IPART

Independent Pricing and Regulatory Tribunal
New South Wales

Review of prices for Water NSW Greater Sydney

From 1 July 2020

Draft Report
Water

March 2020

ISBN 978-1-76049-401-8

The Independent Pricing and Regulatory Tribunal (IPART)

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Tribunal Members

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Invitation for submissions

IPART invites written comment on this document and encourages all interested parties to provide submissions addressing the matters discussed.

Submissions are due by 27 April 2020.

We would prefer to receive them electronically via our online submission form <www.ipart.nsw.gov.au/Home/Consumer_Information/Lodge_a_submission>.

You can also send comments by mail to:

Review of prices for Water NSW Greater Sydney from 1 July 2020
Independent Pricing and Regulatory Tribunal
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Late submissions may not be accepted at the discretion of the Tribunal. Our normal practice is to make submissions publicly available on our website <www.ipart.nsw.gov.au> as soon as possible after the closing date for submissions. If you wish to view copies of submissions but do not have access to the website, you can make alternative arrangements by telephoning one of the staff members listed above.

We may choose not to publish a submission - for example, if it contains confidential or commercially sensitive information. If your submission contains information that you do not wish to be publicly disclosed, please indicate this clearly at the time of making the submission. However, it could be disclosed under the *Government Information (Public Access) Act 2009* (NSW) or the *Independent Pricing and Regulatory Tribunal Act 1992* (NSW), or where otherwise required by law.

If you would like further information on making a submission, IPART's submission policy is available on our website.

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1 Executive Summary

The Independent Pricing and Regulatory Tribunal of NSW (IPART) is reviewing the maximum prices Water NSW can charge its customers for its bulk water, raw water and unfiltered water services in the Greater Sydney area.[1]

We received Water NSW's pricing proposal on 1 July 2019. We released an Issues Paper in September 2019 and held a public hearing in Sydney in November 2019. Water NSW's pricing proposal, our Issues Paper, stakeholder submissions and the public hearing transcript are available on our website.[2]

This Draft Report sets out our draft prices to apply over four years from 1 July 2020 to 30 June 2024, explains the rationale for these decisions and analyses the likely impacts on Water NSW and its customers. Figure 1.1 below sets out the review timeline, including when stakeholders can have their say.

Figure 1.1 Indicative timetable for this review

The Draft Report forms the basis of our last public consultation before we make our final decisions. We have already sought feedback on an Issues Paper and held a public hearing.

We invite submissions from all interested parties, which we will consider before making final decisions and releasing our Final Report and Final Determination (which gives legal effect to the maximum prices) in June 2020.

Submissions to this Draft Report are due by Monday 27 April 2020.

All dollar figures quoted in this report are in $2019-20, unless stated otherwise. This means that comparisons between current prices (ie, prices applying in 2019-20) and new prices determined in this review (ie, prices applying from 1 July 2020) are expressed in real terms (ie, excluding the impact of inflation).

1 Water NSW is the main supplier of bulk water in the Sydney region. It manages and protects Sydney's drinking water catchments and catchment infrastructure. Water NSW supplies wholesale bulk water to Sydney Water and to three councils (Wingecaribee Shire Council, Shoalhaven City Council and Goulburn Mulwaree Council) and it also supplies retail raw water and unfiltered water to 63 small customers.

2 https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Metro-Pricing/Prices-for-WaterNSW-Greater-Sydney-from-1-July-2020

1.1 Key themes and decisions for this review

The three key themes that have emerged through the course of this review are:

1. Planning challenges arising due to climate and weather variability.
2. Low interest rates muting the price impacts of proposed expenditure increases – the low interest rate environment allowed Water NSW to propose a 63% increase in capital expenditure while also proposing a 1% decrease in prices to its customers.
3. More risks being proposed to be allocated to customers – Water NSW proposed expanding existing mechanisms and introducing new mechanisms to allocate greater shares of cost, project and demand risk to customers.

We have taken account of these themes when deciding on the appropriate form of regulation, determining efficient costs, setting prices for customers and considering the appropriate allocation of risk between Water NSW and its customers.

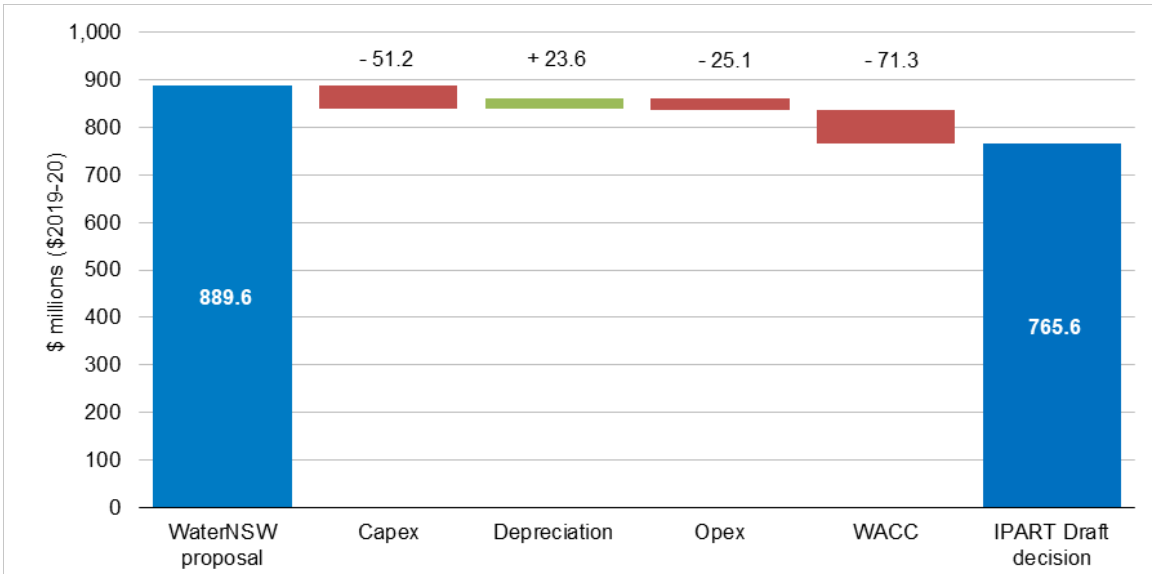
We have decided to set prices for four years, from 1 July 2020 to 30 June 2024 (the 2020 determination period). Under our draft decisions:

- Efficient operating expenditure is $359.6 million over four years, which is $24.9 million or 6.5% lower than Water NSW proposed.
- Efficient capital expenditure is $373.9 million over four years, which is $308.5 million or 45.2% lower than Water NSW proposed.
- Water NSW is expected to recover $765.6 million over four years, which is $123.9 million or 14% lower than Water NSW proposed.
- Draft prices for all customers are about 13% lower than Water NSW proposed.
- Usage (or volumetric) prices for all customers will increase in times of drought to complement water restrictions and allow Water NSW to recover its efficient costs under both unrestricted (ie, non-drought) and drought conditions.

Figure 1.2 breaks down the key differences between Water NSW's pricing proposal and our draft decisions. Our decisions reduce Water NSW's proposed revenue requirement by $123.9 million (or 14%) over four years. This is made up of the following decisions on:

- Efficient capital expenditure, which **reduces** Water NSW's proposed revenue requirement by 6%.
- Asset lives, which **increases** Water NSW's proposed revenue requirement by 3%.
- Efficient operating expenditure, which **reduces** Water NSW's proposed revenue requirement by 3%.
- Updating the weighted average cost of capital (WACC), which **reduces** Water NSW's proposed revenue requirement by 8%.

Figure 1.2 Key changes from Water NSW's proposed NRR to our draft NRR ($millions, 2019-20)

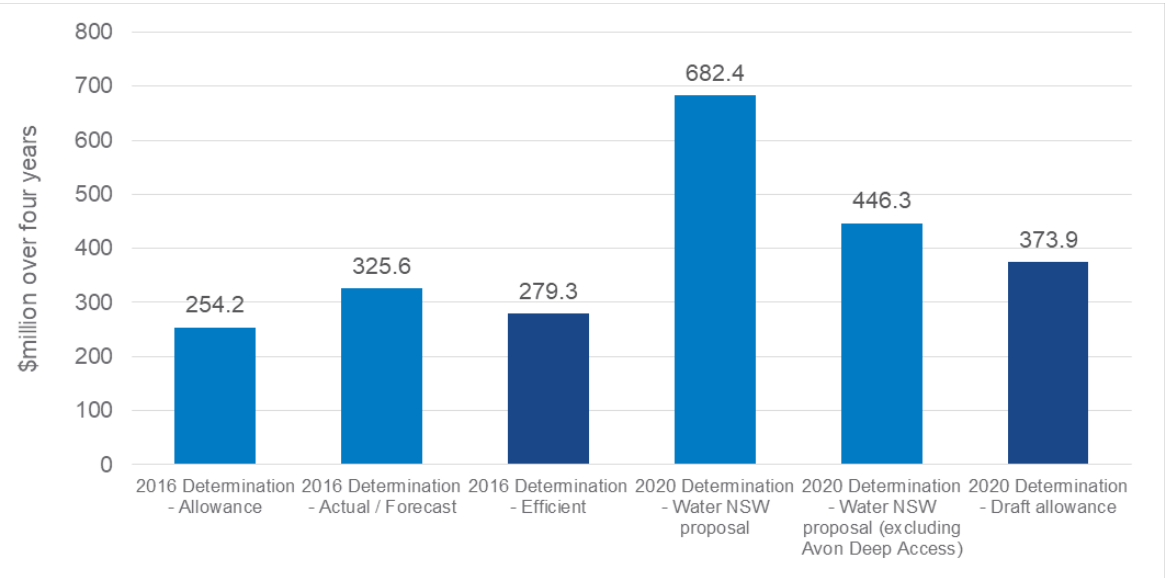


Data source: Water NSW, Pricing Proposal to IPART, July 2019, Table 11.1, p 163 and IPART calculations.

Our draft decision is to allow $373.9 million in capital expenditure over the 2020 determination period. This is 34% greater than what our ex-post efficiency review found to be the efficient level of capital expenditure over the 2016 determination period (ie, $279.3 million).

While our draft decision on the capital expenditure allowance is significantly below Water NSW's proposal, a large part of the difference is the removal of the Avon Deep Water Access project which we consider is no longer required during the 2020 determination period as a result of recent heavy rainfall.

Figure 1.3 Comparison of capital expenditure allowances ($millions, $2019-20)



Data source: Water NSW, Pricing Proposal to IPART, July 2019 and IPART calculations.

1.2 Risk and incentives

For this price review, we have made draft decisions to:

- Not accept Water NSW's proposal to have cost pass-throughs for regulatory change and catastrophic events.
  - Our view is that these proposed general events do not justify a cost pass-through mechanism. Our cost pass-through framework is designed to ensure that cost pass-throughs are limited to situations where it is more efficient to pass the risk onto customers, and where prices become more cost reflective to provide a better signal to customers.
- Accept Water NSW's proposal to maintain the cost pass-through mechanism for Shoalhaven transfers, but we have updated the cost formula to reflect our benchmark approach for all-in energy costs over the 2020 determination period.
  - We consider our amendments to the cost pass-through formula will better reflect the underlying efficient costs of the transfer scheme and provide incentives for Water NSW to efficiently operate the transfer scheme.
- Provide a set of options to help manage contingent project risk.
  - We consider our draft decisions provide a strong package of options to manage contingent project risk, while maintaining appropriate incentives for the business and the Government to undertake proactive, co-ordinated and robust planning and risk management across the sector.
- Accept Water NSW's proposal to maintain the Sydney Desalination Plant (SDP) charging mechanism, which protects Water NSW's revenue from the impact of lower sales as a result of SDP supplying water to Sydney Water (ie, which impact Water NSW's sales to Sydney Water). However, we have updated the formula to allow for the potential expansion of the SDP.
  - We maintain the view we took in the 2012 and 2016 price reviews that it would not be appropriate for Water NSW to be exposed to the risk of reduced sales resulting from supply from SDP because Sydney Water is compelled to accept water supplied by SDP.
- Not introduce a demand volatility adjustment mechanism (DVAM) for the Water NSW Greater Sydney price review.
  - We considered that setting an 80:20 fixed to usage price structure[3] results in a relatively small amount of demand risk, and that Water NSW should be able to effectively manage this without the need for a DVAM.
- Maintain an efficiency carryover mechanism (ECM) for operating expenditure only.

3 Under this price structure, 80% of Water NSW's forecast revenue is expected to be received via its fixed charges and 20% from its usage charges.

1.3 Draft prices

Under our draft decisions, Water NSW's prices for all customers fall by around 14% from 1 July 2020 compared to current 2019-20 prices. These reductions are about 13% greater than the 1% price reduction proposed by Water NSW.

In response to Water NSW's pricing proposal:

- We have accepted Water NSW's proposal to maintain its current price structure (ie, an 80:20 fixed to usage ratio – whereby 80% of its forecast revenue is received via its fixed charges, and 20% from its usage charges).
- We have accepted Water NSW's proposal to decrease its prices to the councils by the same percentage reduction as Sydney Water's prices.
- We have accepted Water NSW's proposal to decrease raw and unfiltered water customers' prices by the same percentage reduction as Sydney Water's and councils' prices.

We have also decided to introduce a dynamic water usage price for Sydney Water, councils and raw and unfiltered water customers, which changes depending on whether we are in unrestricted (ie, non-drought) or drought conditions. This means the usage price will increase by about 20% during drought. This higher usage price is expected to recover the same amount of revenue (that is, the amount of revenue expected to be recovered in unrestricted conditions) from the expected lower volume of water sales forecast during drought.

Table 1.1 Summary of our draft prices ($2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24
Sydney Water					
– Fixed charge ($million/year)	173.5	151.8	151.8	151.8	151.8
– Usage (unrestricted) ($/ML)[a]	78.8	66.1	66.1	66.1	66.1
– Usage (drought) ($/ML)[a]	n/a	79.2	79.2	79.2	79.2
Wingecarribee Shire					
– Fixed charge ($/year)	1,104,880	958,214	958,214	958,214	958,214
– Usage (unrestricted) ($/ML)	57.6	49.9	49.9	49.9	49.9
– Usage (drought) ($/ML)	n/a	59.7	59.7	59.7	59.7
Shoalhaven					
– Fixed charge ($/year)	20,716	17,966	17,966	17,966	17,966
– Usage (unrestricted) ($/ML)	57.6	49.9	49.9	49.9	49.9
– Usage (drought) ($/ML)	n/a	59.7	59.7	59.7	59.7
Goulburn Mulwaree					
– Fixed charge ($/year)	24,860	21,560	21,560	21,560	21,560
– Usage (unrestricted) ($/ML)	57.6	49.9	49.9	49.9	49.9
– Usage (drought) ($/ML)	n/a	59.7	59.7	59.7	59.7
Raw water customers					
– Fixed charge ($/year)	n/a	n/a	n/a	n/a	n/a
– Usage (unrestricted) ($/ML)	730.0	633.1	633.1	633.1	633.1
– Usage (drought) ($/ML)	n/a	757.8	757.8	757.8	757.8

	2019-20	2020-21	2021-22	2022-23	2023-24
Unfiltered water customers					
– Fixed charge ($/year)	111.14	96.39	96.39	96.39	96.39
– Usage (unrestricted) ($/ML)	1,270.0	1,101.4	1,101.4	1,101.4	1,101.4
– Usage (drought) ($/ML)	n/a	1,318.3	1,318.3	1,318.3	1,318.3

a These usage charges to Sydney Water assume SDP and the Shoalhaven Transfer Scheme are not operating.

Note: For unfiltered customers, there are separate fixed charges for 20mm, 25mm, 30mm, 32mm, 40mm, 50mm, 80mm, 100mm, 150mm and 200mm meter connections. We only present the fixed charges for 20mm connections in this table.

Source: IPART analysis.

1.4 Impacts

Based on Water NSW's proposed prices, customer bills would increase by around 11%, including the forecast effects of inflation, by the end of the 2020 determination period.[4]

Under our draft prices, customer **bills are expected to fall by 4.3%**, including the forecast effects of inflation, by the end of the 2020 determination period.[5] This means that bills under our draft prices are expected to be around 15% lower than those proposed by Water NSW by the end of the 2020 determination period. Key drivers of this difference are our decisions to reduce operating and capital expenditure from the levels proposed by WaterNSW and because of falls in interest rates that have occurred since WaterNSW submitted its pricing proposal.

We consider our draft prices will allow Water NSW to continue to meet its obligations in relation to service standards. We have also assessed Water NSW's financeability over the 2020 determination period and do not consider our prices result in a financeability concern for the business.

1.5 List of draft decisions

Form of regulation

1 To adopt a 4-year determination period, from 1 July 2020 to 30 June 2024 15

2 To set maximum prices for Water NSW GS services in each year of the determination period (a price cap) 16

3 To share with customers 50% of rental non-regulated revenue and 100% of revenue from post mining rectification works 16

4 To apportion 50% of the costs of providing recreational areas to water customers, with the remaining 50% to be recovered from either direct users of recreational facilities (ie, user fees) or the NSW Government (on behalf of the broader community). 17

4 For the purpose of modelling bill impacts in 'nominal' terms, we assume inflation is 2.5% per annum over the 2020 determination period

5 We have assumed forecast water sales over the determination period are held constant based on 2019-20 water sales volumes. This means our estimated bill impacts relate only to the effects of changes in prices.

5 To not have the option of Water NSW entering unregulated pricing agreements with large customers. 19

Efficiency operating expenditure

6 To set Water NSW's operating expenditure allowance at $359.6 million as shown in Table 4.1 21

Efficient capital expenditure

7 To set the efficient level of past capital expenditure to be included in the Regulatory Asset Base (RAB) for the 2016 determination period as set out in Table 5.1. 27

8 To set Water NSW's efficient level of capital expenditure to be included in the Regulatory Asset Base (RAB) for the 2020 determination period as set out in Table 5.2 27

9 To set output measures as set out in Table 5.3. 27

Notional revenue requirement

10 To set the notional revenue requirement (NRR) of $765.6 million as shown in Table 6.1. 38

11 To subtract from the NRR the revenue from our decisions on non-regulated revenue in accordance with Table 6.2. 41

12 To share with customers 100% of the revenue from post-mining rectification works. 42

13 To share with customers 50% of other non-regulated revenue, including from rentals. 42

14 To set prices to recover the total adjusted NRR over four years, in present value terms. 42

15 To calculate the **return on assets** using: 43

- An opening RAB of $1,773.4 million for 2020-21, and the RAB for each year as shown in Table H.3. 43
- A WACC of 3.2%. 43

16 To apply a true-up of annual WACC adjustments in the next Determination. 43

17 To calculate the **regulatory depreciation** using: 43

- The asset lives set out in Table H.4 of Appendix H for new and existing assets 43
- The straight-line depreciation method. 43

18 To calculate the **tax allowance** using: 43

- A tax rate of 30% 43
- IPART's standard methodology. 43

19 To calculate the **working capital allowance** using Water NSW's proposed parameters: 43
– quarterly billing cycle 43
– 30 days of delay between reading the meter and receiving payment 43
– 30 days payable cycle, and 43
– zero inventory. 43

In addition, to have zero prepayments in each year of the determination period. 43

Forecast water sales and customer numbers

20 To adopt the forecast water sales volumes as outlined in Table 7.1. 45

21 To adopt Water NSW forecast customer numbers as shown in Table 7.2. 47

Risk allocation and efficiency incentives

22 To not accept Water NSW's proposal to have cost pass-through mechanisms for regulatory change and catastrophic events 49

23 To continue to have a cost pass-through mechanism to Sydney Water for the Shoalhaven Transfer scheme. 51

24 To update the formula for the cost pass-through formula for the Shoalhaven Transfer Scheme as defined in Box 8.1 51

25 To manage the risk of contingent projects commencing during the determination period by a range of options as outlined in Box 8.2 55

26 To maintain the mechanism to adjust Water NSW's usage price to Sydney Water so that Water NSW recovers the same amount of revenue irrespective of whether SDP is also supplying Sydney Water 58

27 To modify the SDP charging formula (as defined in Box 8.3) to ensure that the formula is sufficiently flexible so that it applies in the event that SDP's capacity is expanded. 58

28 To not introduce a demand volatility mechanism for the 2020 determination period. 60

29 To maintain having an efficiency carryover mechanism (ECM) for Water NSW's operating expenditure for the 2020 determination. 62

30 To not introduce an ECM for Water NSW's capital expenditure in its 2020 determination. 62

31 To defer regulating prices for incentive payment mechanisms between Water NSW and Sydney Water for the 2020 determination period: 63
– This will allow Water NSW and Sydney Water to implement incentive payment mechanisms during the 2020 determination period, if agreed to by both parties. 63

Price structures and levels

32 To set two usage prices for all customers based on two water sales scenarios: 67
- Unrestricted water sales, and 67
- Drought water sales. 67

33 The drought usage prices would commence when dam storage levels fall below 60% and remain in place until storage levels reach 70%. Otherwise, unrestricted prices would apply. 67

34 To maintain the price structure of 80:20 fixed to usage ratio for Sydney Water. 70

35 To set Water NSW's maximum fixed charge to Sydney Water over the 2020 determination period as outlined in Table 9.1. 70

36 To adopt a formula based approach to calculate the usage charge to Sydney Water (as defined in Box 9.1) to reflect either unrestricted or drought water sales scenarios, all possible operational modes of the SDP, and additional costs that could be incurred due to the transfer of water from the Shoalhaven system to Sydney. 70

37 To set Water NSW's maximum bulk water prices to councils over the 2020 determination period as outlined in Table 9.5 75

38 To set Water NSW's maximum prices to raw and unfiltered water customers over the 2020 determination period as outlined in Table 9.7 and Table 9.8 respectively. 77

1.6 Questions we seek stakeholder feedback

IPART seeks comments on the following questions

1 Do you agree with our draft decision to share the efficient cost of recreational services between Water NSW's water customers and the direct users of recreational services (or the NSW Government on behalf of broader community)? Or do you consider there is merit in the direct users of recreational services (or the NSW Government on behalf of broader community) funding 100% of the efficient costs of recreational services? 19

2 Do you agree with our draft decision to not introduce the option for Water NSW to enter into UPAs with Sydney Water and the three councils? 20

3 Do you agree with Water NSW's proposal to allocate corporate capital expenditure across its business segments using total expenditure (totex) as the allocator? Or do you think the current allocation (which uses direct salaries as the allocator) continues to be appropriate? 33

4 Do you think we should consider excluding any voluntary supply (from SDP to Sydney Water) out of the SDP exclusion factor, if such an agreement is possible, in future price reviews? 59

5 Do you agree with our draft decisions to introduce unrestricted and drought usage prices for all customers? What are the benefit, risks and/or constraints that could result in having dynamic water usage pricing? 69

6 Do you agree with the asset categories and asset lives contained in Water NSW's March 2020 proposal? Or do you think the asset categories and asset lives we have used in the Draft Report continue to be appropriate? 131

2 Context and key themes

This chapter outlines the key themes influencing this review, as well as summarising our key draft decisions.

2.1 The key themes influencing this price review

The three key themes that have emerged through the course of this review are:

1. Planning challenges arising due to climate variability and weather events
2. Low interest rates muting the price impacts of proposed expenditure increases
3. More risks being proposed to be allocated to customers.

We have taken account of these themes when deciding on the appropriate form of regulation, determining efficient costs, setting prices for customers and considering the appropriate allocation of risk between Water NSW and its customers. The following sections summarise how these themes have affected our decision-making process.

In addition to these themes, there are also a broad range of matters we must consider under the IPART Act when setting prices (see Appendix A).

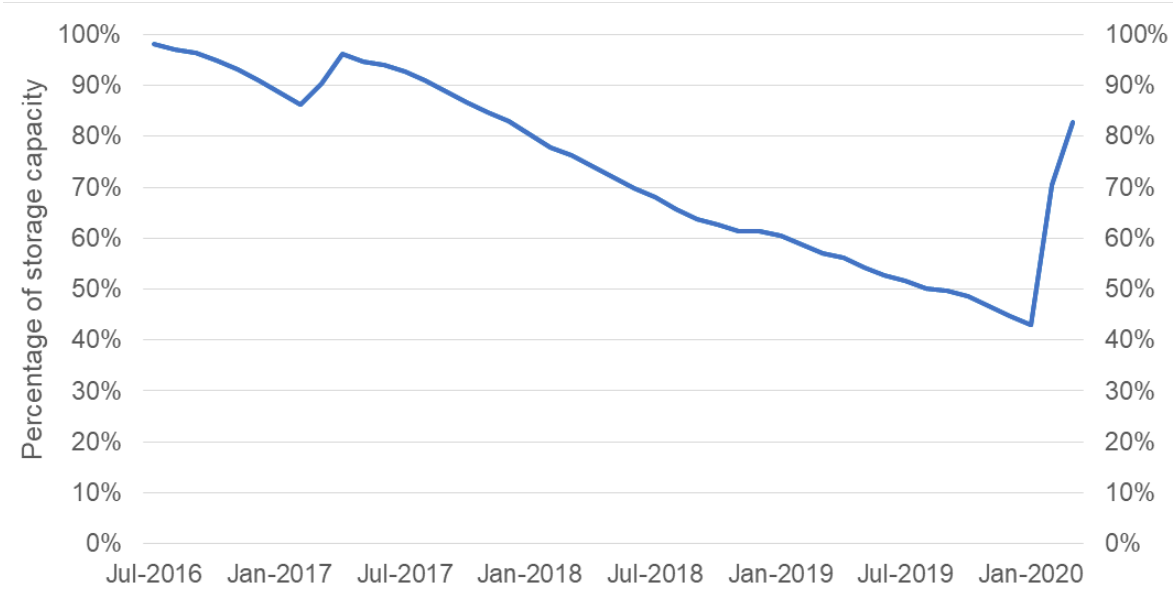
Planning challenges arise due to climate variability and weather events

Since the start of the 2020 price review process, we have experienced significant weather events in the Greater Sydney region, including:

- severe drought resulting in dam storage levels falling to 42% by early 2020
- major bushfires in December 2019 and January 2020, which affected large parts of Greater Sydney's water catchments, and
- heavy rainfall in February 2020 that replenished dam storage levels to above 80% (see Figure 2.1).[6]

6 In February 2020, Water NSW was working to maintain water quality in Sydney's largest catchment after rain washed significant amounts of ash and debris into Warragamba Dam. During December and January, more than 320,000 hectares of the Warragamba Catchment was ravaged by fire. Water NSW has been working to understand the potential consequences of the significant fire damage on water quality. More information can be found on Water NSW's website <www.waternsw.com.au>.

Figure 2.1 Greater Sydney dam storage levels over the 2016 determination period



Data source: Water NSW weekly dam storage data for Greater Sydney is available on its website.

Climate variability makes it challenging when planning for the long-term interests of customers in the Greater Sydney region. Water NSW proposed a 63% increase in its capital expenditure above the amount allowed in IPART's 2016 determination period.[7] Drought related projects were a key driver of this expenditure increase. However, the recent rainfall has brought into question the prudency of this type of expenditure at this stage (ie, now that we are out of emergency, alternative options can be considered).

It is important that drought response and long-term water supply plans are developed in a co-ordinated and timely way. This means utilities will be better prepared to manage water resources – and plan their expenditure – in response to a range of climactic conditions. We consider climate variability in our draft decisions regarding Water NSW's operating and capital expenditure for the determination period (see Chapters 4 and 5).

We also take account of climate variability when assessing forecast water sales over the determination period and our draft decision on dynamic usage (or volumetric) pricing (see Chapters 7 and 9). In addition, we look at ways to incentivise Water NSW to better plan in order to ensure secure, reliable and efficient water supply, with climate variability (see Chapter 8).

Low interest rates mute the price impacts of proposed expenditure increases

Interest rates are at historic lows and this will have the effect of dampening the impact that capital expenditure has on the prices we set over the 2020 determination period.

However, we note that our capital expenditure decisions have long lasting effects on prices, because capital expenditure remains in the Regulatory Asset Base (RAB) for the life of the

7 Water NSW, Pricing Proposal to IPART, July 2019, Tables 5.1 and 5.2, pp 56 and 59.

asset (this is around 50 years for Water NSW's assets in the Greater Sydney region). This means that while a large increase in capital expenditure now would have a muted impact on prices, it could have a significant impact on prices in the future if and when interest rates increase.

We therefore consider it continues to be critically important to only include efficient capital expenditure in regulated prices. We present our draft decisions on efficient capital expenditure in Chapter 5, and our draft prices and impacts in Chapters 9 and 10.

More risks are proposed to be allocated to customers

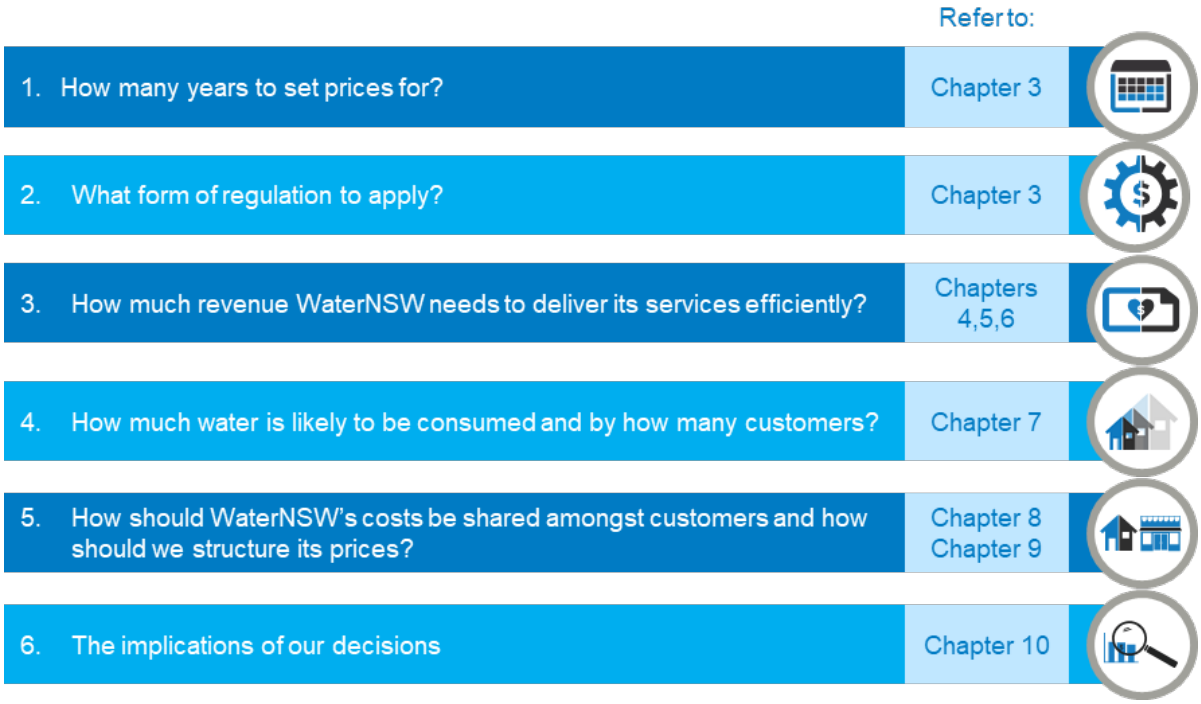
A key theme of Water NSW's pricing proposal is the re-allocation of risk between Water NSW and its customers. Water NSW proposed mechanisms to decrease its share and increase customers' share of demand risk, regulatory change risk, catastrophic event risk and contingent project risk.

In Chapter 8, we discuss our draft decisions on the appropriate allocation of risk between Water NSW and its customers. Our objective is to achieve an allocation that leads to prices reflecting efficient costs, while ensuring that the party best placed to manage the risk has appropriate incentives to manage it efficiently. For example, we look at contingent project risk and consider ways to incentivise the utilities to achieve more coordinated long-term water supply planning in the region.

2.2 Our key draft decisions

The key decisions we made in our review, including where you can find them in this report, are outlined in Figure 2.2.

Figure 2.2 Key decisions in this price review



3 Length of determination and form of regulation

This chapter covers several preliminary decisions related to 'form of regulation', which is the framework or set of approaches we use to set prices. This includes:

- Length of determination period – how many years to set prices for.
- Form of price control - whether to set prices directly (ie, price caps) or indirectly (eg, revenue caps).
- Sharing non-regulated revenue with customers.
- Allocating the costs of recreational facilities between customers and direct users of these facilities (or the NSW Government on behalf of the broader community).
- Whether Water NSW should have the ability to enter into unregulated pricing agreements with large customers.

3.1 We are setting prices for a 4-year determination period

Our draft decision is:

1 To adopt a 4-year determination period, from 1 July 2020 to 30 June 2024

For each water pricing review, we decide on the length of the determination period. In general, this length can be between one and five years. In deciding on the appropriate length, we considered the range of factors outlined in Box 3.1.

Box 3.1 Factors we consider in deciding the length of a determination

In general, the factors we consider when deciding the length of a determination period include 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.

Water NSW proposed a 4-year determination period from 1 July 2020 to 30 June 2024. It stated:

> …the benefits of a 4-year determination period in providing certainty and minimising both regulatory burden and administrative costs outweigh the costs and benefits of moving to a period shorter or longer than four years.[8]

8 Water NSW, Pricing Proposal to IPART, July 2019, p 37.

In addition, Water NSW originally proposed to have a shorter determination period as an option to address its risk exposure to contingent projects (further discussed in Chapter 9).[9] However, in its submission to our Issues Paper, Water NSW clarified that it would prefer to use other options (eg, seek an early determination) than to set a shorter determination period to address contingent project risk.[10]

For this review, we agree with Water NSW that a 4-year determination period is appropriate. While our updated WACC methodology would assist in providing certainty and financial stability over a longer determination period (eg, 5 years), this is offset by the current level of uncertainty on long-term infrastructure planning. In addition, we note that a 4-year determination period for Water NSW GS price review would result in continued alignment between the Water NSW GS and Sydney Water price reviews.

We also received feedback from two customers (Sydney Water and Goulburn-Mulwaree Council) who supported:[11],[12]

- a 4-year determination period, and
- continued alignment between Water NSW Greater Sydney and Sydney Water price reviews and determinations.

3.2 Our maximum prices provide price stability and certainty

Our draft decision is:

2 To set maximum prices for Water NSW GS services in each year of the determination period (a price cap)

Water NSW proposed to maintain the use of a price cap as the form of price control. It considered the price cap, combined with the ability to adjust costs and prices (see Chapter 8 for its proposals and our draft decisions) to be "fit-for-purpose as it promotes pricing stability and is well understood by customers". [13]

We agree that a price cap is appropriate for Water NSW GS price review. In principle, we consider a price cap approach provides certainty and stability for both customers and Water NSW.

3.3 We are sharing non-regulated revenue with water customers

Our draft decision is:

3 To share with customers 50% of rental non-regulated revenue and 100% of revenue from post mining rectification works

9 Water NSW, Pricing Proposal to IPART, July 2019, p 37.
10 Water NSW, *Submission to the IPART's Issues Paper – Review of prices for WaterNSW Greater Sydney services from 1 July 2020*, October 2019, p 5.
11 Sydney Water, *Submission to IPART's Issues Paper – Review of prices for WaterNSW Greater Sydney services from 1 July 2020*, October 2019, p 4.
12 Goulburn Mulwaree Council, *Submission to IPART's Issues Paper – Review of prices for WaterNSW Greater Sydney services from 1 July 2020*, October 2019 p 1.
13 Water NSW, Pricing Proposal to IPART, July 2019, p 36.

We encourage water utilities to optimise the use of their assets and seek ways to generate revenue in ways other than from traditional services – provided this doesn't compromise the delivery of their core services. For instance, this could include renting land or facilities if there is an interested lessor. Where a utility 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. We do this by reducing the Notional Revenue Requirement (NRR), to be recovered from regulated prices, by a share of the non-regulated revenue.

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.

During the review process, Water NSW clarified that it has intended to share 50% of its non-regulated revenue from rental income with customers. In addition, it is also intending to share 100% of its revenue from post mining rectification works with customers. This revenue represents external funding from Subsidence Advisory NSW for specific mining rectification works. Hence, this revenue offsets the cost of this work.

We agree with Water NSW's proposals on sharing its non-regulated revenues. In Chapter 6, we discuss the adjustments we made to the notional revenue requirements to recognise the benefits that customers should enjoy from additional income derived using regulated assets.

3.4 We are sharing the costs of recreational facilities between water customers and the direct users of these facilities

Our draft decision is:

4 To apportion 50% of the costs of providing recreational areas to water customers, with the remaining 50% to be recovered from either direct users of recreational facilities (ie, user fees) or the NSW Government (on behalf of the broader community).

In our Issues Paper, we questioned whether the provision and management of recreational areas is within the scope of Water NSW's regulated monopoly services and whether all of the costs associated with these activities should be included in Water NSW's prices in the GS area. In considering this issue, we said that we would apply the impactor pays principle. This principle aims to ensure that those that create the need to make an investment and/or undertake an activity should pay for the costs associated with this investment and/or activity.

In response to our Issues Paper[14] and during the Public Hearing[15], Water NSW stated that providing and maintaining recreational areas is part of its catchment management activities and is a more cost effective option than the alternative (ie, attempting to restrict access and managing the risks of unauthorised access into catchment areas).

For context, Water NSW incurs $1.5 million of operating expenditure for recreational facilities over the 2020 determination period (or less than 1% of NRR over the determination period).[16]

14 Water NSW, *Submission to the IPART's Issues Paper – Review of prices for WaterNSW Greater Sydney services from 1 July 2020*, October 2019, p 7.
15 IPART, *Sydney Water and WaterNSW Public Hearings*, Transcript, 26 November 2019, p 11.
16 Water NSW, Pricing Proposal to IPART, July 2019, p 122.

We consider it reasonable that Water NSW provides access to recreational areas on the basis that the benefits (from reduced risks and costs of unauthorised entry to other parts of the catchment area) exceed the costs (from providing and maintaining recreational areas). Therefore, we consider providing recreational facilities, which are targeted at reducing overall catchment management costs, can be considered part of Water NSW's regulated service.

However, in providing these recreational areas, we note that Water NSW appears to go above and beyond what is required for catchment management. It appears that Water NSW promotes its recreational areas as attractions. This includes offering overnight camping and school excursion programs at certain locations free of charge. These activities appear to go beyond the general scope of catchment management. We are not suggesting Water NSW should not provide these additional services. Rather, we are assessing who is causing the need for these costs to be incurred and therefore who should pay for these costs.

