced drought scenario water sales by 4.7% because of price increases

The new usage prices we have proposed for drought and non-drought conditions are both higher than current prices which, all else equal, will reduce the demand for water. We therefore reduced the drought water sales forecast by 4.7% to account for the impact of higher prices on demand (which is measured by 'price elasticity' of demand). We have based these estimates on new modelling Sydney Water undertook.

253 IPART analysis of Sydney Water data.

254 Sydney Water submission to IPART Draft Report, 27 April 2020 p 75.

O Demand volatility adjustment mechanism

In our 2016 price review we stated we would consider, at this 2020 price review, an adjustment to the utility's revenue requirement to address any over- or under-recovery of revenue over the 2016 determination period due to material variations (exceeding +/-5% over the whole determination period) between forecast and actual water sales.[255] As a result of this DVAM, our decision is to return $18.4 million to customers over the 2020 determination period, to reflect Sydney Water's over-recovery of water revenue (above the +5% deadband) over the first three years of the 2016 determination period.

In its November 2019 price proposal update, Sydney Water proposed a modified DVAM, with an annual adjustment and end-of-period true-up to protect it against revenue risk in the case of prolonged water restrictions.[256] We did not consider this was appropriate as we discuss further below.

O.1 We will return $18.4 million to customers

Sydney Water's water sales to customers exceeded our forecasts by more than 5% over the 2016 period. We estimate that actual water sales exceeded our forecasts by 5.6% over the 3-year period to 2018-19. We have reduced the NRR for the 2020 determination period by $18.4 million, which is the additional revenue, in present value terms, above the 5% threshold that Sydney Water recovered from customers over the three years from 2016-17 to 2018-19.

O.2 We will retain the current DVAM but with a one year lag

We consider that the DVAM remains relevant for the 2020 determination period, particularly given our new dynamic approach to water usage pricing.

We have accepted the following aspects of the DVAM, which Sydney Water proposed in response to our Issues Paper:

- Continuing to apply a 5% materiality threshold when calculating a demand volatility adjustment.
- Calculating the DVAM based on four years of water sales, lagged by one year from the determination, so that it is based on actual water sales data. The DVAM for the 2020 determination period will consider water sales revenue in four years from 2019-20 to 2022-23, as shown in Figure O.1. Water sales forecasts for 2023-24 will be considered in the next determination period.

255 IPART, *Review of prices for Sydney Water Corporation from 1 July 2016 to 30 June 2020, Final Report*, June 2016, p 151.

256 Sydney Water, *Update to 1 July 2019 proposal*, 12 November 2019, pp 51-56.

Figure 15.15O.1 Sydney Water's proposed lagged DVAM

	True up period 1			True up period 2				True up period 3			
Year	1	2	3	4	1	2	3	4	1	2	3
Determination Period	2016-20				2020-24[a]				2024-2028[a]		

[a] Indicative determination periods

Source: Sydney Water Pricing Proposal, 1 July 2019, Attachment 7: Regulatory framework and application, p 8

O.3 We will use monthly water sales forecasts to account for dynamic pricing

We use water sales forecasts to estimate the amount of revenue Sydney Water will recover from water usage charges. The Demand Volatility Adjustment Mechanism (DVAM) provides a revenue true-up if the revenue from actual water sales is significantly different from our forecasts. Because we are introducing dynamic pricing, the forecast revenue from water sales would be a weighted average of water sales revenue across drought- and non-drought periods. As outlined in our Draft Report, we proposed using seasonally adjusted drought- and non-drought water sales forecasts to account for the unknown timing of drought pricing periods, when calculating forecast water sales revenue used in the DVAM.

Implementing a rolling one-month lagged trigger means that we cannot rely on the quarterly drought, and non-drought, water consumption forecasts we calculated in the Draft Report, to calculate whether the DVAM should be triggered at the next pricing review.

Instead, we have used monthly demand to calculate 'daily' water demand forecasts that we would use to calculate a 'weighted' average of the forecast revenue from water sales across drought and non-drought periods. These forecasts include a small allowance for unfiltered water sales, which do not vary seasonally (because this demand is not seasonal, and is extremely small).

As noted above, we have decided to calculate the DVAM based on the difference between forecast and outturn water sales revenue on a one-year lagged basis. So in the 2024 determination we will consider total water sales over the years 2019-20 to 2022-23. Given drought pricing was not in place in 2019-20, we will calculate a composite revenue forecast based on:

- The annual sales forecast for 2019-20 in our 2016 determination,
- The sum of the daily forecasts over 2020-21 to 2022-23 on a pro-rata basis between drought and non-drought forecasts.

P Sydney Water's LRMC estimates

IPART sets water usage charges with regard to the long-run marginal cost (LRMC) of supply. LRMC promotes efficient water usage and investment decisions to the extent that it signals the costs of supplying water to meet demand over the long-term which are predominantly the costs of bulk water supply augmentation measures. It also provides a price signal to conserve water and encourage the development of substitutes such as recycled water.

In proposing to maintain a water usage price of $2.11/kL, Sydney Water estimated its LRMC of supplying water. Its updated estimate of the LRMC for water is $2.33/kL, with a sensitivity of between $0.72/kL and $3.08/kL.[257]

Since our Draft Report we have further analysed Sydney Water's LRMC estimates and have determined an appropriate estimate – in $20-21 – to \be in the order of $2.23-$2.64/kL, plus $0.13-$0.30/kL for the non-bulk augmentation costs estimated by Sapere consulting (for Sydney Water).[258]

Sydney Water's response to our Draft Report

Sydney Water considered that IPART's primary reason for adopting a $2.30/kL water price was inconsistent with the LRMC estimates in our Draft Report of between $2.00/kL to $2.20/kL.[259] Based on these estimated ranges, IPART reported a reasonable range between $1.93/kL to $2.20/kL. Sydney Water considered a point in the middle of this range strikes a better balance between the efficiency of the pricing structure and impacts on customers. Sydney Water's proposed $2.11/kL is marginally higher than the mid-point of this range of $2.07/kL.[260]

In response, our LRMC estimates were based on the LRMC model that Sydney Water provided us. In reviewing Sydney Water's LRMC model, we identified a broad range of concerns with Sydney Water's assumptions and methodology which we were not fully able to address prior to the Draft Report. We have since gone back and attempted to remediate these issues, as well as new ones which we identified. Through this process we have concluded that Sydney Water's LRMC was likely producing estimates that are downwardly biased.

257 Sydney Water Pricing Proposal to IPART, July 2019, Appendix 4C p 10.
258 Sydney Water Pricing Proposal to IPART, July 2019, Appendix 4C(i) p 8-9.
259 IPART *Prices for Sydney Water from 1 July 2020 Draft Report*, February 2020, p 75.
260 Sydney Water submission to IPART Draft Report, 27 April 2020, pp 70-71.

Specifically we identified:

- Sydney Water had annuitized capital expenditure for supply augmentations using asset lives much longer than the simulation period, meaning some capital expenditure was not being recovered at all.
- Over the long term, Sydney Water projected water sales growth is around 30% lower than if it had simply projected water sales to grow at the same rate as in its four year forecast for the 2020 Determination Period. For this to be correct it would either require high levels of ongoing customer water efficiency gains or population growth significantly slower than government projections. We calculated this ambitious demand forecast had significant impacts on the marginal cost (~$0.40/kL).
- Augmentations were not ordered from low cost to high cost and the order of the augmentations was unrealistic.
- A few other minor concerns, most notably that the estimation window began a number of years before the beginning of the 2020 Determination Period.

Addressing these issues, we consider Sydney Water's LRMC estimate should have realistically been in the order of $2.23-$2.64/kL with a 4.2% pre-tax WACC, plus $0.13-$0.30/kL (in $2020-21) for the non-bulk augmentation costs estimated by Sapere consulting (for Sydney Water).

P.1 Estimates for wastewater

We prepared catchment-level wastewater LRMC estimates for Sydney Water using an Average Incremental Cost (AIC) method, calculated as:

$$LRMC = \frac{NPV(Annualised\ capital\ expenditure + Incremental\ operating\ expenditure)}{NPV(Incremental\ Demand)}$$

In addition:

- We assumed a discount rate of 4.2%, consistent with the IPART pre-tax real WACC.
- Capital expenditure is estimated from Sydney Water planning documents at the 1-5 year, 5-15 year, 15-25 year and >25 year planning horizons. Capital expenditure was assumed to be spread evenly over each five or ten year period.
- We applied an 18% reduction to Sydney Water's capital costs. This is consistent with the average 18% efficiency challenge applied by Sydney Water across all its proposed capital expenditure.
- We estimated the incremental operating expenditure, by estimating the operational costs of wastewater treatment and transport:
- Unit treatment costs for each catchment are based on Sydney Water estimates and vary from $91/ML to $5,954/ML (in $2014-15). These are based on the average costs of treatment, which could over-estimate the costs for smaller catchments.
- A common unit transport cost of $0.37/kL (in $2019-20) was used across all catchments based on Sydney Water's SIR.

- Incremental demand was based on the forecast growth in average dry weather flows in Sydney Water's planning documents.

Our estimates are presented in Table P.1 below.

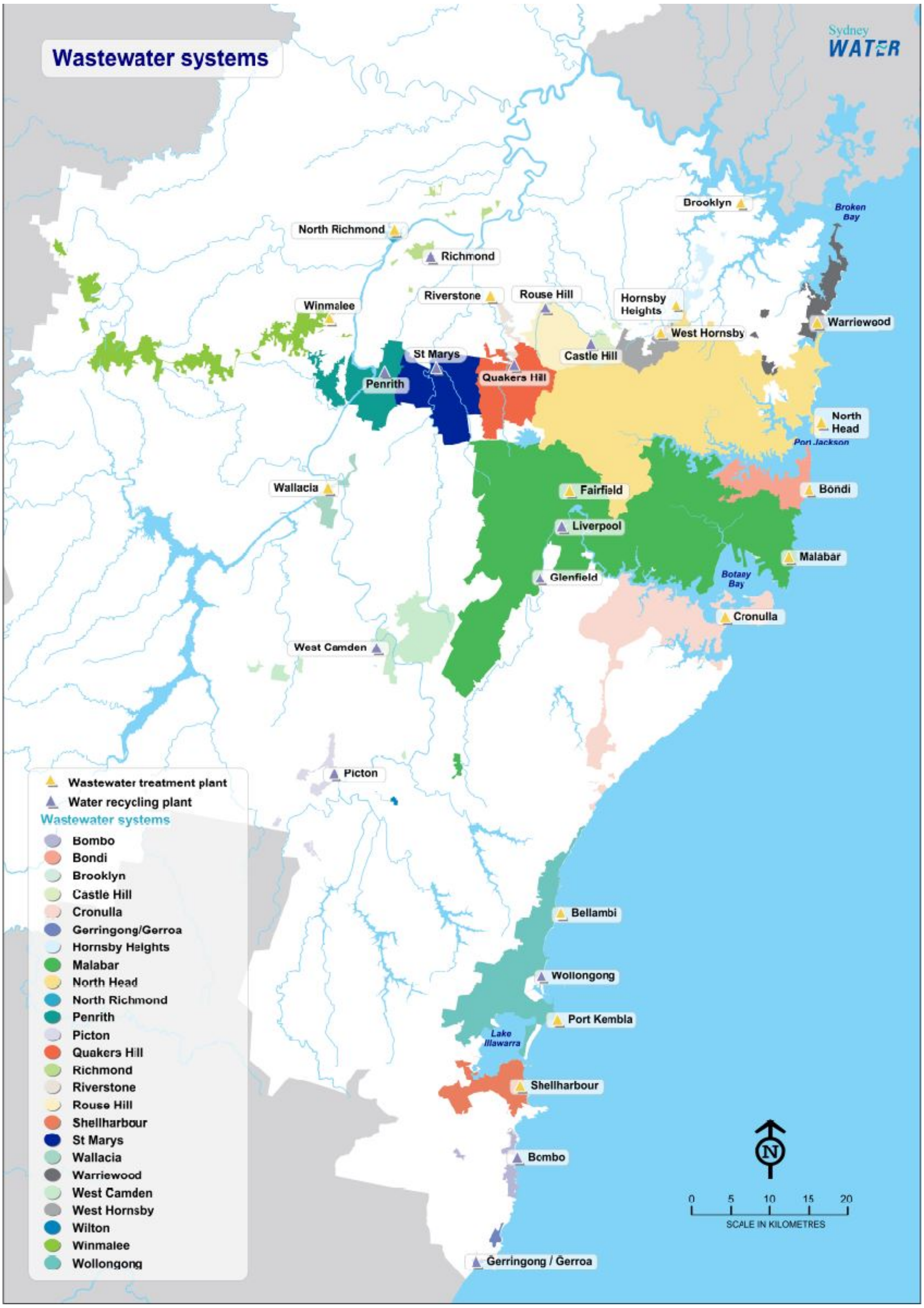
Table P.1 Estimated wastewater LRMC for some of Sydney Water's catchments ($2020-21)

	Treatment process	Dry weather flow in 2018 GL/yr	LRMC $/kL	Short-run operating costs $/kL
Bombo	Secondary (with recycling)	1.4	16.71	0.79
Bondi	**Primary (deep ocean outfall)**	**44.5**	**1.48**	**0.62**
Brooklyn	Tertiary	0.1	16.04	7.00
Castle Hill	Tertiary (with recycling)	2.5	3.93	0.89
Cronulla	Tertiary	19.0	0.82	0.64
Malabar	**Primary[a] (deep ocean outfall)**	**170.0**	**2.89**	**0.45**
North Head	**Primary (deep ocean outfall)**	**119.7**	**3.63**	**0.50**
Penrith	Tertiary (with recycling)	10.1	3.07	0.99
Picton	Tertiary (with recycling)	1.3	12.16	1.12
Quakers Hill	Tertiary (with recycling)	13.8	1.85	0.79
Riverstone	Tertiary	4.8	10.02	2.40
Rouse Hill	Tertiary (with recycling)	10.3	6.78	1.06
Shellharbour	Secondary	6.7	4.33	0.87
St Marys	Tertiary (with recycling)	14.7	2.39	0.89
Wallacia	Tertiary	0.3	12.14	1.80
West Camden	Tertiary (with recycling)	7.9	9.38	1.12
West Hornsby	Tertiary	4.7	3.50	0.95
Wollongong	Tertiary (with recycling)	18.1	10.94	0.73
Weighted average			**3.53**	**0.60**

a Some wastewater in the Malabar system receives secondary or tertiary treatment at the Glenfield or Liverpool wastewater recycling plants for local recycling purposes or to minimise system degradation if the wastewater is transported to Malabar for ocean discharge.

Source: IPART analysis of Sydney Water data.

Figure Q.1 Map of Sydney Water's wastewater catchments



Data source: Sydney Water website.

Q Multi Premises, Joint Service Arrangements, and Dual Occupancies

We decided:

57 To maintain our approach to charging multi premises, joint services and dual occupancies.

Service charges for water, wastewater, and stormwater (where relevant) are set based on whether a property is non-residential or residential, and individually metered or on a common meter.

- Residential properties are charged a standard 20mm residential service charge.
- Non-residential properties are charged a service charge based on their meter size.
- Non-residential properties in a non-residential multi premises that share a common meter pay a share of the meter-based charge.

However, sometimes it is not easy to apply a meter-based charge for non-residential properties that share a meter. This affects mixed multi premises and non-residential properties in a joint service arrangement.

Mixed multi premises properties have a mixture of residential and non-residential properties that share a common meter. Currently, all properties within these premises pay residential charges, because it is not feasible to determine what share of the meter-based charge any non-residential properties should pay. We decided to continue with this approach.

A **joint service arrangement** occurs where there is a 'parent' premises with a connection to the network, as well at least one 'child' premises that has a pipe connected to the 'parent' property's connection. The parent and/or child premises could have a single property, or be a multi premises, and contain a mixture of residential and non-residential properties.

In these cases, we charge a non-residential property a meter-based charge where it is feasible to do so, but charge a non-residential property a residential charge where it is not. The table below explains our charging approach.

Table Q.1 Each joint service arrangement permutation

First property/ premises (parent)	Charge type	Subsequent property(s) or premises (child)	Charge type
Single residential property	Residential base charge	Single residential property	Residential base charge
	Residential base charge	Single non-residential property	Residential base charge
	Residential base charge	Residential Multi Premises	Residential base charge per premise
	Residential base charge	Non-residential Multi Premises	Residential base charge per premise
Single non-residential property	Meter size	Single residential property	Residential base charge
	Meter size	Single non-residential property	Residential base charge per premise
	Meter size	Residential Multi Premises	Residential base charge per property
	Meter size	Non-residential Multi Premises	Residential base charge per premise
Residential Multi Premises	Residential base charge per premise	Single residential property	Residential base charge
	Residential base charge per premise	Single non-residential property	Residential base charge
	Residential base charge per premise	Residential Multi Premises	Residential base charge per premise
	Residential base charge per premise	Non-residential Multi Premises	Residential base charge per premise
Non-residential Multi Premises	Meter size / premises	Single residential property	Residential base charge
	Meter size / premises	Single non-residential property	Residential base charge
	Meter size / premises	Residential Multi Premises	Residential base charge per premise
	Meter size / total premises	Non-residential Multi Premises	Meter size / total premises

Source: Sydney Water, internal document from 2016 price review.

In the Draft Report, we proposed a change to pricing in the following situations:

- a single non-residential **parent property** with a single non-residential **child property**
- single non-residential **parent property** with a multi premise non-residential **child property.**

We proposed to charge these properties on a common meter basis.

Sydney Water opposed this changed approach because of the costs and complexity of implementation while affecting only a small – and falling – number of customers and the fact that Sydney Water hasn't had time to consult with its customers on the changed approach.[261]

In the circumstances, we have agreed with Sydney Water to maintain the existing approach to charging joint services customers. At this time, we do not consider the benefits of this change outweigh the costs of implementation given the small group of customers that are affected.

However, we will reconsider this issue in the lead up to the 2024 Sydney Water review.

261 Sydney Water, *Response to IPART's Sydney Water Draft Report and Determination*, 27 April 2020, p 106-7 and email correspondence with Sydney Water, 6 May 2020.

R Trade waste prices

Our decision is to set the maximum trade waste prices for 2020-21 to 2023-24 as presented in the following tables.

Table S.1 Annual industrial agreement, commercial agreement, and Wastesafe charges ($2020-21)

	2019-20 (current, $2019-20)	2020-21	2021-22	2022-23	2023-24
Industrial agreements					
Risk Index 1	9,116.07	10,856.42	10,975.84	11,096.57	11,218.63
Risk Index 2	9,116.07	10,856.42	10,975.84	11,096.57	11,218.63
Risk Index 3	9,116.07	10,856.42	10,975.84	11,096.57	11,218.63
Risk Index 4	4,207.82	5,010.65	5,065.77	5,121.49	5,177.83
Risk Index 5	2,806.83	3,340.43	3,377.18	3,414.33	3,451.89
Risk Index 6	1,403.41	1,670.22	1,688.59	1,707.16	1,725.94
Risk Index 7	701.71	835.11	844.30	853.59	862.98
Commercial agreements					
First process	164.65	108.59	109.78	110.99	112.21
Each additional process	56.51	36.19	36.59	36.99	37.40
Wastesafe charges					
Administration charge	117.11	40.94	41.39	41.85	42.31
Missed service charge (<2000kL trap)[a]	322.70	N/A	N/A	N/A	N/A
Missed service charge (>2000kL trap)[a]	645.42	N/A	N/A	N/A	N/A

[a] Sydney Water proposes to eliminate missed service charges as part of its new approach to managing non-compliant Wastesafe customers.

Source: Sydney Water trade waste agreement model, IPART analysis.

Table S.2 Trade waste ancillary charges ($2020-21)

		2019-20 (current, $2019-20)	2020-21	2021-22	2022-23	2023-24
Additional inspection	$/each	219.44	205.53	207.79	210.08	212.39
Industrial trade waste application – standard	$/each	529.72	812.78	821.72	830.76	839.90
Industrial trade waste application – non-standard	$/hr	162.27	112.11	113.34	114.59	115.85
Industrial trade waste application - variation	$/each	636.88	457.77	462.81	467.90	473.05
Sale of trade waste data[a]	$/hr	158.14	N/A	N/A	N/A	N/A

a Sydney Water proposes to eliminate this charge.

Source: Sydney Water trade waste agreement model.

Table S.3 Commercial pollutant charges, $/kL ($2020-21)

	2019-20 (current, $2019-20)	2020-21	2021-22	2022-23	2023-24
Low strength BOD food	2.452	1.720	1.740	1.760	1.780
Higher strength BOD food	4.029	2.380	2.410	2.440	2.460
Automotive	0.8	0.490	0.500	0.500	0.510
Laundry	0.5	0.400	0.410	0.410	0.420
Lithographic	0.385	0.280	0.290	0.290	0.290
Photographic	Nil	Nil	Nil	Nil	Nil
Equipment hire wash	3.653	2.840	2.870	2.900	2.930
Ship to shore	Nil	Nil	Nil	Nil	Nil
Miscellaneous	Nil	Nil	Nil	Nil	Nil
Other (default)	Nil	Nil	Nil	Nil	Nil
Charge for low and higher strength BOD food if pre-treatment is not maintained in accordance with requirements	12.581	13.290	13.440	13.590	13.740

Source: Sydney Water trade waste pollutant model, IPART analysis.

Table S.4 Industrial pollutant charges, $/kg above domestic equivalent ($2020-21)

	2019-20 (current, $2019-20)	2020-21	2021-22	2022-23	2023-24
Primary STPs					
BOD – treatment charge[a]	0.318	0.33	0.33	0.33	0.34
BOD – corrosion charge[a]	0.137	0.14	0.14	0.14	0.15
Suspended Solids	0.577	0.46	0.47	0.47	0.48
Grease	0.521	0.42	0.42	0.43	0.43
Secondary and Tertiary STPs					
BOD – treatment charge[a]	2.066	1.61	1.63	1.64	1.66
BOD – corrosion charge[a]	0.137	0.14	0.14	0.14	0.15
Suspended Solids	1.672	1.05	1.06	1.07	1.08
Grease	1.597	1.09	1.10	1.11	1.12
Nitrogen	1.894	1.20	1.22	1.23	1.24
Phosphorous	6.792	1.39	1.40	1.42	1.44

[a] The total BOD price is calculated using the formula $a + \left(b \times \frac{c}{600}\right)$ where *a* is the BOD treatment charge, *b* is the BOD corrosion charge and *c* the concentration of BOD in the customers discharge measured in mg/L.

Note: The trade waste charges which apply reflect which STP a trade waste customer discharges into.

Source: Sydney Water trade waste pollutant model, IPART analysis.

Corrosive substance charges

Temperature and acidity (pH) charges were introduced in 2012. These charges can only be applied to customers within a corrosion declared catchment. To date these charges have not been used as customers have been successfully managed using Effluent Improvement Programs (EIPs).

Table S.5 Corrosive substance charges, $/ML ($2020-21)

	2019-20 (current, $2019-20)	2020-21	2021-22	2022-23	2023-24
Acidity (pH)[a]	71.956	74.350	75.170	75.990	76.830
Temperature[b]	7.966	8.230	8.320	8.410	8.510

[a] The charge is applied for each unit of pH less than pH7 eg if the pH is pH5 then the charge will be multiplied by two.