By applying our impactor pays principle, we consider that:

- Water customers should contribute to the efficient costs required to set up recreational areas and provide basic recreational facilities so as to effectively control access and reduce unauthorised entry into other parts of the catchment. This is because without the consumptive use of water there would be no need for Water NSW to undertake catchment management activities, which include the targeted provision of recreational areas on the basis that this forms part of a cost effective catchment management program.
- The direct users of recreational areas should contribute to the efficient costs of providing expanded recreational services, which are beyond what is required for catchment management. We consider the direct users as the impactor of these expanded services and should pay user fees to use these services (eg, camping grounds). If these options are not feasible, we consider these costs should be allocated to the NSW Government (on behalf of the broader community).

On balance, we consider a 50/50 sharing of efficient costs is reasonable between water customers and direct users (or the NSW Government on behalf of the broader community), instead of fully recovering these costs through regulated water prices.

We seek stakeholder feedback on whether there is merit in considering that direct users pay (or the NSW Government on behalf of the broader community) 100% of the efficient costs of recreational activities.

In Appendix H, we discuss the adjustments we make in operating expenditure to ensure that water customers only pay for 50% of costs associated with recreational facilities. Of the $1.5 million of operating expenditure that Water NSW's incurs for recreational facilities over the 2020 determination period, we have made a draft decision to include $750,000 (50% of Water NSW's proposed expenditure for recreational areas) as part of their operating allowance. This represents about 0.1% of the total NRR over the 2020 determination period.

We understand that Water NSW does not currently charge direct users when using these recreational facilities. Water NSW has included all costs as part of its operating expenditure and NRR proposal, therefore it proposed that all water customers pay for these recreational facilities.

IPART seeks comments

1 Do you agree with our draft decision to share the efficient cost of recreational services between Water NSW's water customers and the direct users of recreational services (or the NSW Government on behalf of broader community)? Or do you consider there is merit in the direct users of recreational services (or the NSW Government on behalf of broader community) funding 100% of the efficient costs of recreational services?

3.5 We seek stakeholder feedback on unregulated pricing agreements

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 reviews, we decided to allow Hunter Water and Sydney Water to enter into unregulated pricing agreements (UPAs) with large non-residential customers.[17,18] Neither utility entered a UPA during the 2016 determination period. We have maintained the option to enter into UPAs in our draft reports for the 2020 Hunter Water and Sydney Water reviews.

Our draft decision is:

5 To not have the option of Water NSW entering unregulated pricing agreements with large customers.

Water NSW did not propose having the flexibility to enter into UPAs with its customers.

We did not discuss the option of Water NSW entering into UPAs in our Issues Paper. However, in our concurrent price reviews of Sydney Water and Hunter Water, we have considered the option of these utilities entering into UPAs with their large customers. We have taken this opportunity to also consider the merit of this option for Water NSW.

Generally, UPAs are optional and are only entered into voluntarily if the agreement is mutually beneficial to the utility and the large non-residential (end-use) 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.

For this price review, we consider there could be too much risk and/or no clear benefits if we allow Water NSW to enter into UPAs with its large customers. This is because:

- Sydney Water and the three councils are not end-use water customers, rather they sell water to their respective end-use customers. It is important to make the distinction as the option to enter into UPAs is designed for end-use customers.

17 Large non-residential customers are defined as those with annual water consumption greater than 7.3 ML.

18 See IPART, *Review of prices for Hunter Water Corporation from 1 July 2016 to 30 June 2020, Final Report*, June 2016, pp 23-28 and
IPART, *Review of prices for Sydney Water Corporation from 1 July 2016 to 30 June 2020, Final Report*, June 2016, pp 44-48.

- Between Water NSW and Sydney Water, we consider there is no clear benefit that can be derived from these parties entering into a UPA. We ultimately set maximum prices for Sydney Water's (end-use) water customers. We would still review the prudency and efficiency of Water NSW's cost as part of our role in setting prudent and efficient prices for Sydney Water to its customers.
- Between Water NSW and councils, we consider it could be risky if these parties enter into a UPA because there is no countercheck if end-use water customers would be worse off if councils and Water NSW enter into a UPA.
- Between Water NSW and the 59 raw and unfiltered customers, we have excluded these customers because the estimated annual demand per customer is below the threshold we have set for large customers (ie, customers that have annual water consumption greater than 7.3 ML) for Sydney Water and Hunter Water.

We seek stakeholder feedback on our draft decision to not introduce the option for Water NSW to enter into UPAs with its large customers.

IPART seeks comments

2 Do you agree with our draft decision to not introduce the option for Water NSW to enter into UPAs with Sydney Water and the three councils?

4 Operating expenditure

This chapter sets out our assessment of the operating expenditure allowance that we will provide Water NSW when setting its prices. As discussed in Chapter 6, our draft decision on the operating expenditure allowance reflects our view of the efficient level of operating costs Water NSW will incur in providing its services over the 2020 determination period. These costs include labour, corporate overheads, hire services, energy, materials, plant and fleet, external consultants and/or contractors and employee provisions.

To inform our draft decision on operating expenditure, we engaged Atkins to review the efficiency of Water NSW's proposed operating expenditure allowance. We asked Atkins to recommend any efficiency savings that it considered Water NSW should be able to achieve. We also considered the level of ongoing productivity improvements that water utilities, including Water NSW, should be able to make over the next four years.

4.1 Summary of our draft decision

Our draft decision is:

6 To set Water NSW's operating expenditure allowance at $359.6 million as shown in Table 4.1

Our draft decision is to set Water NSW's allowance for operating expenditure at $359.6 million over the 2020 determination period. This is $24.9 million (or 6.5%) lower than Water NSW proposed in its July 2019 pricing proposal.

Table 4.1 Draft decision on Water NSW's efficient operating expenditure for the 2020 determination ($millions, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Water NSW's proposal (including its proposed 1% efficiency adjustment)	96.5	96.4	97.8	93.7	384.4
Water NSW's proposal [a] (excluding its proposed 1% efficiency adjustment)	97.5	97.4	98.8	94.7	388.3
Total IPART adjustments [b]	-4.4	-6.0	-8.5	-9.8	-28.8
Total efficient operating expenditure	**93.1**	**91.4**	**90.2**	**84.9**	**359.6**
% Variance between IPART's efficient expenditure and Water NSW's proposal (including its proposed efficiency adjustment)	*-3.6%*	*-5.2%*	*-7.7%*	*-9.4%*	*-6.5%*

a Calculations are based on Water NSW's proposed operating expenditure before its proposed 1% efficiency adjustment.
b Includes adjustments to specific programs such as land management, water quality science and monitoring, as well as catch up and continuing efficiencies.

Note: Totals may not add due to rounding. To avoid double counting, we have applied Atkins' efficiency adjustments to Water NSW's proposed pre-efficiency operating expenditure (ie. excluding the 1% efficiency adjustment proposed by Water NSW).

Source: Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, Table 5-22, February 2020, p 102 and IPART analysis.

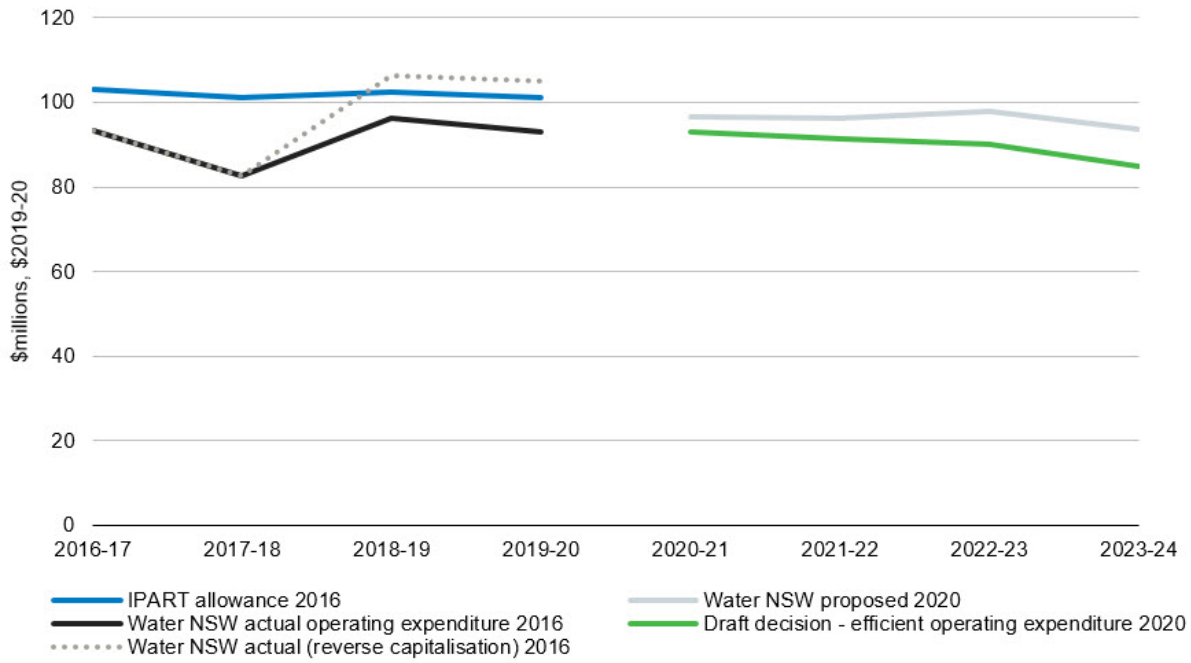
Our draft decision reflects our assessment of the level of operating expenditure an efficient utility would incur in delivering services to Water NSW's customers. In making our decision, we considered:

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

We have accepted Atkins' recommendations on specific adjustments to Water NSW's proposed operating expenditure. We have also applied Atkins' recommended catch-up and continuing efficiency adjustments of 0.9% per year and 0.8% per year respectively (cumulative in each case).[19] [20]

Figure 4.1 shows our draft decision on Water NSW's operating expenditure in comparison to its historical expenditure over the 2016 determination period and proposed expenditure for the 2020 determination period.

Figure 4.1 Our draft decision and Water NSW's past and proposed operating expenditure ($millions, $2019-20)



Source: IPART analysis; Water NSW Annual Information Return 2019-20; Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, Tables 5-2, p 71.

19 To avoid double counting, we have applied Atkins' efficiency adjustments to Water NSW's proposed pre-efficiency operating expenditure (ie. excluding the 1% efficiency adjustment proposed by Water NSW).

20 Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART,* February 2020, p 99.

The sections below outline our findings in relation to Water NSW's current and proposed operating expenditure. See Appendix E for a more detailed analysis of these items.

4.2 Operating expenditure over the 2016 determination period

Over the 2016 determination period, Water NSW's total actual operating expenditure was $361.6 million. This represents an under-spend, relative to the allowance we used to set prices, of $45.8 million (or 11.2%).[21]

The difference between the allowance for operating expenditure in the 2016 determination period and the amount Water NSW spent helps inform our decision on the efficient level of operating expenditure over the 2020 determination period.

Water NSW attributed some of the under-spend to restructuring of its business during the first part of the determination period (2016-17 and 2017-18), which resulted in a lower headcount.[22] However, Atkins found that it was largely due to Water NSW:

- Changing its capitalisation rules during the period. This change in rules accounts for $25.9 million of the total underspend.[23]
- Changing the method of apportioning its corporate overheads to Greater Sydney, Rural and WAMC business segments. The net impact of the change in cost allocation and restructuring was $6.8 million.[24]

By reversing the impact of these changes, Water NSW's operating expenditure would be $13.1 million below its allowance for operating expenditure in the current determination period (instead of $45.8 million).

In relation to this lower level of actual expenditure, Atkins found it was mainly due to Water NSW reducing its activities for maintenance, catchment management and water operations.[25] That is, Water NSW's actual underspend resulted from lower activity levels rather than it achieving efficiencies. Atkins noted it did not see evidence that efficiencies had been encouraged across the business.[26]

4.3 Operating expenditure over the 2020 determination period

In its July 2019 pricing proposal, Water NSW proposed operating expenditure of $384.4 million over the four years to 2023-24. This includes an efficiency adjustment of 1% per

21 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, Table 5-2, February 2020, p 71.
22 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, Table 5-2, February 2020, p 65.
23 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 65.
24 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 65.
25 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, pp 12, 66.
26 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Repot for IPART*, February 2020, p 82.

annum, which equates to $3.9 million over the determination period.[27] Water NSW's proposed operating expenditure is an average of $96.1 million per year, which is $5.85 million (6.5%) per year higher than its actual average operating expenditure over the 2016 determination period.[28]

Specific adjustments

Atkins recommended $12.9 million in specific adjustments to Water NSW's operational programs.[29] Atkins' recommended adjustments are based on its findings that:

- Water NSW should make greater savings in **land management** costs from outsourcing its firefighting activities ($1.5 million saving). [30]
- Some increase in **water quality science** and **monitoring costs** above 2016 levels is justified, but not to the extent requested by Water NSW. This is because the program has not yet been subject to an internal business plan process and Atkins questions whether there are sufficient resources available for the level of expenditure proposed ($5.6 million saving).[31]
- **Additional monitoring** for Sydney Water should be resourced by streamlining duplicate monitoring activities currently undertaken by both utilities, instead of including additional funding in the allowance ($4.0 million saving).[32]
- Expenditure to support the **Metropolitan Water Plan** and **drought planning activities** is required. However, the information provided by Water NSW did not justify this expenditure continuing through the whole determination period. While work is required to develop plans in the short term, activity is likely to reduce in the second half of the determination period ($1.8 million saving).[33] See Box 4.1 for further information.

In addition, we have separately analysed Water NSW's operating expenditure for its recreation areas. We have decided that some expenditure for recreational areas should be included in Water NSW's operational allowance. However, we consider only half of Water NSW's proposed expenditure should be included (ie, $750,000), because not all of Water NSW's activities in managing these areas are required for catchment management.

27 Water NSW, Pricing Proposal to IPART, July 2019, p 108.
28 Water NSW, Pricing Proposal to IPART, July 2019, Table 6.4, p 109.
29 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, Table 5-22, February 2020, p 102.
30 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 90.
31 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 90-92.
32 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 92.
33 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, pp 82, 93.

Box 4.1 Co-ordinated and timely planning is required to respond to weather variability

Although recent rainfall has deferred the need for some drought-related capital expenditure, it is still important for water planning and drought studies to be undertaken in a co-ordinated and timely way. This means utilities will be better prepared to manage water resources in response to weather variability.

Atkins noted that the current drought options study did not incorporate sophisticated economic optimisation or set out a clear process of options identification and evaluation.[34] We agree with Atkins' view that deferring the Avon Deep Water Access project (discussed in Chapter 5) allows time for more sophisticated drought response and long term supply-demand plans to be developed.[35]

Source: Atkins Cardno, *WaterNSW expenditure review – Addendum to Final Report,* 27 February 2020, p 5.

Catch-up and continuing efficiency adjustments

We have applied efficiency adjustments to Water NSW's forecast operating expenditure. This accounts for the productivity improvements that efficient businesses should reasonably be able to achieve over the next determination period.

There are two types of efficiency adjustments we consider:

- **Catch-up efficiency** - this is the efficiency 'gap' between an individual business within the industry and the efficiency frontier.
- **Continuing efficiency** – this represents the frontier shift, the efficiency savings that even an efficient business would make with assumed productivity gains over time.

Atkins recommended $15.9 million in savings from catch-up and continuing efficiencies.[36]

We have applied a catch-up efficiency adjustment of 0.9% per year

Atkins considered Water NSW has scope to deliver greater efficiencies over the 2020 determination period than it has proposed.[37] It found:

- There was little evidence of Water NSW actively driving efficiencies during the previous price path or undertaking internal-top down efficiency challenges across its operating expenditure proposed for the 2020 Determination.[38]
- There is scope for Water NSW's business structure to be rationalised to more closely focus on its primary activities to deliver efficiencies. For example, Atkins found that Water NSW has a higher number of operating departments across its businesses than other water utilities, including Sydney Water.[39]

34 Atkins Cardno, *WaterNSW expenditure review – Addendum to Final Report,* February 2020, p 5.
35 Atkins Cardno, *WaterNSW expenditure review – Addendum to Final Report,* February 2020, p 5.
36 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART,* Table 5-22, February 2020, p 102.
37 Water NSW proposed a 1% efficiency to its total operating expenditure in every year of the determination period.
38 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART,* February 2020, p 72.
39 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART,* February 2020, p 85.

- Water NSW's corporate and support expenditure and its ICT expenditure, when compared to its total operating expenditure, was high in comparison with other utilities. Atkins notes that Water NSW's corporate expenditure includes customer service, which it considers unusual when compared to other utilities. [40]

It therefore recommended catch-up efficiencies of 0.9% per year, cumulative, to move Water NSW towards the efficiency frontier.[41]

We have applied a continuing efficiency adjustment of 0.8% per year

Atkins recommended an annual adjustment of 0.8% per year, cumulative, to reflect the scope for ongoing efficiency.[42] We compared this recommendation with the long-term multi-factor productivity (MFP) in the Australian economy, which is an appropriate indicator of a water utility's future productivity growth.

Our analysis of historical data published by the Productivity Commission suggests that an appropriate range for ongoing productivity based on MFP is between 0.6% and 0.8% per year, which is consistent with Atkins' recommendation. See Appendix D for additional information.

40 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 97.
41 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 100.
42 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 100.

5 Capital expenditure

This chapter sets out our assessment of Water NSW's efficient level of capital expenditure. It discusses:

- Water NSW's actual capital expenditure during the 2016 determination period.
- Water NSW's proposed capital expenditure for the 2020 determination period.
- Our draft decisions on Water NSW's efficient level of capital expenditure.

Under the building block method, capital costs are not immediately recovered as they are spent. Instead, efficient capital expenditure is added to the RAB and recovered over time through allowances for a return on assets and regulatory depreciation (discussed in Chapter 6 and Appendix H).

As with operating expenditure, we engaged Atkins to review Water NSW's historical and forecast capital expenditure and recommended the efficient amount to include in the RAB. As part of its review, Atkins also reviewed Water NSW's performance against output measures over the 2016 determination period, and made recommendations about Water NSW's proposed output measures.

5.1 Summary of our draft decisions

Our draft decisions are:

7 To set the efficient level of past capital expenditure to be included in the Regulatory Asset Base (RAB) for the 2016 determination period as set out in Table 5.1.

8 To set Water NSW's efficient level of capital expenditure to be included in the Regulatory Asset Base (RAB) for the 2020 determination period as set out in Table 5.2

9 To set output measures as set out in Table 5.3.

Our draft decision is to set Water NSW's efficient capital expenditure over the 2016 determination period at $279.3 million. This is $46.3 million (or 14.2%) lower than Water NSW's actual capital expenditure over the period (see Table 5.1).

Our draft decision on the efficient level of capital expenditure over the 2016 determination period reflects our assessment of how much of Water NSW's actual capital expenditure should be included in the RAB.

Table 5.1 Our draft decision on the efficient capital expenditure for the 2016 determination ($millions, $2019-20)

	2016-17	2017-18	2018-19	2019-20	Total
Water NSW's proposal	29.8	43.2	87.0	165.6	325.6
Specific adjustments					
Capitalisation policy	-	-	-13.6	-12.3	-25.9
Updated planning costs for drought response projects	-	-	-	-10.3	-10.3
Other minor cost adjustments	-	-0.6	-2.7	-6.8	-10.1
Total efficient capex					
Total	**29.8**	**42.6**	**70.8**	**136.1**	**279.3**
Difference ($)	*0.0*	*-0.6*	*-16.3*	*-29.4*	*-46.3*
Difference (%)	*0.0%*	*-1.4%*	*-18.7%*	*-17.8%*	*-14.2%*

Source: IPART analysis; Water NSW, Submission to IPART's Issues Paper - *Review of Prices for WaterNSW Greater Sydney services from 1 July 2020,* October 2019, Table 5.2, p 59; Atkins Cardno, *WaterNSW expenditure review – Addendum to Final Report*, February 2020, Table 6-12, p 132.

Our draft decision is to set Water NSW's allowance for capital expenditure at $373.9 million over the 2020 determination period. This is $308.5 million (or 45.2%) lower than Water NSW proposed in its July 2019 pricing proposal (see Table 5.2).

Table 5.2 Our draft decision on Water NSW's efficient capital expenditure for the 2020 determination period ($millions, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Water NSW's proposal	147.2	216.9	216.9	101.5	682.4
Specific adjustments					
▼ Avon Deep Water Access	-18.8	-98.2	-108.5	-10.5	-236.1
▼ Warragamba E-flows [a]	-11.6	-28.2	7.2	6.9	-25.8
▼ Greater Sydney Resilience project	-1.9	-5.7	-5.5	-3.9	-17.0
▼ Drought response project on hold	-1.9	-	-	-	-1.9
▼ Other minor cost adjustments	1.8	2.4	-0.1	0.2	4.2
Total before efficiency targets	114.7	87.1	109.9	94.2	405.9
Efficiencies					
Catch-up efficiency	-2.4	-4.5	-8.5	-8.7	-24.0
Continuing efficiency	-0.9	-1.4	-2.6	-3.0	-8.0
Total efficient capex					
Total	**111.4**	**81.3**	**98.8**	**82.5**	**373.9**
Difference ($)	*-35.8*	*-135.6*	*-118.1*	*-19.0*	*-308.5*
Difference (%)	*-24.3%*	*-62.5%*	*-54.4%*	*-18.8%*	*-45.2%*

Source: Water NSW, *Submission to IPART Review of Prices for WaterNSW Greater Sydney,* July 2019, p 56; Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, Table 6-14, p 135; Atkins Cardno, *WaterNSW expenditure review – Addendum to Final Report*, February 2020, Table 3-1, p7; IPART analysis.

a: We have made a draft decision to defer the Warragamba E-flows project by one year. This results in re-profiling of capital expenditure for this project ie, reductions in both 2020-21 and 2021-22.

Note: Numbers may not add due to rounding.

We have made a draft decision to set Water NSW's output measures over the 2020 determination period as set out in Table 5.3. Our draft output measures track Water NSW's progress on capital programs that we have assessed as efficient to be undertaken during the 2020 determination period and, as such, have included in Water NSW's capital allowance. See Appendix G for further details.

Table 5.3 Output measures for the 2020 Determination

Project	Output measure	Atkins recommended completion date
Fitzroy Falls Dam Safety Upgrade	Completion of Stage 1 works, internal erosion interception trench	June 2022
Cataract Dam Safety Upgrade	Completion of Stage 1 works, installation of foundation relief drains and access ramp	June 2024
Cordeaux Dam Safety Upgrade	Completion of Stage 1 works, completion of foundation relief drain expansion and upgrade	June 2024
Warragamba Pipelines valves and controls upgrade	All valves in program installed and commissioned	June 2023
Dam Safety Telemetry	Automation and telemetry of relevant instrumentation for selected metropolitan sites listed under project	June 2024
Warragamba e-Flows	Commissioning and proving period commenced for Warragamba E-Flows to provide capability to release increased environmental flows from Warragamba Dam	December 2025 - Outside Determination period

Source: Atkins Cardno, *WaterNSW expenditure and forecast review, Final Report for IPART, February 2020,* p 148; Atkins Cardno, *WaterNSW expenditure review – Addendum to Final Report,* February 2020, p 6.

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

We asked Atkins to review Water NSW's historical and forecast capital expenditure in its expenditure review. Atkins also undertook a strategic review of Water NSW's long-term investment planning and asset management systems, processes and demand forecasts. Our draft decisions on Water NSW's capital expenditure reflect Atkins' recommendations.

The sections below outline our findings in relation to Water NSW's current and proposed capital expenditure. See Appendix F for a more detailed analysis of these items.

5.2 Capital expenditure over the 2016 determination period

We have accepted Atkins' recommendation to set Water NSW's efficient level of capital expenditure over the 2016 determination period at $279.3 million.

Overall, Atkins found that compared to the allowance set by IPART, there was systemic capital underspending on many of Water NSW's projects. It noted that this was often the result of issues with Water NSW's cost estimation processes, and indicates that Water NSW's projects would benefit from a top-down efficiency challenge.[43]

Atkins, in arriving at its recommended efficient level of capital expenditure over the 2016 determination period, made several adjustments including:

- $25.9 million reduction to reverse the impact of Water NSW's change in its **capitalisation policy**. Water NSW changed its capitalisation rules during the period, which resulted in some operating expenditure being converted to capital expenditure. Atkins reversed an equivalent amount from the RAB to avoid double counting.[44]
- $10.3 million reduction to align planning costs for proposed **drought response projects** with the most recent forecast expenditure.[45] Atkins considered it was prudent for planning to proceed on the proposed projects.[46] However, an adjustment is required to take account of updated planning costs.

5.3 Capital expenditure for the 2020 determination period

We have accepted Atkins' recommended adjustments to Water NSW's proposed capital expenditure over the 2020 determination period and to set the allowance at $373.9 million.

Drought and climate variability are key themes of this review and they have implications for Water NSW's capital expenditure program over the 2020 determination period. Our assessment of the need for Water NSW's proposed capital projects in light of drought and climate variability is discussed in Box 5.1.

43 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, pp 106.
44 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, pp 105, 131.
45 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, Table 6-12 p 131.
46 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 14.

Box 5.1 Recent weather events have changed the prudency of some projects

A key theme of Water NSW's proposed expenditure for the 2020 determination period was for drought-related capital investment. During the 2016 determination period, drought conditions impacted on the Greater Sydney catchments, with storage levels dropping by 30% between September 2017 and January 2019. At the time of Water NSW's pricing submission, storages in Greater Sydney had dropped to 52.3% capacity (as at 23 June 2019).[47] During Atkins' review of Water NSW's expenditure, and prior to the release of its Final Report, storage levels in Greater Sydney had dropped further to 41.6% (as at 6 February 2020).

Following Atkins' Final Report to IPART, the Greater Sydney area experienced high rainfall over a short period of time (between 6 and 13 February 2020), which increased total storage levels to over 80% capacity by 17 February 2020.

Atkins has therefore provided IPART with an addendum to its Final Report, addressing the implication of significantly increased storage levels on its recommendations for two of Water NSW's proposed projects. Atkins' revised recommendations presented in its addendum are:

- **Avon Deep Water Access project**: Atkins no longer considers it efficient to include expenditure for this project during the 2020 determination period.
- **Warragamba Dam Environmental Flows**: Atkins recommends deferring this project to commence from 2022-23. This represents a one year deferral from the date proposed by Water NSW, but is one year sooner that the date originally recommended in Atkins' Final Report.

We have made draft decisions to accept Atkins' recommendations for these two projects, consistent with the addendum to Atkins' final report.

Source: Atkins Cardno, *WaterNSW expenditure review – Addendum to Final Report,* February 2020, p 4-11.

Specific adjustments

Atkins made a number of specific adjustments to Water NSW's proposed capital program. The most significant are:

- Removing $236.1 million in costs for the **Avon Deep Water Access** project - the largest individual project proposed by Water NSW. Atkins does not recommend including expenditure for this project during the 2020 determination period in light of storage levels increasing well above the trigger level for construction. [48]
- Reducing $25.8 million in costs by deferring the **Warragamba E-flows** (e-flows) project to commence in 2022-23. This represents a one year deferral from that proposed by Water NSW. Atkins considers its recommended deferral represents prudent timing as it allows Water NSW time to decouple the e-flows project from the raising of the Warragamba Dam Wall project.[49]

47 Water NSW, Pricing Proposal to IPART, July 2019, p 12.
48 Atkins Cardno, *WaterNSW expenditure review – Addendum to Final Report,* February 2020, p 5.
49 Atkins Cardno, *WaterNSW expenditure review – Addendum to Final Report,* February 2020, pp 5-6.

- Reducing $17.0 million in costs for the **Greater Sydney Resilience** provision. Atkins considers Water NSW's expenditure for this project does not appear to be prudent based on the resilience that already exists within the system.[50]
- Reducing Water NSW's proposed expenditure on planning for **drought response projects** by $1.9 million. This is a result of a drought response project being put on hold.

Atkins accepted Water NSW's proposed planning costs for several drought response projects. However, Water NSW has subsequently advised it may need to revise these costs (see Box 5.2).[51]

Box 5.2 Efficient planning for drought response projects

A key theme of our review is the importance of **co-ordinated, long-term planning** across Greater Sydney between Water NSW, Sydney Water and the NSW Government. In relation to drought response projects, this is to ensure they are efficient and include consideration of the organisation best placed to undertake any future works. These planning activities should align to long-term integrated planning across Greater Sydney in response to weather variability.

In March 2020, Water NSW indicated it may need to **revise planning costs** for several drought response projects. However, that cost information would not be available until mid-April 2020 at the earliest. This is after the release of our Draft Report.

We are required to determine final prices by June 2020. Receiving revised costs in mid-April 2020 would restrict our ability to thoroughly **assess their efficiency**. It would also limit stakeholder's opportunity to adequately **review and provide feedback** on them. As such, we do not propose to include any additional planning costs for drought response projects in Water NSW's capital expenditure allowance for the 2020 determination period.

Our approach does not preclude Water NSW from **progressing with planning** on drought response projects. We have already included the current forecast planning costs in draft prices. If Water NSW incurs additional planning costs, we would consider the efficiency of this capitalised expenditure at our next price review and may include it in prices at that time.[a]

a In the 2016 determination period, Water NSW responded to the worsening drought conditions by undertaking planning for several drought response projects. This was a factor in Water NSW exceeding its capital expenditure allowance for that period. Atkins reviewed this expenditure and assessed it was efficient. We accepted this recommendation and factored it into draft prices for the 2020 determination period.

Source: Water NSW email to IPART, 10 March 2020; Atkins Cardno, *WaterNSW expenditure and demand forecast review*, Final Report for IPART, February 2020, p 14.

Atkins made minor reductions to areas it has identified as imprudent in corporate capital expenditure, in particular ICT.[52] It also recommended reductions to costs of Water NSW's property program and supply augmentation, totalling $2.4 million over the four year

50 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 107.
51 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 120.
52 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, pp 175-176.

determination period.[53] Further, Atkins adjusted expenditure for fleet by increasing it by $320k to reflect a slight underestimate by Water NSW.[54]

Since Atkins' review of its expenditure, Water NSW has proposed changing the way it allocates corporate capital expenditure across its business segments (see Box 5.3).

Box 5.3 Method for allocating corporate capital expenditure

- Water NSW has several business segments, including Greater Sydney (the subject of this price review), Rural Valleys and part of WAMC. Water NSW allocates capital expenditure for its corporation-wide projects – such as ICT, property and fleet – across these business segments.
- In its Cost Allocation Manual, Water NSW proposed allocating corporate capital expenditure using the proportional value of direct salaries in each business segment. It preferred this method due to the close correlation between the expenditure and the number of employees working on each project. We have accepted this method, which is reflected in our draft prices.
- In March 2020, Water NSW indicated it would like to amend its allocation method. The revised proposal is available on our website.
- Under Water NSW's March 2020 proposal, corporate capital expenditure would be allocated using total expenditure ('totex') as the allocator, instead of direct salaries. Water NSW stated:
  - The effect of the revised proposal is to allocate a greater share of corporate capital expenditure from WAMC and Rural Valleys to Greater Sydney.
  - The amended method would result in a similar proportion of costs being allocated to Greater Sydney in the 2016 and 2020 determination periods (67% and 63%, respectively).

	Greater Sydney	WAMC	Rural Valleys
% allocation (salaries)	37%	36%	28%
% allocation (totex)	63%	13%	24%

- Water NSW did not provide its amended allocation proposal in time for us to consider it for inclusion in draft prices. We are seeking your views on this issue. We intend to review the appropriateness of reallocating corporate capital expenditure in this way – and consider stakeholder feedback – in the Final Report.

Source: Water NSW email to IPART, 10 March 2020. WaterNSW Pricing Proposal to IPART, July 2019 and Cost Allocation Manual, pp 19-20.

IPART seeks comments

3 Do you agree with Water NSW's proposal to allocate corporate capital expenditure across its business segments using total expenditure (totex) as the allocator? Or do you think the current allocation (which uses direct salaries as the allocator) continues to be appropriate?

53 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 129.

54 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 130.

Catch-up and continuing efficiency adjustments

Consistent with our approach for operating expenditure, we have applied catch-up and continuing efficiency factors to Water NSW's forecast capital expenditure.[55] This accounts for the productivity improvements that efficient businesses should reasonably be able to make over the next determination period.

Atkins recommended $32 million in savings from catch-up and continuing efficiencies. This includes:

- Catch-up efficiency adjustments of between 2% and 4% per year, totalling $24 million in efficiency savings over the 2020 determination period.
- Continuing efficiency adjustments of 0.8% per year, totalling $8 million in efficiency savings over the 2020 determination period. [56]

5.4 How does our draft decision differ from Water NSW's proposal?

Water NSW's capital expenditure for the 2016 determination period was $325.6 million, which exceeded the IPART allowance of $254.2 million by $71.4 million (28.1%). Atkins considers Water NSW's efficient level of capital expenditure for this period is $279.3 million.

Water NSW's proposed capital expenditure for the 2020 determination period is $682.4 million. This represents an increase of:

- $428.2 million (168.6%) from the IPART allowance for the 2016 determination period
- $356.8 million (109.6%) over its actual/forecast expenditure for the same period.

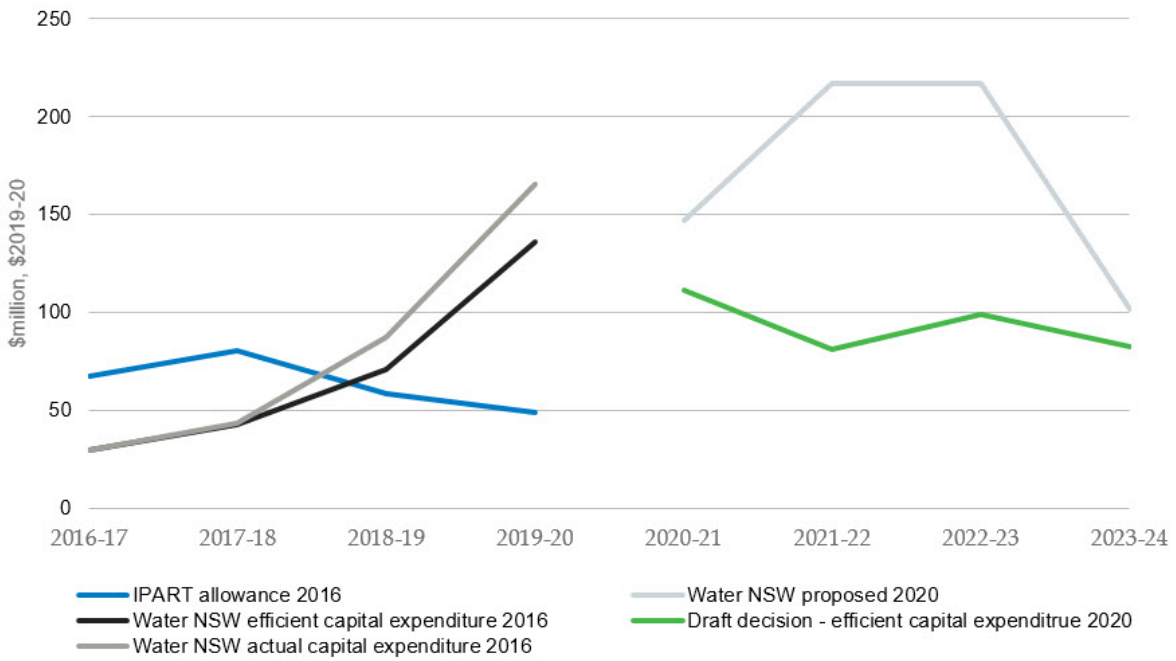
Atkins has recommended reducing it by $308.5 million (or 45.2%).

Our draft decisions on Water NSW's capital expenditure reflects our assessment of the level of efficient capital expenditure that should be recovered through Water NSW's prices. It also reflects our assessment that the Avon Deep Water Access project, the largest individual project in Water NSW's proposal, is no longer required during the 2020 determination period as a result of recent heavy rainfall and increased storage levels. Figure 5.1 shows our draft decisions in comparison to Water NSW's historical expenditure and proposed expenditure.

55 Chapter 4 provides an overview of the efficiency adjustments we have applied to Water NSW's operating expenditure program. Appendix F provides further information on the specific efficiency adjustments we have applied to Water NSW's capital program, and Appendix D provides additional information on IPART's approach to applying catch-up and continuing efficiencies.

56 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, Table 6-13 p 134 and Atkins Cardno, *WaterNSW expenditure review – Addendum to Final Report*, February 2020, Table 3-1, p 7.

Figure 5.1 Our draft decision and Water NSW's past and proposed capital expenditure ($million, $2019-20)

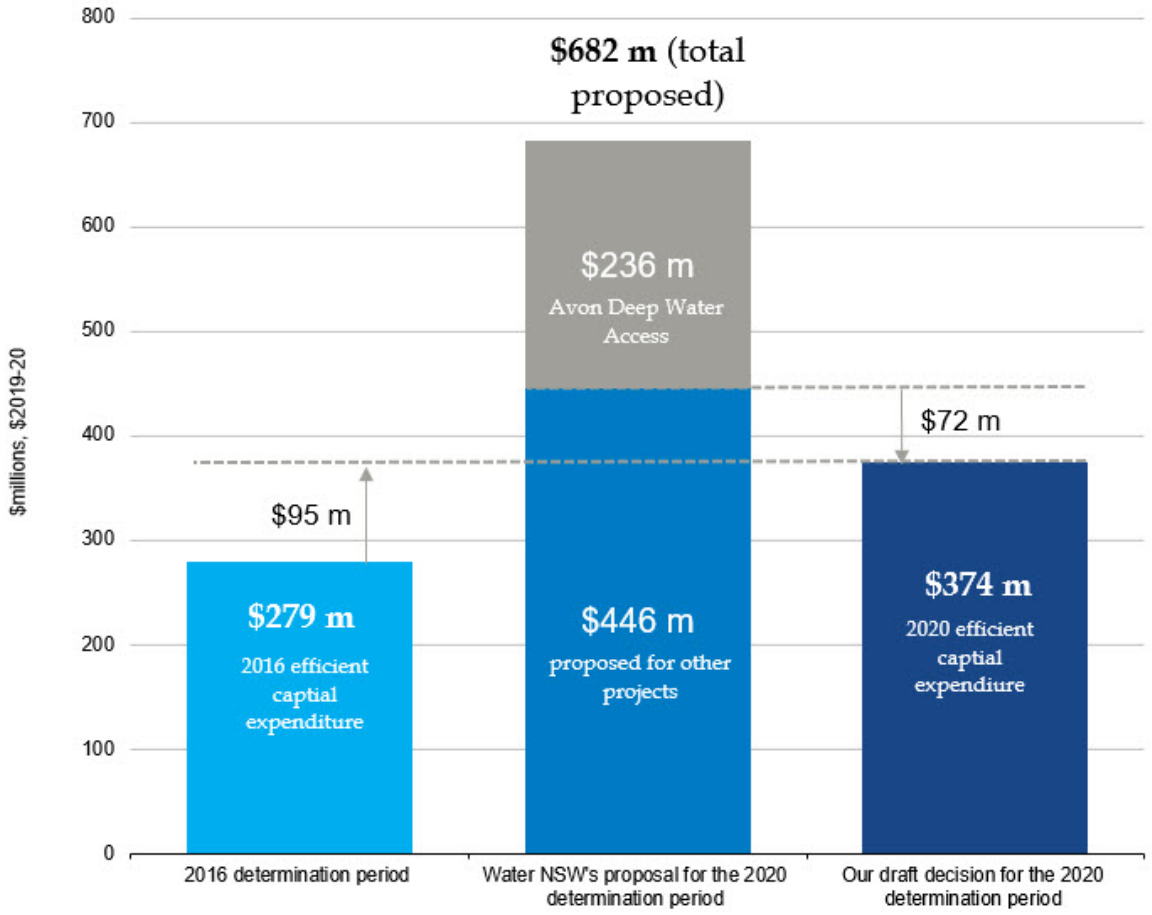


Data source: IPART analysis; Water NSW Annual Information Return 2019-20; Water NSW, Pricing Proposal to IPART, July 2019; Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, Tables 6-12 and 6-14 on pages 132 and 135.