[b] The charge is applied for each degree by which the temperature per ML of wastewater is greater than 25 degrees

Source: Sydney Water trade waste pollutant model, IPART analysis

Revenue forecasts

Trade waste revenue will fall by approximately 25% in 2020-21 as a result of lower prices (before inflation).

Table S.6 Trade waste and Wastesafe revenue (million, $2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24
Industrial pollutant	11.8	9.8	9.9	10.0	10.2
Commercial pollutant	15.2	10.9	11.0	11.1	11.2
Industrial agreement	1.3	1.4	1.5	1.4	1.5
Commercial agreement	3.1	2.0	2.0	2.1	2.1
Trade waste ancillary	0.03	0.03	0.03	0.03	0.03
Wastesafe	1.6	0.5	0.6	0.6	0.6
Total	**33.0**	**24.7**	**25.0**	**25.3**	**25.6**

Source: Sydney Water pricing proposal – Attachment 4, 1 July 2019, p 15.

Box R.1 Trade waste pollutant charges explained

Sydney Water's trade waste pollutant prices are set to recover the additional operating costs of transporting and treating the five pollutants discussed below. The prices for commercial and industrial customers are set to recover the relative contributions these two groups make to Sydney Water's costs. These costs are estimated as a fraction of the total costs required to manage all wastewater discharge, rather than as the marginal impact of trade waste.

Pollutant charges for industrial customers are set on a load[a] basis – they are based on the mass of a particular pollutant a customer is deemed to discharge into the sewer system. This requires Sydney Water to inspect and sample the discharge from individual customers, to reflect the diverse scale and nature of industrial customers and allow for cost reflective pricing.

Commercial customers' pollutant charges are set on a volume basis – customers are charged a flat rate for each kilolitre of wastewater discharged — similar to sewerage usage charges. The rate applied varies depending on the nature of the customers' business (for example, food businesses pay a higher rate than laundromats). These rates are based on the relative contribution of each business type to the total pollutant load. This approach is administratively simple and reflects the more homogeneous discharges of different types of commercial customers.

Pollutants which Sydney Water charges for:

Sydney Water sets pollutant charges based on five pollutants: BOD, oil and grease, suspended solids, nitrogen and phosphorus. It also has the ability to charge for high temperature or acidic discharges under certain circumstances, however it does not currently levy any customers these charges. It manages other pollutants, such as heavy metals and industrial chemicals which are not present in domestic sewerage, through acceptance standards which limit the concentration [b] of these materials in the waste stream.

Biochemical Oxygen Demand (BOD)	BOD is a technique for measuring the amount of organic material in water which can serve as a fuel source for bacteria. [c] Excessive BOD affects Sydney Water's costs in two ways: through its effects on treatment plant loads and by promoting corrosion in transport networks. This is reflected in the industrial pollutant pricing formula: $$BOD\ (\$/kg) = P_t + P_c \times \frac{[BOD]}{L_{BOD}}$$ P_t reflects the additional costs Sydney Water faces for removing excess organic material in its wastewater treatment plant. This is charged at a flat rate per kg of pollutant load, regardless of the concentration of pollutant in the discharge. P_c reflects that as organic material breaks down it makes water more acidic which accelerates corrosion and also produces toxic (and foul smelling) hydrogen sulphide. To address this, Sydney Water doses in chemicals prior to waste reaching a treatment plant. Corrosion management costs are dependent on the concentration of BOD entering the sewer system. To reflect this, the pricing formula includes an adjustment factor where [BOD] is the BOD concentration in a customer's discharge and L_{BOD} is a reference concentration of 600mg/l. This means that customers with lower strength discharge pay lower corrosion charges.
Grease	Oil and grease from cooking and industrial processes can block sewers and treatment plants and create slicks in rivers and oceans. It floats to the top of settled wastewater and is removed using a skimmer. Pollutant charges are set on a pure load basis.
Suspended solids	Includes fine inert material such as dirt suspended in the water column which causes cloudiness and provides a breeding ground for bacteria and viruses. This material is settled out using flocculating agents such as iron chloride. Pollutant charges are set on a pure load basis.
Nitrogen and phosphorous	Nitrogen and phosphorous releases into the environment from wastewater treatment have been a major cause of algal blooms in rivers. Sydney Water needs to manage these pollutants in inland catchments only, given ocean outfalls can better disperse flows. Excess nitrogen is normally managed through biological processes, while phosphorous is managed chemically. Pollutant charges are set on a pure load basis in catchments with secondary and tertiary treatment plants.

a "Load" is the total mass in kg of a pollutant discharged by a customer over a particular period of time, normally a trade waste billing cycle. It is not measured directly, but instead estimated from sampling. Pollutant charges are generally set on a load basis, because treatment plants are already designed to manage these pollutants in domestic sewerage, and therefore contribute to the average rather than marginal operating costs. Load should not be confused with concentration, see below.

b Concentration is the mass of a pollutant in a given volume of water (measured in mg/l), at a particular point in time. Acceptance standards are set on a concentration basis because although treatment plants are able to manage the *load* of a pollutant over time, the system may not be able to manage a large amount of the material at any one time.

c BOD measures the amount of material indirectly by observing the amount of oxygen converted into carbon dioxide by bacteria in a water sample over time.

S Miscellaneous and ancillary charges

S.1.1 Sydney Water's miscellaneous and ancillary charges

Table S.1 sets out our miscellaneous and ancillary charges for Sydney Water. The charges are subject to an annual 1.1% corporate cost increase.

Table T.T.1 Miscellaneous and ancillary charges ($2020-21)

Service no.	Function	2020-21	2021-22	2022-23	2023-24
1	Conveyancing Certificate Electronic	7.16	7.25	7.33	7.40
2	Property Sewerage Diagram				
	(a) Over the counter	N/A	N/A	N/A	N/A
	(b) Electronic	13.67	13.83	13.98	14.14
	(c) Online (Tap In)	24.56	24.82	25.10	25.38
3	Service Location Diagram				
	(a) Over the counter	N/A	N/A	N/A	N/A
	(b) Electronic	7.80	7.88	7.96	8.05
	(c) Online (Tap In)	16.55	16.73	16.91	17.10
4	Special Meter Reading Statement	37.27	37.68	38.10	38.52
5	Billing Record Search Statement - up to and including 5 years	34.53	34.91	35.30	35.69
6	Building over/Adjacent to Asset Advice	47.02	47.54	48.06	48.60
7	Water Reconnection	56.52	57.14	57.77	58.41
8	Workshop Test of Water Meter				
	(a) 20, 25 and 32 mm meters	181.01	183.00	185.01	187.05
	(b) 40 and 50 mm light meters	223.69	226.15	228.63	231.15
	(c) 50 mm heavy, 80, 100 and 150 mm meters	249.41	252.15	254.92	257.72
	(d) 200, 250 and 300 mm meters	416.04	420.61	425.24	429.92
9	Water Service Disconnection	Nil	Nil	Nil	Nil
10	Water Service Connection Installation Application	Nil	Nil	Nil	Nil
11	Water Service Connection Approval Application (32-65 mm)	334.18	337.86	341.58	345.34
12	Water Service Connection Approval Application (80 mm or greater)	334.18	337.86	341.58	345.34
13	Application to Assess a Water Main Adjustment	N/A	N/A	N/A	N/A
14	Standpipe Hire – Security Bond	N/A	N/A	N/A	N/A
15	Standpipe Hire – Annual Fee	N/A	N/A	N/A	N/A
16	Standpipe Water Usage Fee	N/A	N/A	N/A	N/A
17	Backflow Prevention Device Application and Registration Fee	N/A	N/A	N/A	N/A
18	Backflow Prevention Device Annual Administration Fee	N/A	N/A	N/A	N/A
19	Major Works Inspection Fee	N/A	N/A	N/A	N/A
20	Statement of Available Pressure and Flow	138.43	139.95	141.50	143.05
21	Request for Asset Construction Details	51.54	52.10	52.67	53.26
22	Supply System Diagram	148.46	150.09	151.75	153.41

Service no.	Function	2020-21	2021-22	2022-23	2023-24
23	Building Plan Approval Application	17.63	17.82	18.02	18.21
24	Asset Adjustment Application	272.28	275.28	278.30	281.37
25	Water Main Fitting Adjustment Application	Nil	Nil	Nil	Nil
26	Water Pump Application	138.43	139.95	141.50	143.05
27	Extended Private Service Application	Nil	Nil	Nil	Nil
28	Wastewater Connection Installation Application	Nil	Nil	Nil	Nil
29	Wastewater Ventshaft Relocation Application	Nil	Nil	Nil	Nil
30	Disuse of Wastewater Pipe or Structure	Nil	Nil	Nil	Nil
31	Stormwater Connection Approval Application	Nil	Nil	Nil	Nil
32	Application for Inspection of Stormwater Connection	Nil	Nil	Nil	Nil
33	Development Requirements Application				
	(a) Development requirements – complying development	199.72	201.92	204.13	206.38
	(b) Development requirements - other	528.16	533.96	539.84	545.78
34	Road Closure Application	Nil	Nil	Nil	Nil
35	Water and Sewer Extension Application	528.16	533.96	539.84	545.78
36	Monthly Meter Reading request by Customer	12.02	12.15	12.28	12.42
37	Replacement of Meter Damaged by Customer/Customer's Agent				
	(a) 20mm	197.40	199.57	201.76	203.98
	(b) 25, 32 and 40 mm	273.28	276.29	279.32	282.40
38	Integrated Service Connection Application	263.67	266.57	269.50	272.47
39	Sydney Water Hourly Rate	150.47	152.12	153.80	155.50
40	Remote Read Meter (one off fee)				
	(a) 20mm	219.28	221.69	224.13	226.60
	(b) 25mm	231.04	233.59	236.15	238.75
	(c) 32mm, 40mm, 50mm light	253.57	256.36	259.18	262.03
	(d) 50mm heavy, 80mm, 100mm	444.84	449.73	454.68	459.68
41	Inaccessible Meter Fee (quarterly charge)	10.00	10.11	10.22	10.33
42	Backflow Annual Test (new)	233.79	236.37	238.96	241.59

*N/A means that Sydney Water either does not provide the relevant service, or the service has been combined with other services and recovered by one charge.

[#]Nil means service provided has no charge.

T Service charge cost pass-throughs

In this appendix we discuss the three cost pass-throughs, to Sydney Water's water service charge, that we have included in our 2020 Determination. These pass-throughs allow Sydney Water to recover its efficient costs for bulk water costs which are uncertain. They are calculated and applied on an annual basis to reflect costs in the previous year.[262]

The water service price that applies in each year of the determination period is calculated as the sum of the base water service charge, plus each of the three cost pass-throughs, as shown in the formula below.

$$MSC_{WSS} = BSC + SDP + WNSW + CCP$$

Where:

- MSC_{WSS} is the total water supply service charge applicable for a customer's Meter.
- BSC means the base service charge for the Meter. This is the water service charge presented in Chapter 7 of the report.
- SDP is the SDP Adjustment to manage differences in Sydney Water's forecast and actual payments to SDP.
- $WNSW$ is the WNSW Adjustment to account for pumping costs associated with Shoalhaven transfers, and
- CCP is a contingent cost pass-through, for the capital costs Sydney Water faces from an expansion of the capacity of SDP.

We discuss each of the three cost pass-throughs in turn in this appendix. All figures presented in this appendix are in $2020-21, the dollar basis for the pass-throughs in the Determination.

T.1 Service charge cost pass-through for SDP

We have decided to maintain a water service charge cost pass-through mechanism for Sydney Desalination Plant (SDP) costs. It will capture:

- differences in SDP's actual service charges (fixed costs) to Sydney Water, compared to our forecasts
- any forecast error in our estimate of the water usage charge adjustment, and
- any additional charges from SDP if the NSW Government decides to expand SDP during the 2020 determination period.

We have updated this formula from our 2016 determination to account for our new dynamic pricing approach.

262 The formulas and descriptions in this appendix are presented differently to those in the draft Sydney Water Determination to aid readability. Where discrepancies exist, the formulas and descriptions in the determination supersede those here.

The SDP cost pass-through formula adjusts the water service price, in the following year, for the difference between SDP's actual charges to Sydney Water, compared to the forecast revenue that we have already included in customer prices.

Broadly, the formula is calculated using the following information:

1. The **Actual Costs** that Sydney Water pays to SDP over a period. These costs are determined on a *nominal* cost basis. As discussed further below, we have decided that these costs would be lagged by 15 months between when they are incurred, and when the cost pass-through formula adjusts customers' prices.
2. The **Expected Revenue** that Sydney Water was initially allowed through water service and usage prices. This revenue is calculated on a *real* $2020-21 basis. We have allowed Sydney Water the following revenue:
   - The base revenue we assume Sydney Water would pay to SDP when it is not operational in non-drought periods.
   - The additional revenue, recovered from customers through a higher water usage price in drought, to cover the assumed costs of operating SDP.
3. The **Avoided Costs** (of water treatment) that Sydney Water would actually save depending on the volume of water actually supplied by SDP during the period. These avoided costs are also calculated on a *real* $2020-21 basis.

Because the costs and revenues are calculated using different price bases, the formula first converts all values to $2020-21.

The actual costs, less the expected revenues and avoided costs, is the net amount to be recovered (or returned) from all water customers through the SDP cost pass-through adjustment.

The formula then makes three additional adjustments.

1. It adjusts for the holding period between when the 'net cost' was incurred, and when this net amount is recovered through the water service charge. We have decided that the SDP cost pass-through formula would calculate the costs and revenues, for the period of 1 April to 31 March of the year preceding the cost pass-through. Therefore, the holding period is 5 quarters, and we have applied a real pre-tax WACC of 5.3% in making this adjustment.[263]
2. It then "re-inflates" these costs to the determination year of the pass-through formula, using a second CPI adjustment.
3. It then calculates the adjustment to each customers' water service charge, depending on the size of their meter. The SDP adjustment is firstly divided by the forecast number of "20mm equivalent" customers, and then scaled up based on the size of a customer's actual meter.

263 This is the rounded value of the 4.2% real pre-tax WACC, compounded for 5 quarters.

Note that we have decided to not apply an SDP service charge cost pass-through in 2020-21, because we included the pass-through amount for the first year of the determination into the base service charge. This amount was calculated for the period 1 June 2019 to 31 March 2020, to take account of our decision to lag the pass-through by 15 months.

The SDP service charge cost pass-through formula for the remainder of the 2020 determination period is:

$$SDP_t = \left\{ \underbrace{\left[\frac{C_{t-1}}{CPI^*_{t-2}}\right]}_{\substack{\text{Actual costs}\\\text{in \$2020-21}}} - \underbrace{\left[B_{t-1} + (DRD_{t-1} \times w_{t-1}) + U_{t-1}\right]}_{\substack{\text{Expected revenue}\\\text{in \$2020-21}}} - \underbrace{\left[V_{t-1} \times A_{t-1}\right]}_{\substack{\text{Actual avoided}\\\text{treatment costs}\\\text{in \$2020-21}}} \right\} \times \underbrace{WACC}_{\substack{\text{Holding}\\\text{cost}}} \times \underbrace{CPI_{t-1}}_{\substack{\text{Converts}\\\text{\$2020-21 into}\\\text{nominal costs}}} \times \underbrace{\left(\frac{1}{M_t}\right)}_{\substack{\text{Divides by total}\\\text{customer numbers}}} \times \underbrace{\left(\frac{Z^2}{400}\right)}_{\substack{\text{Calculates the}\\\text{per property}\\\text{charge}}}$$

Where:

SDP_t is the SDP Adjustment to the base water supply service charge for a Meter in a Period;

C_{t-1} is the charges paid by Sydney Water to SDP under the SDP Determination between 1 April in the year before and 31 March of that year;

B_{t-1} represents the base SDP costs (in $2020-21) included in the revenue requirement for Sydney Water.

1. $180,158,304, when calculating SDP_t for 2021-22;
2. $178,505,971, when calculating SDP_t for 2022-23; and
3. $178,085,959, when calculating SDP_t for 2023-24;

DRD_{t-1} is the number of days where the drought price applied between 1 April in the year before and 31 March of that year;

w_{t-1} is the daily usage charges Sydney Water is expected to pay to SDP when drought pricing is in place, in $2020-21,[264] set as:

1. $168,333, when calculating SDP_t for 2021-22;
2. $165,456, when calculating SDP_t for 2022-23; and
3. $165,456, when calculating SDP_t for 2023-24;

U_{t-1} is the revenue that Sydney Water recovered from customers, through the SDP uplift to the water usage charge under the 2016 Determination, between 1 April 2020 and 30 June 2020. This variable only applies when calculating the cost pass-through for the 2021-22, and in future years this variable is $0;

V_{t-1} is the volume of filtered water (in megalitres) actually supplied by SDP to Sydney Water in the immediately preceding Pass-Through Charging Period;

264 IPART SDP determination June 2017 schedule 1 cl 3.

A_{t-1} is the avoided water filtration costs per megalitre of water supplied to Sydney Water by SDP (in $2020-21), set as:

1. $43.70, when calculating SDP_t for 2021-22;
2. $43.75, when calculating SDP_t for 2022-23; and
3. $43.81, when calculating SDP_t for 2023-24;

The values of CPI_{t-1} and CPI^*_{t-2} are outlined in Table T.1 below.

WACC is the real pre-tax weighted average cost of capital applicable to Sydney Water. We have determined this to be 1.053 for this determination.

M_t is IPART's forecast number of 20mm equivalent water customers, set as:

1. 2,211,153, when calculating SDP_t for 2021-22;
2. 2,250,064, when calculating SDP_t for 2022-23; and
3. 2,287,272, when calculating SDP_t for 2023-24;

Z means the actual or deemed size of a customer's water meter (in millimetres).

In response to our Draft Report, Sydney Water agreed with maintaining and amending this cost pass-through formula to account for drought water usage prices. It did not agree with lagging the true-up by 15 months. Instead, Sydney Water argued that the existing 12 month lag was simpler to implement and was easier to communicate to customers.

We acknowledge these concerns, but consider they are outweighed by the importance of setting the pass-through formula on actual, rather than forecast, costs. For example, there could be a temporary operational event at SDP in the period between April-June, which could result in customers – at least in the short-term – paying too much through the SDP cost pass-through mechanism.

In terms of communicating with customers, our drought water usage price incorporates the expected costs of operating SDP in drought, so the residual pass-through costs should be relatively small. Furthermore, there is already a lag between when SDP's costs are incurred by Sydney Water, to when they are recovered from customers.

T.2 Service charge pass-through for Shoalhaven transfer costs

We are maintaining the service charge cost pass-through mechanism to compensate Sydney Water for actual bulk water costs incurred from Water NSW for transfers from Shoalhaven. Shoalhaven transfers represent uncertain bulk water operating costs to Sydney Water in terms of volume and price risk. Under the 2017 Metropolitan Water Plan, Water NSW starts pumping from the Shoalhaven River system when Sydney's dam levels fall to 75% and continue until they rise above 80%.[265]

Under this cost pass-through mechanism, Sydney Water's forecast bulk water costs from Water NSW and its actual bulk water costs from Water NSW will be passed through to Sydney Water's customers at a year's lag via the water service charge.

As with the SDP pass-through, we have decided that the pass-through formula would calculate the costs and revenues, for the period of 1 April to 31 March of the year preceding the cost pass-through.

We have decided to not apply a service charge cost pass-through for Shoalhaven transfer costs in 2020-21, because we included the pass-through amount for the first year of the determination into the base service charge.

We have amended this formula since the Draft Report to reflect our decision to recover all Shoalhaven Transfer pumping costs through the service charge, rather than recovering a portion of these costs through the drought water usage charge as we had initially proposed. This is because our final decision is to implement dynamic water usage prices on a rolling basis, rather than a quarterly basis. And that estimating expected Shoalhaven transfers on a daily basis would be impractical, and likely inaccurate.

The formula for the 2020 determination period is:

$$\mathrm{WNSW_t} = \left(\frac{\mathrm{C_{t\text{-}1}}}{\mathrm{CPI^*_{t\text{-}2}}}\right) \times \mathrm{WACC} \times \mathrm{CPI_{t\text{-}1}} \times \frac{1}{\mathrm{M_t}} \times \frac{\mathrm{Z^2}}{400}$$

Where:

$WNSW_t$ is the WNSW Adjustment to the base water supply service charge for a Meter in a Period;

C_{t-1} is the charges paid by Sydney Water to Water NSW for the Shoalhaven Transfer between 1 April in the year before and 31 March of that year;

The values of $\mathrm{CPI_{t\text{-}1}}$ and $\mathrm{CPI^*_{t\text{-}2}}$ are outlined in Table T.1 below;

WACC is the real pre-tax weighted average cost of capital applicable to Sydney Water. We have determined this to be 1.053 for this determination.

265 NSW Government, *2017 Metropolitan Water Plan*, March 2017 p 28.

M_t is the forecast number of 20mm equivalent water customers, set as:

1. 2,211,153, when calculating $WNSW_t$ for 2021-22;
2. 2,250,064, when calculating $WNSW_t$ for 2022-23; and
3. 2,287,272, when calculating $WNSW_t$ for 2023-24.

Z means the actual or deemed size of the meter (in millimetres).

T.3 Service charge cost pass-through for Sydney Water's contingent capital expenditure related to expanding the SDP

If the NSW Government decides to expand SDP during the 2020 determination period, our decision is that Sydney Water's costs of expanding its network to accommodate additional flows from an expanded SDP would be pass-through annually to the water service charge. In future determination periods these assets would be rolled into Sydney Water's water RAB.

The trigger for this pass-through is IPART receiving a "Construction Commencement Notification" which will reflect a government decision to expand the capacity of SDP.

$$CC_t = CCA \times CPI_{t-1} \times \frac{Z^2}{400}$$

Where:

CCP_t is the contingent capital cost adjustment to the base water supply service charge for a Meter;

CCA means the contingent cost amount, which is:

1. $0 in a year where there has not been a Construction Commencement Notification received;
2. $0 in a year where a Construction Commencement Notification is received;
3. $7.13 (in $2020-21) in any year following the year a Construction Commencement Notification is received, over the 2020 determination period.

The values of CPI_{t-1} are outlined in Table T.1 below.

Z means the actual or deemed size of the meter (in millimetres).

T.4 Consumer cost index in this appendix

We use the consumer price index (CPI) to inflate prices over time. The 'base' CPI value used to set prices for $2020-21 is the March quarter 2020 CPI value. The table below presents the CPI values we use to convert nominal prices into $2020-21, and to convert real $2020-21 values into nominal values in later years of the determination.

Table U.1 Values of CPI that apply to the cost pass-through formulae

Year of cost pass-through	CPI_{t-1} Applies to all three pass-throughs	CPI^*_{t-2} Only applies to SDP and Shoalhaven pass-throughs
2021-22	$\frac{CPI_{March2021}}{CPI_{March2020}}$	$\frac{CPI_{December2019}}{CPI_{March2020}}$
2022-23	$\frac{CPI_{March2022}}{CPI_{March2020}}$	$\frac{CPI_{December2020}}{CPI_{March2020}}$
2023-24	$\frac{CPI_{March2023}}{CPI_{March2020}}$	$\frac{CPI_{December2021}}{CPI_{March2020}}$

U Efficiency carryover mechanism

An Efficiency Carryover Mechanism (ECM) mitigates the incentive for a regulated utility to delay reporting efficiency savings. This is because any permanent cost savings retained by the business for the period will be passed onto customers through lower prices at the next price determination regardless of when these savings are identified within the regulatory period.