As shown in Figure 5.2 below, our draft decision on Water NSW's efficient capital expenditure for the 2020 determination period is $72 million, or 16% less that Water NSW's pricing proposal, excluding the Avon Deep Water Access project.[57] Our draft decision also represents a $95 million, or 34% increase from our draft decision on Water NSW's efficient capital expenditure over the 2016 determination period.

57 We have made a draft decision to remove $236.1 million in costs for the Avon Deep Water Access project in light of storage levels increasing well above the trigger level for construction (see section 5.3).

Figure 5.2 Our draft decision on Water NSW's past and proposed capital expenditure – excluding Avon Deep Water Access project ($million, $2019-20)



Data source: IPART analysis; WaterNSW, Pricing Proposal to IPART, July 2019; Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, Tables 6-12 and 6-14 on p 132 and 135.

6 Notional revenue requirement

To set prices, we first determine the efficient costs that Water NSW should incur to efficiently deliver its services. The notional revenue requirement (NRR) represents our view of the total efficient costs of providing Water NSW's regulated services in each year of the determination period. In general, we set prices to recover this amount of revenue.

This chapter presents our approach and decisions on the total NRR, including any adjustments we make to account for revenue from sources other than water customers. We also compare the NRR with that used to set prices in the 2016 determination and that in Water NSW's proposal.

6.1 How do we assess the notional revenue requirement?

We have continued to use the 'building block' approach to calculate the NRR. Under this approach, we break down Water NSW's costs into five components (or building blocks), namely:

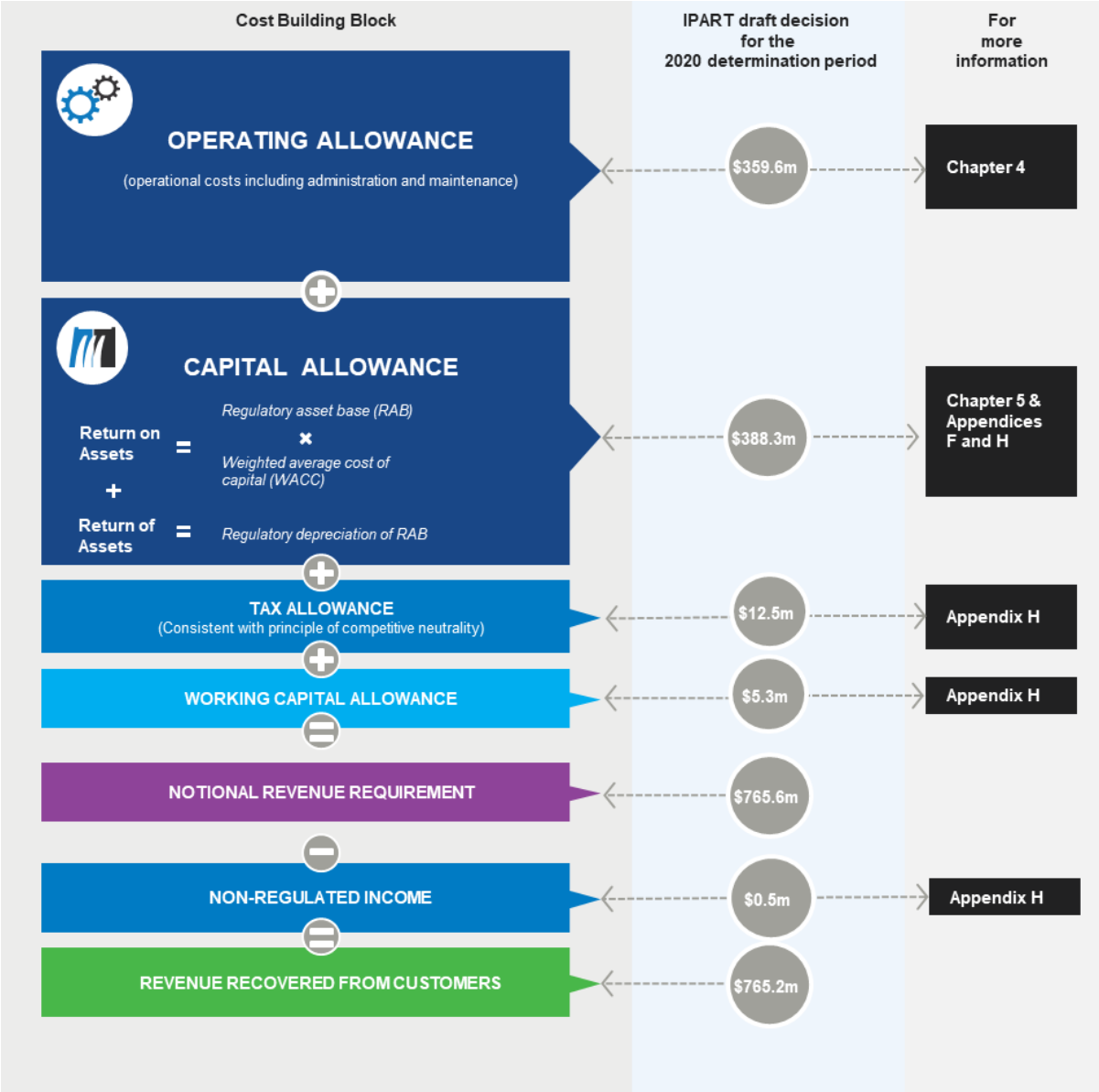
- **Operating allowance**, to cover costs such as maintenance and administration costs
- **Capital allowance**, comprised of:
  - **Return on assets** that Water NSW uses to provide its services
  - **Regulatory depreciation** (or a return of the assets that Water NSW uses to provide its services), which 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 five building blocks is the NRR, and represents our assessment of the total efficient costs Water NSW should incur in delivering its services. Once we calculated Water NSW's NRR, we took account of any adjustments to accommodate revenue that Water NSW will receive from other sources.

We then decided on the approach we would use to convert this amount into prices. This involved setting the **target NRR** for each year – that is, the actual revenue we expect Water NSW to generate from prices and charges for that year. 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 Water NSW and its customers.

Figure 6.1 illustrates our approach to calculating the NRR and how we set prices.

Figure 6.1 The building block model



Note: Numbers may not add due to rounding.

6.2 The total draft NRR is $765.6 million over four years

Our draft decision is:

10 To set the notional revenue requirement (NRR) of $765.6 million as shown in Table 6.1.

The total draft NRR is $765.6 million over four years, as set out in Table 6.1. This is $123.9 million (13.9%) less than Water NSW'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 6.1 Draft NRR and comparison to Water NSW's proposal ($2019-20, $million)

	2020-21	2021-22	2022-23	2023-24	Total
Water NSW's proposal					
Total NRR	208.6	217.3	229.6	234.1	889.6
IPART draft decision					
Operating allowance	93.1	91.4	90.2	84.9	359.6
Regulatory depreciation	33.4	36.0	37.7	39.9	147.0
Return on assets	57.6	59.6	61.2	62.9	241.3
Working capital allowance	1.2	1.4	1.3	1.4	5.3
Tax allowance	3.0	2.9	3.2	3.4	12.5
Total NRR	188.3	191.2	193.7	192.5	765.6
Difference ($)	-20.3	-26.1	-36.0	-41.6	-123.9
Difference (%)	-9.7%	-12.0%	-15.7%	-17.8%	-13.9%

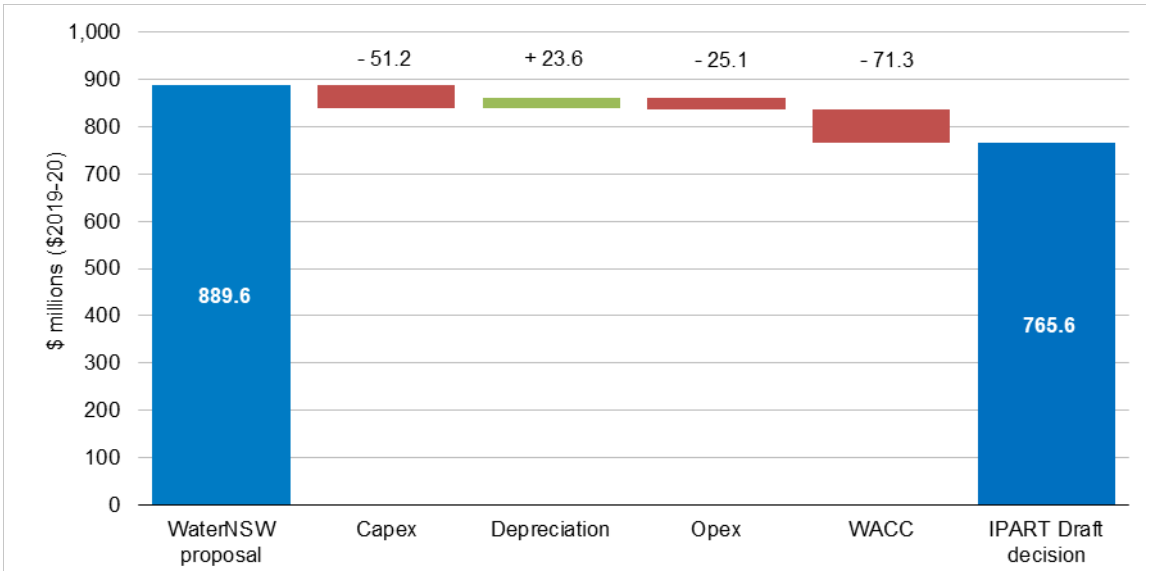
Note: Totals may not add due to rounding. The notional revenue requirement is our assessment of the efficient economic costs of delivering services. Before setting prices, we make other adjustments such as subtracting a share of non-regulated income.

Source: Water NSW, Pricing Proposal to IPART, July 2019, Table 11.1, p 163, IPART calculations.

6.3 Our draft NRR is lower than that proposed by Water NSW

Compared to Water NSW's proposal, our draft NRR is $123.9 million or 13.9% lower over the four years of the 2020 determination period. Figure 6.2 illustrates the impacts of our various decisions on this difference.

Figure 6.2 Key differences between Water NSW's proposed NRR and our draft decision NRR ($2019-20, $million)



Data source: Water NSW, Pricing Proposal to IPART, July 2019, Table 11.1, p 163 and IPART calculations.

The changes in the WACC have had by far the most significant impact in driving the differences between our draft NRR and Water NSW's proposed NRR. This is largely a function of timing: Water NSW's proposal used the same methodology to set the WACC as

IPART, however between when Water NSW submitted its proposal and now, market conditions have changed, lowering the WACC from 4.1% to 3.2%. That is, if Water NSW submitted its pricing proposal now, its proposed NRR would be significantly closer to our draft NRR.

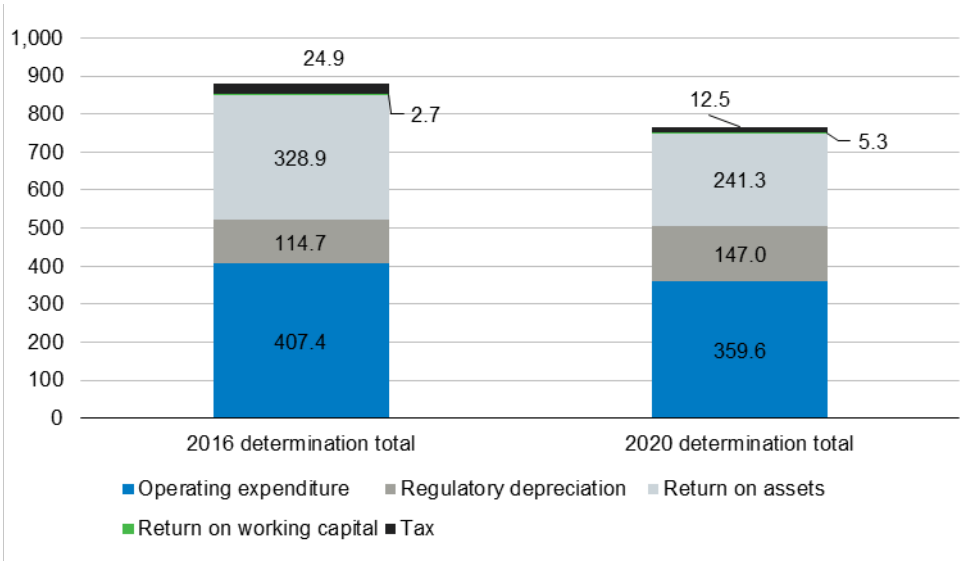
6.4 The total draft NRR is lower than the NRR in the 2016 price review

Our total draft NRR (before adjustments) is $113.0 million (or 12.9%) lower than we used to set prices in 2016 over 4 years. Comparatively, the draft NRR includes:

- A lower allowance for operating expenditure, reflecting Water NSW's proposed decreases.
- A lower return on assets, driven by the lower WACC.
- A higher allowance for regulatory depreciation, with the RAB disaggregation allowing for shorter asset lives for some new capital expenditure, which in turn brings forward depreciation into this regulatory period.
- A marginally lower tax allowance, driven by the lower WACC and increased tax depreciation.
- A higher working capital allowance, due to a longer accounts receivables cycle in this determination period.

Figure 6.3 below compares the annual average NRR under our draft decision, with the NRR we used to set prices in 2016.

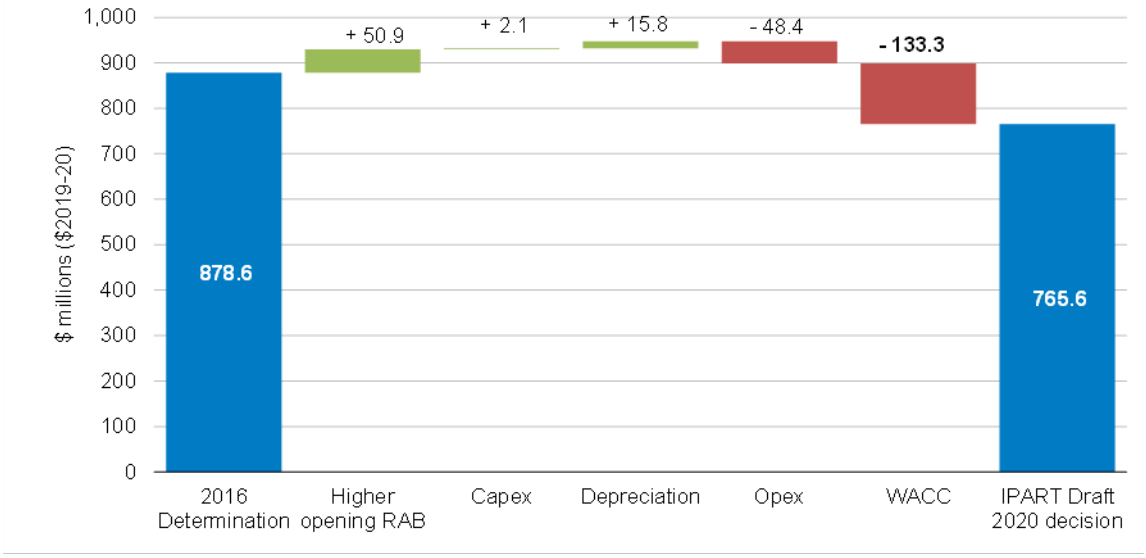
Figure 6.3 Comparison of our draft unadjusted NRR and that used in 2016 review ($2019-20, $million)



Data source: IPART calculations.

Error! Reference source not found. illustrates the key changes between the total NRR for the 2016 determination period and our draft decisions for the NRR for the 2020 determination period.

Figure 6.4 Key changes from our 2016 NRR and our draft 2020 NRR ($2019-20, $million)



Note: The 'Higher opening RAB' captures the impact of a higher opening RAB on 1 July 2020 compared to 1 July 2016. For this reason alone, the 2020 determination NRR would be higher than 2016 determination NRR even if we use 2016 determination opex, capex, asset lives and WACC. (The change in working capital policy is included in the RAB uplift, but the impact is small.). In addition, 'Depreciation' includes the impact of depreciating capex by asset category.

Data source: IPART calculations.

6.5 We adjusted the NRR by $0.5 million to account for revenue from non-regulated sources

Before setting prices to recover the NRR, we subtract a share of the revenue Water NSW is forecast to receive from non-regulated sources, when that revenue is made using regulated assets. This acknowledges that customers have paid for the regulated assets, and should therefore share in some of the gains. It also ensures that the utility does not over-recover its efficient level of expenditure, and that customers do not pay too much.

Our draft decision is:

11 To subtract from the NRR the revenue from our decisions on non-regulated revenue in accordance with Table 6.2.

Table 6.2 presents our draft decisions on the revenue that Water NSW would receive from other sources.

Table 6.2 Adjustments to the NRR ($2019-20, $million)

	2020-21	2021-22	2022-23	2023-24	Total
IPART decision NRR from building blocks	188.3	191.2	193.7	192.5	765.6
Non-regulated revenue[a]	0.2	0.1	0.1	0.1	0.5
Revenue to be recovered by prices	188.1	191.1	193.6	192.4	765.2

a This includes 50% of rental income and 100% of expected revenue from post mining rectification works to be shared with customers.

Note: Totals may not add due to rounding.

Source: IPART calculations.

We encourage water utilities to optimise the use of their assets and seek ways to generate revenue in ways other than from traditional services – provided this doesn't compromise the delivery of their core services. Where a utility 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. For this review, we have adopted that approach, except in relation to post-rectification mining works. See Appendix H for more information on our approach to non-regulated revenue.

Our draft decision is:

12 To share with customers 100% of the revenue from post-mining rectification works.

13 To share with customers 50% of other non-regulated revenue, including from rentals.

6.6 We smoothed the revenue requirement before setting prices

Our draft decision is:

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

We decided 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. This approach smooths the impact of price changes over the period, thus reducing price volatility for customers, and revenue volatility for Water NSW.

However, this approach also means the target revenue to be recovered in each year of the period will not equal the adjusted NRR in each year (see Table 6.3). To ensure that the Water NSW and customers do not benefit or lose from this arrangement, we set prices so that the target revenue expected to be received from prices equates to the adjusted NRR over the determination period, in 'present value' terms. That is, prices are set over the 4-year determination period so that the present value of the target revenue equals the present value of the NRR (ie, the price path is NPV neutral).

Table 6.3 Comparison of adjusted NRR and smoothed target revenue ($2019-20, $million)

	2020-21	2021-22	2022-23	2023-24	4-year NPV
Adjusted NRR	188.1	191.1	193.6	192.4	707.9
Target revenue from prices	190.6	191.0	191.4	192.0	707.9
Difference	2.5	-0.1	-2.2	-0.4	0.0

Source: IPART calculations.

6.7 Summary of our building block decisions

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

Our draft decision is:

15 To calculate the **return on assets** using:

- An opening RAB of $1,773.4 million for 2020-21, and the RAB for each year as shown in Table H.3.
- A WACC of 3.2%.

16 To apply a true-up of annual WACC adjustments in the next Determination.

17 To calculate the **regulatory depreciation** using:

- The asset lives set out in Table H.4 of Appendix H for new and existing assets
- The straight-line depreciation method.

18 To calculate the **tax allowance** using:

- A tax rate of 30%
- IPART's standard methodology.

19 To calculate the **working capital allowance** using Water NSW's proposed parameters:

- quarterly billing cycle
- 30 days of delay between reading the meter and receiving payment
- 30 days payable cycle, and
- zero inventory.

In addition, to have zero prepayments in each year of the determination period.

7 Forecast water sales and customer numbers

A key step in our price setting process is to decide on Water NSW's forecasts for water sales and customer numbers for the Water NSW Greater Sydney business. These forecasts are used to determine the price levels necessary to recover Water NSW's NRR.

It is important that the forecasts are reasonable. Differences between forecast and actual water sales over the determination period will lead to an over- or under-recovery of revenue. If forecasts are lower than actual sales, customers will pay higher than efficient prices (as the utility will 'over-recover' relative to its efficient costs). If they are higher than actual sales, Water NSW may not earn sufficient revenue to recover its efficient costs.

In this chapter, we present our draft decisions on Water NSW's forecast water sales and customer numbers for the 2020 determination period.

7.1 Forecast water sales

7.1.1 Summary of our draft decision

Sydney Water demand makes up around 99% of Water NSW's total sales. Water NSW does not independently forecast water sales to Sydney Water. Instead it adopts the water sales forecast prepared by Sydney Water, adjusted for losses from Sydney Water's network between purchase from Water NSW and supply to end use customers. See Box 1 for how Sydney Water calculates its forecast water sales.

Box 7.1 Sydney Water's demand model

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. Demand is forecast for 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%.

Source: Sydney Water pricing proposal, July 2019, Appendix 8A.

We asked our consultants, Atkins, to review Water NSW's water sales forecasts to Sydney and its other customers (councils and raw and unfiltered water customers).

Atkins recommended adjustments to Water NSW's forecast sales to Sydney Water to take into account factors such as process losses and a more ambitious water leakage reduction target for Sydney Water. It also recommended forecasts which took into account changes in Sydney Water's demand during times of drought and water restrictions.

We used these forecasts to develop two demand scenarios:

1. An 'unrestricted' forecast (ie, no water restrictions) for when dam levels are above 60%, and
2. A lower 'drought' forecast for when dam levels are below 60% and until they go above 70%.

In its submission, Water NSW also provided forecast water sales to its other customers (council and raw and unfiltered customers). These forecasts were based on an unrestricted scenario.

Our draft decision is to accept this unrestricted forecast, and also include a drought forecast for these customers (which takes into account the effects of water restrictions and price elasticity on demand). This ensures we are taking a consistent approach to calculating water sales for all of Water NSW's customers.

Our draft decision is:

20 To adopt the forecast water sales volumes as outlined in Table 7.1.

Table 7.1 IPART's decision on water sales volumes 2021 to 2024 (ML/year)

	2020-21	2021-22	2022-23	2023-24
Unrestricted				
Sydney Water	564,491	571,004	577,436	585,479
Goulburn Mulwaree Council	50	50	50	50
Shoalhaven City Council	108	110	112	114
Wingecarribee Shire Council	6,219	6,343	6,470	6,600
Raw and Unfiltered	152	152	152	152
Total	571,020	577,659	584,220	592,395
Drought				
Sydney Water	470,993	476,356	481,655	488,278
Goulburn Mulwaree Council	5,196	5,299	5,405	5,514
Shoalhaven City Council	90	92	94	95
Wingecarribee Shire Council	42	42	42	42
Raw and Unfiltered	127	127	127	127
Total	476,447	481,916	487,323	494,056

Note: Sydney Water drought water sales include 91,250 ML of water supplied by SDP in each year.

Source: Water NSW, Pricing Proposal to IPART, July 2019; Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART,* February 2020; IPART calculations.

7.1.2 Reasons for our draft decision

We have developed unrestricted and drought sales forecasts for Water NSW's customers. They are based on forecasts provided by Water NSW and factor in the recommendations from Atkins.

The drought sales forecasts take into account the effects of **water restrictions** and **price elasticity** on demand from Water NSW's customers.

- Atkins recommended using a 15% reduction in demand in response to water restrictions.
  - We consider this estimate to be reasonable for sales to Sydney Water, since it is consistent with the demand reduction forecasts for its end-use customers.[58]
  - We also consider this estimate to be appropriate for sales to the council customers. Each of the three councils has imposed water restrictions on its end-use customers.[59]
  - We are seeking comment from stakeholders about whether water restrictions typically apply to raw/unfiltered water customers (and if so, whether exemptions are usually granted). If the restrictions are unlikely to apply, we propose removing the 15% demand reduction for these customers.
- We then made a price elasticity adjustment to the forecasts, applying the same elasticity assumption used to revise Sydney Water's water sales forecasts for its end-use customers.[60] Lower demand under the drought scenario leads to an increase in Water NSW's usage charge, so it can continue to recover its efficient costs. This price increase itself then generates a further reduction in demand from Water NSW's other customers.[61]

7.2 Forecast customer numbers

Forecast customer numbers are used in calculating fixed service charges.

Given Sydney Water accounts for approximately 99% of Water NSW's total water sales, the effect of customer numbers is not as important in setting prices as forecast bulk water sales.

Water NSW has forecast no change in its customer numbers over the 2020 determination period compared to 2019-20 levels, which have been constant since 2017-18. We consider Water NSW's forecast is reasonable.

58 Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART,* February 2020, p 59.

59 Level 2 water restrictions were imposed on residents in Sydney, the Blue Mountains and the Illawarra in December 2019. Substantial rainfall in February 2020 led to these water restrictions being eased to Level 1 in March 2020. While they do not apply to the residents of Wingecarribee, Goulburn or Shoalhaven councils, these councils have also imposed water restrictions that appear to be similar to Level 1 (eg, gardens can be watered with a hose, but only before 10am and after 4pm).

60 IPART, *Review of prices for Sydney Water Corporation – Draft report*, March 2020, Appendix J.

61 We have assumed that the council's pass-through the price increases to their end-use customers.

Our draft decision is:

21 To adopt Water NSW forecast customer numbers as shown in Table 7.2.

Table 7.2 Water NSW customer numbers

	2020-21	2021-22	2022-23	2023-24
Wholesale customers	4	4	4	4
Raw water (ie, unfiltered and untreated)	6	6	6	6
Unfiltered water (ie, chemically treated)	53	53	53	53
Total customers	63	63	63	63

Source: Water NSW, Pricing Proposal to IPART, July 2019, Table 10.2, p. 159.

8 Risk allocation and incentives

In this chapter, we discuss:

- How cost and revenue risks are shared between Water NSW and its customers, and
- How we can incentivise Water NSW to deliver efficiency savings.

In its pricing proposal, Water NSW outlined its proposals to manage its cost risks, revenue risks and provide incentives to deliver efficiency savings. This is outlined in the figure below.

Figure 8.1 Summary of risk and incentive mechanisms

8.1 Summary of our decisions

For this price review, we have made draft decisions to:

- Not accept Water NSW's proposal to have cost pass-throughs for regulatory change and catastrophic events.
- Accept Water NSW's proposal to maintain the cost pass-through mechanism for Shoalhaven transfers, but we have updated the cost formula to reflect our benchmark approach for all-in energy costs over the 2020 determination period.
- Provide a set of options to help manage contingent project risk.
- Accept Water NSW's proposal to maintain the SDP charging mechanism, but we have updated the formula to consider potential expansion of the SDP.
- Not introduce a demand volatility mechanism for the Water NSW GS price review.
- Maintain having an ECM for operating expenditure only.

We discuss our draft decisions in more detail below.

8.2 Regulatory change and catastrophic events cost pass-throughs

Water NSW has proposed two broad cost pass-through events to deal with unforeseen costs relating to:[62]

- **Regulatory change events** to deal with regulatory change, service standards and tax events, and
- **Catastrophic events** to deal with a natural disaster event and a terrorism event.

Water NSW has proposed a materiality threshold of 2.5% of its NRR, which would be triggered if there was a change in costs of approximately $5 million.[63] The specifics of these proposals are presented in Appendix J.

In addition, Water NSW expressed its view that IPART's cost pass-through framework is not appropriate to deal with uncertainties during the determination period because it is impractical to forecast the efficient costs of these uncertainties at the time prices are set.[64] Therefore, it has proposed IPART to consider expanding the framework that applies for Water NSW.

Our draft decisions are:

22 To not accept Water NSW's proposal to have cost pass-through mechanisms for regulatory change and catastrophic events

Reasons for our decisions

We have assessed Water NSW's proposed cost pass-through events against our criteria, which are outlined in Box 1 in Appendix J. Our full assessment is also presented in Appendix J.

In summary, our view is that these proposed general events do not justify a cost pass-through mechanism. Our cost pass-through framework is designed to ensure that cost pass-throughs are limited to situations where it is more efficient to pass the risk onto customers, and where prices become more cost reflective to provide better signal to customers. Where a utility is best placed to do so, it is important that it faces incentives to manage risks. If all (or substantial) risk is removed from the utility, it would face little incentive to effectively manage risks.

We consider that:

- The risk of regulatory change events is not new. This is a risk that applies to all regulated utilities and is a relevant consideration in our length of determination decisions. If there was a clearly defined risk and resulting cost that was clearly beyond the utility's control (eg, a potential change in tax rates or a proposed price on carbon), we could establish a cost pass-through to address this risk. However, we do not support the introduction of a general cost pass through mechanism for regulatory change events because this would remove the utility's incentive to engage in regulatory decision making processes and may lead to unintended outcomes.

62 Water NSW, Pricing Proposal to IPART, July 2019, pp 37-40.
63 Water NSW, Pricing Proposal to IPART, July 2019, p 39.
64 Water NSW, Pricing Proposal to IPART, July 2019, p 38.

- The risk of catastrophic events is also not a new risk. We consider a general cost pass-through would remove the utility's incentive to insure against (insurable) risks, and/or take actions to limit the impact of events if and when they occur (eg, preparing for and responding to a flood or cyclone) and may ultimately lead to inefficient costs being passed through to customers.

Further, we consider that if an event does have a materially adverse impact on Water NSW's financial position, it can seek to bring forward the next price review and determination.

Submissions to our Issues Paper indicate that some stakeholders expressed reservations and cautions about Water NSW's proposal. In particular, Sydney Water and Flow Systems consider that Water NSW's proposal could inefficiently shift risks to end-use water customers.[65] Further, Flow Systems considers that Water NSW should retain an incentive to avoid the likelihood of occurrence and impact of these events.[66]

8.3 Shoalhaven transfer scheme cost pass-through

Water NSW incurs additional costs if it transfers water from the Tallowa Dam on the Shoalhaven River to Upper Nepean Dams and Warragamba Dam (ie, the Shoalhaven transfer scheme) in times of low water availability. Under the 2017 Metropolitan Water Plan, the transfer is triggered when the total dam storage level in the Sydney system is less than 75% and would continue until the total dam storage level reaches 80%.[67]

In the 2016 Determination, we introduced a mechanism to pass through the efficient cost of the Shoalhaven transfer scheme to Sydney Water via the bulk water usage charge.[68] Applying these costs to the usage charge sends a signal to Sydney Water about the increasing cost of bulk water supply in times of water scarcity. In addition, Shoalhaven transfers are triggered by dam level rules set out in the Metropolitan Water Plan. It is difficult to predict when these triggers will take effect (ie, when dam levels will fall to a specific level and when they will recover to a specific level) and therefore a cost pass-through mechanism that passes through the efficient cost of Shoalhaven transfers if and when they are incurred allows Water NSW's prices to Sydney Water to more closely reflect efficient costs over the determination period.

In its pricing proposal, Water NSW supported the continuation of the cost pass-through mechanism for the Shoalhaven transfer scheme over the 2020 determination period. However, Water NSW proposed changing the formula to allow it to recover its total actual energy costs as well as the revenue shortfall it incurred over the 2016 determination period. The specifics of these proposals are presented in Appendix K.

65 Sydney Water, *Submission to IPART's Issues Paper – Review of prices for Water NSW Greater Sydney services from 1 July 2020*, October 2019, p 7.
Flow Systems, *Submission to IPART's Issues Paper – Review of prices for Water NSW Greater Sydney services from 1 July 2020*, October 2019, p 2.

66 Flow Systems, *Submission to IPART's Issues Paper – Review of prices for Water NSW Greater Sydney services from 1 July 2020*, October 2019, p 2.

67 Metropolitan Water, *2017 Metropolitan Water Plan Water for a Liveable, Growing and Resilient Greater Sydney*, March 2017, p 28.

68 IPART, *Review of prices for Water NSW from 1 July 2016 to 30 June 2020 – Final Report*, June 2019, p 73.

Our draft decisions are:

23 To continue to have a cost pass-through mechanism to Sydney Water for the Shoalhaven Transfer scheme.

24 To update the formula for the cost pass-through formula for the Shoalhaven Transfer Scheme as defined in Box 8.1

Reasons for our draft decisions

We have accepted Water NSW's proposal to continue to have a cost pass-through mechanism for the Shoalhaven transfer scheme.[69] This is because the rationale for having a cost pass-through mechanism in the 2016 determination period remains relevant for the 2020 determination period. We also agree with Water NSW that there is a need to review and update the cost pass-through formula. This is because the formula in the 2016 Determination does not include some of the components of the total energy cost of pumping water.

For the 2020 Determination, we have considered options to improve our cost pass-through formula that would result in:

- Better reflecting the underlying efficient cost of the transfer scheme.
- Maintain incentives for Water NSW to efficiently operate the transfer scheme and to continue to seek efficiencies.

The section below outlines the changes we have made. Refer to Appendix K for full details.

We have updated the cost formula used to determine the efficient costs of Shoalhaven transfers

We have decided to set prices based on a **benchmark** of the efficient cost of operating the transfer scheme because this:

- Results in more cost-reflective prices, by including components of the energy cost that were previously omitted from the formula.
- Maintains appropriate incentives for Water NSW to enter into efficient energy contracts.
- Reflects the prioritisation of off-peak energy over peak energy to incentivise Water NSW to operate the scheme efficiently and ensure that customers only pay the efficient costs of Shoalhaven transfers.

If we allowed actual costs to be passed through, rather than our benchmark approach, there would be a risk of customers paying for inefficient costs because Water NSW would not have an incentive to efficiently procure energy and it would not have an incentive to efficiently operate the transfer scheme.

We engaged an independent consultant, Frontier Economics (Frontier), to calculate the benchmark energy price per megalitre (ML) per year over the 2020 determination period. Frontier has calculated the efficient energy price in $/ML by:

69 Water NSW, Pricing Proposal to IPART, July 2019, pp 40-43.

- reviewing the composite usage factor[70] in MWh/ML, and
- estimating the energy price in $/MWh through a bottom-up approach. Frontier has estimated the efficient price of each electricity cost component (see Appendix K). Further, Frontier has provided the energy price in $/ML for off-peak and peak periods on a quarterly basis.

Our updated formula for determining the costs of Shoalhaven transfers is defined in Box 8.1.

The aim of this formula is to set prices that reflect efficient costs of operating the Shoalhaven transfer scheme. In addition, we have structured the formula to prioritise operating the scheme during off-peak periods by first allowing Water NSW to recover costs up to the maximum volume available for transfer in the off-peak period at the off-peak price and then recover the remaining volume transferred at the peak price. This will provide greater flexibility and is an improvement on the current mechanism which assumes all operation occurs during off-peak. If Water NSW chooses to operate the Shoalhaven transfer scheme during the peak period when there is capacity to transfer water during the off-peak period, the pass-through mechanism only compensates Water NSW for the costs incurred at the off-peak price.

70 This represents the volume of energy required to transfer a ML of water through the Shoalhaven system.

Box 8.1 Updated cost formula to determine the efficient cost of Shoalhaven transfers

$$Cost\ of\ the\ Shoalhaven\ Transfer = OPT + PT$$

Where:

OPT is the cost of transferring in the off-peak period using the following equation:

$$OPT = OP_p \times OP_V$$

- Where:
  - OP_p is the benchmark off-peak energy price in $/ML, set out in Table K.1
  - OP_V is the lower of the actual volume of water in ML, transferred from the Shoalhaven system during that month or OP_{max}.
  - OP_{max} is the sum of:
  a) Number of business days in a month multiplied by 2,092.0 ML (which is the maximum volume of water that can be transferred during off-peak hours on business days)
  b) Number of other days in a month multiplied by 2,510.4 ML (which is the maximum volume of water that can be transferred during off-peak period on other days)

PT is the cost of transferring in the peak period using the following equation:

$$PT = P_p \times P_V$$

- Where:
  - P_p is the benchmark peak energy price in $/ML, set out in Table K.1 in Appendix K.
  - P_V is:
  a) If the actual volume of water transferred during the month is equal to or less than OP_{max}, then 0;
  b) If the actual volume of water transferred during the month is greater than OP_{max}, then the actual volume of water in ML less OP_{max}.

The cost pass-through will continue to apply for Sydney Water only

In our 2016 price review, we concluded that the pass-through mechanism should not apply to the three council customers as the transfers result in water leaving the Shoalhaven scheme. Councils should not pay for the transfers as they are triggered by storage levels in that part of the supply system which predominately services Sydney Water. The cost of transfers would not reflect the costs of providing water to the councils in times of increased scarcity.

In our Public Hearing, Wingecarribee Council expressed its concerns that the cost of the Shoalhaven transfer could be passed on to other customers (eg, councils) even if these customers do not drive the need for the transfer to occur.[71] It noted that the Shoalhaven transfer predominantly occurs to supply Sydney.

For these reasons, our draft decision is to maintain the pass-through of Shoalhaven transfer costs to Sydney Water only.