For an ECM to apply:

1. The regulated utility will need to include details of efficiency savings in its next pricing submission, and be able to demonstrate these are permanent efficiency improvements.
2. IPART will then assess the efficiency gain and the appropriate level of funds to be carried forward.

In this Appendix, we explain why the ECM only applies to operating expenditure and the utilities' views on this. We also explain why an ECM would remove an incentive for the utility to delay efficiency savings it identifies during a regulatory period until the beginning of the following period. It provides worked examples of how the ECM removes this incentive by identifying efficiency savings that are permanent, and allowing the utility to retain permanent efficiencies savings for the same amount of time, regardless of when they are implemented by the utility.

We can set the holding period to be equal to (or different to) the length of determination. Typically, we have set the holding period to equal the length of the determination period so that the strength of the incentive to make efficiency savings that applies in year 1 of the determination period continues to apply for the remainder of the determination period.

Sections U.1 and U.2 below compare the 'profits' that a utility would enjoy if it implemented a permanent efficiency saving under the regulatory framework that does not have ECM, with those available under the ECM. Section U.3 outlines why the ECM only applies to operating expenditure. Section U.4 explains how the ECM is applied and why we implement the ECM with a 1-year lag.

U.1 Regulatory framework without ECM

The four tables in Figure U.1 show the profits that a regulated utility retains after making an efficiency improvement **decrease** the further into a regulatory period that the efficiency is made. The efficiency is then incorporated into the regulatory allowance – in the form of lower prices to customers – in the next determination period and the utility gains no more profit from that efficiency. This creates the incentive for the utility to delay efficiencies to the first year of a new regulatory period.

Figure U.1 assumes that an efficiency saving implemented by a utility in the final year of a determination would be identified by IPART in the expenditure review process.

Figure V.1 How the current framework incentivises delaying efficiencies

Permanent saving made in year 1

	Regulatory Period 1				Regulatory Period 2			
Year	1	2	3	4	5	6	7	8
	$	$	$	$	$	$	$	$
Allowance	100	100	100	100	80	80	80	80
Actual	80	80	80	80	80	80	80	80
Annual profit	20	20	20	20	-	-	-	-
Total profit in period				**80**				

Permanent saving made in year 2

	Regulatory Period 1				Regulatory Period 2			
Year	1	2	3	4	5	6	7	8
	$	$	$	$	$	$	$	$
Allowance	100	100	100	100	80	80	80	80
Actual	100	80	80	80	80	80	80	80
Annual profit	-	20	20	20	-	-	-	-
Total profit in period				**60**				

Permanent saving made in year 3

	Regulatory Period 1				Regulatory Period 2			
Year	1	2	3	4	5	6	7	8
	$	$	$	$	$	$	$	$
Allowance	100	100	100	100	80	80	80	80
Actual	100	100	80	80	80	80	80	80
Annual profit	-	-	20	20	-	-	-	-
Total profit in period				**40**				

Permanent saving made in year 4

	Regulatory Period 1				Regulatory Period 2			
Year	1	2	3	4	5	6	7	8
	$	$	$	$	$	$	$	$
Allowance	100	100	100	100	80	80	80	80
Actual	100	100	100	80	80	80	80	80
Annual profit	-	-	-	20	-	-	-	-
Total profit in period				**20**				

U.2 How the ECM removes the incentive to delay savings

The ECM removes the incentive to delay savings by allowing the utility to retain profits for each permanent saving as though the saving were made in year 1 of the determination period in the scenario above. That is, the total profit for the utility is the same regardless of which year the efficiency was made.

The four tables in Figure U.2 demonstrate the ECM for a 4-year determination. Using the same example as in Figure U.1, the utility retains an $80 profit regardless of which determination year it makes the saving in. This is because we calculate a "carryover" into the next determination period.

After four years, the saving is passed onto customers.

Figure V.2 How the ECM removes incentives to delay efficiencies

Permanent saving made in year 1

	Regulatory Period 1				Regulatory Period 2			
Year	1	2	3	4	5	6	7	8
	$	$	$	$	$	$	$	$
Base allowance	100	100	100	100	80	80	80	80
Actual	80	80	80	80	80	80	80	80
Permanent saving	20	20	20	20	-	-	-	-
Incremental saving	20	20	20	20	-	-	-	-
Carryover calc	N/A	N/A	N/A	N/A				
Net allowance	100	100	100	100	80	80	80	80
Annual profit	20	20	20	20	-	-	-	-
Total profit in period				**80**				**-**

Permanent saving made in year 2

Year	1	2	3	4	5	6	7	8
	$	$	$	$	$	$	$	$
Base allowance	100	100	100	100	80	80	80	80
Actual	100	80	80	80	80	80	80	80
Permanent saving	-	20	20	20	-	-	-	-
Incremental saving	-	20	20	20	-	-	-	-
Carryover calc		20	20	20	20			
Net allowance	100	100	100	100	100	80	80	80
Annual profit	-	20	20	20	20	-	-	-
Total profit in period				**60**				**20**

Permanent saving made in year 3

Year	1	2	3	4	5	6	7	8
	$	$	$	$	$	$	$	$
Base allowance	100	100	100	100	80	80	80	80
Actual	100	100	80	80	80	80	80	80
Permanent saving	-	-	20	20	-	-	-	-
Incremental saving	-	-	20	20	-	-	-	-
Carryover calc			20	20	20	20		
Net allowance	100	100	100	100	100	100	80	80
Annual profit	-	-	20	20	20	20	-	-
Total profit in period				**40**				**40**

Permanent saving made in year 4

Year	1	2	3	4	5	6	7	8
	$	$	$	$	$	$	$	$
Base allowance	100	100	100	100	80	80	80	80
Actual	100	100	100	80	80	80	80	80
Permanent saving	-	-	-	20	-	-	-	-
Incremental saving	-	-	-	20	-	-	-	-
Carryover calc				20	20	20	20	
Net allowance	100	100	100	100	100	100	100	80
Annual profit	-	-	-	20	20	20	20	-
Total profit in period				**20**				**60**

Note: Regulatory period 2 does not necessarily have to be the same length as previous regulatory period. We have not made a decision on the length of the subsequent regulatory period. The tables in this figure are illustrative only.

U.3 The ECM only applies to operating expenditure

The ECM applies to operating expenditure only – it does not apply to **capital expenditure**. This is due to the additional complexity of introducing an ECM for capital expenditure, the risk of unintended consequences (ie, incentivising the utility to over-forecast and inefficiently defer capital expenditure. To date, we have not been presented with examples of efficient trade-offs between operating expenditure and capital expenditure over the determination period that might be impeded by the application of an ECM to operating expenditure and not to capital expenditure.

In our 2016 Final Reports, we did acknowledge the potential value in encouraging efficient trade-offs between operating and capital expenditure, and that this issue could be explored further in the future.[266] In the lead up to this review, we asked the utilities whether the ECM should be extended to include capital expenditure.

The utilities expressed mixed views on an ECM for capital expenditure:

- Hunter Water noted reservations about the effectiveness of the current ECM model because it only applies to operating expenditure and is asymmetric (that is, it only applies to efficiency gains, but not to losses). It proposed IPART undertake a broader review of the framework, including incentivising efficiencies. [267]
- Water NSW considers that a capital incentive scheme (either ECM or another) would not result in improved outcomes for the utility and customers; and that the lumpy nature of capital expenditure can be related to different stages of the asset life-cycle, business decisions and planning, and/or government-directed investment, rather than efficiency.[268]
- Sydney Water indicated interest in exploring an ECM for capital expenditure and re-iterated its proposal from 2016.[269]

For reasons outlined above and in Chapter 13, we have decided that the ECM should only apply to operating expenditure. We will be undertaking a broader review of our form of regulation before we next review prices for Sydney Water, and as part of that broader review we will consider incentives for efficiency gains.

266 Further information on the ECM we established is available in Chapter 3 and Appendix E in the 2016 Final Report of our determination of Sydney Water's prices. IPART, *Sydney Water Corporation: Maximum prices for water, sewerage, stormwater drainage and other services from 1 July 2016*, Final Report, June 2016.

267 Hunter Water, *Pricing Proposal to IPART, Technical Paper 3*, 1 July 2019, p B-12.

268 Water NSW, *Water NSW Pricing Proposal to the Independent Pricing and regulatory Tribunal*, July 2019, p 54.

269 Sydney Water, *Price proposal 2020-24*, July 2019, Attachment 7, pp 3-5.

U.4 Applying the ECM

If the utility decides to apply the ECM, the utility would need to calculate the following values:

- **Under (over):** first the utility identifies the difference between the base allowance set by IPART to its actual expenditure.
- **Outperformance:** second, the utility only reports where it underspends against our allowances (overspends are omitted).
- **Permanent gain:** working backwards from year 4 to year 1, the utility then determines how much of the outperformance in year 4 also occurred in year 3, how much of the outperformance that occurred in both year 4 and 3 occurred in year 2, etc.
- **Incremental gain:** working forwards from year 1 to 4, it then determines the first year that a permanent saving occurred. It is this 'incremental gain' in each year that would be carried forward for four years through the ECM calculation that follows.
- **ECM calculations:** ensures that any incremental gain is carried forward and held for four years.

At the next determination period, we would consider these calculations, and decide whether the savings identified by the utility are permanent.

U.4.1 Why there is a 1-year lag in implementation

In practice, at the time we undertake our review, we only have a forecast of expenditure in the final year of the determination period.

To address this limitation, we make three adjustments.

First, we lag the implementation of the ECM by one year. For example, with a 4-year determination period, we apply the ECM calculation to the first three years of the current determination period (years 1, 2, and 3), and to the final year of the previous regulatory period (ie, year 0). Efficiency savings in the final year of the current period (year 4) would be included in the ECM calculation for the following determination period.

Second, we assume an efficiency saving made in year 3 is permanent. Therefore, the benefit is held in year 3 and year 4, and the ECM allows the benefit to be carried forward in years 5 and 6.

Figure U.3 shows the first two adjustments. In this example, the two regulatory periods are years 1 to 4 (regulatory period 1), and year 5 to 8 (regulatory period 2). The ECM is then applied to operating expenditure in Years 0 to 3 in the first regulatory period, and years 4 to 7 in the second.

Figure V.3 ECM is lagged one year so that it is based on actuals

		Regulatory Period 1				Regulatory Period 2			
	ECM1				ECM2				
Year	**–**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
	$	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**
Base allowance	100	100	100	100	100	80	80	80	80
Actual	100	100	100	80	80	80	80	80	80
Under (over)	–	–	–	20	20	–	–	–	–
Outperformance	–	–	–	20	20	–	–	–	–
Performance gain	–	–	–	20					
Incremental gain	–	–	–	20					
ECM1 calc									
▼ year 0	–	–	–	–	–				
▼ year 1		–	–	–	–	–			
▼ year 2			–	–	–	–	–		
▼ year 3				20	20	20	20	–	
ECM benefit						**20**	**20**		
Total allowance		**100**	**100**	**100**	**100**	**100**	**100**	**80**	**80**
Total gain (loss)		**–**	**–**	**20**	**20**	**20**	**20**	**–**	**–**

Source: The numbers in this figure are illustrative only.

The third adjustment made is to ensure that any efficiency made in the final year of a determination period is only retained for one regulatory period, in present value terms. This is because we review efficiency savings made in the final year of a determination in the following period. For example, with a 4-year determination period, it is five years before we review this expenditure. Therefore, the utility would have retained these cost savings for five years.

Figure U.4 shows that we would calculate a 'year 0 adjustment' to ensure permanent savings made in the last year of a determination are only held for the length of the determination period, in this example for four (and not five) years.

In this example, a permanent efficiency saving of $20 is made in Year 0. Without an adjustment factor, the business would retain this saving for five years. The 'Year 0 adjustment' offsets the fifth year of benefit (received in year 4) with a corresponding negative adjustment to the allowance in the first year of the next regulatory period (ie, year 5). Note that we are inflating this adjustment term by the WACC[270] in order to ensure incentives are fully equalised in present value terms (because the WACC represents our view of the appropriate discount rate).

270 If cash flows are assumed to occur at the end of each year, this should be the WACC used for regulatory period 2.

Figure V.4 ECM adjustment to ensure savings are held for no longer than determination]

			Regulatory Period 1			Regulatory Period 2			
		ECM1				ECM2			
Year	**–**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
	$	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**
Base allowance	100	100	100	100	100	80	80	80	80
Actual	80	80	80	80	80	80	80	80	80
Under (over)	20	20	20	20	–	–	–	–	–
Outperformance	20	20	20	20	–	–	–	–	–
Performance gain	20	20	20	20					
Incremental gain	20	–	–	–					
ECM1 calc									
▼ year 0	20	20	20	20	20				
▼ year 1		–	–	–	–	–			
▼ year 2			–	–	–	–	–		
▼ year 3				–	–	–	–		
▼ year 0 adjust.						**-21**			
ECM benefit						**-21**	**–**	**–**	**–**
Total allowance		**100**	**100**	**100**	**100**	**59**	**80**	**80**	**80**
Total gain (loss)	**20**	**20**	**20**	**20**	**20**	**-21**		**–**	**–**

Source: We have assumed a real WACC of 5% in this example. The numbers in this figure are illustrative only.

Retaining the saving for five years would be inconsistent with the purpose of the ECM of equalising incentives over time. The business may have an incentive to delay savings until the last year of a determination period in order to maximise returns.[271]

The adjustment term only applies to a permanent efficiency saving that is made in the final year of a regulatory period. Because the business receives this benefit for five years initially (years 0, 1, 2, 3, and 4), the adjustment term inflates the fifth year of this benefit (received in year 4) by the WACC and returns it to customers in year 5.

271 This incentive already exists under the current form of regulation.

V Discretionary expenditure framework

V.1 What is discretionary expenditure

We set utilities' prices to recover the efficient costs of supplying monopoly services to customers. The prices recover the efficient operating and capital expenditure required for utilities to meet service standards to customers (eg, as specified in the operating licence), and to comply with other regulatory obligations (eg, as specified in Environment Protection Licences, administered by the EPA).

Discretionary expenditure could include:

- Expenditure that is not required to deliver the utility's monopoly services.
- Expenditure to provide services or achieve outcomes that are not mandated.
- Expenditure to provide a level of service that goes beyond service standards stipulated in the utility's operating licence or other regulatory requirements.

In 2016, we noted that we would consider, and could allow, discretionary expenditure to be recovered via regulated prices, but that we would require clear evidence that it would be efficient for customers to pay to exceed mandated standards. For instance, we would consider whether:

- The proposal would best fit with the utility's responsibilities or whether it would best fit with another party's responsibilities.
- The utility's customers have the capacity and willingness to pay for the discretionary expenditure (based on information or evidence provided by the utility).[272]

Our recent decisions on recycled water pricing also recognised the importance of customer willingness to pay.[273] We allow for the costs of recycled water schemes to be recovered from general water and/or wastewater prices to the extent there is sufficient evidence that the broader customer base is willing to pay for the external benefits of the recycled water scheme.[274] We have set out a number of best practice principles for demonstrating willingness to pay, and for consulting customers around discretionary expenditure.[275]

As outlined in our Guidelines for Water Agency Pricing Submissions, utilities should have a strong and up to date understanding of customer preferences.[276] Further, it is the utility's responsibility to engage with its customers to understand their views, priorities and needs and that the information gathered through this engagement should inform a utility's decision-making and pricing submission.

272 IPART, Review of prices for Sydney Water Corporation, Final Report, June 2016, p 37.
273 IPART, Review of pricing arrangements for recycled water and related services, July 2019.
274 To qualify for funding from the broader customer base, external benefits must be additional to any outcomes already mandated by Government, specific to the recycled water scheme(s) in question, and supported by customer willingness to pay for them. IPART, Review of pricing arrangements for recycled water and related services, July 2019, p 2.
275 IPART, Review of pricing arrangements for recycled water and related services, July 2019, p 61.
276 Guidelines for Water Agency Pricing Submissions, IPART, April 2018, pp. 20-21.

Utilities should engage with their customers on existing business and standards and where a utility proposes to make changes to prices or services which would affect specific customer groups. Utilities should also engage with customers if they include any discretionary expenditure in their pricing proposal.

Significant or material changes to a utility's service standards, environmental obligations or other regulatory outcomes should primarily be addressed by consulting customers and the entity which enforces the regulation, with the aim of updating standards or regulations to reflect changing community preferences. Where the cost to achieve a discretionary outcome is relatively small, utilities can propose expenditure allowances to achieve these discretionary outcomes through the IPART pricing process. For any discretionary expenditure to be approved through the IPART pricing process, we:

- Require robust evidence of customer willingness to pay.
- Will apply our discretionary expenditure framework (detailed below) to assess any proposal put forward by the utility.
- Require utilities to report annually on output measures to ensure that they have upheld their agreement with customers.

V.2 Why have we developed a framework for assessing discretionary expenditure?

As part of the 2020 water pricing reviews, we have developed a framework to guide how we will assess the discretionary expenditure Sydney Water and Hunter Water have included in their pricing proposals. This new framework acknowledges the growing appetite for both IPART and the water businesses to take into account liveability issues (such as environmental sustainability) when setting prices.

Although the discretionary expenditure proposed by the utilities represents only 1 to 2 % of total proposed capital expenditure over the 2020 determination period, we expect that the quantum of this type of expenditure may increase in the future. Our framework provides guidance to the utilities and establishes robust processes and checks to ensure that the impact on customers' bills arising from discretionary projects is no more than they are willing to pay for those projects.

We note that water utilities have included discretionary expenditure in their pricing proposals in the past. Previously, we assessed this expenditure within the broader capital and operating expenditure review process. This ensured that the costs were efficient and that the utility had appropriately prioritised any discretionary expenditure within its total expenditure program. We have accepted discretionary expenditure in the past where we considered that a profit-maximising business would have opted to undertake that expenditure. We have taken a different approach to assessing discretionary expenditure in this review, (through the establishment of the discretionary framework) as this will allow the utility a broader range of activities they may conduct in response to consumer preferences.

V.2.1 Our discretionary expenditure framework must work for a range of different proposed projects

There is a large spectrum of potential discretionary projects with various characteristics and any discretionary expenditure framework we develop will need to apply to all possible projects.

V.2.2 Mandatory versus discretionary expenditure

A utility's proposal can include two categories of costs. These are the costs to:

- Comply with its **mandatory obligations**. For example, service levels under its operating licence and environmental licence obligations set by the Environmental Protection Authority (EPA).
  - We set prices to recover the efficient level of these costs that enables a monopoly service provider to deliver its service in compliance with its other regulatory obligations.
- Undertake **discretionary projects**. These are projects which are not driven or required by an external regulator or body.

Discretionary expenditure is incurred when a utility invests in projects that provide services or achieve outcomes that go beyond services standards/environmental obligations stipulated in the utility's operating licence or other regulatory instruments/requirements.

V.2.3 The discretionary expenditure component can be the cost difference between achieving the discretionary standard and the mandatory standard

Sydney Water and Hunter Water deliver their monopoly services within the bounds of their regulatory requirements. The cost of complying with these regulatory requirements is recovered from the prices that customers pay to use the service. For example, the EPA requires water utilities to comply with environmental protection licences (EPLs) while delivering wastewater services, and water utilities must also meet conditions imposed by their operating licence. An integral part of our price review process is to ensure that these costs are efficient and that the utility can raise sufficient revenue to recover these efficient costs.

However, a utility may undertake activities which result in outcomes that go beyond its regulatory requirements. For example, Sydney Water's operating licence includes a Water Continuity Standard. The standard requires that 9,800 properties per 10,000 properties do not experience an unplanned water interruption in a given year.[277] The cost to comply with this standard would be a mandatory cost that Sydney Water must incur. However, Sydney Water may obtain evidence to support that its customers prefer that no properties experience an unplanned water interruption in a given year and are willing to pay (through their water service charges) for Sydney Water to deliver this outcome.

[277] Recommended Sydney Water Operating Licence 2019-2023, April 2019, p 12.

The cost to Sydney Water to ensure that the extra 2% of customers are not affected by an unplanned water interruption is discretionary because it is the cost to Sydney Water to deliver an outcome that is beyond its regulatory requirements. This cost can only be recovered through prices to customers if there is evidence that the customer base is willing to pay for this 'enhanced' service.

V.2.4 We must also consider the circumstances and context of adopting a discretionary standard

We emphasise that the example above is a simplified scenario. We acknowledge that specialised regulatory bodies set service standards, environmental obligations and drinking water quality standards (amongst other regulator obligations). These standards and obligations are set to achieve outcomes which are supported by strong evidence and cost-benefit analysis. Therefore we must also consider the circumstances and context of adopting a discretionary standard that is different to the existing mandatory standard. For example, whether the discretionary standard has been considered by Parliament and/or government when setting the existing mandatory standard and whether the facts around the issue have changed since that time.

V.3 Our discretionary framework

This section will discuss first the principles that underpin the framework we have developed to assess both Sydney Water and Hunter Water's proposed discretionary framework. We then discuss in detail each phase of the framework. Table P.1 provides a summary of the framework.

V.3.1 There are a number of principles we consider key in developing a framework

Our framework is underpinned by a number of key principles.

Efficiency

Our framework encourages both cost efficiencies and efficient levels of service provision. Robust willingness to pay survey results can identify the efficient level of service provision that maximises welfare. Additionally, we also look at efficiency in terms of the least-cost solution to meeting customer preferences.

Transparency

Transparency is an important element to ensure that the utility's activities and prices are well understood by stakeholders and its customers. Our discretionary framework endeavours to facilitate this transparency between the utility's activities and its customers.

Achieving discretionary outcomes are outside of the mandated monopoly services that utilities must supply to their customers. It is important that utilities and customers fully understand the implications of these outcomes on prices.

Additionally, the simplicity of both the framework and the utility's proposal should facilitate transparency.

Accountability

Our framework endeavours to hold utilities accountable for any proposed discretionary expenditure. This ensures that a utility's proposal matches its customers' understanding of what they are paying for and that the outcome is delivered over the specified timeframe at an efficient cost. This element of our framework is particularly important in the absence of any additional regulatory process such as obligatory service standards or environmental standards that a utility must uphold. We also need to balance the sharing of risk associated with under- or over-spending on proposed discretionary projects between the utility and the broader customer base.

Equity

Our framework recognises the benefits that utilities can gain from understanding their customers' preferences, however it emphasises the need for robust evidence of customer willingness to pay. This ensures that the customer sample consulted, appropriately reflects the population, especially vulnerable customer groups, small and large businesses and non-English speaking groups.

We outline our framework below and detail each step in the sections that follow.