71 IPART, *Sydney Water and WaterNSW Public Hearings, Transcript*, 26 November 2019, p 47.

We have not included a shortfall levy

Water NSW proposed to recover its revenue shortfall (incurred during the 2016 determination period) through prices over the 2020 determination period. Water NSW estimates the shortfall to be approximately $4.2 million in total. It explained that the revenue shortfall is the result of IPART omitting certain elements of the all-in cost of energy from our benchmark cost estimate, including greenhouse gas abatement charges, ancillary charges, network charges and network transmission losses.[72]

On balance, we decided to not accept Water NSW's proposal to recover the revenue shortfall it has incurred in the 2016 determination period from future customer prices. This is because we typically do not make retrospective adjustments for any under- or over-recovery of operating costs between determination periods, unless in exceptional circumstances. One of the reasons for this is that across a large number of operating expenditure items, the utility may over-recover on some and under-recover on others – hence, there would be risks of asymmetric treatment of just focusing on one item (or a few items).

In our 2016 price review, we consulted with stakeholders on the formula of the cost pass-through before making a final decision. Water NSW provided a submission to our Draft Report indicating that the formula for the Shoalhaven cost pass-through, while not perfect, was a reasonable method to cover its costs. Further, Water NSW provided its support of the pass-through mechanism over the 2016 determination period, and noted that it would work with IPART on potential refinements to the cost pass-through mechanism in the future.[73]

In addition, in our 2012 price review, we provided an allowance of $5.3 million for Water NSW to recover the cost of Shoalhaven transfers on an expected cost basis.[74] Shoalhaven transfers did not occur over the 2012 determination period and as a result, Water NSW over-recovered as it did not incur any costs.

Therefore, Water NSW's under-recovery in the 2016 determination period was more than offset by its over-recovery in the 2012 determination period.

8.4 Managing contingent project risks

In Chapter 5, we discussed Water NSW's proposed capital expenditure program of $682 million over the 2020 determination period. In its pricing proposal, Water NSW indicated it is investigating several major capital projects as part of the NSW Government's planning for the Greater Sydney region (referred to as contingent projects), which are not included in its explicit proposed capital expenditure program for the 2020 determination period. The Government may decide that one or more of these projects are required to address climate variability and/or growth and may direct Water NSW to commence more detailed planning (and potentially construction) work during the 2020 determination period.[75]

72 Water NSW, Pricing Proposal to IPART, July 2019, Appendix D, pp 188-194.
73 Water NSW, *Prices for Water NSW Greater Sydney Area – Water NSW response to IPART Draft Report*, April 2016, p 1.
74 IPART, Review of prices for the Sydney Catchment Authority, p 60.
75 Water NSW, Pricing Proposal to IPART, July 2019, p 44.

Because of this uncertainty, Water NSW considers that if one or more contingent projects were to commence during the 2020 determination period, it would face a material risk if its revenue requirements and prices are not able to adjust to reflect the costs of these projects during the determination period (ie, contingent project risk). Consequently, Water NSW proposed options to address this risk as part of its pricing proposal and submission to our Issues Paper. These options range from adopting contingent project mechanisms based on those used in the energy sector to seeking an early price review and determination.[76]

Our assessment of this proposal and draft decision is discussed below.

Our draft decision is:

25 To manage the risk of contingent projects commencing during the determination period by a range of options as outlined in Box 8.2

Reasons for our decisions

We agree with Water NSW's approach to exclude contingent projects costs from its capital expenditure program for the 2020 determination period. This is because the types of projects, potential timing and associated costs of contingent projects are uncertain and cannot be reasonably assessed for the 2020 Determination. If cost estimates for these projects were included in prices, prices would be unlikely to reflect efficient costs. However, we recognise that Water NSW can be exposed to project risks if new contingent projects are approved and commence during the determination period.

In our decision on the length of determination period (see chapter 3), one of the factors we consider is certainty (or uncertainty) of the operating environment. Overall, our decision on a 4-year determination period is an on-balance consideration of a range of factors including the sharing of risk between the utility and customers and the trade-off between price stability and cost reflectivity. We consider that the risk of contingent projects can be managed using a range of mechanisms as outlined below.

To address this risk, we consider that a set of options outlined in Box 8.2 can be utilised by Water NSW. We consider that the decision on which option to pursue will depend on the materiality of the project or projects being considered. That is, a 'one size fits all' solution is inappropriate to deal with different materiality of project risk. We will be open to engaging with the utility during the determination period to discuss specific contingent projects and how they may be assessed at the next price review.

The set of options also recognises that some of the risk should be borne by Water NSW. The high level of uncertainty around these contingent projects is at least partially the result of planning gaps across the water sector. Consequently, we consider that allowing some of the risks to remain with Water NSW provides the utility (and its shareholder, the NSW Government) an incentive to address these planning gaps, while continuing to provide price stability to customers over the determination period. While the need to have an immediate

76 Water NSW, Pricing Proposal to IPART, July 2019, pp 44-49.
IPART, *Review of prices for Water NSW Greater Sydney services from 1 July 2020 – Issues Paper*, September 2019, pp 76-79.

drought response solution has lessened due to the recent rainfall, the recent experience has highlighted how variable our climate is and the critical need for better water supply planning.

In addition, we consider that addressing project uncertainty through the introduction of cost pass through mechanisms can result in price uncertainty over the determination period. The likelihood of contingent projects materialising in the early years of the determination is low. The likelihood increases towards the end of the determination, so it might be only a year or two before prices can adjust (which is small relative to bulk water infrastructure, with asset lives of 100 years).

We consider our draft decisions provide a strong package of options to manage contingent project risk, while maintaining appropriate incentives for the business and the Government to undertake proactive, co-ordinated and robust planning across the sector. We have decided not to adopt the measures proposed by Water NSW because we consider these do not provide the right incentives for the utility to plan and may result in inefficiently allocating contingent project risk to customers.

Box 8.2 Options to manage contingent project risks

Depending on the materiality of risk, Water NSW can address the risk by:

1. If the materiality of risk is low, Water NSW can reprioritise its capital expenditure program during the determination period.
2. If the materiality of risk is medium, Water NSW can seek a preliminary assessment from IPART on the efficiency of a contingent project, which could provide it with a level of comfort that the capital expenditure will be rolled into the RAB at the next price determination.
3. If the materiality of risk is high, Water NSW can seek an early price determination.

Details of each options are outlined below.

Reprioritise capex program during the determination period

If a new major project is required during the determination period, Water NSW can reprioritise its capex program so that the total expenditure is still within its set allowance by shifting some capital expenditure into future periods, changing scope to reduce costs, and/or cancelling projects that are no longer efficient and/or a priority.

The risk is mostly allocated to the utility during the determination period:

- Customer prices are not adjusted during the determination period.
- Net capital costs are considered at the subsequent price review, when we undertake an ex-post assessment of capital expenditure.
- This risk allocation to the utility represents a financial incentive for it to manage its capital expenditure within its set capital allowance.

Seek a letter of comfort from IPART

Water NSW can engage with IPART during the determination period if a project commences that is not included in current prices. Water NSW and IPART can discuss the efficiency of the project and how the project may be treated at the next price review. Water NSW could request IPART provide a letter of comfort setting out how IPART may treat a specific contingent project at the next price

review based on the information available at the time. However, the efficient costs, and impact on prices, would be determined at the next price review.

The risk is shared because:

- Customer prices are not adjusted during the determination period. However, if approved, customer prices would be adjusted to reflect the efficient costs of the contingent project at the next determination.
- The utility would bear the cost of the contingent project for the remainder of the current determination period. However, the utility would have a greater level of assurance that the efficient cost of the project would be factored into prices at the next determination.

Seek an early price determination

If project risks result in a material impact on the utility, which the utility is not able to manage in the short term and may require price adjustments as soon as possible, a utility can seek an early price determination.

This option involves costs to both the utility and other stakeholders and should be reserved for exceptional circumstances, where the utility does not have capacity to absorb the impact before the next price review (including, for example, by re-prioritising and delaying other projects). Considering these projects during a price review will also allow IPART to consider and consult on a range of factors, including whether some of the cost increase can be offset through efficiencies elsewhere in the business and customers' capacity to pay for the cost increase.

8.5 SDP charging mechanisms

In the 2016 Determinations, we adopted a formula based approach to calculate the usage charge to large customers (ie, Sydney Water) to reflect all possible modes of operation of the Sydney Desalination Plant (SDP). By increasing Water NSW's usage price to Sydney Water when SDP is supplying to Sydney Water, this approach protects Water NSW's revenue from the effects of lower bulk water sales to Sydney Water when the SDP is in operation, and allows it to recover its efficient costs.

There are two elements that, when combined, explain the rationale for this formula, as a risk mitigation measure for Water NSW:

- First, Water NSW's usage price to Sydney Water is greater than its short-run variable (or avoidable) costs of supply – which exposes it to the risk of under-recovering (or over-recovering) its costs if its water sales are less than (greater than) the forecasts used to set its prices.
- Second, based on current operating arrangements, Water NSW has no control over when its sales may be affected by SDP supplying Sydney Water: SDP's operations are determined by dam levels, and Sydney Water must accept all water supplied by SDP.

We note that for Sydney Water and its customers, the formula means SDP's operating costs are entirely additional to Water NSW's bulk water costs.

In its pricing proposal, Water NSW proposed to maintain the formula over the 2020 determination period.

Our draft decisions are:

26 To maintain the mechanism to adjust Water NSW's usage price to Sydney Water so that Water NSW recovers the same amount of revenue irrespective of whether SDP is also supplying Sydney Water

27 To modify the SDP charging formula (as defined in Box 8.3) to ensure that the formula is sufficiently flexible so that it applies in the event that SDP's capacity is expanded.

Reasons for our draft decisions

We agree with Water NSW to maintain the existing approach to exclude SDP supply to Sydney Water from the sales forecasts used to set Water NSW's bulk water usage price to Sydney Water. The effect of this is that the amount of revenue Water NSW generates from Sydney Water is unaffected when SDP supplies water to Sydney Water. We have made this decision because we maintain the view we took in the 2012 and 2016 determinations that it would not be appropriate for Water NSW to be exposed to the risk of reduced sales resulting from supply from SDP because Sydney Water is compelled to accept water supplied by SDP. We note that if Water NSW's price structure (currently 80:20 fixed to variable) matched its cost structure (ie, greater fixed and smaller variable shares), then Water NSW would not be exposed to demand risk in any form and would be financially indifferent as to whether SDP supply displaced some of its own sales to Sydney Water.

However, we decided to update the formula, as defined in Box 8.3, to accommodate a potential expansion of the SDP, contingent on commencement of the supply of drinking water from the expanded desalination plant. The expansion of the SDP (also referred to as SDP Stage 2) would entail almost doubling the capacity of the current desalination plant, ie from the current daily output of 250 ML[77] to having (at least) an additional daily output of 250 ML[78].

Under the Metropolitan Water Plan,[79] the planning for the expansion of the SDP (ie, SDP Stage 2) would commence if dam levels drop to 50% and construction for the SDP Stage 2 would commence if dam levels drop to 35%. We note that planning for SDP Stage 2 commenced in 2019 when dam levels dropped to 50%. As at 26 February 2020, the Greater Sydney dam storage levels are currently at 82%.[80]

77 The nameplate capacity of the existing SDP is 250 ML per day. However, we understand that the existing plant can produce up to 260 ML of water per day.
IPART, *Sydney Desalination Plant Pty Ltd Review of prices from 1 July 2017 to 30 June 2022, Final Report*, June 2017, p 23.

78 IPART, Sydney Desalination Plant Expansion – Terms of Reference, 8 January 2020.

79 Refer to Appendix C of this Draft Report.

80 Water NSW website at: https://www.waternsw.com.au/supply/Greater-Sydney/greater-sydneys-dam-levels. Accessed 26 February 2020.

Box 8.3 Updated SDP charging formula for large customers ($/ML)

$$Volumetric\ price = \frac{20\% \times TR}{(FS - Q_{SDP})}$$

Where:

- TR is the target revenue requirement from prices to be recovered from all large customers[a] for the relevant month (as listed in the determination)
- FS is forecast water sales (ML) to all large customers for the relevant month (as listed in the determination). There are two forecast water sales (as discussed in Chapter 7):
  - Unrestricted water sales, and
  - Drought water sales
- Q_{SDP} is the lesser of:
  a) The SDP Total Monthly Plant Capacity; or
  b) The total volume of water supplied by SDP to all large customers in the relevant month

a Currently Sydney Water is Water NSW's only large customer.

We seek stakeholder feedback on limiting the application of the formula in the future

The SDP charging formula allows Water NSW's usage charge to increase so that it can continue to recover 20% of its target revenue when SDP is supplying water to Sydney Water (subject to the total demand forecast being accurate). This SDP exclusion factor includes all supply from SDP. It does not discriminate between drought response, minimum run time, emergency response or any other type of operation.

Although it may be highly unlikely based on SDP's current operating arrangements, there may be situations in the future where SDP and Sydney Water are able to enter into a voluntary bulk water supply agreement. In this case, the voluntary supply from SDP would be equivalent to voluntary supply from any other potential bulk water supplier.

We consider there may be merit in not including this voluntary supply in the SDP exclusion factor. Limiting the scope of the SDP exclusion factor in this way means that Water NSW would be exposed to the risk of SDP and Sydney Water entering into a voluntary agreement (if such an agreement is possible in the future). However, we consider that this is reasonable as customers should be able to benefit from this competition for bulk water supply.

Given this situation is currently unlikely and given the current uncertainty about the future SDP operating arrangements, we seek feedback from stakeholders on the merit of excluding the voluntary supply from the SDP exclusion factor.

IPART seeks comments

4 Do you think we should consider excluding any voluntary supply (from SDP to Sydney Water) out of the SDP exclusion factor, if such an agreement is possible, in future price reviews?

8.6 Demand volatility adjustment mechanism

When determining prices, we forecast the volumes of water we expect the utility to sell over the determination period. If actual sales differ from our forecasts, then the utility's revenues will be impacted (ie, they may be less or greater than the revenue needed to recover efficient costs). One way to mitigate this risk is to adjust the utility's prices at the next price reset to account for any under or over-recovery of revenue.

In our 2016 price reviews of Water NSW GS, Sydney Water and Hunter Water, we considered whether to make an adjustment to the revenue requirement and prices at the 2020 determinations to address any over- or under-recovery of revenue over the 2016 determination period.

For Sydney Water and Hunter Water, we included a 'demand volatility adjustment mechanism' (DVAM) to protect customers and the utilities from material variations between forecast and actual water sales. This was because there is a large discrepancy between their price structures and their cost structures (at least in the short-term), and due to factors such as climate variability there can be differences between forecast and actual sales volumes.[81]

For Water NSW, we considered that such an adjustment is not warranted because only 20% of its sales are recovered by its usage charges. Therefore, 80% of its revenue from fixed charges is not impacted by changes in demand. Further, as outlined above, we have protected Water NSW from demand risk as a result of water supplied by SDP.

In its pricing proposal, Water NSW proposed to introduce a DVAM over the 2020 determination period.[82] Water NSW has indicated that, if any part of its price structure is variable, it needs a DVAM.

Our draft decision is:

28 To not introduce a demand volatility mechanism for the 2020 determination period.

Reasons for our draft decisions

In our 2016 price review, we decided not to introduce a DVAM for Water NSW. We considered that setting an 80:20 price structure would result in a relatively small amount of revenue risk that could be effectively managed by Water NSW. That is, the 80:20 price structure significantly reduces the need for a DVAM to manage the impact of not accurately forecasting demand on revenue given that 80% of Water NSW's revenue from fixed charges is not impacted by changes in demand. Water NSW also has reasonable amount of certainty around customer numbers, which further reduces revenue volatility risk from fixed charges.

We consider this rationale continues to be appropriate for the 2020 determination period. We also have not been presented with sufficient evidence from Water NSW to change our

81 For example, Sydney Water's fixed to usage charge ratio is 15:85, which is almost the opposite of Water NSW's existing ratio of 80:20. Having such a high share of revenue linked to its usage price (and a usage price greater than its avoidable costs of supply) means that Sydney Water faces substantial revenue risks if its demand deviates from forecasts.

82 Water NSW, Pricing Proposal to IPART, July 2019, p 51.

assessment that Water NSW can manage the relatively small amount of demand risk it faces under an 80:20 fixed to variable price structure.

In addition to the high fixed to variable pricing structure, we made two more draft decisions which further reduce risk for Water NSW. In Chapters 6 and 9, we discuss our draft decision on using two sets of water sales forecasts (based on unrestricted and drought conditions) and having dynamic water usage pricing. This allows Water NSW to recover its efficient costs by having the flexibility to increase its usage price when dam storage levels hit the 60% threshold.

In section 8.5, we discuss how Water NSW is protected from demand variability as a result of water supply from SDP to Sydney Water (but not from differences between forecast sales (net of SDP supply) and actual sales). This is because of our decision to maintain the SDP charging mechanism, which adjusts the usage price to Sydney Water to account for SDP's operation.

Further, Water NSW's largest customers (Sydney Water) provided a submission to our Issues Paper indicating its view that a DVAM for Water NSW is inappropriate and not in the interest of end-use customers. Sydney Water expressed its view that Water NSW does not face the same revenue risk nor does it need an incentive to efficiently forecast demand.[83]

8.7 Efficiency carryover mechanism

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.

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.[84] The ECM currently applies to the utility's operating expenditure only, and our decision is to maintain the current arrangement. Appendix L provides a detailed explanation of how the ECM works.

To date, we have not applied the mechanism in practice – it was available for Water NSW, Hunter Water and Sydney Water[85] but none of the utilities made a claim under the mechanism for this price review.

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83 Sydney Water, *Submission to IPART's Issues Paper – Review of prices for Water NSW Greater Sydney services from 1 July 2020*, October 2019, p 12.

84 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 utility's efficient costs, and if the utility 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.

85 IPART, *Review of prices for Hunter Water Corporation from 1 July 2016 to 30 June 2020, Final Report*, June 2016, p 29;
IPART, *Review of prices for Sydney Water Corporation from 1 July 2016 to 30 June 2020 – Final Report*, June 2016, p 53.
IPART, *Review of prices for Water NSW Greater Sydney services from 1 July 2016 to 30 June 2020 – Final Report*, June 2016, p 62.

Our draft decisions are:

29 To maintain having an efficiency carryover mechanism (ECM) for Water NSW's operating expenditure for the 2020 determination.

30 To not introduce an ECM for Water NSW's capital expenditure in its 2020 determination.

The ECM only applies to operating expenditure

As noted, the ECM applies to operating expenditure only – it does not apply to **capital expenditure**.[86] 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.[87] 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

Water NSW did not propose broadening the ECM. Water NSW considered 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.[88]

Hunter Water noted reservations about the effectiveness of the current ECM model because of its asymmetry[89] (that is, it only applies to efficiency gains, but not to losses). 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 from 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

86 This was 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), and the limited opportunities for efficient trade-offs between operating and capital expenditure.

87 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.

88 Water NSW, Pricing Proposal to IPART, July 2019, p 54.

89 Hunter Water, Pricing Proposal to IPART, Technical Paper 3, 1 July 2019, p B-12.

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.

8.8 Incentive payment mechanisms with Sydney Water

In the context of this review, an incentive payment mechanism between Water NSW and Sydney Water involves Sydney Water agreeing to pay Water NSW an incentive payment if Water NSW is able to deliver bulk water in a way (or to a quality) that is expected to generate an overall cost saving for Sydney Water. For example, if Water NSW is able to deliver higher quality bulk water to Sydney Water, this could result in lower water treatment costs for Sydney Water. If the benefit to Sydney Water (of lower treatment costs) is greater than the cost to Water NSW (of delivering higher quality water), there is potential for an incentive payment mechanism between the two parties to deliver this saving.

In its pricing proposal, Water NSW reported that it was working with Sydney Water to agree the terms of a new Raw Water Supply Agreement (RWSA) that will include a performance payment mechanism focused on Water NSW's asset availability and configuration activities. Water NSW also reported that it is collaborating with Sydney Water to establish appropriate baseline metrics for the future incorporation of water quality based performance mechanisms and/or payments. Water NSW expects to finalise and notify IPART of the outcomes of the new RWSA in 2019-20.[90]

Our draft decision is:

31 To defer regulating prices for incentive payment mechanisms between Water NSW and Sydney Water for the 2020 determination period:

- This will allow Water NSW and Sydney Water to implement incentive payment mechanisms during the 2020 determination period, if agreed to by both parties.

Reasons for our draft decision

In our 2016 Water NSW Greater Sydney price review, we decided to defer regulating prices for the Annual Water Quality Incentive Payment (AWQIP) scheme[91] in order to allow Water NSW and Sydney Water to implement the scheme and investigate the potential for the scheme to deliver cost savings during the 2016 determination period.[92] We understand that the AWQIP scheme was not implemented over the 2016 determination period and is now subject to negotiations between Water NSW and Sydney Water as part of the new RWSA.

90 Water NSW, Pricing Proposal to IPART, July 2019, p 54.
91 Included in the current RWSA between Water NSW and Sydney Water.
92 IPART, *Review of prices for Water NSW Greater Sydney, Final Report*, June 2016, p 60.

We support the rationale for incentive payment mechanisms between Water NSW and Sydney Water on the basis that they have the potential to unlock and deliver efficiency savings while not exposing Sydney Water's customers (or Water NSW's other customers) to downside risk (ie, there is no risk of these mechanisms leading to higher prices).

This decision allows Water NSW and Sydney Water to negotiate and implement payments associated with these mechanisms during the 2020 determination period. We strongly encourage Water NSW and Sydney Water to work together to investigate whether these mechanisms can deliver net cost savings which could ultimately benefit Sydney Water's customers through lower prices in future determination periods. We will monitor how these mechanisms are applied in practice over the 2020 determination period and may review them in more detail at the 2024 price review when more information is available.

9 Prices

In this chapter, we present our draft prices for water services provided by Water NSW to its key customer groups:

- Sydney Water
- Three council customers, ie, Wingecarribee Shire Council, Shoalhaven City Council and Goulburn Mulwaree Council, and
- 59 raw and unfiltered water customers.

Our draft pricing decisions are based on our draft decisions on the notional revenue requirement (NRR), price structures and forecast water sales for the 2020 determination period under unrestricted and drought conditions. We set prices to recover Water NSW's NRR by allocating the NRR between its customers (ie, Sydney Water, the three councils and its 59 raw and unfiltered customers).

9.1 Summary of Water NSW's pricing proposal

For this review, Water NSW proposed the following.

- For Sydney Water:
  - To maintain the current price structure for the 2020 determination period. Under this structure, 80% of the revenue requirement is recovered from the fixed charge and 20% from the usage (or volumetric) charge.[93]
  - To reduce fixed and usage charges by 1% in real terms (ie, increasing with inflation) over the determination period.[94]
- For council customers:
  - To reduce current fixed and usage charges by 1% in real terms over the 2020 determination period.[95]
  - To continue to align council customers' price structures with the Sydney Water's price structure (ie, a 80:20 fixed to usage ratio).
- For raw and unfiltered water customers:
  - To reduce current fixed and usage charges by 1% in real terms over the 2020 determination period.[96]

93 Water NSW, Pricing Proposal to IPART, July 2019, p 165.
94 Water NSW, Pricing Proposal to IPART, July 2019, p 165.
95 Water NSW, Pricing Proposal to IPART, July 2019, p 166.
96 Water NSW, Pricing Proposal to IPART, July 2019, p 167. We note that Water NSW's pricing proposal states that it is maintaining current fixed and usage charges in real terms over the 2020 determination period on page 167 of its pricing proposal. However, our review of Water NSW's pricing model and the pricing tables included in the Water NSW's pricing proposal showed that Water NSW reduced prices by 1% in real terms instead.

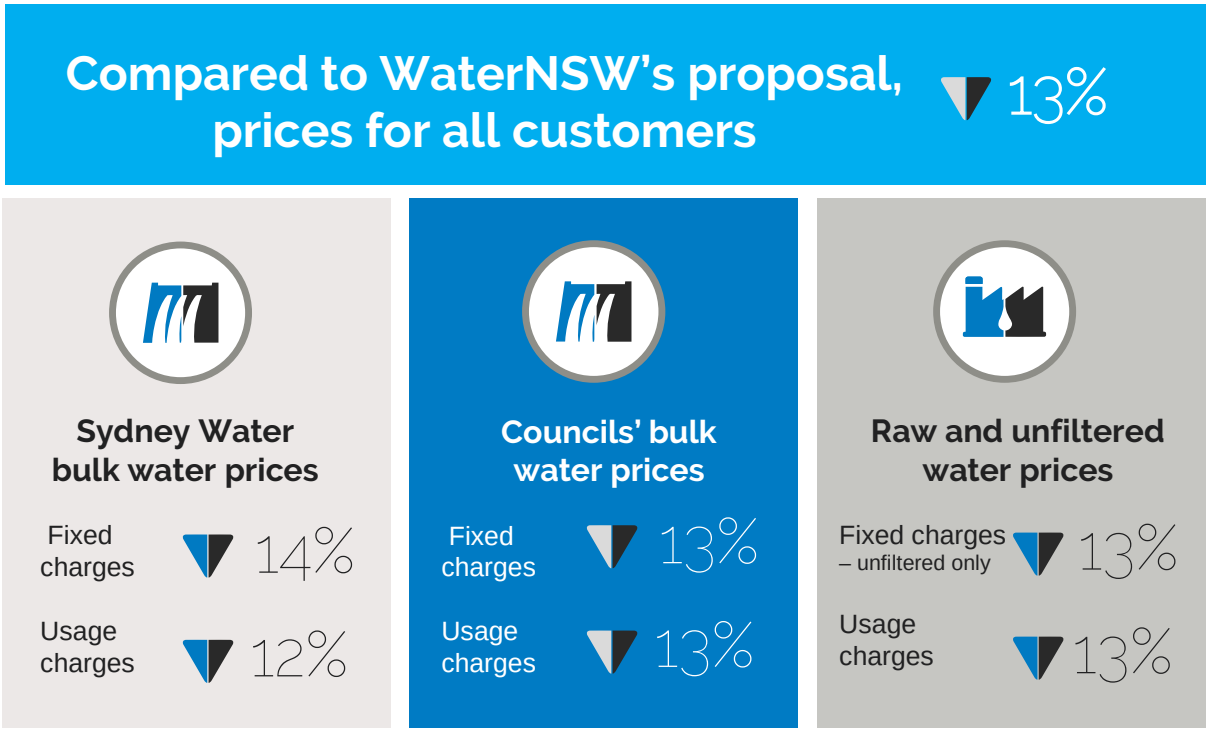
9.2 Summary of our draft decisions on Water NSW's prices

For this price review, we have made the following draft decisions:

- For Sydney Water:
  - To introduce a dynamic water usage (or usage) price, which changes depending on whether we are in unrestricted or drought conditions.
  - To accept Water NSW's proposal to maintain its current price structure (ie, 80:20 fixed to usage ratio).
  - To set Water NSW's maximum bulk prices to Sydney Water over the 2020 determination period as outlined in Table 9.1.
- For council customers:
  - To introduce a dynamic water usage price, which changes depending on whether we are in unrestricted or drought conditions.
  - To accept Water NSW's proposal to decrease councils' prices by the same percentage reduction as Sydney Water's prices.
  - To set Water NSW's maximum bulk water prices to councils over the 2020 determination period as outlined in Table 9.5.
- For raw and unfiltered water customers:
  - To introduce a dynamic water usage price, which changes depending on whether we are in unrestricted or drought conditions.
  - To decrease raw and unfiltered customers' prices by the same percentage reduction as Sydney Water's prices.
  - To set Water NSW's maximum prices to raw and unfiltered water customers over the 2020 determination period as outlined in Table 9.7 and Table 9.8.

In summary, our draft water prices for all customers fall by around 14% from 1 July 2020 compared to 2019-20 prices. These reductions are about 13% greater than the 1% price reduction proposed by Water NSW and factors in both fixed and usage prices (see Figure 9.1). The following sections outline in detail our draft decisions for each customer groups.

Figure 9.1 Our draft Water NSW prices compared to Water NSW's proposed prices



9.3 To introduce dynamic water usage (or usage) pricing

We made a draft decision to introduce dynamic water usage pricing during unrestricted and drought conditions over the 2020 determination period for all of Water NSW's customers (ie, Sydney Water, the three councils, and raw and unfiltered water customers).

Our draft decisions are:

32 To set two usage prices for all customers based on two water sales scenarios:

- Unrestricted water sales, and
- Drought water sales.

33 The drought usage prices would commence when dam storage levels fall below 60% and remain in place until storage levels reach 70%. Otherwise, unrestricted prices would apply.

9.3.1 Reasons for our draft decision

The purpose of having dynamic water usage prices is to recognise that during drought water sales are expected to fall and Water NSW's bulk water price will need to increase so that it continues to recover its efficient cost.

During drought conditions, we expect demand and water sales for Water NSW would decrease in response to water restrictions and price elasticity of demand. In Chapter 7, we have modelled two forecast demand scenarios for unrestricted and drought conditions. Our

draft drought sales forecast accounts for an approximate demand reduction of 16% and this forecast applies when dam levels are below 60% and remains until dam levels go above 70%.

Our draft decisions to have different usage prices for all customers in unrestricted and drought conditions is focused on cost recovery for Water NSW. This means the usage price will increase by about 20% during drought. This higher usage price is expected to recover the same amount of revenue (that is, the amount of revenue expected to be recovered in unrestricted conditions) from the expected lower volume of water sales forecast during drought. This is necessary, given Water NSW's costs are largely fixed.

For Sydney Water, we note that in our concurrent price review of Sydney Water we have introduced dynamic usage water prices to Sydney Water's water customers. This is to ensure that Sydney Water recovers its efficient costs during drought, and also to send a price signal to customers during times of relative water scarcity. Our dynamic usage water prices for Water NSW have been designed to operate in a consistent way to Sydney Water's dynamic usage prices to its customers.

For Water NSW's council customers, we note that it would be up to councils to determine if, and how, they factor this into their prices to their end use customers. For raw and unfiltered water customers (which are end-use customers), having higher usage prices during drought will provide a direct price signal of water scarcity.

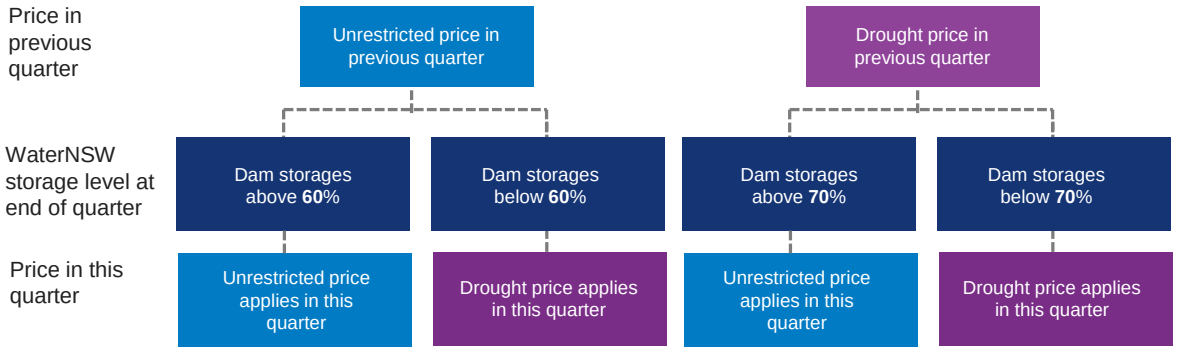
9.3.2 A '60/70% trigger' for moving between unrestricted and drought prices

Our draft decision is to implement a '60/70 trigger' for moving between the unrestricted and drought usage prices, consistent with that applied for drought forecast sales (see Chapter 7). Under this rule, the usage price will be determined at the beginning of each billing quarter based on the previous Water NSW weekly water storage report:

- If the unrestricted usage price was in place in the previous quarter, but dam levels are below 60% in the last week of the previous quarter, the drought usage price will apply.
- The drought usage price would continue to apply until dam levels are above 70% in the last week of the quarter, at which point the unrestricted usage price would apply going forward.

Figure 9.2 shows which usage prices will be applied for each quarter.

Figure 9.2 How usage prices are determined for each quarter



We seek stakeholder feedback on the merits of introducing dynamic usage prices to ensure Water NSW recovers its NRR during unrestricted and drought conditions.

IPART seeks comments:

5 Do you agree with our draft decisions to introduce unrestricted and drought usage prices for all customers? What are the benefit, risks and/or constraints that could result in having dynamic water usage pricing?

9.4 Water NSW's prices to Sydney Water

Sydney Water accounts for about 99% of Water NSW's bulk water sales and revenue. Water NSW's prices to Sydney Water includes:

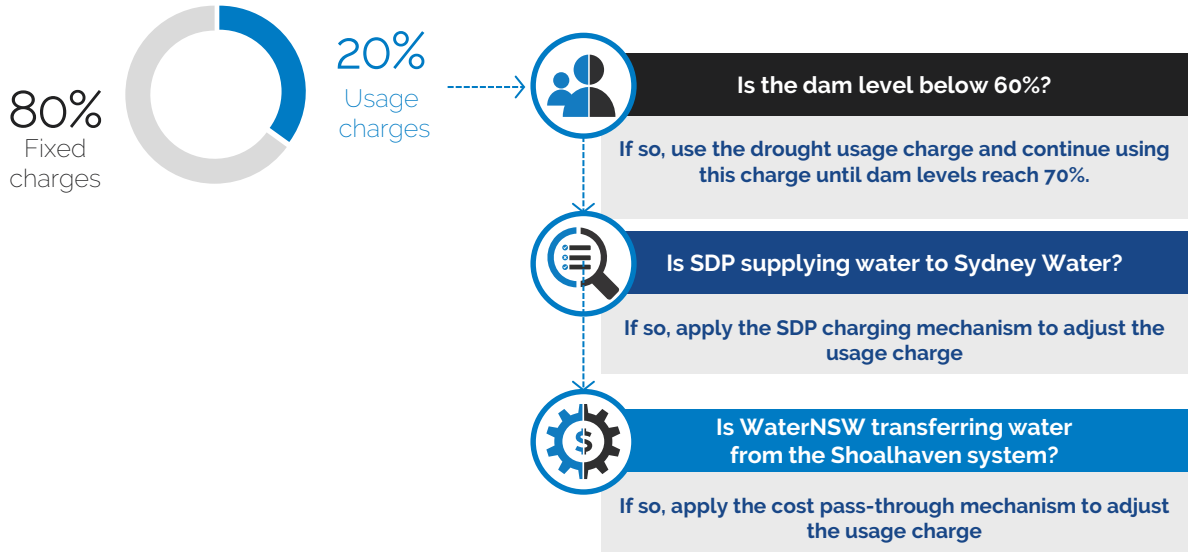
- A fixed charge component ($ per annum), and
- A usage charge ($ per ML of water supplied).

There are three key factors that affect the value of the usage charge component:

1. Two water sales scenarios (as discussed in Chapter 7):
   a) Unrestricted water sales scenario
   b) Drought water sales scenario
2. The supply of water from SDP to Sydney Water as per the Metropolitan Water Plan (as discussed in Chapter 8)
3. The transfer of water from the Shoalhaven system by Water NSW to supplement water supply in Sydney as per the Metropolitan Water Plan (as discussed in Chapter 8).

Figure 9.3 outlines the two key components of Water NSW's prices to Sydney Water and key factors affecting usage prices. The following sections step-through our draft decisions for each of the components and factors.

Figure 9.3 Components and factors that affects Water NSW's prices to Sydney Water



Our draft decisions are:

34 To maintain the price structure of 80:20 fixed to usage ratio for Sydney Water.

35 To set Water NSW's maximum fixed charge to Sydney Water over the 2020 determination period as outlined in Table 9.1.

36 To adopt a formula based approach to calculate the usage charge to Sydney Water (as defined in Box 9.1) to reflect either unrestricted or drought water sales scenarios, all possible operational modes of the SDP, and additional costs that could be incurred due to the transfer of water from the Shoalhaven system to Sydney.

Table 9.1 Maximum prices for Sydney Water ($2019-20)

	2020-21	2021-22	2022-23	2023-24
Fixed charge ($million/year)	151.8	151.8	151.8	151.8
Unrestricted usage charge ($/ML) assuming: ▼ SDP is not operational ▼ Shoalhaven Transfer Scheme is not operational	66.1	66.1	66.1	66.1
Unrestricted usage charge ($/ML) assuming: ▼ SDP is operational ▼ Shoalhaven Transfer Scheme is not operational	78.8	78.6	78.4	78.3
Drought usage charge ($/ML) ▼ SDP is not operational ▼ Shoalhaven Transfer Scheme is not operational	79.2	79.2	79.2	79.2
Drought usage charge ($/ML) ▼ SDP is operational ▼ Shoalhaven Transfer Scheme is not operational	98.2	97.9	97.7	97.5
Drought usage charge ($/ML) ▼ SDP is operational ▼ Shoalhaven Transfer Scheme is operational[a]	135.1	134.3	133.6	132.8

a This is an indicative estimate based on an energy price of $100/MWh, an energy requirement of 2MWh/ML and an assumed 70,000 ML transferred through the Shoalhaven scheme per year.

Source: IPART modelling.

9.4.1 Reasons for our draft decisions

Maintain the 80:20 fixed to usage price structure

Water NSW proposed maintaining its current price structure for the 2020 determination period.

Our draft decisions is to accept Water NSW's proposal to maintain a 80:20 fixed to usage ratio for its bulk water prices to Sydney Water. This price structure broadly reflects Water NSW's underlying cost structure, although it's likely that a higher proportion of its costs (than 80%) are fixed.

As its underlying cost structure is predominantly fixed, we initially considered moving to a higher fixed to usage ratio. In our Issues Paper, we asked for stakeholder comments on potentially moving to a higher fixed and lower usage price structure. Stakeholders had mixed views on this issue: some preferred we maintain the current structure; some supported

moving to a 90:10 price structure; and some supported a lower fixed and higher usage structure.[97] Water NSW's response to our Issues Paper noted that while moving towards a higher fixed to usage ratio would provide greater revenue certainty, it did not propose changing its existing price structure. [98]

We consider that 90:10 fixed to usage pricing structure is more reflective of Water NSW's underlying cost structure. However, given stakeholder feedback, which generally does not support moving to a higher fixed to usage ratio, we have decided to maintain the existing 80:20 fixed to usage price structure.

To introduce dynamic usage prices for Sydney Water

As discussed in section 9.3, our draft decision is to introduce dynamic water usage prices for all customers. Therefore, in Table 9.1, we set two usage prices: unrestricted usage prices and drought usage prices.

The usage price for Sydney Water will increase by about 20% during drought. This higher usage price is expected to recover the same amount of revenue from the forecast lower volume of water sales.