Table V.1 Discretionary expenditure framework

Phase	Principle	Description	Existing material
Phase 1: Project definition	▼ Accountability and transparency	▼ **The project or outcome is adequately described and defined**. At a minimum, the project or outcome specification must include the following characteristics and conditions: – Location, customer/user, delivery timeframes, whether it will be replacing another service and outcomes expected. ▼ The project or outcome **fits within the utility's responsibilities and is related to its monopoly services.** ▼ The project is discretionary.	
Phase 2: Willingness to pay	▼ Transparency and equity	▼ Survey participants are given **sufficient context and information** on the proposed project or outcome. This should align with the characteristics and conditions of the project definition identified in Phase 1. ▼ The **willingness to pay dollar amounts** that customers are surveyed on **correspond to the cost of the project/outcome** estimated in Phase 3**.** ▼ The survey used to elicit customer willingness to pay is **well designed and results are statistically valid.** ▼ Bill impacts should be shown in the context of the broader bill impact.	Our 'best practice willingness to pay principles' we published in our Recycled Water review.

Phase	Principle	Description	Existing material
Phase 3: Efficiency test	▼ Accountability	▼ **The project is prioritised and optimised** within the utilities broader and required responsibilities. ▼ The project is the **most efficient cost way of achieving the outcome**. ▼ Total efficient cost estimates should transparently **net off any avoided costs and/or grants.**	Our 'efficiency test'
Phase 4: Recovery from customers	▼ Transparency and equity	▼ The proposed **prices to customers recover only the efficient cost** of the outcome or project determined in Phase 3. ▼ Bill impact per household less than WTP from Phase 2. ▼ Recovered from those whose WTP was assessed in Phase 2 (res/non res; water/wastewater/stormwater). ▼ **Separate RAB** with appropriate asset lives and long term WACC estimate so future bill impact remains within bounds of willingness to pay from Phase 2. ▼ Transparent and accountable – utility to develop and propose approaches to ensure accountability. ▼ Next period adjustment will consider whether any underspend is returned to customers or retained by the utility for other projects or as an efficiency gain.	Our 'pricing principles'
Phase 5: Follow up	▼ Accountability	▼ **Capture the program as an output measure** to ensure sufficient reporting on what is achieved. ▼ **Ex-post adjustment mechanism** where only investments in line with project definition in willingness to pay survey added to the RAB. ▼ Where proposed expenditure is not carried out or outcomes are not delivered, funds collected through the discretionary charge may be returned to customers in the subsequent determination period. ▼ Outline expectation that the **charge remains equal to or below demonstrated willingness to pay amount** over the long term.	

V.3.2 Phase 1: Project definition

Our framework requires that any discretionary expenditure proposed by the utility is appropriately defined in terms of the outcomes the expenditure will achieve. The project's definition or desired outcome should be adequately scoped before a utility engages with customers on their willingness to pay.

In some cases, a discretionary project may be defined by the characteristics and conditions of the outcome that the utility wants to achieve instead of a specific project. This is because a utility may want to confirm the extent of their customers' willingness to pay for an outcome before allocating funds to scope and plan for a specific project that would achieve that outcome. For example, a utility's preliminary project definition may be to improve the appearance of its stormwater assets in a particular location instead of scoping out the activities that would be required to achieve this.

At a minimum, however, these characteristics and conditions should include the outcome or project:

- location(s)
- customers that would benefit from the discretionary expenditure
- estimated timeframes for delivery, and
- if the project would be replacing an existing service.

Discretionary expenditure should be related to the utility's monopoly services

The project or outcome that the discretionary expenditure will achieve should be related to the utility's mandatory monopoly services and fit within the utility's responsibilities. For example, the utility should confirm in its proposal:

- That the utility is the most suitable agency to deliver the proposed outcome or project
- That the proposal best fits within the utility's responsibilities instead of another party or party's responsibilities, such as another arm of government or local government, and
- That the proposal is consistent with the *Independent Pricing and Regulatory Tribunal Act 1992* and any other relevant legislation.

The utility's customers should inform the type of discretionary project/outcome proposed by the utility

The identification of any proposed discretionary project or outcome should be customer driven and as part of its proposal, a utility should show evidence of how it consulted its customers to identify any proposed discretionary projects.

As a first step, utilities should understand its customers' priorities and preferences and this should inform not only its proposal for discretionary expenditure but in general, its overall decision-making process.

Project identification and selection

Ideally the identification of potential projects should be customer driven rather than proposed by the utility and/or its staff, or stakeholders with a vested interest in particular outcomes. The utility could offer a menu of options to customers and ask customers to rank the projects or indicate which projects of those offered they would prefer.

V.3.3 Phase 2: Are customers willing to pay?

Utilities should regularly engage with customers, so as to understand their preferences. The outcomes of this process should then inform which discretionary outcomes a utility includes in its pricing proposal. Additionally, it is essential that utilities show robust evidence of customers' willingness to pay for the proposed discretionary outcome. It is important to highlight that the extent of the willingness to pay surveys conducted by the utility should be proportionate to the relative quantum of the discretionary expenditure proposed compared to its overall expenditure proposal. This section outlines some elements of a robust customer willingness to pay survey. Box P.1 provides our best practice principles for demonstrating willingness to pay.

Survey participants should be given sufficient context and information on the proposed outcome or project

The utility should ensure that when consulting customers on their willingness to pay for proposed discretionary expenditure, there is sufficient context and supporting information provided in a clear manner to allow respondents to make informed decisions. In particular, the characteristics and conditions of the project or outcome presented in willingness to pay questions must align with the characteristics and conditions of the proposed project or outcome in the utility's pricing proposal.

Survey participants should be consulted on the same outcomes that the utility previously defined and scoped. This includes the characteristics and conditions outlined in Phase 1. The discretionary outcomes or projects should be expressed in terms of benefits that customers directly value.

The dollar amounts presented in the survey should correspond with the actual estimated cost of the project or outcomes

When surveying customers on their willingness to pay, the choices presented must be in dollar amounts and require discrete voting. The dollar values that respondents are asked to vote on should correspond with the actual estimated cost of the project or outcomes and should be expressed in terms of the ongoing bill impact for the customer, not the total project cost.

Utilities should use a long-term view of the funding costs when estimating the cost of the project/outcome and presenting it to customers on a bill impact basis. This is to avoid a situation where a future change to the interest rate (or weighted average cost of capital (WACC)) results in future project costs being greater than those proposed in the original survey of customers' willingness to pay.

The bill impact of the project should be presented in the context of the respondents' total bill, including any other planned bill increases/decreases occurring as a result of price changes external to the discretionary expenditure. Customers should be made aware of their budget constraint, and that choices could potentially subtract from the amount they can spend on other outcomes.

The surveys used to elicit customers' willingness to pay should be well designed and produce statistically significant results

Estimates of willingness to pay can only be accurately drawn from a robust survey that produces valid responses. Key features of a well-designed survey include: a sample size that is both sufficiently large and is representative of all demographics of the broader customer population; participants being randomly sourced and screened to ensure all quotas for customer groups are represented; and no participants having a personal interest in the utility or related organisations.

The survey should be carried out in an appropriate format that may include multiple platforms such as online surveys, face-to-face forums and discussion groups. The survey should aim for reliability through repetition. Utilities should ensure that sensitivity to the survey instrument is tested, including whether the structure, wording and order of questions influences responses (eg, respondents 'anchoring' answers to values seen earlier in the survey).

Results of the survey should be analysed, ensuring they are statistically significant. A survey can be deemed invalid if there are high non-response rates to certain questions or to the overall survey, and if there is evidence of obvious bias in the survey design or conduct.

Box V.1 Best practice principles for demonstrating willingness-to-pay using a contingent valuation approach to stated preference surveys

- Participants are given the impression that their answers are consequential and that they may be compelled to pay any amount they commit to in the survey. The payment mechanism by which people would financially contribute is specific and credible (eg, annual change in water or wastewater bills).
- The non-market outcomes (external benefits) in the survey are expressed in terms of outcomes that people directly value (eg, people should be asked about willingness-to-pay for the environmental improvements brought about by increases in water recycling, rather than for increases in water recycling in and of itself).
- There is alignment between the external benefits being valued and the likely investment outcomes. The survey should not reflect an overly optimistic view about what benefits the scheme would achieve, and major uncertainties should be made clear to participants.
- The information provided to participants is clear, relevant, easy to understand and objective. For example, this can be tested through focus groups and pilot surveys, consulting stakeholders, and including appropriate maps and diagrams.
- Participants are encouraged to consider the context of their decisions, including the broader context of expected or proposed changes in prices for other services, as well as alternative approaches to achieving the external benefits.
- The valuation questions require participants to make discrete choices (such as ‘yes/no’ or selecting options), and include a ‘no-answer’ option to identify participants that are indifferent.
- Follow-up questions are used to detect potential sources of bias, such as cases where participants did not understand the valuation question(s) or the information provided.
- The sample of people surveyed is representative of the broader customer base and large enough to permit robust data analysis. The study should clearly set out how customers were selected for the survey, the number of participants and the response rate.
- Estimates of average willingness-to-pay are supplemented with confidence intervals to indicate the precision of the estimates.
- Population-wide estimates of willingness-to-pay for external benefits are calculated in a transparent and appropriate way. Potential reasons for non-response to the survey should be identified. Sensitivity analysis should be used to demonstrate how aggregate estimates change depending on assumptions about the values held by non-respondents and the extent of the population affected by the investment.
- Survey questions are designed and analysed using appropriate statistical techniques. For example, payment levels need to cover the likely range of amounts that customers might be willing to pay, no option should clearly dominate the others, and participants should not be burdened with too many choices.

Source: Based on Productivity Commission, Environmental Policy Analysis: A Guide to Non-Market Valuation, January 2014, pp 44-47

V.3.4 Phase 3: Are the costs efficient?

We set prices to allow a utility to recover the efficient cost of delivering its monopoly services. This principle applies to any discretionary expenditure that the utility proposes. We would assess whether the proposed discretionary expenditure is the most efficient means of achieving the outcome or delivering the 'enhanced' service that the customers are willing to pay for. To do this, we apply our existing efficiency test. This way the priority of the discretionary outcome is assessed along with the mandatory outcomes that the utility is required to achieve. Our efficiency test is described in Appendix B.

A utility may propose multiple projects to achieve a discretionary outcome

We will assess the efficient costs of delivering a service or achieving an outcome. This could mean that there are multiple projects a utility may undertake to achieve a single outcome. In the case that a utility proposes multiple projects to meet a discretionary outcome, the portfolio of projects together should be the most efficient or optimum mix of projects to meet the outcome.

The efficiency test also applies to historical discretionary expenditure

As part of our efficiency test we also review historical capital expenditure incurred in the previous determination period. This assesses whether the actual expenditure was efficient based on the information available to the utility at the time it incurred the expenditure. This principle applies to discretionary expenditure, and we will do a post-expenditure assessment to ensure that the actual or historical discretionary expenditure was within the bounds of what customers were willing to pay, and the project characteristics and conditions of the project as it was delivered matched those described to willingness to pay survey participants.

The utility should calculate the efficient net discretionary expenditure

Willingness to pay surveys should quantify the benefits that customers would receive from discretionary expenditure. We recognise that there may be third parties who could also benefit from the proposed project or outcome. This provides an opportunity for the utility to access funding from these third parties, or Government, to fund or partially fund discretionary projects.

Should a utility receive any third party funding for a project, our standard approach is to subtract this amount from the utility's total efficient costs, to ensure that it does not over-recover for a project.

Avoided costs should be deducted

Similarly, any avoided costs should be deducted from the total cost, and the willingness to pay survey conducted on the value of external benefits provided to the broader customer base. This is because our recycled water framework already allows any avoided costs net of revenue forgone to be recovered from the broader customer base.