9.4.2 Approach in calculating usage prices

We have modelled prices to recover the notional revenue requirement. We then applied the 80:20 fixed to usage ratio to determine how much will be recovered through the fixed water charge and how much will be recovered through the two usage charges.

Accordingly, we set fixed charges at $151.8 million (real terms) per year over the 2020 determination period. The fixed charge is around $24.3 million or 13.8% lower than proposed by Water NSW per year. For usage prices, we have adopted a usage pricing formula that will apply over the 2020 determination period as defined in Box 9.1

97 Water NSW, *Submission to the IPART's Issues Paper – Review of prices for Water NSW Greater Sydney services from 1 July 2020*, October 2019, p 22. Sydney Water, *Submission to the IPART's Issues Paper – Review of prices for Water NSW Greater Sydney services from 1 July 2020*, October 2019, p 6. Goulburn-Mulwaree Council, *Submission to the IPART's Issues Paper – Review of prices for Water NSW Greater Sydney services from 1 July 2020*, October 2019, p 1.

98 Water NSW, *Submission to the IPART's Issues Paper – Review of prices for Water NSW Greater Sydney services from 1 July 2020*, October 2019, p 22.

Box 9.1 Usage price for Sydney Water ($/ML)

$$\frac{20\% \times TR}{FS - Q_{SDP}} + \frac{CST}{AS}$$

Where:

- ***TR*** is the target revenue requirement from prices to be recovered from all large customers [a] for the relevant month (as listed in the determination)
- ***FS*** is forecast water sales (ML) to all large customers for the relevant month (as listed in the determination). There are two forecast water sales (as discussed in Chapter 7):
  - Unrestricted water sales as set out in Table 7.1 in Chapter 7, and
  - Drought water sales as set out in Table 7.1 in Chapter 7
- Q_{SDP} is the lesser of:
  - The SDP Total Monthly Plant Capacity; or
  - The total volume of water supplied by SDP to all large customers in the relevant month
- ***AS*** is the actual water sales (ML) to all Large Customers by Water NSW in the month, to the nearest whole ML; and
- ***CST*** (cost of Shoalhaven transfer for the month) is the amount calculated as per Box 8.1 in chapter 8.

[a] Currently Sydney Water is Water NSW's only large customer.

Revenues from usage charges represent 20% of Water NSW's NRR. Our draft decision aims at ensuring Water NSW's receives sufficient revenue from its usage charges to recover its efficient costs. We have done this by:

- Using dynamic usage pricing to consider two water sales scenarios (as defined by FS in Box 9.1). This is to recognise the impact of reduced water supply in Water NSW's dams (ie, dam levels) on water restrictions, demand and sales.
- Having an SDP adjustment to recognise the reduction in water sales from Sydney Water when SDP is turned on (as defined by Q_{SDP} in Box 9.1). This is because Sydney Water must accept all water supplied by SDP.
- Having a cost pass-through for the Shoalhaven Transfer Scheme (as defined by the second part of the formula in in Box 9.1) to recover the efficient cost of this scheme under the requirements of the Metropolitan Water Plan.

Under our draft decision, usage charges will increase under drought conditions and when SDP is in operation. However, the total bill that Sydney Water pays to Water NSW would be the same regardless, because:

- The fixed component of the bill would be the same under all scenarios
- The usage component of the bill would be the same (to the extent that forecast water sales are the same as actual water sales). This is because lower water sales volumes would offset the higher usage charges so the revenue generated from the usage charge would be the same (ie, 20% of the revenue requirement for a relevant period would be recovered from usage charges).

However, under our draft decision, the total bill that Sydney Water pays to Water NSW would increase if the Shoalhaven Transfer Scheme is in operation (because these are additional costs that would be passed thought to Sydney Water via the usage charge).

To apply the usage price formula to Sydney Water, we have established the Target Revenue (TR) from prices to be recovered from Sydney Water, as shown in Table 5.3.

Table 9.2 Target revenue to be recovered from Sydney Water ($millions, $2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24
Water NSW's TR from prices	219.6	190.6	191.0	191.4	192.0
% of TR to be recovered from Sydney Water prices	99.5%	99.2%	99.2%	99.2%	99.2%
TR to be recovered from Sydney Water	218.5	189.1	189.5	189.9	190.5

Note: TR is the same as the notional revenue requirement.

Source: IPART modelling.

9.4.3 Our draft prices to Sydney Water in comparison to Water NSW's proposed prices

Table 9.3 compares our draft prices for Sydney Water with Water NSW's proposed prices when SDP and the Shoalhaven Transfer Scheme are not in operation. Using this table:

- For fixed charges, our draft prices are on average 14% lower than the prices proposed by Water NSW over the 2020 determination period.
- For unrestricted usage charges, our draft prices are on average 12% lower than the prices proposed by Water NSW over the 2020 determination period.
- For drought usage charges, Water NSW did not propose drought pricing and therefore there is no directly comparable price (although we note that our drought usage charges are higher than the usage charges proposed by Water NSW).

Overall, our draft prices for Sydney Water are around 13% lower than the prices proposed by Water NSW.

Table 9.3 Comparison of maximum prices for Sydney Water ($2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24
Our draft decision					
Fixed charge ($million)	173.5	151.8	151.8	151.8	151.8
Unrestricted usage charge ($/ML) ▼ SDP is not operational [a] ▼ Shoalhaven Transfer Scheme is not operational [b]	78.8	66.1	66.1	66.1	66.1
Drought usage charge ($/ML) ▼ SDP is not operational [a] ▼ Shoalhaven Transfer Scheme is not operational [b]	na	79.2	79.2	79.2	79.2
Water NSW proposal (1 July 2019) [c]					
Fixed charge ($million)	173.5	175.4	175.8	176.2	176.8
Usage charge ($/ML) (assuming unrestricted water sales)	78.84	76.13	75.42	74.73	73.89
Difference					
Fixed charge (%)		*-13.4%*	*-13.7%*	*-13.9%*	*-14.1%*
Unrestricted usage charge (%)		*-13.2%*	*-12.4%*	*-11.6%*	*-10.6%*
Drought usage charge (%) [d]		*na*	*na*	*na*	*na*

a When SDP is turned on, Water NSW will apply the SDP charging formula to adjust the usage charge to ensure Water NSW recovers the notional revenue requirement. See Table 9.4 for usage charge when SDP is turned on at full capacity.

b When the Shoalhaven Transfer Scheme is turned on, the usage charge will increase by the efficient cost of the Shoalhaven transfers divided by the actual sales for that month.

c The 2019-20 prices above reflect actual 2019-20 inflation. Water NSW used a forecast inflation in its July proposal.

d Water NSW did not propose drought prices so there is no comparable drought usage charge.

Source: Water NSW, Pricing Proposal to IPART, July 2019 and IPART modelling.

Adjusting usage prices when SDP is in operation

The SDP charging formula allows Water NSW to recover the approved notional revenue requirement by adjusting the forecast volume of water by the amount of water supplied by SDP in the month. If SDP is operating at capacity, the usage charge will increase up to $12.5 per ML for unrestricted conditions and $18.6 per ML for drought conditions (see Table 9.4). For more details on our decision on the SDP charging mechanism refer to Section 8.5.

Table 9.4 Maximum prices for Sydney Water – SDP is "on" ($2019-20)

	2020-21	2021-22	2022-23	2023-24
Unrestricted usage charge ($/ML) – SDP volume 250 ML per day [a]	78.8	78.6	78.4	78.3
Drought usage charge ($/ML) – SDP volume 250 ML per day	98.2	97.9	97.7	97.5

[a] The nameplate capacity of SDP is 250ML per day. These usage charges are based on current SDP capacity do not take into account the potential expansion of SDP.

9.5 Water NSW's prices to council customers

Water NSW has three council customers (ie, Wingecarribee Shire Council, Shoalhaven City Council and Goulburn Mulwaree Council) which account for most of the remaining 1% of its bulk water sales and revenue.

Our draft decisions are:

37 To set Water NSW's maximum bulk water prices to councils over the 2020 determination period as outlined in Table 9.5

Table 9.5 Maximum prices for council customers ($2019-20)

	2020-21	2021-22	2022-23	2023-24
Fixed charges ($/year)				
Wingecarribee Shire	958,214	958,214	958,214	958,214
Shoalhaven City	17,966	17,966	17,966	17,966
Goulburn-Mulwaree	21,560	21,560	21,560	21,560
Usage charges ($/ML)				
Unrestricted - all councils	49.9	49.9	49.9	49.9
Drought - all councils	59.7	59.7	59.7	59.7

Source: IPART modelling.

9.5.1 Reasons for our draft decisions

To apply a uniform percentage decrease to prices

We have accepted Water NSW's proposal to apply a uniform percentage change to prices for council customers based on the price reduction determined for Sydney Water. This means that the councils' maximum fixed and usage prices will decrease (by approximately 13% compared to Water NSW's proposal) in line with the overall decrease for bulk water prices to Sydney Water.

We recognise that accepting Water NSW's proposed approach means that the council prices are not derived from cost allocations based on each council's respective water demand and assets that supply water to it.

We have compared the forecast demand used in the 2016 Determination to the forecast demand volumes for the 2020 determination period. We found that for Wingecarribee Shire

and Shoalhaven City councils, the demand forecasts for the 2020 determination period were significantly higher and for Goulburn Mulwaree Council the demand forecasts for the 2020 determination period were significantly lower than those forecast in the 2016 determination period. Based on the three councils' respective forecasts, it is likely that if we were to recalculate councils' prices, prices may vary significantly resulting in price instability.

Other than updated demand forecasts, we do not have robust cost information to determine the cost of the assets supplying water to the councils in order for us to recalculate council prices for the 2020 determination period. In the absence of robust cost information to recalculate councils prices, we consider Water NSW's proposed approach to apply a uniform percentage to councils' prices is appropriate. However, we intend to review the cost allocation and demand volumes for each council and the impact on council prices at the next determination period.

Water NSW proposed a uniform reduction in both service charges and usage charges for Councils. This proposal has the effect of moving away from the existing 80:20 fixed to variable price structure. Since our draft decision is to accept Water NSW's proposal to apply a uniform reduction to council prices in line with the decrease for bulk water prices to Sydney Water, this will result in a slight movement away from the 80:20 fixed to usage pricing structure for councils.

To introduce dynamic usage prices for councils

As discussed in section 9.3, our draft decision is to introduce dynamic water usage prices for councils. Therefore, in Table 9.5, we set two usage prices for councils: unrestricted usage prices and drought usage prices.

The usage price for councils will increase by about 20% during drought. This higher usage price is expected to recover the same amount of revenue from the expected lower volume of water sales.

9.5.2 Our draft prices to council customers in comparison to Water NSW's proposed prices

Our draft prices are lower than Water NSW's proposed prices by 13% per year as shown in Table 9.6. Using this table:

- For fixed and unrestricted usage charges, our draft prices are on average 13% lower than the prices proposed by Water NSW over the 2020 determination period.
- For drought usage charges, there is no comparison to Water NSW's prices.

Table 9.6 Comparison of maximum prices for council customers ($2019-20)

	Council	2019-20	2020-21	2021-22	2022-23	2023-24
Our draft decision						
Fixed charge ($/year)	Wingecarribee Shire	1,104,880	958,214	958,214	958,214	958,214
Fixed charge ($/year)	Shoalhaven City	20,716	17,966	17,966	17,966	17,966
Fixed charge ($/year)	Goulburn-Mulwaree	24,860	21,560	21,560	21,560	21,560
Unrestricted usage charge ($/ML)	All councils	57.6	49.9	49.9	49.9	49.9
Drought usage charge ($/ML)	All councils	na	59.7	59.7	59.7	59.7
Water NSW proposal (1 July 2019) [a]						
Fixed charge ($/year)	Wingecarribee Shire	1,104,880	1,106,553	1,106,553	1,106,553	1,106,553
Fixed charge ($/year)	Shoalhaven City	20,716	20,748	20,748	20,748	20,748
Fixed charge ($/year)	Goulburn-Mulwaree	24,860	24,897	24,897	24,897	24,897
Unrestricted usage charge ($/ML)	All councils	57.6	57.6	57.6	57.6	57.6
Difference						
Fixed charge (%)	*Wingecarribee Shire*		*-13.4%*	*-13.4%*	*-13.4%*	*-13.4%*
Fixed charge (%)	*Shoalhaven City*		*-13.4%*	*-13.4%*	*-13.4%*	*-13.4%*
Fixed charge (%)	*Goulburn-Mulwaree*		*-13.4%*	*-13.4%*	*-13.4%*	*-13.4%*
Unrestricted usage charge (%)	*All councils*		*-13.4%*	*-13.4%*	*-13.4%*	*-13.4%*
Drought usage charge (%) [b]	*All councils*		*na*	*na*	*na*	*na*

a The 2019-20 prices above reflect actual 2019-20 inflation. Water NSW used a forecast inflation in its July proposal.

b Water NSW did not propose drought prices so there is no comparable drought usage charge.

Source: Water NSW, Pricing Proposal to IPART, July 2019 and IPART modelling.

9.6 Water NSW's prices to raw water and unfiltered water customers

Our draft decisions are:

38 To set Water NSW's maximum prices to raw and unfiltered water customers over the 2020 determination period as outlined in Table 9.7 and Table 9.8 respectively.

Table 9.7 Maximum prices for raw water customers ($2019-20)

	2020-21	2021-22	2022-23	2023-24
Fixed charge ($/year)	-	-	-	-
Unrestricted usage charge ($/ML)	633.1	633.1	633.1	633.1
Drought usage charge ($/ML)	757.8	757.8	757.8	757.8

Source: IPART modelling.

Table 9.8 Maximum prices for unfiltered water customers ($2019-20)

	2020-21	2021-22	2022-23	2023-24
Fixed charge ($/year)				
- 20mm metered	96.39	96.39	96.39	96.39
- 25mm metered	150.60	150.60	150.60	150.60
- 30mm metered	216.87	216.87	216.87	216.87
- 32mm metered	246.75	246.75	246.75	246.75
- 40mm metered	385.55	385.55	385.55	385.55
- 50mm metered	602.42	602.42	602.42	602.42
- 80mm metered	1,542.20	1,542.20	1,542.20	1,542.20
- 100mm metered	2,409.67	2,409.67	2,409.67	2,409.67
- 150mm metered	5,421.77	5,421.77	5,421.77	5,421.77
- 200mm metered	9,638.69	9,638.69	9,638.69	9,638.69
Unrestricted usage charge ($/ML)	1,101.42	1,101.42	1,101.42	1,101.42
Drought usage charge ($/ML)	1,318.32	1,318.32	1,318.32	1,318.32

Source: IPART modelling.

9.6.1 Reasons for our draft decisions

To apply a uniform percentage decrease to prices

Our draft decision is to decrease prices for raw and unfiltered water customers to align with the overall reduction in prices for Sydney Water. This means that prices for raw and unfiltered water customers are approximately 13% lower than the prices proposed by Water NSW. Revenue from raw and unfiltered water customers accounts for 0.1% of Water NSW's target revenue.

To introduce dynamic usage prices for councils

As discussed in section 9.3, our draft decision is to introduce dynamic water usage prices for raw and unfiltered water. The usage price for raw and unfiltered water customers will increase by about 20% during drought. This higher usage price is expected to recover the same amount of revenue from the expected lower volume of water sales.

9.6.2 Our draft prices to raw and unfiltered water customers in comparison to Water NSW's proposed prices

Our draft prices are lower than Water NSW's proposed prices by 13% per year as shown in Table 9.9, for raw and unfiltered water customers.

Table 9.9 Comparison of maximum prices for raw and unfiltered water customers ($2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24
Raw water customers					
Our draft decision					
Fixed charge ($/year)	-	-	-	-	-
Unrestricted usage charge ($/ML)	730.0	633.1	633.1	633.1	633.1
Drought usage charge ($/ML)	na	757.8	757.8	757.8	757.8
Water NSW proposal (1 July 2019)[a]					
Fixed charge ($/year)	-	-	-	-	-
Unrestricted usage charge ($/ML)	730.0	729.1	729.1	729.1	729.1
Difference					
Fixed charge (%)	-	-	-	-	-
Unrestricted usage charge (%)		*-13.2%*	*-13.2%*	*-13.2%*	*-13.2%*
Drought usage charge (%) [b]		*na*	*na*	*na*	*na*
Unfiltered water customers [c]					
Our draft decision					
Fixed charge ($/year)	111.14	96.39	96.39	96.39	96.39
Unrestricted usage charge ($/ML)	1,270.0	1,101.4	1,101.4	1,101.4	1,101.4
Drought usage charge ($/ML)		1,318.3	1,318.3	1,318.3	1,318.3
Water NSW proposal (1 July 2019)[a]					
Fixed charge ($/year)	111.14	111.31	111.31	111.31	111.31
Unrestricted usage charge ($/ML)	1,270.0	1,267.9	1,267.9	1,267.9	1,267.9
Difference					
Fixed charge (%)		*-13.4%*	*-13.4%*	*-13.4%*	*-13.4%*
Unrestricted usage charge (%)		*-13.1%*	*-13.1%*	*-13.1%*	*-13.1%*
Drought usage charge (%) [b]		*na*	*na*	*na*	*na*

a The 2019-20 prices above reflect actual 2019-20 inflation. Water NSW used a forecast inflation in its July proposal.

b Water NSW did not propose drought prices so there is no comparable drought usage charge.

c This charge is for customers with 20mm meters, customers with larger meters will face proportionately higher charges based on the relative size of their meter.

Source: Water NSW, Pricing Proposal to IPART, July 2019 and IPART modelling.

10 Impacts of draft prices

This chapter outlines the impact of our pricing decisions on Water NSW's customers and Water NSW. It also discusses the implications of our pricing decisions on other matters we must consider under section 15 of the IPART Act (see Appendix A). These include:

- Water NSW's service standards
- Water NSW's financial viability and impact on the NSW Government's Consolidated Fund
- general inflation, and
- the environment.

We are satisfied that our 2020 Determination achieves an appropriate balance between these matters.

This chapter presents our findings on bill impacts in terms of nominal dollar impacts – **that is, bill impacts including the impact of forecast inflation**[99].

10.1 Impacts on Water NSW's customers

In reaching our draft pricing decisions, we consider the impacts of our draft prices on Sydney Water (and its end-use customers), the three councils supplied by Water NSW and their customers, and Water NSW's smaller retail customers that receive raw water and unfiltered water.

We consider the impact to these customers to be reasonable. In summary, we expect the following customer impacts of our draft pricing decisions:

- Under Water NSW's proposed prices, customer bills would increase around 10% in nominal terms over the 2020 determination period.[100]
- Under our draft prices and assuming forecast water sales are constant based on 2019-20 water sales volumes,[101] **bills fall by 4.3% in nominal terms for all customers** over the 2020 determination period (ie, Sydney Water, the three Councils, and raw and unfiltered water customers). This means that bills under our draft prices are around 15% lower than those proposed by Water NSW. This bill impact analysis is shown in Table 10.1. Key drivers of this difference are our decisions to reduce operating and capital expenditure from the levels proposed by WaterNSW and because of falls in interest rates that have occurred since WaterNSW submitted its pricing proposal.

99 We use an inflation assumption of 2.5% per year over the 2020 determination period.

100 We have assumed forecast water sales over the determination period are held constant based on 2019-20 water sales volumes. This is to estimate the bill impact based on change in prices only.

101 We have assumed forecast water sales over the determination period are held constant based on 2019-20 water sales volumes. This is to estimate the bill impact based on change in prices only.

- Under our draft prices and using the unrestricted forecast water sales over the 2020 determination period, bills fall within a range of 2.0 to 10% as shown in Table 10.2. This means that bills under our draft prices and based on unrestricted water sales are around 15% lower than those proposed by Water NSW.
- Sydney Water is Water NSW's largest customer, accounting for about 99% of Water NSW's NRR. The prices for Water NSW to Sydney Water will have a small impact on the bills of Sydney Water's customers. Under our prices, the cost of Sydney Water's bulk water purchases from Water NSW account for an average of 7.6% of Sydney Water's total revenue requirement[102] over the 2020 determination period.
- Our prices for Water NSW's bulk water supply to Sydney Water will reduce the bills of Sydney Water's customers in nominal terms (Table 10.3). For example, in 2020-21, a Sydney Water residential customer who uses 200 kL per year of water and has a 20 mm meter will see a decrease of $114 or 10% in their bill compared to 2019-20. This is partly due to a decrease in bulk water costs from Water NSW by around $12 per customer.

Table 10.1 Bill impacts of draft prices for Water NSW's customers ($nominal, assuming forecast water sales are constant based on 2019-20 water sales volumes)

Customers ($)	2019-20	2020-21	2021-22	2022-23	2023-24	Under our draft prices	Under Water NSW's proposal
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*Change from (1) to (2)*	*Change from (1) to (2)*
Sydney Water	218,453,443	194,201,024	199,056,049	204,032,450	209,133,262	-4.3%	10.6%
Wingecarribee Council	1,455,762	1,294,082	1,326,435	1,359,595	1,393,585	-4.3%	10.5%
Shoalhaven City Council	26,817	23,838	24,434	25,045	25,671	-4.3%	10.5%
Goulburn-Mulwaree Council	29,447	26,176	26,831	27,501	28,189	-4.3%	10.5%
Raw water customers[a]	579	514	527	540	554	-4.3%	10.2%
Unfiltered water customers[b]	3,636	3,232	3,313	3,396	3,481	-4.3%	10.2%

a Bills for raw water customers are based on average consumption.

b Bills for unfiltered water customers are based on average consumption and a 20mm meter connection.

Source: IPART analysis using our draft prices and assuming forecast water sales are constant based on 2019-20 water sales volumes to calculate bills.

102 This is based on unrestricted water sales and pricing.

Table 10.2 Bill impacts of draft prices for Water NSW's customers ($nominal, using forecast unrestricted water sales over the 2020 determination period)

Customers ($)	2019-20	2020-21	2021-22	2022-23	2023-24	Under our draft prices	Under Water NSW's proposal
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*Change from (1) to (2)*	*Change from (1) to (2)*
Sydney Water	218,453,443	193,807,488	199,104,594	204,539,764	210,239,591	-3.8%	11.2%
Wingecarribee Council	1,455,762	1,300,324	1,339,334	1,379,644	1,421,297	-2.4%	12.7%
Shoalhaven City Council	26,817	23,941	24,644	25,368	26,112	-2.6%	12.4%
Goulburn-Mulwaree Council	29,447	24,657	25,273	25,905	26,553	-9.8%	4.1%
Raw water customers[a]	579	514	527	540	554	-4.3%	10.2%
Unfiltered water customers[b]	3,636	3,232	3,313	3,396	3,481	-4.3%	10.2%

a Bills for raw water customers are based on average consumption.

c Bills for unfiltered water customers are based on average consumption and a 20mm meter connection.

Source: IPART analysis using our draft prices and using unrestricted forecast water sales to calculate bills.

Table 10.3 Impact of bulk water costs on a typical Sydney Water customer bill ($nominal, unrestricted demand and pricing scenario)

	2019-20	2020-21	2021-22	2022-23	2023-24
Residential: 20mm meter and 200kL pa					
Water and sewerage bill, SWC customer ($)	1,133.54	1,019.57	1,045.06	1,071.19	1,097.97
Water NSW total impact on bill ($)	88.07	76.22	77.28	78.43	79.42
Water NSW impact as percentage of bill	7.8%	7.5%	7.4%	7.3%	7.2%
Non-residential: 40mm meter and 5800kL pa					
Water and sewerage bill, SWC customer ($)	19,654.24	20,473.82	20,985.68	21,510.31	22,048.08
Water NSW total impact on bill ($)	2,133.25	2,117.02	2,145.42	2,175.97	2,203.16
Water NSW impact as percentage of bill	10.9%	10.3%	10.2%	10.1%	10.0%

Notes: Totals may not add due to rounding. Bills are calculated based on 'unrestricted' water demand scenario and pricing. In addition, under our draft determination prices, Sydney Water would recover about 4% of its water service costs from the fixed charge and 96% from the usage charge. We have assumed that it would recover bulk water costs in the same proportions, ie, 4% from the fixed charge and 96% from the usage change. This means that, for a given meter size, larger users would pay a higher proportion of the bulk water costs than smaller users.

Source: IPART analysis using our draft prices.

10.2 Impacts on service standards

Under our Draft Determination, we consider that the draft prices we have determined will allow Water NSW to continue to meet its obligations in relation to service standards.

Water NSW is licensed under the *Water NSW Act 2014* (the Water NSW Act). The Water NSW Act requires Water NSW to hold an operating licence that is issued by the Minister and reviewed annually by IPART. This licence contains a number of standards that Water NSW must meet, or risk facing penalties associated with a breach of licence conditions. Water NSW is also required to establish arrangements with Sydney Water under the Water NSW Act, which include the standard of quality of the water supplied, the continuity of water supply and the maintenance of adequate reserves of water by Water NSW. These arrangements are included in a Raw Water Supply Agreement (RWSA) with Sydney Water.[103]

Water NSW's pricing submission identified the expenditure required for it to meet its service standard obligations. In its review of Water NSW's operating and capital expenditure, Atkins noted that Water NSW's performance generally met its required service standards during the 2016 determination period.[104]

Atkins has recommended an efficient level of expenditure for the 2020 determination period, which facilitates Water NSW continuing to meet its service standards. For example, Atkins supports a modest increase in Water NSW's water quality science expenditure, enabling it to comply with its new operating licence requirement.[105] We have accepted Atkins' recommendations, and discuss them further in chapters 4 and 5.

10.3 Impacts on Water NSW's financial viability

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.

In 2018, we reviewed the financeability test we use as part of our price regulation process.[106] 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

103 The agreement covers raw water quality management as well as flow measurement, information management, operational changes, system configuration, strategic planning and maintenance planning. The maximum values of colour and turbidity are defined in the RWSA. These are important to define treatment requirements and drive costs to Sydney Water. There is then an obligation that Water NSW and Sydney Water work together to manage operating costs efficiently.

104 Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 7.

105 Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 90.

106 IPART, *Review of our financeability test*, November 2018, p 1.

- Tailor the remedy for a financeability concern based on its source.

To assess Water NSW's financeability over the 2019 Determination, we analysed its forecast financial performance, financial position and cash flows for both the *benchmark*[107] and *actual*[108] business. We then forecast financial ratios for both tests and assessed Water NSW'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 10.4.

Table 10.4 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%

For the actual test, Water NSW did not provide actual information that would enable us to perform the analysis. Therefore, the analysis below is only for the benchmark test.

Under our draft prices, Water NSW meets two of the three target benchmark ratios (interest cover and gearing ratios), but does not achieve the target FFO over debt ratio during the 2020 determination period.

The Real FFO over debt is forecast to underperform against the benchmark target during the regulatory period. However, we do not consider this constitutes a financeability concern.

The financeability metric FFO over debt is designed to test whether a firm generates sufficient free cash flow to repay its debt over the economic life of its assets. For a regulated firm, FFO represents the sum of the depreciation allowance and the after-tax return on equity. Thus it can be influenced by changes to the regulatory asset lives and the permitted return on equity.

Since February 2018 the permitted return on equity for a water business has reduced from 5.95% to 4.95% in real post-tax terms.[109] This change has reduced the real FFO/net debt ratio by approximately 0.7% between 2018 and 2020.[110]

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107 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.

108 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.

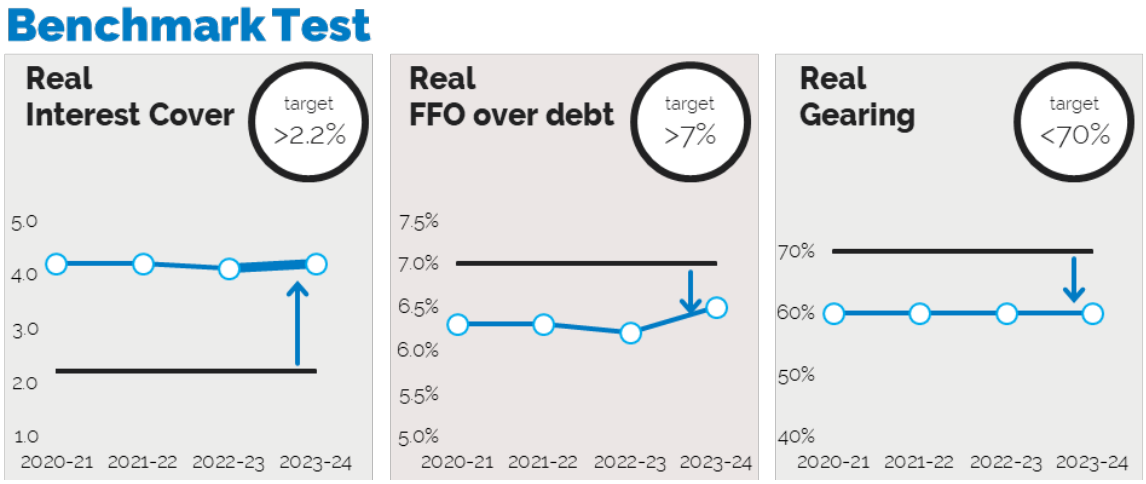
109 See, for 2018:
https://www.ipart.nsw.gov.au/Home/Industries/Special-Reviews/Regulatory-policy/WACC/Market-Update/Spreadsheet-WACC-Model-February-2018
and, for 2020:
https://www.ipart.nsw.gov.au/Home/Industries/Special-Reviews/Regulatory-policy/WACC/Market-Update/Spreadsheet-Model-WACC-model-February-2020
On the tab "WACC Calculator", set cell C14 to "Water". The current real-post tax cost of equity is in cell C82 and the long term average post-tax cost of equity is in cell D82. The average of these two values for 2018 was 5.95%. For 2020, with the transition to trailing average enabled (cell C41 set to "Yes"), the average of these two values was 4.95%.

110 This finding is based on 60% gearing and an assumption of unchanged asset lives between February 2018 and February 2020.

We did not update our financeability target ratios to reflect this change because our targets are general financial market standards and were the subject of consultation during our financeability review. The target ratios make standard underlying assumptions on asset lives and return on equity. Clearly some of those assumptions do not strictly apply to the present water utility price reviews. However, we see value in retaining the standard targets because they are widely used in financial markets and by ratings agencies. When we next review our financeability test we may consider this issue in more detail.

Our building block method of establishing prices ensures that Water NSW will be able to finance and repay its debt while providing its owners with a market return on equity. The building block method accounts for all cashflows in a more precise and detailed way than the FFO/net debt ratio test does. Therefore, we consider that the FFO/net debt metric does not indicate a problem with Water NSW's financial sustainability at our draft prices.

Figure 10.1 Financeability test results



Source: IPART analysis

10.4 Implications for the consolidated fund

Under section 16 of the IPART Act, IPART is required to report on the likely impact to the Consolidated Fund if prices are not increased to the maximum levels permitted. If this is the case, then the level of tax equivalent and dividends paid to the Consolidated Fund will fall. The extent of this fall will depend on Treasury's application of its financial distribution policy and how the change affects after-tax profit.

Our financial modelling is based on a tax rate of 30% for pre-tax profit and dividend payments at 70% of after-tax profit. A $1 decrease in pre-tax profit would result in a loss of revenue to the Consolidated Fund of 49 cents in total, which is 70% of the decrease in after-tax profit of 70 cents.

10.5 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 0.76 out of 100, meaning that a 1% change in the price of water and sewerage services in Sydney would result in a 0.0076% change in the CPI for Sydney, which is not large.[111]

Further, the water and sewerage measure for the Sydney CPI contributes 24.09% to the national measure of water and sewerage[112], which has a weighting in the national measure of 1.02 out of 100[113]. This means that a 1% change in the price of water and sewerage services in Sydney would result in a 0.0024% change in the national CPI, which is negligible.

With these weightings in the CPI, it would require an increase in the prices of water and sewerage services in Sydney that is much larger than under our draft decisions to have significant impact on either the Sydney CPI or the national CPI.

Further, considering that the cost of bulk water from Water NSW to Sydney Water is about 7.6% of Sydney Water's NRR, the impact of Water NSW's services on general inflation is negligible.

10.6 Implications for the environment

Under section 15 of the IPART Act, we are required to have regard to the need to maintain ecologically sustainable development by taking account of all feasible options **to protect the environment**.

Water NSW' environmental obligations are regulated by different environmental legislation, regulation, agreements and regulatory bodies. For example:

- **Environmental management report (EMR)** under its Operating Licence[114]
- **Water quality** is regulated under its Operating Licence and RWSA
- Portfolio Risk Assessment as part of its **dam safety requirements**
- **Catchment management** as required under the Water NSW Act.

Water NSW's environmental obligations and water quality requirements require a large portion of its budget. In determining Water NSW's revenue requirement, we have ensured

111 Australian Bureau of Statistics, *Consumer Price Index 17th Series Weighting Pattern (cat. no.6471.0)*, 6 November 2017; Table 2, CPI weights, September quarter 2017; Utilities, Water and sewerage.

112 Australian Bureau of Statistics, *Consumer Price Index 17th Series Weighting Pattern (cat. no.6471.0)*, 6 November 2017; Table 4, Capital city percentage contribution to the Weighted average of eight capital cities, September quarter 2017; Utilities, Water and sewerage.

113 Australian Bureau of Statistics, *Consumer Price Index 17th Series Weighting Pattern (cat. no.6471.0)*, 6 November 2017; Table 2, CPI weights, September quarter 2017; Utilities, Water and sewerage.

114 Water NSW is required to provide IPART with an EMR annually that details its environmental objectives and targets, and programs to achieve these environmental objectives and targets.

Water NSW can fully recover all efficient costs it incurs in meeting its environmental obligations through prices.

As an example, Atkins found that Water NSW's proposed capital expenditure for the Warragamba Dam Environmental Flows was generally prudent, and we have included this expenditure in Water NSW's revenue requirement. The purpose of this project is to improve the health of the Hawkesbury-Nepean River, by introducing a variable environmental flow regime through releases of water from Warragamba Dam.[115] See Chapter 5 and Appendix F for further details.

115 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, pp 118-119; Atkins Cardno, *WaterNSW expenditure review – Addendum to Final Report,* February 2020, pp 5-6.

A Matters to be considered by IPART

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 the following matters:

c) The cost of providing the services concerned

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

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

f) The effect on general price inflation over the medium term

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

h) 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

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

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

k) The need to promote competition in the supply of the services concerned

l) Considerations of demand management (including levels of demand) and least cost planning

m) The social impact of the determinations and recommendations

n) Standards of quality, reliability and safety of the services concerned (whether those standards are specified by legislation, agreement or otherwise).

Table A.1 outlines the sections of the report that address each matter.

Table A.1 Consideration of section 15(1) matters by IPART

Section 15(1)	Report reference
a) Cost of providing the services	Chapter 6 sets out Water NSW's total efficient costs to deliver its regulated services over the determination period. Further detail is provided in Chapters 4 and 5, and Appendices E, F, and G on efficient historical and forecast 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 Water NSW requires to deliver its regulated services. This is addressed throughout the report, particularly in Chapters 4 and 5 (where we establish the efficient historical and forecast expenditure) and Chapters 9 and 10 (where we set out our pricing decisions and impacts).
c) Appropriate rate of return and dividends	Chapter 6 outlines 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.
d) Effect on general price inflation	Chapter 10 outlines our estimate that the impact of our prices on general inflation is negligible.
e) Need for greater efficiency in the supply of services	Chapters 4 and 5 set out our decisions on Water NSW's efficient historical and forecast expenditure. These decisions would promote greater efficiency in the supply of Water NSW's regulated services.
f) Ecologically sustainable development	Chapters 4 and 5 set out Water NSW's efficient historical and forecast expenditure that allows it to meet all of its regulatory requirements, including its environmental obligations.
g) Impact on borrowing, capital and dividend requirements	Chapters 6 and 10 explain how we have provided Water NSW with an allowance for a return on and of capital; and our assessment of its 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 4 and 5 determine the prudent and efficient cost of construction and operational contracts which Water NSW 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 Water NSW as set out in Chapter 6).
j) Considerations of demand management and least cost planning	Chapters 4 and 5 outline how we have assessed Water NSW's efficient historical and forecast expenditure required to deliver its regulated services at least cost. Chapter 9 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 10 considers the potential impact of our pricing decisions on Water NSW, its customers and the NSW Government (on behalf of the broader community).
l) Standards of quality, reliability and safety	Chapters 4, 5 and 10, and Appendices E, F and G detail our consideration of Water NSW's efficient historical and forecast expenditure so that it can meet the required standards of quality, reliability and safety in delivering its services.

B Our approach when setting prices

We set the maximum bulk water prices to recover the efficient costs that Water NSW will incur in delivering services to its customers in the Greater Sydney area. When setting prices, we balance our prices to be cost reflective (ie, customers should pay for the costs they create) to send the appropriate price signals against other factors, including customer affordability and government funding commitments.

The sections below briefly explain our review process, as well as how we approach the major elements of the price review. The key steps include:

1. Estimating Water NSW's efficient costs and notional revenue requirement (NRR),
2. Adjusting the NRR for any other revenue and costs
3. Determining the forecast water sales and customer numbers
4. Setting prices to recover the adjusted NRR

B.1 Comprehensive review process when setting prices

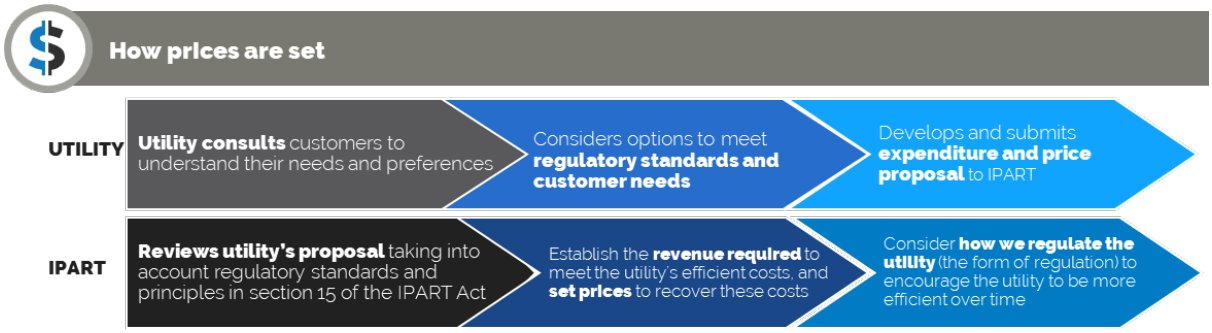
Our periodic pricing reviews span 12 months and consider, broadly, the utility's efficient costs (or revenue needs), forecast demand for services, appropriate prices stuctures, and the impacts of our decisions.

Our regulatory framework aims to ensure that Water NSW's prices provide it with sufficient revenue to recover its efficient costs of delivering its water services to its customers, while complying with its regulatory requirements (including environmental regulatory requirements and service standards in its operating licence).

Our price review begins with Water NSW's pricing proposal, which it submitted to us on 1 July 2019. This review is our response to Water NSW's proposal. Water NSW proposed operating and capital expenditure, prices, and a preferred regulatory framework for the four years from 1 July 2020. This is available on our website.

Figure B.1 outlines the process undertaken by Water NSW and by us during this review. While our price setting process involves a detailed assessment of Water NSW's proposed operating expenditure and capital expenditure program, IPART does not require Water NSW to undertake certain projects during the determination period. Water NSW has flexibility to prioritise and undertake its capital expenditure program accordingly. However, we have set output measures as a starting point for measuring the efficiency of Water NSW's expenditure and it will be required to provide reasons for departing from these output measures.

Figure B.1 Our process to setting prices under a propose-respond regulatory model



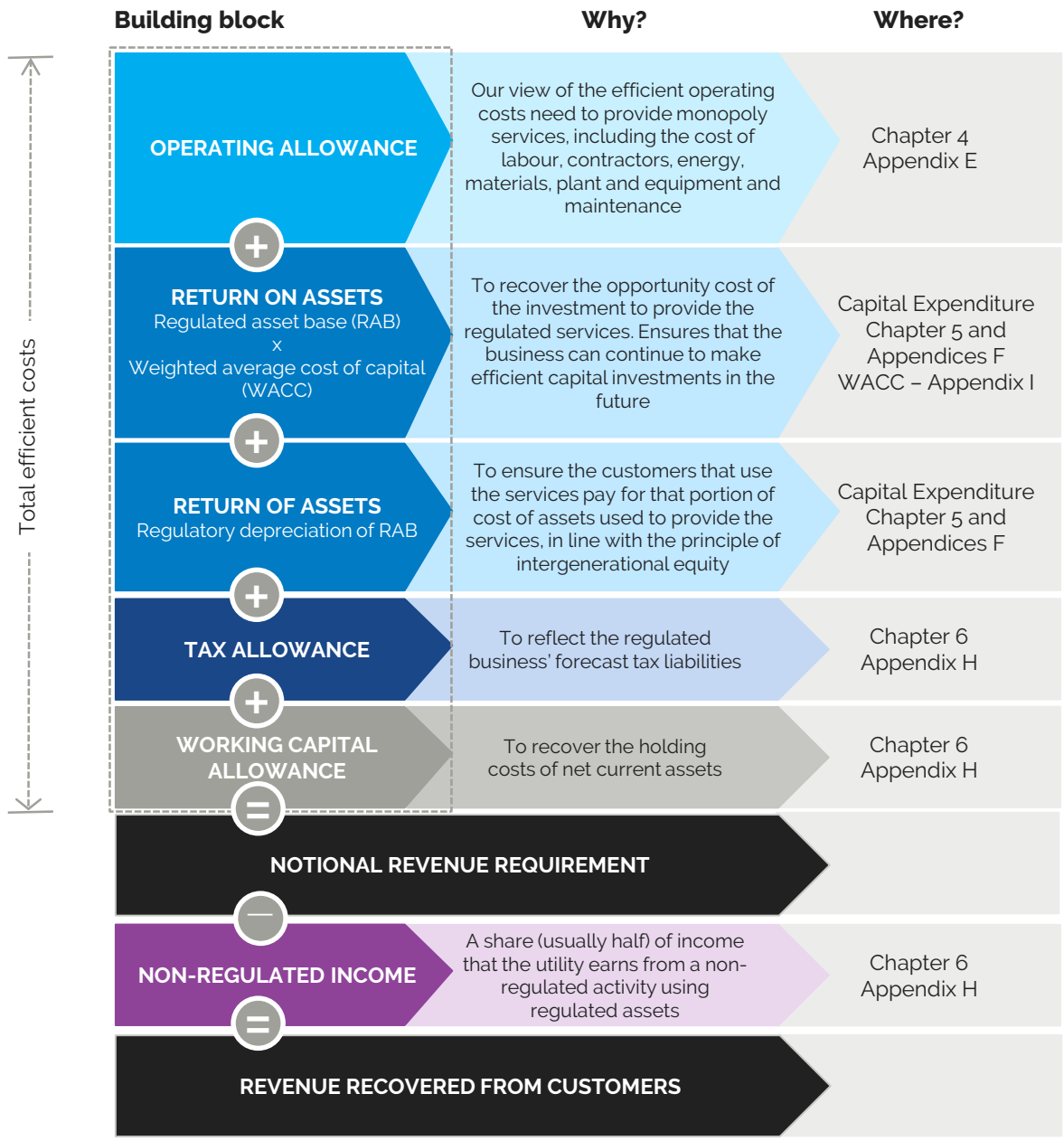
B.2 Estimating efficient costs and the NRR

Our first step in determining prices is to calculate the NRR, which represents our view of the total efficient costs of providing regulated services in the GS area in each year of the determination period.

We have used a 'building-block' approach to calculate Water NSW's NRR for the GS area, which represents our view of the efficient costs for Water NSW to deliver its regulated service. Figure B.2 provides a brief explanation of each cost 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 regarding our assessment for this review of Water NSW's prices.

Figure B.2 Building block approach to calculate the 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.2.1 Operating expenditure

The allowance for operating expenditure in the building block reflects our view of the efficient level of operating costs required to deliver Water NSW'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 engage expert consultants to assess the efficiency of the utility's proposed operating expenditure and to examine whether the expenditure represents the best and most cost

effective way of delivering regulated services. Our efficiency test is presented in Box B.1, and our assessment of operating expenditure is provided in Chapter 4.

Box B.1 Our 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).

B.2.2 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 Water NSW's existing assets and capital expenditure.

Similar to operating expenditure, we have applied an efficiency test (see Box B.1) to test the **actual** capital expenditure incurred over the current period (2016 determination period), and the proposed expenditure for the upcoming determination 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 explains how capital expenditure affects prices, and the return on assets and regulatory depreciation are both explained further below.

Box B.2 How capital expenditure is an input into prices

Under our building block model, we do not include the up-front capital costs in prices, but instead, we add their value to the Regulatory Asset Base (RAB) to calculate capital-related allowances to be included in the Notional Revenue Requirement (NRR) and recovered via prices:

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.

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 over the determination period by an efficient rate of return, which we calculate as the weighted average cost of capital (WACC). We discuss our decisions on the return on assets in Chapter 6 on NRR. Further detail on how we calculate the value of the RAB and the WACC is set out in Appendices H and I.

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 Water NSW's depreciation allowance are accurate – ie, they reasonably reflect the consumption of its assets. If they are too short, today's customers will over-pay (ie, 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.

We discuss our decisions on regulatory depreciation in Chapter 6 with technical details in Appendix H.

B.2.3 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. This allowance reflects what Water NSW's tax liabilities would be under our regulatory settings.

Our tax allowance is not intended to recover Water NSW'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[116], adjusted for the value of imputation credits (the 'gamma')[117], to the business's taxable income. For this purpose:

- Taxable income is the notional revenue requirement (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.
- Other items such as interest expenses are based on the parameters used for the WACC, and the value of the RAB[118] and working capital.

B.2.4 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.[119] 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.3 Adjusting the NRR

After we have estimated the efficient costs, we need to determine whether we should make any adjustments to the NRR. For Water NSW, the NRR adjustments relate to revenue that should be shared between water customers and its shareholders.

B.3.1 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.

116 We have a 30% statutory corporate tax rate.
117 Under a post-tax framework, the value of franking credits (gamma) enters the regulatory decision only through the estimate of the tax liability.
118 The nominal cost of debt is the sum of the nominal risk-free rate and nominal debt margin.
119 IPART, Working Capital Allowance Policy Paper, November 2018.

We discuss our decisions on revenue that should be adjusted for non-regulated income in Chapters 6, and Appendix H.

B.4 Forecasting water sales and customer numbers

A key step in our price setting process is to decide on Water NSW's forecasts for water sales and customer numbers. These forecasts are used to determine the price levels necessary to recover Water NSW's NRR.

If the forecasts are too high or too low, it would lead to an over- or under-recovery of the NRR. Our decisions on forecast water sales and customer numbers are discussed in Chapter 7.

B.5 Setting prices to recover the NRR

We generally set prices to recover the utility's NRR.[120] In setting 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 Water NSW's proposed price structures, demand and price levels, 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 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, whereby:
  - Usage charges reference an appropriate estimate of marginal cost (ie, the additional cost of supplying an additional unit of water or sewerage services), and
  - 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 Water NSW to administer, and customer preferences.

120 Before setting prices, we subtract 50% of any non-regulated revenue that Water NSW may generate, and then set prices to recover the remaining NRR. Non-regulated revenue is generally very small compared to regulated revenue.

B.5.1 How we set prices?

We set prices to recover the adjusted NRR in NPV terms over the determination period across its customer base. Before we set prices, we will make decisions on how long the determination period should be. Our decision on the determination period is discussed in Chapter 3.

For Water NSW, we will recover the adjusted NRR between Sydney Water, three council customers and its raw and unfiltered water customer. For each customer, we will make decisions on its price structures and price levels.

Price structures determine how the customers' share of the total efficient cost of delivering the service is split between its different **price components** (ie, fixed service charges that are applied regardless of water supplied and volumetric charges that are levied per megalitre (ML) of water delivered). Price levels are the actual prices that will be paid by customers to recover the NRR based on forecast demand models. Our decisions on prices are discussed in Chapter 9.

C Context for this review

Water NSW is the main supplier of bulk water in the Greater Sydney (GS) region. It manages and protects Sydney's drinking water catchments and catchment infrastructure. Its services are prescribed by the *Water NSW Act 2014* and its operating licence.

IPART sets the maximum prices for services that Water NSW supplies in the GS region in accordance with the matters under section 15 of the *Independent Pricing and Regulatory Tribunal Act 1992* (see Appendix A). Section 15 requires us to consider a range of matters when determining prices, including the costs of providing the services, customer affordability, environmental impact and service standards. We also administer Water NSW's operating licence, which includes service standards.

This appendix provides additional information on Water NSW's regulatory framework, the services it provides and cost drivers.

C.1 Water NSW's regulatory framework

The roles and responsibilities of Water NSW are prescribed by the *Water NSW Act 2014*, and its operating licence. Under Section 6 of the *Water NSW Act 2014*, Water NSW is required to meet the following primary objectives:

- Capture, store and release water in an efficient, effective, safe and financially responsible manner
- Supply water in compliance with appropriate standards of quality
- Ensure that declared catchment areas and water management works in such areas are managed and protected so as to promote water quality, the protection of public health and public safety, and the protection of the environment
- Provide for the planning, design, modelling and construction of water storages and other water management works, and
- Maintain and operate the works of Water NSW efficiently and economically and in accordance with sound commercial principles.

It also has other objectives, including: to be a successful business; exhibit social responsibility towards the community and regional development; and conduct its operations in compliance with the principles of ecologically sustainable development.[121]

C.2 What services does Water NSW provide?

Water NSW is the main supplier of bulk water in the NSW. This review sets the maximum bulk water prices Water NSW can charge its customers in the GS area by providing the following monopoly services:

121 Water NSW, Pricing Proposal to IPART, July 2019, p 23.

- **Bulk water supply** to urban water utilities for treatment and then consumption by Sydney, Illawarra, Blue Mountains, Southern Highlands and Shoalhaven communities. Water NSW has four wholesale customers (Sydney Water, Wingecarribee Shire Council, Shoalhaven City Council and Goulburn-Mulwaree Council).
- **Raw and unfiltered water supply** to 63 other smaller customers.[122]

It also provides non-monopoly services within the GS region, such as leasing some of its facilities and certain commercial hydrometrics services.

C.3 What drives Water NSW's costs in the GS area?

Water NSW's costs can be allocated into broad categories. These categories are the costs:

- To address any key issues or **recent developments** that impact its operating environment. Our analysis on these issues are discussed in Chapter 2.
- To meet its existing service standards and **regulatory obligations**, including any new or amended requirements under its operating licence and dam safety legislation, and
- To implement any long-term plans under the **2017 Metropolitan Water Plan**.

C.3.1 Regulatory licencing requirements and obligations

Water NSW's operations are governed by a number of regulatory and licensing requirements, and supply arrangements, including:

- **IPART (pricing)**: We are responsible for setting the maximum prices that Water NSW can charge to customers for its monopoly services.
- **IPART (licensing):** We are also responsible for monitoring and reporting on Water NSW's compliance with its operating licence, including its obligations in relation to customer service, water quality, and system performance. Water NSW's operating licence (licence) is granted under section 11 of the Water NSW Act. The term of the current licence is 1 July 2017 to 30 June 2022.
- **NSW Dam Safety Committee:** The Committee is responsible for prescribing dam safety requirements and monitoring compliance of Water NSW's prescribed dams with those requirements.
- **NSW Health:** NSW Health provides advice to Water NSW on public health issues in regard to drinking water. The Memorandum of Understanding (MoU) between NSW Health and Water NSW sets out the role of each agency in relation to water quality standards and public health.
- **Water Administration Ministerial Corporation (WAMC) and Natural Resources Access Regulator (NRAR):** WAMC, NRAR and Water NSW share responsibility for licensing and monitoring the extractions of water from the natural environment and regulating its releases of water to the environment.

122 Water NSW, Pricing Proposal to IPART, July 2019, p 22.

- **Environment Protection Authority (EPA):** The EPA is responsible for monitoring Water NSW's compliance with the EPA's regulatory instruments relating to environment protection. The MoU between the two agencies recognises their role in protecting the environment of NSW.
- **Catchment Audits:** Under the Water NSW Act, Water NSW is required to conduct catchment audits every three years, and asses the state of the catchments having regard to catchment health indicators, and document its findings in its annual Catchment Activities report.
- **Water supply agreements:** The agreements outline the arrangements between Water NSW and its customers for the supply of water.

C.3.2 2017 Metropolitan Water Plan

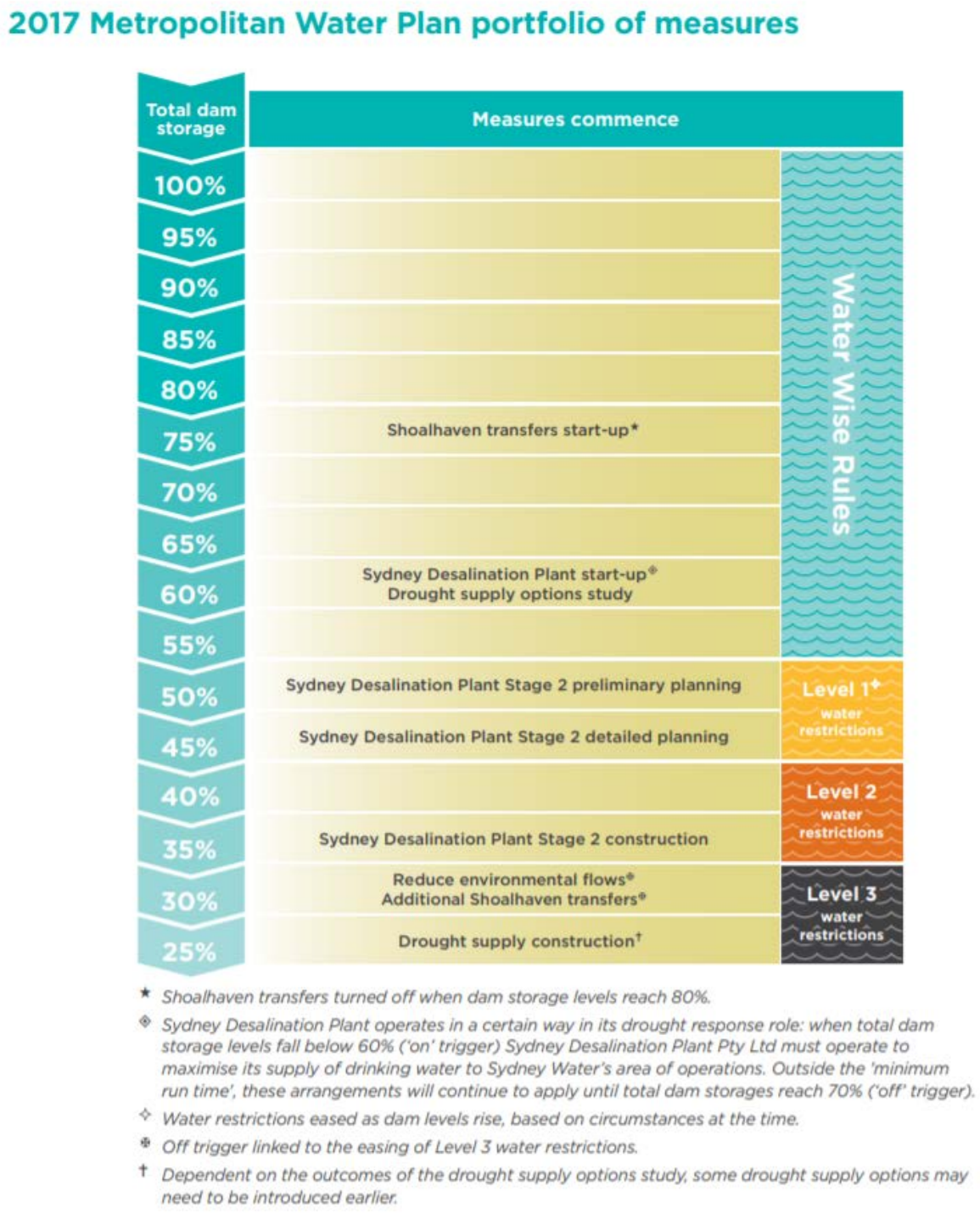
The Government's plan to ensure sufficient water to meet the needs of the people and environment within the GS area is outlined in the 2017 Metropolitan plan. The plan sets out a mix of supply and demand measures to:[123]

- Ensure water supply is secure and reliable to meet growing water demand due to a growing population and increased business and industry activity
- Ensure water supply is resilient to stresses and shocks
- Contribute to more liveable and resilient urban communities
- Help protect the health of rivers impacted by dams
- Maximise net benefits to the community.

Figure C.1 summarises the series of water supply and drought response measures for the region including the trigger levels for these measures.

[123] Metropolitan Water, *2017 Metropolitan Water Plan Water for a Liveable, Growing and Resilient Greater Sydney*, March 2017, pp 7-10.

Figure C.1 2017 Metropolitan Water Plan portfolio of measures



Source: Metropolitan Water, *2017 Metropolitan Water Plan Water for a Liveable, Growing and Resilient Greater Sydney*, March 2017, Figure 5, p 28.

D Continuing and catch-up efficiencies

In reviewing the expenditure of water utilities, we may decide to apply catch-up efficiency targets to the proposed expenditure of those that are not yet at the frontier. The catch-up efficiency adjustment reflects the scope to make efficiency improvements in systems and processes to achieve the performance of an efficient frontier company over time.

In addition, we generally apply a continuing efficiency adjustment. 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 input.

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.

This appendix presents our assessment of the ongoing efficiency adjustments that we have applied to Water NSW.

D.1 An ongoing efficiency adjustment should apply to both operating and capital expenditure

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.

We consider that if an ongoing adjustment for productivity improvements is justified, then it should be applied to both capital expenditure and operating expenditure.

D.2 What productivity target is best supported by evidence?

Our review of Productivity Commission multi-factor productivity (MFP) data suggests that a sustained average annual MFP improvement[124] of between 0.6% and 0.8% is achievable in Australia.[125] These results include performance from 1975-76 to 2017-18. They reflect economy-wide performance,[126] ie, all industry sectors and all firms in each sector—not just

124 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.

125 Productivity Commission (2019) *PC Productivity Bulletin* May 2019.

126 While productivity estimates are available for the combined energy and water utility sector, we prefer to examine productivity changes across the entire Australian economy. The productivity of the energy sector has been impacted by market restructuring, and policy uncertainty for the past twelve years.

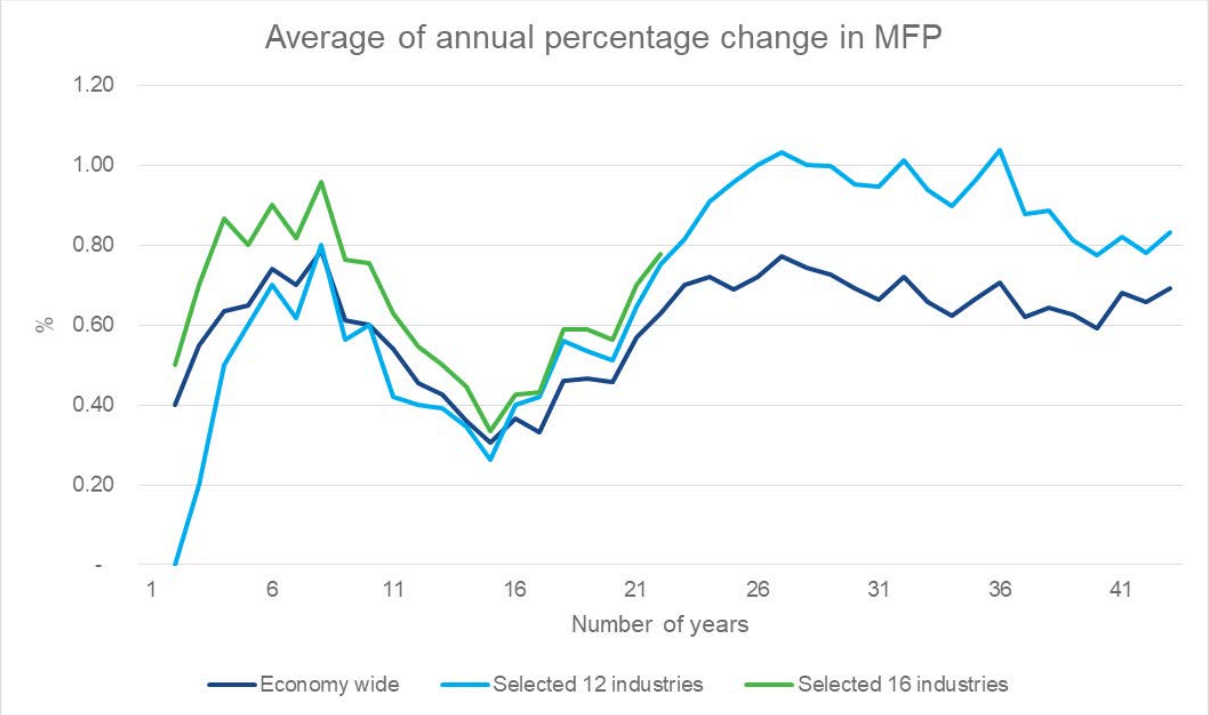
frontier firms. In that sense, this range is conservative. Recognising this conservatism, our draft decision is to accept the top end of that range: 0.8% per annum.

Evidence from the Productivity Commission

The Productivity Commission's 2019 Productivity Bulletin presents MFP estimates for the Australian economy from 1975-76 to 2017-18. Figure D.1 shows the arithmetic averages over various time periods ending in 2017-18 of the annual percentage changes in MFP. It shows that the average MFP growth rate was between 0.4% and 1.0% per annum over the most recent six years. Then that average dropped to around 0.3% per annum from 2006-07, before returning to the range 0.6% to 1.0% per annum 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 D.1 Average of annual MFP changes (%)



Data source: IPART analysis of Productivity Commission MFP data from 2019 Productivity Bulletin.

Box D.1 below presents average annual MFP growth over various time horizons ending with 2017-18.

Table D.1 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 observe 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 (Box D.1 shows which industries are in the different groups).

The Productivity Commission states that the most accurate estimates of productivity are for the market sector industry groups — where prices are set and therefore easier to value output. The four industries in the non-market sector (eg Public administration and safety, and Health care and social assistance) are more difficult to measure outputs.

The MFP is a more holistic indicator than labour productivity

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.

The 'all industries' data is a better reflection of potential efficiency gains than the 'utilities' sector

While the 'utilities' industry sector seems similar in profile to the water utilities, the negative rates of productivity growth shown in Table D.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. For this reason, we consider that whole-economy indicators of MFP growth are more indicative of an efficient production possibility frontier.

For comparison, Table D.2 below presents MFP growth in Australia over selected time periods for 'all industries' and for 'utilities'.

Table D.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

Source: Productivity Commission, *2019 Productivity Bulletin*, May 2019, Figure 1.7, IPART analysis.

What is an appropriate time period to look at when determining a continuing efficiency adjustment?

We consider that a figure of between 0.6% and 0.8% per annum is consistent both with recent averages and much longer-term productivity averages.

The period of low average productivity growth in-between recently and the longer-term is influenced by poor MFP results in the period before and immediately after the Global Financial Crisis. Table D.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. We consider it is the reason that the 10 year averages shown in Table D.1 are so much lower than averages over shorter and longer periods.

Box D.1 Industry coverage used

Market sector (12 industries)	**Market sector (16 industries)**
Agriculture, forestry & fishing	Market sector (12 industries) plus
Mining	Rental, hiring & real estate services
Manufacturing	Professional, scientific & technical services
Electricity, gas, water & waste services	Administrative & support services
Construction	Other services
Wholesale trade	
Retail trade	**Non-market sector (4 industries)**
Accommodation & food services	Public administration & safety
Transport, postal & warehousing	Education & training
Information media & telecommunications	Health care & social assistance
Financial & insurance services	Ownership of dwellings
Arts & recreation services	

Source: Productivity Commission, *Productivity Bulletin*, May 2019, Box A.1, p 49.

E Additional information on Operating Expenditure

This Appendix outlines our findings on Water NSW's operating expenditure for the 2020 determination period. It also explains in more detail our draft decisions on Water NSW's past operating expenditure over the 2016 determination period.

E.1 Operating expenditure over the 2016 determination period

Atkins, in its review of Water NSW's operating expenditure over the 2016 determination period, found:

- Water NSW changed its capitalisation rules during the period. In order to compare Water NSW's performance against its regulatory allowance, Atkins:
  - Reversed the $25.9 million that had been capitalised into the RAB and allocated these costs into operating expenditure (Atkins allocated $13.6 million in 2018-19 and $12.3 million in 2019-20). [127]
  - Found, after reversing the impact of Water NSW's change in capitalisation rules, operating expenditure for the 2016 determination was $19.8 million below the regulatory operating allowance (instead of $45.8 million). [128]
- Water NSW changed the method of apportioning its corporate and support costs across its businesses (ie, Greater Sydney, Rural and WAMC businesses). The impact of this change reduced the allocation of costs to the Greater Sydney business (the subject of this review) by $6.8 million. [129]
- There was a significant increase in expenditure in 2019 and forecast for 2020 which exceeded the allowance for those years. Expenditure in 2019 increased by 21% on the average of years 2017 and 2018. Atkins notes that the level of increased expenditure over one year questions the efficiency of the business and the extent to which the merger of the former Sydney Catchment Authority and State Water have been maintained.[130]
- The level of disaggregation of financial data has improved overall. However, some issues remained meaning that Atkins were unable to do a full variance analysis. Operating expenditure is reported by activity, such as water operations, maintenance and catchment management. However, the 2016 Determination and supporting reports did not disaggregate expenditures by these activities so variances with actual expenditure was not possible. In addition, the financial management system has changed during the period, which questions the ability for any variance analysis.[131]

127 Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 81.
128 Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART*, February 2020, 5-4, p 73.
129 Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART*, February 2020, Table 5-4, p 73; IPART analysis.
130 Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 65.
131 Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 81.

Atkins also noted some areas of the business where Water NSW could be more efficient, including:

- Maintenance: there is a backlog in preventative maintenance work, which the business has recognised and is seeking to resolve. The impact of the backlog is to defer some maintenance into the 2020 determination period.
- Site security: Atkins questioned whether a more cost-effective solution could be used by applying existing and new technology.
- Catchment management: these activities relate to regulatory requirements to protect the catchment, and reduce pollution risk and other impacts on water quality in the catchment. Atkins considered that catchment management activities should be subject to risk assessment to determine what benefits are delivered in terms of risk reduction using a sliding scale. These risks should then be compared against the business risk thresholds.
- Water operations: these costs are directly related to the supply function. Because of the nature of the supply arrangements, these costs are not sensitive to changes in the volume of raw water delivered. In average years, operations are straightforward. In a period of drought and reducing reservoir levels, operational monitoring is important to manage flows and assess water quality.[132]

E.2 Operating expenditure over the 2020 determination period

Water NSW proposed $384 million (including a 1% efficiency adjustment) in operating expenditure for the 2020 determination period.[133] This represents a decrease of $23 million (5.6%) from the IPART allowance of $407.4 million in the 2016 determination period, and an increase of $23.4 million (6.5%) over its actual/forecast expenditure for the same period.[134]

Atkins recommended reducing Water NSW's operating expenditure (from the level proposed by Water NSW) by $24.9 million (6.5%) to $359.6 million. [135] In making its recommendation, Atkins made a number of recommended adjustments to Water NSW specific programs as well as catch-up and ongoing efficiency adjustments.

We have accepted Atkins' recommended adjustments to Water NSW's proposed operating expenditure for the 2020 determination period. Our recommended adjustments are shown in Table 4.1. Our rationale for these adjustments are described in the following sections.

132 Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART,* February 2020, p 81.
133 Water NSW, Pricing Proposal to IPART, July 2019, p 96.
134 IPART, *Review of prices for Water NSW Greater Sydney services from 1 July 2020* – Issues Paper, September 2019, p 29.
135 Atkins have calculated its recommended adjustments to Water NSW's operating expenditure before its proposed efficiency adjustment. This is to avoid double counting of Water NSW's proposed efficiencies and Atkins' recommended efficiencies.

Table E.1 Draft decision on Water NSW's efficient operating expenditure for the 2020 determination ($2019-20, $million)

	2020-21	2021-22	2022-23	2023-24	Total
Water NSW's proposed expenditure [a] (before its proposed efficiency adjustments)	**97.5**	**97.4**	**98.8**	**94.7**	**388.3**
Water NSW's proposed efficiency adjustment	*-1.0*	*-1.0*	*-1.0*	*-0.9*	*-3.9*
Water NSW's proposal	*96.5*	*96.4*	*97.8*	*93.7*	*384.4*
Specific adjustments to pre-efficiency proposal					
▼ Land management	-0.4	-0.4	-0.4	-0.3	-1.5
▼ Water quality science	-0.5	-0.5	-0.5	-0.5	-2.0
▼ Water monitoring	-0.9	-0.9	-0.9	-0.9	-3.6
▼ Additional monitoring for Sydney Water	-1.0	-1.0	-1.0	-1.0	-4.0
▼ Drought studies for the Metropolitan Water Plan	0.0	0.0	-0.9	-0.9	-1.8
Total before efficiency adjustments	94.7	94.6	95.1	91.1	375.4
Efficiency adjustments					
Catch-up efficiency	-0.9	-1.7	-2.6	-3.3	-8.4
Continuing efficiency	-0.8	-1.5	-2.3	-2.9	-7.5
Efficient operating expenditure					
Total	**93.1**	**91.4**	**90.2**	**84.9**	**359.6**
% Variance	*-3.56%*	*-5.23%*	*-7.73%*	*-9.44%*	*-6.47%*

a: Calculations are based on Water NSW's proposal before its proposed 1% efficiency adjustment to avoid double counting.

Note: Totals may not add due to rounding.

Source: Atkins Cardno, Water NSW expenditure and demand forecast review, Final Report for IPART, Table 5-22, February 2020, p 102; IPART analysis.

Reduce catchment management (land management and water quality science) expenditure by $3.5 million

Atkins recommended the following adjustments to catchment management:

- Reducing expenditure for **land management** by a total of **$1.5 million**. Water NSW has outsourced its fire-fighting activities, which represents an increase of $3 million in proposed expenditure. However, the estimates do not offset the likely in-house savings and the contingency applied is high. Therefore, Atkins recommends that Water NSW should look to absorb a portion of the fire-fighting activities through a reduction of in-house activities and lower the level of contingencies applied.[136]

136 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART,* February 2020, p 90.

- Reducing expenditure for **water quality science** by a total of **$2 million**. Atkins supports an increase in water quality expenditure above the 2016 level, but not to the extent proposed by Water NSW. Atkins' recommended reductions reflect its assessment of an efficient and achievable level of expenditure and is a 50% increase on the average 2016 period expenditure, reflecting the need to meet new Operating Licence requirements.[137], [138]

We have accepted Atkins' recommendations to reduce catchment management expenditure by a total of $3.5 million over the 2020 determination period to reflect:

- Atkins' findings that Water NSW should reduce its in-house activities for fire-fighting activities services, given that it has outsourced this to a third-party, and
- An 'on-balanced' level of expenditure that is both achievable and efficient to meet Water NSW's new Operating Licence Requirements.

Atkins also found that Water NSW's proposed $1.5 million for the management of recreational areas, as part of its catchment management activities, is efficient. However, we have made a draft decision to allow half of the costs for the management of recreational areas to be included in regulated prices (ie, $750,000). This is because we consider some of Water NSW's management activities for recreational lands benefits the health of the catchment, and therefore its customers, while other activities go beyond what is required for catchment management.[139] The remaining 50% of these costs (i.e. $750,000) could be recovered from user fees or funded by the NSW Government on behalf of the broader community.

Reduce water monitoring expenditure by $3.6 million

Atkins recommended reducing Water NSW's proposed operating allowance for water monitoring by $3.6 million. In deriving its recommended efficient level of expenditure, Atkins:

- Considered the ongoing level of monitoring costs in an average year.
- Considered the impact of the drought on expenditure during the current period, and
- Allowed for the under-reporting of some monitoring expenditure.

Atkins therefore recommends that a total efficient level of water monitoring over the determination period is $52.9 million. Atkins' recommended expenditure recognises some increase in monitoring activity above the 2016 determination period – overall, Atkins' assessment of this program results in a reduction of $0.9 million per annum.

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137 Water NSW's Operating Licence 2017-2022 came into effect during the 2016 determination period. Clause 2.8 of Water NSW's Operating Licence contains provisions for research on its catchment areas.

138 Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 90.

139 We consider it is reasonable that Water NSW provide access to recreational areas in the catchment on the basis that the benefits exceed the costs. However, we consider that some of Water NSW's activities in managing its recreational areas goes beyond what is required for catchment management (eg, Water NSW currently provides camping grounds at some recreational areas and school excursions at Warragamba Dam free of charge).

We have made a draft decision to accept Atkins' recommendations to reduce water monitoring expenditure by $3.6 million. We agree with Atkins' considered approach in establishing the efficient expenditure level, which takes into consideration the impacts of climate variability, ongoing costs in an average year, and the requirement to catch-up on any under-reporting to meet Water NSW's water monitoring requirements.

Reduce additional water monitoring for Sydney Water by $4 million

Water NSW submitted that Sydney Water has requested that Water NSW undertake additional water monitoring under the Raw Bulk Water Supply Agreement.

Atkins reviewed the existing sampling program and noted that at some sites, sampling and testing of particular parameters is carried out by both Sydney Water and Water NSW. Atkins considers that the additional monitoring requested by Sydney Water is reasonable. However, it considers that instead of including expenditure to conduct this additional monitoring, it would be more efficient to have one utility carry out the existing sampling and testing (where this is currently being duplicated by both utilities) and use the cost savings to undertake the additional sampling requested by Sydney Water.[140]

Atkins recommended setting the efficient expenditure level for water monitoring at $2.2 million, which results in a reduction of $4 million from Water NSW's proposal[141]. Atkins, in deriving its recommended expenditure considered:

- That it would be more efficient to have **one** utility sample and test at locations where monitoring activities are currently being duplicated by both utilities.
- That the level of savings by having one utility conduct these monitoring activities would mostly cover the additional monitoring requested by Sydney Water.

We have made a draft decision to accept Atkins' recommendations to reduce monitoring expenditure by a total of $4 million over the determination period. We agree with Atkins' view that one utility should do the sampling and testing rather than both unless there is a strong case for it.

Reduce expenditure for water planning and drought studies by $1.8 million to reflect lower levels of activity

Atkins recommended reducing the level of expenditure for drought studies in the last half of the determination period, by a total of $1.8 million.[142]

While Atkins accepted that expenditure was required for activities related to the support of the Metropolitan Water Plan and drought planning studies, it questioned whether the level of activity would continue through the whole of the 2020 determination period. In other words, these planning documents are likely to be completed in the early years of the 2020

140 Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 92.
141 Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART*, Table 5-22 February 2020, p 102.
142 Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART*, Table 5-22 February 2020, p 102.

determination period. On that basis, Atkins recommended adjustments to reduce the level of expenditure for this program in years 2023 and 2024.[143]

We have made a draft decision to accept Atkins' recommendation to reduce expenditure for drought planning by $1.8 million in the last two years of the 2020 determination period (ie, years 2022-23 and 2023-24) because:

- We agree that expenditure for drought studies to support the Metropolitan Water Plan is required, but that this expenditure should be reduced in the last half of the determination period to reflect lower levels of activity.
- Efficient expenditure for drought studies are consistent with our draft decision to remove capital expenditure for the Avon Deep Water Access project to allow Water NSW time to develop more sophisticated drought response and long term supply-demand plans (see Appendix F).

Total adjustment of $8.4 million for catch-up efficiencies

Atkins recommended catch-up efficiencies of 0.9% per annum, applied cumulatively to Water NSW's proposed pre-efficiency expenditure and excluding uncontrollable costs.[144] Atkins' recommendation is based on the following key findings:

- There is scope to reduce the efficient level of Corporate and Support expenditure allocated to Greater Sydney given that:
  - The proportion of Corporate and Support expenditure to total operating expenditure for Greater Sydney is an average of 32%, which is relatively high when compared to comparable utilities such as Central Coast (20%) and Sydney Water (25%).[145]
  - Customer service costs are included in the Corporate and Support expenditure. Atkins considers this is unusual as other utilities have these costs under their own categories. If these costs are separated and apportioned between the Greater Sydney and Rural businesses based on customer numbers, Atkins considers that Corporate and Support expenditure can be reduced by a total of $4.9 million. Currently, the allocation of costs to Greater Sydney is around 63% on average and if the allocation is based on customer numbers this would be reduced to 30%.[146]
- There is scope to reduce the efficient level of business systems and information (ICT) expenditure. The benchmarking of ICT expenditure shows that Water NSW's ICT cost to total operating expenditure is 7.9%, which is high when compared with 6.6% for other utilities.[147]

143 Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART,* February 2020, p 82 & 93.
144 Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART,* February 2020, p 67.
145 Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART,* February 2020, p 85.
146 Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART,* February 2020, p 85.
147 Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART,* February 2020, p 89.