V.3.5 Phase 4: Recovery from customers and delivery incentives

Phase 4 of our framework considers how the discretionary expenditure we allow should be recovered from customers, and how to hold the utility accountable for delivery of the outcomes in a way that meets customer expectations.

How much to recover?

The maximum total cost to be recovered for a specific project is the efficient expenditure identified in Phase 3. When translated to prices, it must also be less per household per year than the maximum demonstrated willingness to pay from Phase 2.

We propose creating a separate RAB for discretionary expenditure to calculate the most accurate charge. This will ensure appropriate asset lives are used that match the nature of the proposed projects.

Who should we recover the expenditure from?

At the extreme, there is scope for discretionary expenditure to be recovered from the business's entire broader customer base. However we consider there should be alignment between the sample of customers whose willingness to pay has been assessed and those customers among whom the costs are shared. This may limit the recovery of discretionary expenditure costs to, for example, residential customers only, if the willingness to pay of non-residential customers has not been assessed in Phase 2. Whilst we acknowledge that spreading the costs across a larger customer base will likely result in smaller prices for residential customers (or a greater level of additional services), we note there may be a higher degree of difficulty in engaging non-residential customers in willingness to pay surveys.

Discretionary expenditure should be transparent to customers

We consider that utilities must keep customers informed around both the cost and the outcomes of discretionary expenditure. Utilities could communicate this information on customer bills or bill inserts, through their websites, or by displaying the discretionary charge as a separate line item on bills.

A separate charge allows flexibility in recovery of discretionary expenditure

A separate charge on bills that incorporates discretionary expenditure allows utilities to target their willingness to pay surveys to customer segments relevant to a particular proposed project. For example, customers in particular locations; residential or non-residential customers; or customers of specific services.

A separate charge maximises accountability to customers

A separate charge allows utilities to easily provide context when conducting willingness to pay surveys for future discretionary expenditure. Customers will be able to make decisions on how much they are willing to pay for a project with full knowledge of how much discretionary expenditure they are currently paying for, rather than it being hidden within monopoly service charges.

Ensuring utilities are accountable for the delivery of the project

We need to hold utilities accountable for any proposed discretionary expenditure. This ensures that the utility's proposal matches the customers' understanding of what they are paying for and that the outcome is delivered over the specified timeframe at an efficient cost. This element is particularly important given the absence of any additional regulatory process such as obligatory service standards or environmental standards that a utility must uphold in relation to this type of expenditure.

To ensure accountability to customers, we have included performance commitments to ensure delivery of discretionary projects and alignment with customer expectations.

Sharing of risk between customers and the utility

For discretionary expenditure we are aiming to provide incentives that ensure that utilities are accountable to customers and appropriately gauge project risks prior to making commitments to customers.

When considering the incentives to ensure project delivery, the utility should face clear financial consequences if it cannot meet its stated outcomes on which it has gained community support. We realise that this assessment may not be purely objective, however, many of the projects that would be classed as discretionary would be discrete in nature and amenable to having a clear set of outcomes defined.

The clear incentive for focus on delivery will be achieved through:

- our standard approach to ex-post adjustments to capital expenditure during the next review, and
- a next period adjustment to assess whether any underspend is returned to customers, used to provide similar outcomes or retained by the utility as an efficiency gain. This is a slightly different approach to our standard approach as we are focussed on discrete discretionary proposals which may not be 'part' of a much wider expenditure profile.

In some cases, an underspend may be used to increase the level of a particular outcome as some projects have a 'budget envelope', and an improved level of outcome may be an appropriate strategy rather than refunding customers.

This approach will achieve outcomes based regulation for program expenditure which is closely aligned with customer preferences.

V.3.6 Phase 5: Follow up

Capture the program of discretionary expenditure in output measures

Outcomes associated with the discretionary expenditure, particularly those that were key to the phrasing of the willingness to pay survey, be included in the utility's output measures. This will ensure sufficient reporting on what is being achieved as a result of discretionary expenditure, and allow comparison with the project definition used as part of the willingness to pay survey. Output measures could include, for example, kilometres of stormwater channel naturalised.

Ex-post adjustment mechanism

We consider that it is essential that any discretionary project aligns with the characteristics and conditions presented as part of the willingness to pay survey. This can be achieved through an ex-post adjustment mechanism that considers whether the specific projects undertaken align with the project definition presented to customers as part of the willingness to pay survey. This mechanism should also consider whether the project is still discretionary, or if for example due to changes in licence conditions or mandatory standards it is now part of the utility's monopoly service obligations.

Part of this ex-post adjustment will include a standard review of discretionary expenditure to assess that utilities have not exceeded their initial project cost estimates. This will also ensure that utilities cannot exceed the willingness to pay price cap indicated by customers.

A next period adjustment will ensure any underspend is returned to customers, and any overspend is not recovered from customers. Alternatively, we will consider whether the utility may instead deliver more of the proposed outcome rather than returning any underspend to customers.

What happens if expenditure is no longer discretionary?

It is possible that additional services or outcomes funded through discretionary expenditure subsequently become required to meet the utility's monopoly service outcomes. This could occur when licence conditions or mandatory environmental standards are changed such that expenditure initially proposed to exceed standards, is now expenditure to meet the new (higher) standards.

When this occurs, the expenditure becomes part of the cost base required to meet the utility's monopoly service obligations. The project would be transferred from the Discretionary Regulatory Asset Base to be folded back into the Monopoly Regulatory Asset Base, which would remove the cost of the project from the separate discretionary charge and add it to the relevant monopoly service charge.

W Assessment of Sydney Water's proposed discretionary expenditure and prices

We have applied the discretionary expenditure framework to each of the proposed projects

We have applied the framework to each proposed project, using the information provided to us by Sydney Water in its proposal and subsequently.

Diverting untreated wastewater from Vaucluse-Diamond Bay

Our application of the framework to this project is summarised in Table W.1.

Table Q.1 Vaucluse-Diamond Bay project assessment against discretionary framework

Phase	Description	Assessment / Approach
Phase 1: Project definition	Project location is specified as Vaucluse-Diamond Bay (VDB) in Sydney Water's Price Proposal to IPART. Customers/users are identified as around 2000 people who visit the affected area annually (for fishing and swimming). Delivery timeframes are not specified, however Sydney Water proposes $63.5m in capital expenditure over 2020-24 to build assets to divert wastewater to the Bondi treatment plant. The project is not replacing an existing service. Outcomes are outlined as stopping untreated wastewater outfalls during dry weather, but no specific output measures.	The project fits within the utility's responsibility, but there is no regulatory requirement to undertake the project (ie, without the project, monopoly services could still be delivered while complying with environmental regulatory requirements). The project is discretionary. It is well defined and the outcomes are clearly communicated through Sydney Water's proposal. However, the project could be better supported by the inclusion of specific and tangible output measures to be achieved.
Phase 2: Willingness to pay	The location of the project was not outlined specifically in the survey, but simply disclosed as "three locations in Sydney". A Willingness to Pay (WTP) dollar amounts are elicited through a Contingent Valuation Method (CVM) approach. In a subsequent survey, respondents were presented with a single $2.30/year price to vote on, which does not correlate with WTP. The $2.30 price is based on project cost estimates available at the time. Bill impacts were shown in the context of broader bill impacts.	Overall, Sydney Water has conducted a thorough and comprehensive customer engagement program, which consults on whether customers would pay to divert untreated wastewater ocean outfalls from Vaucluse-Diamond Bay to the Bondi treatment plant. The WTP study has been mostly carried out using best practice principles. However: ▼ The outcome of this project in reducing public health risks and environmental degradation is not stated. ▼ The location of this project is not stated, despite it being normal practice to provide this information to survey respondents.

Phase	Description	Assessment / Approach
Phase 3: Efficiency test	Sydney Water proposed investing $63.5 million over 2020-24 to deliver the VDB upgrade. Supporting documentation provided: ▼ VDB Economic Assessment of options (including CBA) conducted by Aither, provided by Sydney Water. ▼ VDB option approval business case provided by Sydney Water. Atkins assessment of efficient expenditure: $62.2 million over 2020-24.	Our expenditure consultants, Atkins, have assessed the program as efficient and consider it prudent to be undertaken in the next period. Sydney Water has also provided sufficient documentation (business case, cost-benefit analysis and options analysis) to demonstrate that the project has been developed using appropriate processes.
Phase 4: Recovery and delivery incentives	The $2.30/year price was based on project cost estimates available at the time of the WTP survey.	IPART prices are less than this and are included in a separate discretionary RAB. There is a separate charge in the 2020 Determination, but this charge is incorporated into wastewater service charge on bills.
Phase 5: Implementation & performance commitments		We do not assess implementation and performance commitments at this stage. These will be completed in the next determination period.

Waterway Health Improvement Program (WHIP)

Our application of the framework to this project is summarise in Table W.2.

Table Q.2 Waterway Health Improvement Program assessment against discretionary framework

Phase	Description	Assessment / Approach
Phase 1: Project definition	The location is defined as creeks and rivers in the catchments of the Georges, Cooks and Parramatta Rivers. Customers/users are not specifically defined. Beneficiaries could be visitors to waterways, but only stormwater customers are charged. Delivery timeframes are stated as 2020-25 period. Outcomes are clearly defined. Sydney Water states that the program is a continuation of a waterway health program started in 2016, but it is unclear whether the WHIP is replacing the existing service or is a continuation of the same service.	It is somewhat unclear whether the project is discretionary, since Sydney Water states the project is to achieve mandatory standards in its Operating Licence. Our view is that this project is discretionary, as we consider Sydney Water is currently not obliged to deliver the WHIP to meet its monopoly service obligations. Our view is that customers are willing-to-pay for improved waterways health outcomes, and Sydney Water's future licence obligations could be refined to include this expenditure. The project was defined clearly in terms of location, timeframes, and outcomes, with tangible output measures specified.

Phase	Description	Assessment / Approach
Phase 2: Willingness to pay	The survey gives sufficient contextual information and describes tangible outcomes to respondents. The first economic WTP study determines the maximum WTP, but this amount does not correspond with the second market research study. The price provided in the context of bill impacts is assumed to correspond with the estimated cost of the project at the time of the survey, although Sydney Water states that total cost is likely to be less than $2.90/year. In the second study, the project was only presented to respondents in the postcodes comprising a large majority of Sydney Water stormwater customers, since these customers will be paying for the program.	Customer WTP was sought through a two-step consultation process, where the first stage included a study conducted by Gillespie Economics. This first stage was carried out using best practice principles for calculating WTP. However, the second stage only asked respondents whether they would vote to either implement the program for a specified price or not. This does not reveal average WTP but only the proportion of customers that are willing to pay this amount for the project.
Phase 3: Efficiency test	Total capital expenditure forecast is $16.1 million. Sydney Water states that the project is "an integral part of the monopoly service. The program is "well-supported" by customers and has been prioritised within broader responsibilities. Appropriate processes undertaken to plan and develop this project, with sufficient documentation provided: ▼ Waterway Health Draft Capital Program Business Case submitted to IPART 22 July 2019 by Sydney Water. ▼ WHIP Decision Framework document (including CBA) submitted to IPART by Sydney Water. Atkins efficient expenditure assessment: $15.9 million over 2020-24.	The WHIP was developed using appropriate processes, with a supporting business case. Our expenditure consultants, Atkins, have assessed the program as efficient and consider it prudent to be undertaken in the next period.
Phase 4: Recovery and delivery incentives	Customers voted to implement the program at $2.90 per year ongoing.	IPART's prices are less than this and are included in a separate discretionary RAB. Although there is a separate charge in the 2020 Determination, this charge will be incorporated into the stormwater service charge on customer bills.
Phase 5: Implementation & performance commitments		We do not assess implementation and performance commitments at this stage. These will be completed in the next determination period.

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Tribunal Members

The Tribunal members for this review were:

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