- The structure of the business and the technology put in place during the 2016 determination period can drive further efficiencies in the business.[148]
- While Atkins has not identified specific reductions for business activities such as, catchment management, water operations and security, it concluded that there is scope for efficiencies for these activities to catch-up to a Frontier Company.[149]

We have made a draft decision to accept Atkins' recommendation to have a 0.9% per year catch-up efficiency adjustment, which is equivalent to a total reduction of $8.4 million across Water NSW's operating expenditure over the determination period.

Total adjustment of $7.5 million for continuing efficiencies

Atkins recommended applying a frontier shift adjustment of 0.8% per year to Water NSW's proposed pre-efficiency operating expenditure. The frontier shift (or continuing shift) relates to the ability of even the most efficient firms in the sector, those at the efficient frontier, to become more efficient over time.

Atkins' recommendation is based on the following information:

- Using the data from the Australian Productivity Commission on multi-factor productivity (MFP) estimates for the Australian economy up to the year 2017/18, Atkins has calculated a forward-looking productivity range of 0.7% to 1.0% per annum.
- A review conducted by the Organisation of Economic Cooperation and Development (OECD) in 2015 examined a wide sample of global firms and found that efficiency gains at the frontier have averaged 3.5% per year for firms in the manufacturing sector and 5.0% per year in the service sector.
- Ofwat commissioned Europe Economics to undertake an assessment of the 'frontier shift' as part of Ofwat's 2019 price reviews. Europe Economics recommended a frontier shift range of 0.6% to 1.4% per year based on botex (ie, combination of wholesale operating and asset replacement expenditure).
- In its July 2019 draft determination, Ofwat updated its assessment of the frontier shift. Ofwat applied a 1.5% p.a. efficiency adjustment across the 5-year regulatory period.
- Water NSW's proposed efficiency target of 1% per annum. [150]

We have made a draft decision to accept Atkins' recommendation to apply a continuing efficiency adjustment of 0.8% per year to Water NSW's proposed pre-efficiency expenditure.

See Appendix D for more information on efficiency adjustments.

148 Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 99.
149 Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 99.
150 Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 99; Data provided to Atkins by IPART as set out at Appendix D.

F Additional information on capital expenditure

This Appendix describes how we made our draft decisions on Water NSW's past capital expenditure for the 2016 determination period and for the upcoming 2020 determination period.

F.1 Capital expenditure over the 2016 determination period

Water NSW's capital expenditure for the 2016 determination period was $325.6 million, which exceeded the IPART allowance of $254.2 million by $71.4 million (28.1%).

Despite exceeding the capital allowance, Atkins found there was systemic capital underspending on many of Water NSW's projects. This often resulted from issues with Water NSW's cost estimation processes, and indicates that its projects would benefit from a formal top-down efficiency challenge.[151]

As shown in Table F. 1 below, Water NSW underspent relative to its allowance in the first two years of the 2016 determination. However, its total capital expenditure is masked by increased expenditure on drought response schemes and a change to its capitalisation policy in the final two years of the determination period.[152]

Table F.1 Capital expenditure over the 2016 determination period ($millions, $2019-20)

	2016-17	2017-18	2018-19	2019-20	Total
Allowance	67.0	80.3	58.2	48.6	254.2
Actual / Forecast	29.8	43.2	87.0	165.6	325.6
Difference ($)	*37.2*	*37.1*	*-28.8*	*-116.9*	*-71.4*
Difference (%)	*-55.5%*	*-46.2%*	*49.5%*	*240.6%*	*28.1%*

Note: Totals may not add due to rounding.

Source: Water NSW, Pricing Proposal to IPART, July 2019, Table 5.2, p 59; Water NSW Annual Information Return 2019-20, and IPART calculations.

Atkins considers Water NSW's efficient level of capital expenditure is $279.3 million for the 2016 determination period. This is $46.3 million (or 14.2%) lower than Water NSW's actual capital expenditure over the period. Atkins has recommend two main adjustments, reducing Water NSW's expenditure by:

1. $25.9 million to reverse the impact of Water NSW changing its capitalisation policy, in order to avoid double counting amounts already included in Water NSW's operating expenditure allowance.

151 Atkins Cardno, *WaterNSW expenditure and demand forecast review*, *Final Report for IPART,* February 2020, pp 106 & 132.

152 Atkins Cardno, *WaterNSW expenditure and demand forecast review*, *Final Report for IPART,* February 2020, p 106.

2. $10.3 million to align planning costs for several drought response projects with the most recent forecast expenditure.[153]

These two main adjustments are explained in the following sections.

F.1.1 Reverse the impact of Water NSW changing its capitalisation policy by removing $25.9 million from its historical expenditure

Water NSW changed its capitalisation rules in 2019, resulting in $25.9 million of operating expenditure being converted to capital expenditure. Atkins noted that, although there may be sound accounting reasons for the policy change, it represents a change in assumption made in the 2016 Determination when this amount was allocated as operating expenditure. Atkins therefore recommended $25.9 million be reduced from Water NSW's capital expenditure over the 2016 determination period.[154]

We have made a draft decision to accepted Atkin's recommendation to reduce Water NSW's expenditure over the 2016 determination period by $25.9 million. We agree with Atkins' approach to reverse Water NSW's capital expenditure by the same amount converted to operating expenditure ($25.9 million) to avoid double counting in the both operating expenditure and in the RAB. However, we note that going forward into the 2020 determination period, Water NSW's new capitalisation rules apply to the allocation of capital expenditure vs operating expenditure.

F.1.2 Reduce $10.3 million from historical expenditure due to updated planning costs for drought response projects

Atkins considered it was prudent for planning to proceed on several drought response projects. However, it recommended a $10.3 million reduction to align these planning costs with the most recent forecast expenditure. [155] We have therefore made a draft decision to allow expenditure for the drought response projects, with an adjustment to take account of these updated planning costs.

F.2 Proposed capital expenditure over the 2020 determination period

Water NSW proposed $682.4 million in capital expenditure for the 2020 determination period. This represents an increase of $428.2 million (168.5%) from the IPART allowance of $254.2 million for the 2016 determination period, and an increase of $356.8 million (109.6%) over its actual/forecast expenditure for the same period.

Atkins recommended reducing Water NSW's proposed capital expenditure by 45.2% to $373.9 million. In making its recommendation, Atkins made a number of recommended adjustments including:

153 Atkins Cardno, *WaterNSW expenditure and demand forecast review*, *Final Report for IPART*, February 2020, pp 105 & 132.
154 Atkins Cardno, *WaterNSW expenditure and demand forecast review*, *Final Report for IPART*, February 2020, p 11.
155 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, Table 6-12 p 131 and p14.

- Specific adjustments to Water NSW's proposed capital programs.
- Minor adjustments to areas it identified as imprudent in corporate capital projects, in particular ICT. It also recommended adjustments to Water NSW's property program, supply augmentation, drought response measures and fleet.
- Adjustments to reflect catch-up and continuing efficiency.

We have made a draft decision to accept Atkins' recommended adjustments to Water NSW's proposed capital expenditure for the 2020 determination period. Our recommended adjustments are shown in Table F.2. Our rationale for these adjustments are described in the following sections.

Table F.2 Our draft decision on Water NSW's efficient capital expenditure for the 2020 determination period ($millions, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Water NSW's proposal	147.2	216.9	216.9	101.5	682.4
Specific adjustments					
▼ Avon Deep Water Access	-18.8	-98.2	-108.5	-10.5	-236.1
▼ Warragamba E-flows	-11.6	-28.2	7.2	6.9	-25.8
▼ Greater Sydney Resilience project	-1.9	-5.7	-5.5	-3.9	-17.0
▼ Drought response project on hold	-1.9	-	-	-	-1.9
▼ Other minor cost adjustments	1.8	2.4	-0.1	0.2	4.2
Total before efficiency targets	114.7	87.1	109.9	94.2	405.9
Efficiencies					
Catch-up efficiency	-2.4	-4.5	-8.5	-8.7	-24.0
Continuing efficiency	-0.9	-1.4	-2.6	-3.0	-8.0
Total efficient capex					
Total	**111.4**	**81.3**	**98.8**	**82.5**	**373.9**
Difference ($)	*-35.8*	*-135.6*	*-118.1*	*-19.0*	*-308.5*
Difference (%)	*-24.3%*	*-62.5%*	*-54.4%*	*-18.8%*	*-45.2%*

Source: Water NSW, *Submission to IPART Review of Prices for Water NSW Greater Sydney,* July 2019; Atkins Cardno, *Water NSW expenditure and demand forecast review,* February 2020, Table 6-14, p 135; Water NSW Annual Information Return 2019-20 and IPART analysis.

F.2.1 Exclude $236.1 million for the proposed Avon Deep Water Access project

Water NSW originally proposed $236.1 million for the Avon Deep Water Access project as a drought response measure for the Illawarra supply node. [156]

Atkins, in its Final Report, recommended accepting Water NSW's updated proposal for this project, which Water NSW had revised to $245.2 million, of which $9.1 million occurred within the 2016 determination period.[157] Atkins acknowledged that Water NSW had conducted an

156 Water NSW, Pricing Proposal to IPART, July 2019, pp 73 & 78.
157 Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART,* February 2020, p 116

options study, which concluded that the higher-cost option was preferable, given the technical risks associated with the identified lower-cost option.

In the Final Report, Atkins stated that, if the drought continued, expenditure for the Avon Deep Water Access project would likely be prudent. Atkins considered the project would reduce the risk of water deficits for a number of years and may help to defer or reduce the scale of major investments (eg, new drought response projects). However, Atkins also noted that the trigger point for commencing construction would require significant consideration, and contracts would need to allow for the potential for the decision (to commence construction) to be revered if the drought breaks.[158]

Prior to the release of our Draft Report, the Greater Sydney area experienced significant rainfall, which increased total storage levels in Sydney to just over 80%, and storage levels in Avon Dam to 87.9% (as of 18 February 2020).[159]

In response to the increase in storage levels, Atkins provided IPART with an addendum to its Final Report with an adjustment to its recommendation for the Avon Deep Water Access project (as well as the Warragamba E-flows project – discussed below). Atkins stated that when Avon Dam was at low levels (Avon was at 44% capacity in January 2020[160]) and declining at a rate of approximately 1.5% per month, it considered it prudent to assume that the scheme would be required during the 2020 determination period.[161] With Avon Dam at 87.9% capacity in February 2020, Atkins no longer considers it prudent to assume the scheme would be required during the 2020 determination.[162] Atkins' reasons for deferring project are:

- Avon Dam storage levels are now significantly in excess of the trigger for construction of the Avon Deep Water Access project.[163]
- Deferring the project allows time a more sophisticated drought response and long term supply-demand plan to be developed, which may identify more costs effective or robust solutions.
- There are benefits to customer bills by deferring construction of the project closer to when it is likely to be required.

We have made a draft decision to accept Atkins' recommendation as per its addendum to not include $236.1 million for the Avon Deep Water Access project.

F.2.2 Reduce allowance by $25.8 million by deferring the Warragamba Environmental Flows project

Atkins, in its Final Report, recommended an adjustment of $89.3 million by deferring significant expenditure (for construction) on the Warragamba E-flows project until towards

158 Atkins Cardno, *Water NSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 116.
159 Water NSW website at: https://www.waternsw.com.au/supply/Greater-Sydney/greater-sydneys-dam-levels, accessed 18 February 2020.
160 Water NSW website at: https://www.waternsw.com.au/supply/Greater-Sydney/greater-sydneys-dam-levels, accessed 20 February 2020.
161 Atkins Cardno, *Water NSW expenditure review – Addendum to Final Report*, February 2019, p 5.
162 Atkins Cardno, *Water NSW expenditure review – Addendum to Final Report*, February 2019, p 5.
163 Atkins Cardno, *Water NSW expenditure review – Addendum to Final Report*, February 2019, p 5.

the end of the next determination period (2023-24). It stated that this would allow sufficient time to resolve the uncertainly around the potential raising of the Warragamba Dam wall, which is closely linked to the E-flows project and to focus corporate attention on drought-related projects.[164]

Atkins, in its addendum to its Final Report, adjusted its recommendation by bringing forward expenditure for construction of the E-flow project by one year (relative to its recommendation in its Final Report), to commence from 2022-23. This represents a one year deferral from that proposed by Water NSW in its submission.[165]

Atkins stated that the scaling back of the drought response schemes should mean that Water NSW now has the corporate capacity to proceed with the E-flows project during the 2020 determination period.[166]

We have made a draft decision to accept Atkins' recommendation as per its addendum and reduce expenditure for the Warragamba E-flows project by deferring it by one year from Water NSW's proposal.

F.2.3 Reduce allowance by $17.0 million as the Greater Sydney Resilience Provision is not prudent

Atkins recommended a $17 million adjustment to reflect its findings that the Greater Sydney Resilience Provision project does not appear to be prudent based on the resilience that already exists in the system.[167]

Water NSW proposed $17 million for the Greater Sydney Resilience Provision, with the aim of improving the operational resilience of its water supply network under varied conditions including, demand growth, changing quality requirements and climate change.[168]

Atkins noted that Water NSW undertook a study to identify areas of vulnerability within its water supply network. Under this study, a project was identified which would address a high-risk failure scenario involving both existing Warragamba pipelines failing upstream of the Orchard Hills offtake.[169]

Atkins considered that this project appeared to be 'gold-plating' and recommended not including any expenditure for it. Atkins considered this project to be imprudent because there are two existing pipelines (which run in parallel to each other) with interconnectors already in existence. Further, Atkins stated that it considers Water NSW did not provide robust evidence to support the proposed expenditure for this project.

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164 Atkins Cardno, *WaterNSW expenditure and demand forecast review*, *Final Report for IPART,* February 2020, p 17.
165 Water NSW, Pricing Proposal to IPART, July 2019.
166 Atkins Cardno, *Water NSW expenditure review – Addendum to Final Report,* February 2019, p 5.
167 Atkins Cardno, *WaterNSW expenditure and demand forecast review*, *Final Report for IPART,* February 2020, p 114.
168 WaterNSW, Pricing Proposal to IPART, July 2019 AIR/SIR and WaterNSW, Submission to IPART's Issues Paper – *Review of prices for WaterNSW Greater Sydney services from 1 July 2020,* October 2019, p 10 & 11.
169 Atkins Cardno, *WaterNSW expenditure and demand forecast review*, *Final Report for IPART,* February 2020, p 114.

We made a draft decision to accept Atkins' recommendation that there is already sufficient infrastructure in place to provide operational resilience and have made a draft decision to reduce Water NSW's allowance by $17.0 million.

F.2.4 Reduce allowance by $1.9 million for drought response projects

Water NSW has proposed $70.6 million for planning on four drought response projects in 2020 and 2021. Atkins considered the proposed expenditure on planning for these projects was prudent. However, it has recommended an adjustment for the 2020 determination period, to take into account that one of the projects had been put on hold (adjustment of $1.9 million).[170]

We have made a draft decision to accept Atkins' recommendation to reduce Water NSW's expenditure for planning for drought response projects.

F.2.5 Efficiency adjustments

Atkins conducted a frontier analysis[171] and recommended applying catch-up and continuing efficiency adjustments to Water NSW's capital program.[172] Atkins' recommended adjustments are described below.

Atkins recommended catch-up efficiency adjustment of between 2% to 4% per year

Atkins considered Water NSW had scope to deliver efficiency savings. It found:

- There was little evidence of Water NSW undertaking internal top-down efficiency challenges across its capital expenditure proposals.
- Water NSW's capital processes – such as program development and prioritisation, cost estimating and procurement – were at an early stage of maturity.
- While Water NSW's asset management processes were improving, gaps still existed.[173]

As a result, Atkins identified catch-up efficiencies to apply to Water NSW's capital expenditure. In particular, there were four areas where it considered Water NSW should be able to improve its processes to move towards the efficiency of a frontier utility over time and deliver material efficiencies over the next determination period. The areas identified by Atkins are:

1. Improvements to capital program development, optimisation and prioritisation
2. Improvements to value engineering
3. Improvements in cost estimating and the management of contingencies

170 Atkins Cardno, *WaterNSW expenditure and demand forecast review*, *Final Report for IPART,* February 2020, p 120.
171 Measurement of a business's efficiency relative to an efficiency frontier, where the frontier represents the most efficient performance, across a range of measures, from a sample of comparable businesses.
172 Chapter 4 provides an overview of these efficiency adjustments. Appendix D provides additional information on catch-up and continuing efficiencies.
173 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, p 7.

4. Impact of new procurement processes and the likely savings from more effective program management.[174]

Atkins therefore recommended catch-up efficiencies of between 2% to 4% per year, cumulative, to move Water NSW towards the efficiency frontier over the 2020 determination period.

Atkins recommneded a continuing efficiency adjustment of 0.8% per year

Atkins also recommended an annual adjustment of 0.8% per year, cumulative, to reflect the scope for ongoing efficiency. We compared this recommendation with the long-term multi-factor productivity (MFP) in the Australian economy, which is an appropriate indicator of a water utility's future productivity growth.

Our analysis of historical data published by the Productivity Commission suggests that an appropriate range for ongoing productivity based on MFP is between 0.6% and 0.8% per year, which is consistent with Atkins' recommendation (see Appendix D).[175]

Table F.3 shows Atkins' recommended level of continuing and catch-up efficiencies in capital expenditure it considers is achievable for Water NSW in the 2020 determination period up to 2024.

Table F.3 Atkins' proposed capital efficiencies for the 2020 determination period

	2020-21	2021-22	2022-23	2023-24
Continuing efficiency at the Frontier	*0.80%*	*1.60%*	*2.40%*	*3.20%*
Catch-up: capital program development, optimisation and prioritisation	0.07%	0.13%	0.20%	0.26%
Catch-up: value engineering	0.50%	1.00%	1.50%	2.00%
Catch-up: cost estimating	0.50%	2.00%	3.00%	4.00%
Catch-up: procurement	1.00%	2.00%	3.00%	3.00%
Catch-up efficiency	*2.07%*	*5.13%*	*7.70%*	*9.26%*
Total efficiency	**2.87%**	**6.73%**	**10.10%**	**12.46%**

Source: Atkins Cardno, *WaterNSW expenditure and demand forecast review*, *Final Report for IPART*, February 2020, Table 6-13, p 134.

We have made a draft decision to accept Atkins' recommended catch-up and continuing efficiency adjustments.

F.3 Regulatory asset lives

In the 2016 determination, we used a remaining life of 60 years for existing assets and a useful life of 60 years for new assets. In its proposal, Water NSW considered that an average remaining life of assets of 60 years remains appropriate as a proxy for the value-weighted average of the remaining lives of assets obtained prior to the start of the 2020 determination

174 Atkins Cardno, *WaterNSW expenditure and demand forecast review*, *Final Report for IPART*, February 2020, pp 132-133.
175 Productivity Commission (2019) *PC Productivity Bulletin* May 2019, p 3.

period.[176] For new assets over the 2020-24 determination period, Water NSW proposes a weighted average standard asset life of 60 years.[177]

We use a standard method to calculate the remaining lives of existing assets at the start of a new determination period. Consistent with our standard approach, our draft decision is to set the remaining asset lives at 55.5 years (rather than Water NSW's proposed remaining life of 60 years).

Table F.4 shows Water NSW's proposed and Atkins' recommended asset lives by asset category for new assets (ie, capital expenditure). Atkins recommended longer asset lives for three asset categories, these are:

- For dams, a useful life of 200 years rather than 100 years based on Atkin's experience, the technical consultant's report and noting that Water NSW uses an asset life of 200 years for accounting purposes.
- For pipelines, a useful life of 120 years rather than 80 years, noting that Sydney Water uses a useful life of 140 years.
- For ICT systems, 10 years rather than 6 years, based on "the scope of IT assets being procured…. and a comparison with the assumptions made by Sydney Water in the 2016 review".[178]

We have made a draft decision to accept Atkins' proposed asset lives as shown in Table F.4.

Table F.44 Water NSW's proposed and Atkins' recommended expected asset lives

	Water NSW proposed asset life	Atkins recommended asset life
Dams	100	200
Other storages	80	80
Meters	15	15
ICT systems	6	10
Vehicles	5	5
Buildings	40	40
Plant and Machinery	12	12
Pipelines	80	120
Major mechanical	30	30
System controls	10	10
Roads/ minor civil	30	30
5-year inspections	5	5
Major Facilities	30	30

Source: Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Report for IPART*, February 2020, Table 7-3, p 138, and Water NSW, Pricing Proposal to IPART, July 2019, Table 7.3, p 128.

176 Water NSW, Pricing Proposal to IPART, July 2019, p 128.
177 Water NSW calculated an average expected life of 61.2 years, but proposed an average life of 60 years as a reasonable proxy (Water NSW, Pricing Proposal to IPART, July 2019, p 128).
178 Atkins Cardno, *WaterNSW expenditure and demand forecast review*, *Final Report for IPART,* February 2020, p 137.

G Output measures

This Appendix describes how we made our draft decisions on Water NSW's output measure for the 2020 determination period.

Since the 2005 Determination, we have set output measures for Water NSW as a starting point for measuring the efficiency of capital and operating expenditure in our price reviews. In the sections that follow, we examine Water NSW's performance against the 2016 Determination output measures and outline our draft decisions on output measures for the 2020 Determination.

G.1 Water NSW's performance against its output measures over the 2016 determination period

At the 2016 pricing review, we set 10 output measures for Water NSW to measure the delivery of its capital expenditure program and report annually on its progress to IPART.[179] As shown in Table A1, Water NSW has completed or is on track to complete several of its output measures on time, with the exception of ongoing delays with the Warragamba pipelines, valves and controls upgrade and the deferral of the Tallowa Dam Preliminary Risk Assessment and Design project.

Table G.1 Activity against output measures to the end of 2018-19

Project	Capital expenditure ($2019-20)	Output measure	Expected completion	Activity to end 2018-19
Tallowa Dam Preliminary Risk Assessment and Design (WEM009)	$2.6m approved $0 actual	Completion of the project meeting budget and outcomes	N/A	The Greater Sydney Dam Safety Portfolio Risk Assessment resulted in the proposed works being deferred pending further investigation. Other dam safety works have been prioritised in their place.
Upper Canal Interim Works Phase 2	$63m approved $43.1m actual/forecast	Completion of the project meeting budget and outcomes	May 2019	The current packages of works are complete, and Water NSW is transitioning to a 'monitor and respond' phase which will include some minor further works on drainage.

179 IPART, *Review of prices for WaterNSW Greater Sydney services from 1 July 2016 to 30 June 2020 – Final Report*, June *2016*, p 39.

Project	Capital expenditure ($2019-20)	Output measure	Expected completion	Activity to end 2018-19
Metropolitan Dams Electrical system (Stage 3) (WEM028)	$29.4m approved $21.2m actual/forecast	Completion of the project meeting budget and outcomes	Dec 2019	Following a strategic review of the scope of works in line with current organisational priorities in 2016, the scope was refined to provide a more targeted response to Water NSW risks. The rationalised scope of works will be delivered by December 2019.
Warragamba Pipelines valves and controls upgrade	$10.5m approved $15.6m actual/forecast	20% of total planned valve upgrades completed per year	June 2023	Some delays have resulted from the main contractor on these works going into receivership. There are ongoing delays associated with constraints on shutdowns arising from ongoing drought conditions and shutdown constraints arising from Sydney Water treatment works upgrades.
Motor vehicle fleet – procurement	$9.6m approved $2.6m actual/forecast	Achieve a reduction in vehicle changeovers of at least 4 vehicles on average per year until 2020-21	Ongoing	On target. 24 disposals and 15 additions in FY17.
Hydrometric Renewals Program (WEM001)	$3.8m approved $4.5m actual/forecast	Detailed asset management plan in place for the program	31 Dec 2016	Completed.
Blue Mountains Electrical Monitoring and Control	$3.7m approved $5.6m actual/forecast	Project completion	31 Dec 2019	Works are underway with completion expected prior to the end of 2019.
Warragamba Embankment Upgrade	$7.5m approved $6.4m actual/forecast	Progress towards project completion	June 2020	Completion of works to address highest priority issues is underway, with completion expected prior to the end of June 2020.
Burrawang Pumping Station Elect System Stage 3	$3.3m approved $16.3m actual/forecast	Project completion	June 2019	The project has completed physical construction and is undergoing performance testing with final handover following completion of site works (due for final handover prior to the end of June 2019).

Project	Capital expenditure ($2019-20)	Output measure	Expected completion	Activity to end 2018-19
Future augmentation of Sydney's water supply	$21.0m approved $19.1m actual/forecast	Substantial progress required in identifying and planning the next augmentation for Sydney's water supply	Planning phase completed by the end of June 2021.	Planning phase activities for the identified next investment tranche are now underway on the preferred option (a Burrawang to Avon Tunnel), with construction phase to follow based upon the outcomes of the upcoming NSW Government Greater Sydney Water Strategy 2020.

Source: Water NSW, Pricing Proposal to IPART, July 2019, Table 5.3, pp 62-64.

G.2 Output measures for the 2020 determination period

For the 2020 determination period, Water NSW proposed seven output measures.[180] The proposed output measures represent the major projects that Water NSW proposed to undertake during the 2020 determination period. Atkins, in its Final Report did not suggest changes to the projects and output measures, but recommended an amendment to the completion dates for the Warragamba e-flows project to reflect its recommendation that this project be deferred.[181]

In its addendum, Atkins adjusted its recommendation for Water NSW's output measures as follows:

- Remove the drought output to reflect that it does not recommend including expenditure for the Avon Deep Water Access project.
- Amend the recommended date for completion of the Warragamba e-flows project to December 2025.[182]

We have made a draft decision to accept Atkins' recommended output measures for Water NSW over the 2020 determination period. Atkin's recommended output measures in comparison to Water NSW's proposed output measures are shown in Table G.2 below.

Table G.2 Recommended output measures compared to Water NSW's proposed output measures for the 2020 determination period

Project	Output measure	Water NSW proposed completion date	Atkins recommended completion date
Fitzroy Falls Dam Safety Upgrade	Completion of Stage 1 works, internal erosion interception trench	June 2022	June 2022

180 Water NSW, Pricing Proposal to IPART, July 2019, Table 13.1, p 172.
181 Atkins Cardno, *WaterNSW expenditure and forecast review, Final Report for IPART, February 2020,* p 148.
182 Atkins Cardno, *WaterNSW expenditure review – Addendum to Final Report,* February 2020, p 6.

Cataract Dam Safety Upgrade	Completion of Stage 1 works, installation of foundation relief drains and access ramp	June 2024	June 2024
Cordeaux Dam Safety Upgrade	Completion of Stage 1 works, completion of foundation relief drain expansion and upgrade	June 2024	June 2024
Warragamba Pipelines valves and controls upgrade	All valves in program installed and commissioned	June 2023	June 2023
Avon Deep Water Storage	Practical completion of infrastructure that enables access to 'dead storage' of Avon Dam to the Illawarra Water Filtration Plant	June 2024	Atkins have recommended removing this project
Dam Safety Telemetry	Automation and telemetry of relevant instrumentation for selected metropolitan sites listed under project	June 2024	June 2024
Warragamba E-Flows	Commissioning and proving period commenced for Warragamba E-Flows to provide capability to release increased environmental flows from Warragamba Dam	December 2024	December 2025 (Outside of determination period)

Source: Water NSW, Pricing Proposal to IPART, July 2019, Table 13.1, p 172; Atkins Cardno, *WaterNSW expenditure and forecast review, Final Report for IPART, February 2020,* p 148*;* Atkins Cardno, *WaterNSW expenditure review – Addendum to Final Report,* February 2020, p 6.

H Additional information on the Notional Revenue Requirement

This appendix outlines how we calculated some of the building blocks used to derive the NRR. It explains our draft decisions on the:

- Capital cost allowance (ie, the return on assets and regulatory depreciation)
- Working capital allowance
- Tax allowance.

This appendix also explains our key adjustments to the NRR.

Our draft decision on the other key NRR input – the operating expenditure allowance – is explained in Chapter 4.

H.1 Capital cost allowance

The two biggest building blocks after operating expenditure are based on the value of the total stock of Water NSW's assets. Our decision on the efficient level of capital expenditure contributes to this (see Chapter 5). These are the allowances for:

- **A return on assets,** which provides a return on the capital invested in Water NSW's assets used to provide its services – that is, its regulatory asset base (RAB) – and aims to ensure that it can continue to make efficient capital investments in the future.
- **A return of these assets (or regulatory depreciation)**. This allowance recognises that by providing services to customers, a utility's assets will wear out over time, and therefore aims to ensure that the costs of the assets are recovered from users over the useful life of the assets.

H.2 Return on assets

Broadly, we calculate the return on assets by multiplying the value of the RAB over the determination period by an efficient rate of return. As for previous reviews, we have determined the rate of return using an estimate of the WACC.

Our draft decisions have resulted in lower return on assets than Water NSW had proposed. This follows from our draft decisions that resulted in a lower RAB, but mostly from the lower WACC.

Table H.1 Comparison of our draft decision on return on assets, and Water NSW's proposal ($millions, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Water NSW's proposal	76.1	82.1	89.4	94.3	341.9
Our draft decision	**57.6**	**59.6**	**61.2**	**62.9**	**241.3**
Difference ($)	-18.5	-22.6	-28.2	-31.4	-100.6
Difference (%)	-24.3%	-27.5%	-31.5%	-33.3%	-29.4%

Note: Totals may not add due to rounding.

Source: Water NSW, Pricing Proposal to IPART, July 2019, Table 11.1, p 163, IPART calculations.

H.2.1 Value of the RAB

In calculating the opening RAB for the 2020 determination period, we rolled forward the RAB we set in the last determination period and carried this forward to include our draft decisions on capital expenditure and depreciation. The steps we took were to:

- Add prudent and efficient capital expenditure (see Chapter 5)
- 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.2 and Table H.3 below, with a comparison of our decision on the RAB values that Water NSW proposed.

For the 2016 determination period, our draft decisions have a relatively small impact on Water NSW's proposal, with a 13.6% difference in the RAB increase over the four years. The RAB would increase by $297.1 million, which is $46.8 million less than under Water NSW's proposal.[183]

183 The RAB tends to increase over time as capital expenditure exceeds depreciation.

Table H.2 RAB roll-over for 2015-16 and the 2016 determination period ($ million, nominal)

	2015-16	2016-17	2017-18	2018-19	2019-20	Change over 4 years[a]
Opening RAB	**1,471.3**	**1,476.3**	**1,506.6**	**1,551.7**	**1,626.0**	
Plus: Actual prudent and efficient capex	18.4	27.9	40.7	69.0	136.1	
Less: Cash capital contributions	0.0	0.0	0.0	0.0	0.0	
Less: Asset disposals	1.3	0.2	0.2	0.5	0.5	
Less: Allowed regulatory depreciation	26.9	25.7	27.4	29.1	30.7	
Plus: Indexation	14.8	28.3	32.1	34.9	42.3	
Closing RAB	**1,476.3**	**1,506.6**	**1,551.7**	**1,626.0**	**1,773.4**	**297.1**
Water NSW's proposal (closing)	1476.3	1,506.6	1,552.3	1,642.7	1,820.2	**343.9**
Difference ($)	*0.0*	*0.0*	*-0.6*	*-16.7*	*-46.9*	*-46.8*
Difference (%)	*0.0%*	*0.0%*	*0.0%*	-1.0%	-2.6%	-13.6%

[a] This column shows the difference between the opening RAB on 1 July 2016 and the closing RAB on 30 June 2020. The result differs from just comparing the closing RAB which does not account for changes between 1 July 2016 and 30 June 2017.

Note: Totals may not add due to rounding.

Source: Water NSW, Pricing Proposal to IPART, July 2019, Table 7.2, p 126 and IPART calculations.

For the 2020 determination period, our draft decisions have a large impact, with growth in the RAB over the period being 58.4% lower than Water NSW proposed. The RAB would increase by $222.6 million, which is $312.7 million less than Water NSW proposed.[184]

Table H.3 RAB values going forward (as at 1 July; $2019-20, $million)

	2019-20	2020-21	2021-22	2022-23	2023-24	Change over 4 years
Opening RAB		**1,773.4**	**1,850.4**	**1,894.5**	**1,954.5**	**181.1**
Plus: Actual prudent and efficient capex		111.4	81.3	98.8	82.5	
Less: Cash capital contributions		0.0	0.0	0.0	0.0	
Less: Asset disposals		0.5	0.5	0.5	0.5	
Less: Allowed regulatory depreciation		33.9	36.6	38.3	40.5	
Plus: Indexation		0.0	0.0	0.0	0.0	
Closing RAB	**1773.4**	**1,850.4**	**1,894.5**	**1,954.5**	**1,996.0**	**222.6**
Water NSW's proposal (closing RAB)	1820.2	1,935.3	2,117.1	2,295.4	2,355.5	535.3
Difference ($)	-46.9	-85.0	-222.6	-340.8	-359.5	-312.7
Difference (%)	-2.6%	-4.4%	-10.5%	-14.8%	-15.3%	-58.4%

Note: Totals may not add due to rounding.

Source: Water NSW, Pricing Proposal to IPART, July 2019, Table 7.5, p 130 and IPART calculations.

184 The RAB tends to increase over time as capital expenditure exceeds depreciation.

Deductions for 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.

Water NSW did not have any cash capital contributions during the 2016 determination period, and does not forecast any for the 2020 determination period.

Deductions for asset disposals

Asset disposals can include asset sales, write-offs and write-downs. The value of any regulatory assets Water NSW disposed of during the 2016 determination period, as well as any assets it proposes to dispose of during the 2020 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[185] 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.[186]

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 value 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.

185 IPART, *Asset Disposals Policy Paper (for application to water businesses), Final Report*, February 2018.

186 Pre-line-in-the-sand assets are assets that the business purchased or acquired before we established the initial RAB for Water NSW in 2000. Post-line-in-the-sand assets are all assets purchased or acquired since then.

Water NSW's proposal included information on the value of assets it had disposed of, or forecast to dispose of from 2015-16 to the end of the 2016 determination period. These asset disposals total $1.3 million of which there were no significant asset disposals.[187] This value is lower than the $5.6 million Water NSW had forecast during its 2016 determination period pricing proposal. We have incorporated the $1.3 million in asset disposals during the 2016 determination period into our roll forward of Water NSW's historical RAB.

We accepted Water NSW's non-significant asset disposals of $0.5 million ($2019-20) per year over the period. This is about 0.03% of Water NSW's opening RAB value in each year in which the assets are disposed of.

H.2.2 WACC

Our draft decision is to use a WACC of 3.2%. Appendix I sets out the parameters that we used.

We also decided to apply a true-up of annual WACC adjustments in the 2020 Determination. In our 2018 WACC methodology, we decided that at each price review we would consider whether to:

- update prices annually to reflect the updates in the WACC annually, or
- use a regulatory true-up at the next period, which we would pass through to prices at the beginning of the next period.

Our draft decision is to use a regulatory true-up approach. In its proposal Sydney Water stated that a regulatory true-up provides price stability that is preferable to its customers.[188] We agree with that position. In its proposal, Water NSW stated that annual updates are better for customers, however it was referring to the end use customers. That is, Sydney Water's customers. We consider that Sydney Water is better placed to understand its customers than Water NSW is.

There are also benefits to alignment of the annual update/true-up approach between Sydney Water and Water NSW as these two entities are part of the same integrated system. These include a lower administrative burden and less shifting of risk from one entity onto the other.

For these reasons our draft decision is to use a regulatory true-up to account for the changes in the cost of debt over the course of the determination period.

H.3 Regulatory depreciation

Regulatory depreciation aims to recover the cost of an asset over its useful life to ensure that customers that benefit from the asset, pay for it. To calculate the regulatory depreciation, we typically divide the value of asset by their expected lives. For simplicity, we have done this at an aggregated level.

187 Water NSW, Pricing Proposal to IPART, July 2019, Table 7.1, p 125. The numbers presented on Water NSW's proposal were in nominal dollars.

188 Sydney Water, Pricing Proposal to IPART – Attachment 6, July 2019, p 13.

In this review we have made some significant changes to the way we calculate the depreciation allowance.

In its proposal, Water NSW provided capital expenditure and expected asset lives for 13 different asset categories, but proposed to use a weighted average asset life of 61.2 years for all capital expenditure over the 2020 determination period.[189]

However, we can more accurately calculate depreciation on capital expenditure by using the individual asset life for each asset category. While using an average asset life means that Water NSW will recover the full cost of the capital expenditure over the (weighted) average life of that capital expenditure, using disaggregated asset lives provides a more accurate year-by-year depreciation profile.

In their final report, Atkins provided their recommended capital expenditure and asset lives for each of Water NSW's 13 asset categories.[190] We are reducing the number of categories to 10, by combining categories with the same recommended asset lives, as shown in Table H.4 (shaded rows).[191] We then calculate depreciation on capital expenditure using Atkins':

- recommended asset lives for each capital expenditure category, as approved by the Tribunal, and
- recommended capital expenditure by asset category, adjusted in line with Atkins' updated on-going efficiency factor of 0.8%.

Table H.4 shows our draft asset lives and capital expenditure by asset category. Box H.2 summarises the supplementary information provided by Water NSW on using disaggregated asset lives when calculating regulatory depreciation.

189 Water NSW, Pricing Proposal to IPART, July 2019, p 128.
190 Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Repot for IPART*, p138 and IPART calculations.
191 For practical reasons, it is standard regulatory practice to combine assets with similar lives into asset categories.

Table H.4 Capital expenditure and asset lives for depreciating Water NSW's RAB

Asset category	Asset life	Capital expenditure ($million, $2019-20)				
	(years)	2020-21	2021-22	2022-23	2023-24	Total 2021-2024
Dams	200.0	12.4	18.0	19.9	21.0	71.2
Other Storages	80.0	1.5	0.0	0.0	0.0	1.5
Pipelines	120.0	20.2	38.9	52.0	11.7	122.7
Buildings	40.0	5.0	0.9	0.7	1.2	7.8
Major Mechanical & Roads/ Minor Civil[a]	30.0	38.9	18.1	20.3	37.6	115.0
Meters	15.0	0.9	0.5	0.6	1.0	3.0
Plant & machinery	12.0	1.0	0.4	0.8	0.5	2.7
ICT systems & Systems/ Controls	10.0	12.1	4.2	4.3	8.5	29.1
Vehicles & 5 yearly Inspections	5.0	1.3	0.3	0.4	0.8	2.8
Total (excluding major facilities)	na	93.2	81.3	98.8	82.5	355.7
Major facilities[a]	30.0	18.2	0.0	0.0	0.0	18.2

[a] Major facilities refers to planning cost for possible drought response projects.

Note: Totals may not sum due to rounding.

Source: Atkins Cardno, *WaterNSW expenditure and demand forecast review, Final Repot for IPART,* February 2020, Table 7-3, p138 and IPART calculations.

Box H.2 Different asset lives for different asset categories

- In its pricing proposal, Water NSW proposed using a single weighted average asset life for all capital expenditure over the 2020 determination period.
- In March 2020, Water NSW indicated it would like to amend its proposal and use individual asset lives for each asset category. The revised proposal is available on our website.
- Prior to receiving the amended proposal, we already made a draft decision to use disaggregated asset lives – rather than a single weighted average asset life – when calculating regulatory depreciation (see Table H.4). This draft decision is reflected in our draft prices.
- We note that there are differences between the asset categories and asset lives we are using in the Draft Report and those proposed by Water NSW in its March 2020 proposal.
- Water NSW did not provide its amended proposal in time for us to consider it for inclusion in draft prices. We are seeking your views on this issue. We intend to review the appropriateness of its different asset categories and asset lives – and consider stakeholder feedback – in the Final Report.

Source: Water NSW email to IPART, 10 March 2020.

IPART seeks comments

6 Do you agree with the asset categories and asset lives contained in Water NSW's March 2020 proposal? Or do you think the asset categories and asset lives we have used in the Draft Report continue to be appropriate?

H.4 Working capital allowance

The working capital allowance ensures Water NSW 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:

   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 be found in our working capital Policy Paper on our website.

Water NSW's proposed prepayments of $0.3 million in each year of the determination. It is our policy to accept prepayments if a business can reasonably demonstrate the amount is prudent and efficient.[192] It is our draft position that Water NSW has not done this. We have therefore not included the $0.3 million of prepayments in Water NSW's allowance for working capital.

Table H.5 below provides a comparison of our draft decision with Water NSW's proposal. The reduction in working capital is driven by a lower WACC than that proposed by Water NSW.

Table H.5 Comparison of our draft return on working capital allowance to Water NSW's proposal ($million, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Water NSW's proposal	1.4	1.2	1.3	2.0	6.0
Our draft decision	**1.2**	**1.4**	**1.3**	**1.4**	**5.3**
Difference ($)	-0.2	0.2	0.0	-0.6	-0.6
Difference (%)	-13.8%	15.1%	-1.4%	-30.5%	-10.9%

Note: Totals may not add due to rounding.

Source: Water NSW, Pricing Proposal to IPART, July 2019, Table 9.7, p 154 and IPART calculations.

H.5 Tax allowance

We include an explicit allowance for tax, consistent with our use of a post-tax WACC to estimate the allowance for a return on assets in the revenue requirement.

Our tax allowance is not intended to recover Water NSW'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 is 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.

192 IPART, *Working Capital Allowance – Policy Paper*, November 2018, p 13.

Table H.6 below provides a comparison of our draft decision with Water NSW's proposal. Our tax allowance is lower than Water NSW's proposed tax allowance, mainly due to a lower WACC.

Table H.6 Comparison of our draft decision on tax allowance and Water NSW's proposal ($millions, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Water NSW's proposal	3.6	3.7	3.7	4.0	15.0
Our draft decision	**3.0**	**2.9**	**3.2**	**3.4**	**12.5**
Difference ($)	-0.6	-0.8	-0.5	-0.6	-2.5
Difference (%)	-17.6%	-21.9%	-12.8%	-14.5%	-16.7%

Note: Totals may not add due to rounding.

Source: Water NSW, Pricing Proposal to IPART, July 2019, Table 9.8, p 157; IPART calculations.

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 NRR (excluding tax allowance) less operating cost allowances, tax depreciation, and interest expenses. When we forecast the tax allowance we also assessed Water NSW's forecasts for assets received free of charge and tax depreciation.

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.[193]

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 Water NSW is above the small business tax threshold of $50 million per annum.
- Accepted Water NSW's forecast tax depreciation but updated it to reflect our decisions on capital expenditure.

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 business when we calculate the tax allowance.[194] This approach means that our tax depreciation reflects actual business practice (eg, actual tax depreciation rates and depreciation methods).

We have reviewed and accepted Water NSW's approach to forecasting tax depreciation with the exception that we have amended the asset lives to reflect our draft decision rather than Water NSW's proposed amount.

193 The nominal cost of debt is the sum of the nominal risk free rate and nominal debt margin.

194 IPART, *The incorporation of company tax in price determinations, Other Industries – Final Decision*, December 2011, pp 17-18.

H.6 Revenue adjustments for non-regulated revenue

We encourage water utilities to generate revenue in ways other than traditional services, for instance, through renting some of its land if there is an interested lessor. 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. For this review we have diverged from the past approach for income from post mining rectification work. In Chapter 3, we noted that Water NSW is intending to share 100% of its revenue from post mining rectification works with customers. This revenue represents external funding from Subsidence Advisory NSW for specific mining rectification works. Hence, this revenue offsets the cost of this work.

Table H.7 Water NSW's proposed non-regulated revenue and our recommended sharing and NRR adjustment ($million, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Revenue from post mining rectification work	0.12	0.02	0.02	0.02	0.19
Share for customers	*0.12*	*0.02*	*0.02*	*0.02*	*0.19*
Forecast revenue from other rental income	0.13	0.13	0.13	0.13	0.53
Share for customers	*0.07*	*0.07*	*0.07*	*0.07*	*0.27*
Total recommended deduction from NRR	**0.19**	**0.09**	**0.09**	**0.09**	**0.45**

I Weighted Average Cost of Capital

This appendix shows the parameters we used to calculate the weighted average cost of capital (WACC) for the Draft 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.

Table I.1 Water NSW WACC for draft report

	Step 1		Step 2 – Final WACC range		
	Current market data	Long term averages	Lower	Midpoint	Upper
Nominal risk free rate	1.2%	3.1%			
Inflation	2.3%	2.3%			
Implied Debt Margin	1.8%	2.6%			
Market Risk premium	8.8%	6.0%			
Debt funding	60.0%	60.0%			
Equity funding	40.0%	40.0%			
Total funding (debt + equity)	100.0%	100.0%			
Gamma	0.25	0.25			
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)	7.4%	7.3%			
Cost of equity (real-post tax)	4.9%	4.9%			
Cost of debt (nominal pre-tax)	3.0%	5.7%			
Cost of debt (real pre-tax)	0.7%	3.3%			
Nominal Vanilla (post-tax nominal) WACC	4.7%	6.3%	4.7%	5.5%	6.3%
Post-tax real WACC	**2.4%**	**3.9%**	**2.4%**	**3.2%**	**3.9%**
Pre-tax nominal WACC	5.6%	7.2%	5.6%	6.4%	7.2%
Pre-tax real WACC point estimate	3.2%	4.8%	3.2%	4.0%	4.8%

I.2 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 propose to adopt 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.3 Sampling dates for market observations

We sampled market observations for the current year to the end of January 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. We chose that date so that the Final Report WACC would sample all years in consistent months.

I.4 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.5 Regulatory period

We adopt a standard four year regulatory period for Water NSW.

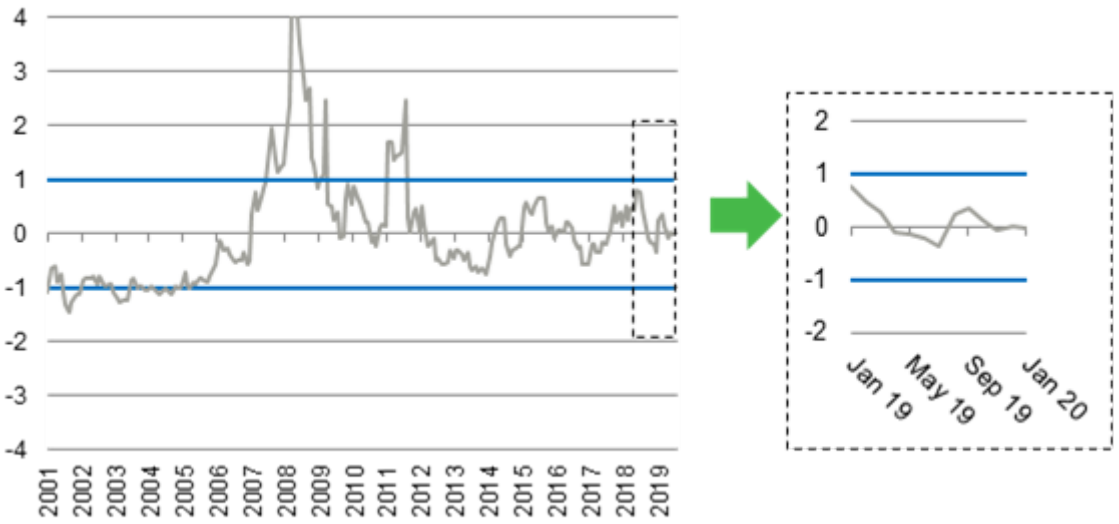
I.6 Application of trailing average method

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.7 Uncertainty index

We tested the uncertainty index for market observations to the end of January 2020. It was within the bounds of plus and minus one standard deviation of the long-term mean value of zero. Therefore we maintain the default 50% – 50% weighting between current and historic market estimates of the cost of debt and the cost of equity.

Figure I.1 IPART's uncertainty index



Data source: Thompson Reuters, Bloomberg and IPART calculations.

I.8 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 draft decision is to use a regulatory true-up approach. In its proposal Sydney Water argued that a regulatory true-up provides price stability that is preferable to its customers.[195] We agree with that position. In its proposal, Water NSW argued that annual updates are better for customers, however it was referring to the end use customers. That is, Sydney Water's customers. We consider that Sydney Water is better placed to understand its customers than Water NSW.

There are also benefits to alignment of the annual update/true-up approach between Sydney Water and Water NSW as these two entities are part of the same integrated system. These include a lower administrative burden and less shifting of risk from one entity onto the other.

For these reasons our draft decision is to use a regulatory true-up to account for the changes in the cost of debt over the course of the determination period.

195 Sydney Water, Pricing Submission to IPART, July 2019, Attachment 6, p 13.

J Cost pass-through for regulatory change and catastrophic events

Cost pass-through mechanisms allow the efficient costs of uncertain and uncontrolled events that arise during the regulatory period to be passed through to customers into prices as they are incurred within the regulatory period.

In this appendix, we summarise Water NSW's proposal for two new cost pass-through mechanisms for the 2020 determination period, our criteria and assessment of its proposal.

J.1 Summary of Water NSW's proposal

To have a new event cost pass-through mechanism

Water NSW proposes to introduce cost pass-through mechanisms to address risks (ie, allocate these risks to customers) arising during the determination period from:

- A **regulatory change event,** including changes to regulation, service standards and taxes, and
- A **catastrophic event** due to a natural disaster event or a terrorism event.[196]

The proposed cost pass-through events will include:

- A **symmetric framework** that applies for both positive and negative cost events, and
- A **materiality threshold of 2.5**% of the annual revenue requirement, which would be triggered if there was a change in costs of approximately $5 million.[197]

To expand its cost pass-through framework

Water NSW's pricing proposal and submission to our Issues Paper commented on the need for an expanded cost pass-through framework and provides relevant examples of cost pass through mechanisms from other jurisdictions and industries (eg, the Australian Energy Market Commission for electricity network businesses, Australian Competition and Consumer Commission and Essential Services Commission Victoria) that could be leveraged by IPART for the 2020 determination.[198]

J.2 Our cost pass-through framework

We assessed Water NSW's proposed cost pass-throughs against a set of criteria (See Box J.1).

196 Water NSW pricing proposal to IPART, July 2019, p 39.
197 Water NSW pricing proposal to IPART, July 2019, p 40.
198 Water NSW pricing proposal to IPART, July 2019, p 38, and Water NSW, Submission to IPART's Issues Paper – *Review of prices for Water NSW Greater Sydney services from 1 July 2020*, October 2019, pp 25-32.

Box J.1 Criteria for cost pass-through mechanisms

Cost pass-through mechanisms should only be applied in very limited circumstances. They are generally limited to situations where:

1. There is a trigger event (to activate the cost pass-through), which can be clearly defined and identified in the price determination.
2. The resulting efficient cost associated with the trigger event can be fully assessed including whether there are other factors that fully or partially offset the direct cost of the event.[a]
3. The resulting cost is assessed to exceed a materiality threshold.
4. The regulated business cannot influence the likelihood of the trigger event or the resulting cost.
5. The mechanism is symmetric in that it applies equally to cost increases and cost decreases (in cases where the risk can result in both cost increases and cost decreases).

It is clear the cost pass-through will result in prices that better reflect the efficient cost of service both before and after the trigger event occurs.

[a] Under the IPART Act, this effectively means the cost must be clearly identified and specified at the time of the price determination.

J.3 To not accept proposed general cost pass-throughs for regulatory change and catastrophic events

Our draft decision is to not accept Water NSW's proposed general cost pass-throughs for regulatory change and catastrophic events. This is because these events do not satisfy our criteria in that:

- **There is no clearly identified trigger event** – that is, Water NSW has proposed general cost pass throughs that could be triggered by any event that it considers falls under the categories of regulatory change and catastrophic events.
- **The efficient cost resulting from an event cannot be fully assessed** –In response to our Issues Paper, Water NSW noted that it is guided by the principal objective under the *State Owned Corporations Act 1989* (SOC Act) to reduce the costs of any potential regulatory change event.[199] It also noted that under its proposed cost pass-through, Water NSW would still require IPART to review the costs of the event, but there is no defined approach regarding how the efficient costs of the proposed cost pass-through event will be calculated.
- **The business can influence the trigger event or resulting cost –** there may be instances where Water NSW is able to influence either the trigger event and/or the resulting costs of regulatory change and catastrophic events. For example:
  - For some regulatory change events, Water NSW may be able to actively influence the likelihood and cost of these events. Water NSW acknowledged that, in limited cases, it may influence regulatory change, however Water NSW is bound by the SOC Act to have regard to the interests of the community in which it operates. [200]

199 Water NSW, Submission to IPART's Issues Paper - *Review of Prices for WaterNSW Greater Sydney services from 1 July 2020,* October 2019, p 26.

200 Water NSW, Submission to IPART's Issues Paper - *Review of Prices for WaterNSW Greater Sydney services from 1 July 2020,* October 2019, p 26.

- For some catastrophic events, Water NSW can actively plan for these events and insure against these events to minimise the impact of the event risk and the resulting cost.

Therefore, we found that it was not appropriate to provide a general undefined cost pass-through mechanism for these categories of risk. Instead, if specific risks are identified, they should be assessed on a case-by-case basis as they arise. This will ensure that a pass-through mechanism is only applied when it is likely that the pass-through event will occur during the determination period (ie, in 2020-24); and where we can ensure that only the efficient costs resulting from this event are passed through to customers. Our criteria is designed to ensure that cost pass-throughs are limited to situations where it is more efficient to pass the risk onto customers, where the utility's incentive to manage the risk efficiently and effectively is not lost and where prices become more reflective of efficient cost to provide better signals to customers over the determination period.

With the exception of Water NSW who maintained its position from its proposal[201], stakeholders generally agreed with our preliminary view in the Issues Paper that there is no need for a cost pass-through mechanism for regulatory change and catastrophic events as this can inefficiently shift risks to end-use customers. Stakeholders also commented that Water NSW should plan for these events and retain an incentive to avoid the likelihood of the occurrence and resulting cost impact of these events.[202]

J.4 To maintain our existing cost pass-through framework

Our current framework ensures that cost pass-throughs are limited to situations where the risk is clearly defined and it is possible to calculate and recover the efficient costs associated with the event. Otherwise, this may:

- **Impact a utility's incentives to act efficiently –** it is important that the regulated business retains some risk to incentivise it to be proactive in managing its risks and advocate for the most effective and efficient solutions.
- **Result in inefficient costs being passed through to customers –** if a business loses the incentive to manage these risks effectively, they could incur inefficient costs which may then be passed through to customers.

With the exception of Water NSW who maintained its position from its proposal, we did not receive any stakeholder feedback that indicate changing our current framework.

J.5 Water NSW can seek an early determination if required

If Water NSW considers that the impact arising from uncertain or unforeseen events materially affects its operating environment and financial position such that it requires price

201 Water NSW, Submission to IPART's Issues Paper - *Review of Prices for WaterNSW Greater Sydney services from 1 July 2020,* October 2019, pp 25-27.

202 Sydney Water, Submission to IPART's Issues Paper – *Review of prices for Water NSW Greater Sydney services from 1 July 2020, October 2019*, p 7 and p11, Flow Systems, Submission to IPART's Issues Paper – *Review of prices for Water NSW Greater Sydney services from 1 July 2020*, October 2019, p 2.

adjustments immediately, our current framework allows Water NSW to apply for an early price determination.

Under this approach, we would be able to consider all prudent and efficient costs of the utility business (including potentially offsetting effects, such as lower costs or higher revenues in other parts of its regulated Greater Sydney business) and we would be in a better position to assess net benefits and/or costs, and efficiently allocate risks between the business and its customers at the time of the price review when material changes would have occurred.

K Cost pass-through – Shoalhaven Transfer Scheme

In our 2016 Determination, we introduced a cost pass-through mechanism to allow Water NSW to recover costs incurred when transferring water from the Shoalhaven transfer scheme from Sydney Water.

In this appendix, we discuss:

- How the Shoalhaven transfer scheme operates
- Water NSW's proposal for amending the formula used to pass-through costs of the Shoalhaven Transfer Scheme to customers, and
- Our draft decisions on the Shoalhaven Transfer Scheme cost pass-through mechanism.

K.1 Operating conditions of the Shoalhaven transfer scheme

When dam levels in Sydney drop to 75%, the Shoalhaven transfer scheme is turned on under Water NSW's requirements in the 2017 Metropolitan Water Plan.[203] When this occurs, water from the Tallowa Dam is fed into the Warragamba Dam to supply water to meet the needs of the people and environment of the Greater Sydney region.

There are some operating conditions for this scheme where by:

- The Shoalhaven system will turn off when Greater Sydney's dam storage levels reach 80%.[204]
- The drawdown level of Tallowa Dam is limited to one metre below the full supply level to avoid negative impacts on the recreational use of the river, storage and local economy.[205]
- During extreme drought conditions (ie, when dam levels drop to 30%), Water NSW are able to draw additional water from the Shoalhaven transfer scheme and lower the level in Tallowa Dam to three metres below the full supply level.

K.2 Summary of Water NSW's proposal

Water NSW proposed:

- To retain the cost pass-through mechanism for the Shoalhaven transfer scheme.[206]
- To adjust the formula to include:

203 Metropolitan Water, *2017 Metropolitan Water Plan Water for a Liveable, Growing and Resilient Greater Sydney,* March 2017, p 28.
204 Metropolitan Water, *2017 Metropolitan Water Plan Water for a Liveable, Growing and Resilient Greater Sydney,* March 2017, Figure 5.
205 Metropolitan Water, *2017 Metropolitan Water Plan Water for a Liveable, Growing and Resilient Greater Sydney,* March 2017, p 38. The capacity of Tallowa Dam available for transfers is 21,800ML as of 28 August 2019.
206 Water NSW, Pricing Proposal to IPART, July 2019, pp 42-43.

- All of its total actual energy costs (ie, includes network costs, environmental costs, retail and residual administration costs, and transmission losses), and
- a shortfall levy to recover the revenue shortfall from the current determination period by including a specific adjustment to the transfer formula.[207]

K.3 Summary of our draft decisions

Our draft decisions are to:

- Accept the proposed continuation of the Shoalhaven cost pass-through mechanism.
- Update the transfer formula to include the all-in efficient cost of the Shoalhaven transfer scheme. The all-in efficient cost is based on our benchmark of the efficient energy price per ML for the transfer scheme.
- Not accept the proposal to include a shortfall levy from the current determination period.

We discuss our draft decisions in further details below.

K.4 We accepted the proposed continuation of the Shoalhaven cost pass-through mechanism

Our draft decision is to accept Water NSW's proposal to maintain its cost pass-through mechanism for the Shoalhaven transfer scheme because we found that the operation of the Shoalhaven transfer scheme is dependent on dam levels in accordance with the Metropolitan Water plan. The trigger is clearly outside of Water NSW's control. The pass-through mechanism also recognises the uncertainty associated with forecasting the incidence of the transfers and how much water is required. It also provides a signal to Sydney Water about the costs of supply augmentation in times of increased water scarcity. Based on the reasons above, we consider the Shoalhaven transfers meet our criteria in our cost pass-through framework set out in Appendix J.

In our 2016 price review, we concluded that the pass-through mechanism should not apply to the three council customers as the transfers result in water leaving the Shoalhaven transfer scheme. Councils should not pay for the transfers as they are triggered by storage levels in that part of the supply system which predominately services Sydney Water. The cost of transfers would not reflect the costs of providing water to the councils in times of increased scarcity.

In our Public Hearing, Wingecarribee Council expressed its concerns that the cost of the Shoalhaven transfer could be passed on to other customers (eg, councils) even if these customers do not drive the need for the transfer to occur.[208] It noted that the Shoalhaven transfer predominantly occurs to supply Sydney.

For these reasons, our draft decision is to maintain the pass-through of Shoalhaven transfer costs to Sydney Water only. This mechanism passes-through the efficient costs of Shoalhaven

207 Water NSW, Pricing Proposal to IPART, July 2019, pp 42-43.
208 IPART, *Sydney Water and Water NSW Public Hearings*, *Transcript*, 26 November 2019, p 47.

transfers from Water NSW to Sydney Water. Sydney Water has a corresponding pass-through mechanism to pass-through these efficient costs to its customers.

K.5 We have decided to benchmark the efficient cost of the Shoalhaven transfer scheme

Our draft decision is to **not** accept Water NSW's proposal to pass-through its **actual** energy costs to Sydney Water.

We consider that while Water NSW has limited influence over the triggers of when the Shoalhaven transfer scheme is required to come in and out of operation (as currently defined in the 2017 Metropolitan Water Plan), it has operational flexibility in terms of how and when it runs the pumps and in terms of how it procures energy for the scheme. For example, Water NSW may choose to pump during off-peak periods (ie, lower energy cost periods) or peak periods (ie, higher energy cost periods). Also, Water NSW could re-negotiate a different price for the energy required by the scheme. Therefore, allowing Water NSW to pass-through its actual costs to Sydney Water may impact its incentives to operate efficiently and to procure energy efficiently. Because Water NSW has some control over these costs, reducing or removing its incentive to manage these costs efficiently may result in inefficient costs being incurred and passed-through to Sydney Water and its end use customers.

Instead, we have made a draft decision to maintain our approach of passing through our best estimate of the benchmark efficient cost of operating the transfer scheme because this protects against the risk of inefficient costs being incurred and passed-through to customers.

Our updated formula for determining the costs of the Shoalhaven transfers is defined in Box K.1.

Box K.1 Cost of Shoalhaven transfers (CST)

$$\boldsymbol{Cost\ of\ the\ Shoalhaven\ Transfer} = \boldsymbol{OPT} + \boldsymbol{PT}$$

Where:

$\boldsymbol{OPT}$ is the cost of transferring in the off-peak period using the following equation:

$$\boldsymbol{OPT} = \boldsymbol{OP_p} \times \boldsymbol{OP_V}$$

- Where:

  $\boldsymbol{OP_p}$ is the benchmark off-peak energy price in $/ML, set out in Table K.1

  $\boldsymbol{OP_V}$ is the lower of the actual volume of water in ML, transferred from the Shoalhaven system during that month or $\boldsymbol{OP_{max}}$

  $\boldsymbol{OP_{max}}$ is the sum of:

  - Number of business days in a month multiplied by 2,092.0 ML (which is the maximum volume of water that can be transferred during off-peak hours on business days)
  - Number of other days in a month multiplied by 2,510.4 ML (which is the maximum volume of water that can be transferred during off-peak period on other days)

$\boldsymbol{PT}$ is the cost of transferring in the peak period using the following equation:

$$\boldsymbol{PT} = \boldsymbol{P_p} \times \boldsymbol{P_V}$$

- Where:

  $\boldsymbol{P_p}$ is the benchmark peak energy price in $/ML, set out in Table K.1

  $\boldsymbol{P_V}$ is:

  - If the actual volume of water in ML transferred during the month is equal to or less than $\boldsymbol{OP_{max}}$ then 0;
  - If the actual volume of water transferred during the month is greater than $\boldsymbol{OP_{max}}$ then the actual volume of water in ML less $\boldsymbol{OP_{max}}$

Worked examples of applying the updated Shoalhaven transfer formula are provided in Box K.2.

Box K.2 Worked examples (expressed in $2020-21)

The examples below compare the results of pumping water from the Shoalhaven Transfer Scheme in February 2023 for two scenarios: pumping in off-peak only and pumping in both peak and off-peak periods.

In February 2023, there are 20 business days and 8 other days. This means that $\boldsymbol{OP_{max}}$ is 61,923.2 ML.

Example 1: Pumping 5,000 ML of water

Since 5,000 ML of water is less than 61,923.2ML, only the off-peak price will apply and the efficient cost of Shoalhaven transfers is calculated as:

CST = $263.66 (ie, Q1 off-peak price in 2022-23) x 5,000 ML = **$1,318,300**.

Example 2: Pumping 65,000ML of water

Since 65,000ML of water is greater than 61,923.2ML, both off peak and peak prices will apply and the efficient cost of Shoalhaven transfers is calculated as:

CST = $263.66 (ie, Q1 off-peak price in 2022-23) x 61,923 ML + $770.73 (ie, Q1 peak price in 2022-23) x 3,076.8 ML= **$18,698,053**.

K.5.1 Our updated formula is based on benchmark energy prices

Table K.1 outlines our estimate of the benchmark energy price when the Shoalhaven system is turned on. The benchmark energy unit price in $/ML is calculated by multiplying the:

- The composite usage rate factor for the Shoalhaven system of 1.96 MWh/ML, by the
- Benchmark energy price estimated by our consultant, Frontier in $/MWh.[209]

In our 2016 review, we allowed Water NSW to recover Shoalhaven transfer costs from operating during the off-peak period only. However, we recognise that there may be instances when Water NSW may be required to pump water from the Shoalhaven system during peak periods. We have therefore updated our prices to include operating in off-peak and peak periods.

Our updated benchmark energy prices are provided on a quarterly basis. This is because we anticipate electricity prices will be influenced by seasonality (ie, there is a higher demand for electricity in summer resulting in more expensive electricity prices).

The following section outlines:

- How we estimated the composite usage rate factor, and
- How we calculated the benchmark energy prices.

[209] The benchmark energy price is the sum of all components of the electricity price and is a quarterly price averaged over each month.

Table K.1 Frontier's estimated benchmark energy price ($2020-21, $/ML)

Quarter	2020-21	2021-22	2022-23	2023-24
Off-peak (OP_p)				
1 July – 30 September	$203.67	$187.76 x CPI_1	$211.35 x CPI_2	$201.59 x CPI_3
1 October – 31 December	$174.08	$159.83 x CPI_1	$164.99 x CPI_2	$160.72 x CPI_3
1 January – 31 March	$243.42	$225.34 x CPI_1	$263.66 x CPI_2	$248.46 x CPI_3
1 April – 30 June	$180.53	$165.95 x CPI_1	$179.47 x CPI_2	$174.34 x CPI_3
Peak (P_p)				
1 July – 30 September	$252.91	$242.32 x CPI_1	$277.19 x CPI_2	$267.54 x CPI_3
1 October – 31 December	$216.01	$203.56 x CPI_1	$223.85 x CPI_2	$213.48 x CPI_3
1 January – 31 March	$762.99	$744.90 x CPI_1	$770.73 x CPI_2	$719.81 x CPI_3
1 April – 30 June	$233.53	$224.59 x CPI_1	$247.19 x CPI_2	$245.78 x CPI_3

Note: Prices for 2021-22, 2022-23 and 2023-24 would need to be adjusted by the relevant CPI factor.

Source: Frontier Economics, *WaterNSW's Energy purchase costs – Shoalhaven Transfer Scheme*, Draft Report for IPART, February 2020, tables 20-23, pp 26-29.

Estimating the composite usage rate factor in MWh/ML

In its pricing proposal, Water NSW included a composite usage rate factor of 1.96 MWh/ML to represent the energy demand or consumption required to transfer a unit of water through the Shoalhaven system. The proposed factor is consistent with the current Shoalhaven transfer formula.

We assessed the efficiency of Water NSW's proposal using a bottom up approach to estimate the variable energy required to pump water based on the Shoalhaven system's specifications. Our resulting estimate of variable energy volume was not materially different to Water NSW's proposal. We also note that the proposed composite usage rate factor is consistent with the Shoalhaven billing information and reflects the true value of the energy demand when the system was in operation during the current determination period. On this basis, we have accepted Water NSW's proposed variable energy volume to transfer a unit of water through the Shoalhaven system as efficient.

Calculating benchmark energy price in $/MWh

We have engaged an independent consultant, Frontier Economics (Frontier), to calculate the benchmark energy price over the 2020 determination period.

Frontier estimated the efficient price of each electricity cost component that an electricity retailer would face in supplying electricity to Water NSW to operate the Shoalhaven transfer scheme.[210]

To calculate the benchmark energy price, Frontier's methodology takes into account the impact of all the cost components of supplying energy, and how these components meet a constant load of the Shoalhaven system in a given period. We have accepted their

210 Frontier Economics, *Water NSW's Energy purchase costs – Shoalhaven Transfer Scheme*, Draft Report for IPART, February 2020, p 4.

methodology and asked Frontier to provide benchmark prices for off-peak and peak periods on a quarterly basis.[211]

Table K.2 outlines Frontier's approach for estimating each cost component. Frontier has calculated each component separately and the sum of these cost components is its estimate of the benchmark energy price in $/MWh.

Table K.2 Frontier's approach to calculate the electricity cost components

Cost component	Approach
Wholesale electricity prices and the cost of purchasing electricity in the Shoalhaven Transfer Scheme	To forecast wholesale market prices, Frontier modelled the long-term investment outcomes in NSW and the NEM using its long-term optimisation model, WHIRLYGIG. It then used the long-term investment to forecast wholesale prices at the half-hourly level using its SYNC model. Electricity prices are a simple average of the half-hourly prices in the off-peak and peak periods. These half-hourly prices are then used to forecast cost of purchasing electricity to meet the electricity requirements of the Shoalhaven Transfer Scheme.
Renewable energy policy costs	Frontier modelled the cost of complying with green schemes including: large-scale Renewable Energy Target (LRET) and small-scale renewable energy scheme (SRES), and forecasted their impacts on costs of supplying electricity throughout the determination period. It has assumed that these schemes will continue to operate during the determination period.
Costs of complying with jurisdictional environmental policies	Frontier used the estimates from the AEMC to forecast the cost of complying with these policies (ie, NSW Energy Savings Scheme (ESS) and Climate Change Fund (CCF)). It has assumed that the costs remain constant in real terms from 2021-22.
Market fees	Frontier used market fees set by AEMO for 2019-20 to estimate the cost of fees in each year of the determination period. Based on AEMO's comments, it has applied growth rates over the determination period.
Ancillary services costs	Frontier estimated ancillary services costs by taking an arithmetic average of historical costs over the past five years.
Network costs	Frontier used publicly available data on Endeavour Energy's network tariff (N39) for 2019-20. Given the uncertainty around future tariffs, it has assumed that these costs remain constant in real terms over the determination period.
Energy losses	Frontier used publicly available distribution and transmission loss factors available from AEMO for Endeavour Energy.
Retail operating cost and margin	Given the limited publicly available information, Frontier used estimates on the fixed ROC and retail margin adopted by the Queensland Competition Authority (QCA) in its most recent decision.

Source: Frontier Economics, *Water NSW's Energy purchase costs – Shoalhaven Transfer Scheme*, Draft Report for IPART, February 2020, sections 2 and 3, pp 5-21.

K.5.2 Our updated formula prioritises operating the Shoalhaven Transfer Scheme during off-peak periods

Electricity used in peak times may place a strain Australia's electricity networks. Electricity networks also generally charge off-peak electricity at a cheaper price to encourage consumers

211 The off-peak and peak periods are defined by Endeavour Energy as: Peak – Business days 4pm to 8pm and Off-peak – All other times.

to use their electricity outside of these time periods. Therefore, we consider it is efficient to optimise pumping in the off-peak period.

We have prioritised operating the scheme during off-peak periods by first allowing Water NSW to recover costs up to the maximum volume available for transfer in the off-peak period at the off-peak price and then recover the remaining volume transferred at the peak price. This means that, if Water NSW chooses to operate the Shoalhaven transfer scheme during the peak period when there is capacity to transfer water during the off-peak period, the pass-through mechanism only compensates Water NSW for the costs incurred at the off-peak price.

Table K.3 sets out the maximum volume of water available for transfer in off-peak and peak periods in day.

Table K.3 Maximum volume of water available for transfer in a day

Name	Type of day	Window of operation	ML per day
Off-peak	Business days	All times except 4pm to 8pm	2,092.0
Off-peak	Other days	All times	2,510.4
Peak	Business days	4pm to 8pm	418.4

Note: The maximum volume of water available for transfer in the Shoalhaven Transfer Scheme in a day is 2,510.4 ML based on the volume of water pumped per hour at the two Burrawang pump stations.

Source: IPART calculations and Endeavour Energy, *Network Price List: Network Tariffs 2019-2020.*

K.6 We have not included a shortfall levy in the updated pass-through formula

Water NSW proposed to recover its revenue shortfall (incurred during the 2016 determination period) through prices over the 2020 determination period. Water NSW estimates the shortfall to be approximately $4.4 million in total. It explained that the revenue shortfall is the result of IPART omitting certain elements of the all-in cost of energy from our benchmark cost estimate including greenhouse gas abatement charges, ancillary charges, network charges and network transmission losses.[212]

In the 2012 Determination, we provided an allowance of $5.3 million ($2011-12) for Water NSW to recover the cost recover of Shoalhaven transfers on an expected cost basis.[213] Shoalhaven transfers did not occur over the 2012 determination period and as a result, Water NSW retained this revenue as profit as it did not incur the estimated pumping costs and we did not clawback this revenue over the 2016 determination period.

On balance, we decided to not accept Water NSW's proposal to recover the revenue shortfall it has incurred in the 2016 determination period from future customer prices. This is because we typically do not make retrospective adjustments for any under- or over-recovery between determination periods unless in exceptional circumstances.

In our 2016 price review, we consulted with stakeholders on the formula of the cost pass-through before making a final decision. Water NSW provided a submission to our Draft

212 Water NSW, Pricing Proposal to IPART, July 2019, Appendix D, pp 188-190.
213 IPART, *Review of prices for the Sydney Catchment Authority from 1 July 2012*, June 2012, pp 61-65.

Report indicating that the formula for Shoalhaven cost pass-through, while not perfect, was a reasonable method to cover its costs. Further, Water NSW provided its support of the pass-through mechanism over the 2016 determination period, and noted that it would work with IPART on potential refinements to the cost pass-through mechanism in the future.[214]

While the cost formula in our 2016 Determination was not perfect, we have updated the formula for the 2020 determination period to ensure the formula is reflective of the efficient costs of the Shoalhaven transfer scheme.

214 Water NSW, *Prices for WaterNSW Greater Sydney Area – WaterNSW response to IPART Draft Report*, April 2016, p 1.

L 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 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 L.1 and L.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 L.3 explains how the ECM is applied. Section L.4 explains why we implement the ECM with a 1-year lag.

L.1 Regulatory framework without ECM

The four tables in Figure L.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 L.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 L.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**				

L.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 L.2 demonstrate the ECM for a 4-year determination. Using the same example as in Figure L.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 L.2 How the ECM removes incentives to delay efficiencies

	Regulatory Period 1				Regulatory Period 2			
Permanent saving made in year 1								
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.

L.3 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.

L.3.1 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 L.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 L.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 L.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[215] in order to ensure incentives are fully equalised in present value terms (because the WACC represents our view of the appropriate discount rate).

215 If cash flows are assumed to occur at the end of each year, this should be the WACC used for regulatory period 2.

Figure L.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.[216]

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.

216 This incentive already exists under the current form of regulation.

Glossary

2016 determination period	The period set by IPART from 1 July 2016 to 30 June 2020
2020 determination period	The period commencing 1 July 2020
ABS	Australian Bureau of Statistics
Annual revenue requirement	The notional revenue requirement in each year of the determination period
Bulk water	Water delivered by Water NSW to irrigators and other licence holders on regulated rivers across NSW
Current determination period	The period from 1 July 2016 to 30 June 2020, as set in the 2016 Determination
CPI	Consumer Price Index
Determination period	Given period over which price limits (maximum prices) set by IPART apply.
DVAM	Demand Volatility Adjustment Mechanism
e-flows	Environmental flows
ECM	Efficiency carryover mechanism
EPA	Environment Protection Authority
EPL	Environment Protection Licence
FFO	Funds from operations
GL	Gigalitre (one billion litres)
Hunter Water	Hunter Water Corporation
IPART	Independent Pricing and Regulatory Tribunal of NSW
IPART Act	*Independent Pricing and Regulatory Tribunal Act 1992* (NSW)
kL	Kilolitre

LRMC	Long run marginal cost
ML	Megalitre (one million litres)
MFP	Multi-factor productivity
MWP	Metropolitan Water Plan
NRR	Notional revenue requirement. Revenue requirement set by IPART that represent the efficient costs of providing Water NSW's monopoly services
NPV	Net Present Value
RAB	Regulatory asset base
Rouse Hill Area	The area to which the Rouse Hill stormwater drainage charges apply
RWSA	Raw Water Supply Agreement
Section 16A direction	Ministerial direction pursuant to section 16A of the IPART Act
Section 20P directions	Ministerial directions pursuant to section 20P of the SOC Act
SDP	Sydney Desalination Plant
SOC Act	*State Owned Corporations Act 1989* (NSW)
Sydney Water	Sydney Water Corporation
Target revenue	The revenue Water NSW generates from maximum prices set by IPART
UPA	Unregulated pricing agreement
WACC	Weighted average cost of capital
Water NSW GS	Water NSW Greater Sydney