IPART

Independent Pricing and Regulatory Tribunal
New South Wales

Sydney Desalination Plant Pty Ltd

Review of prices from 1 July 2017 to 30 June 2022

Final Report
Water

June 2017

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The Tribunal members for this review are:

Dr Peter J Boxall AO, Chair

Mr Ed Willett

Ms Deborah Cope

Inquiries regarding this document should be directed to a staff member:

Jean-Marc Kutschukian	(02) 9290 8453
Alexandra Sidorenko	(02) 9113 7769
Matthew Mansell	(02) 9113 7770
Syvilla Boon	(02) 9113 7767

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1 Executive Summary

The Independent Pricing and Regulatory Tribunal (IPART) has determined the maximum prices charged by the Sydney Desalination Plant Pty Ltd (SDP) for the supply of non-rainfall dependent drinking water to purchasers and the making available of the desalination plant to supply non-rainfall dependent drinking water.[1]

This Final Report sets out our decisions on SDP's maximum prices over the 5-year period from 1 July 2017 to 30 June 2022 (the 2017 determination period). It also:

- discusses the impact of our decisions on SDP's customers and other stakeholders
- explains how we reached these decisions, and
- outlines how our prices compare to the 2012 Determination (which set maximum prices from 1 July 2012 to 30 June 2017) and SDP's proposed prices.

All dollar figures in this Final Report are in $2016-17, unless stated otherwise.

1.1 Our prices for SDP result in bill decreases for customers

The desalination plant is part of Greater Sydney's water security plan. It was built to ensure a secure water supply for the Greater Sydney region, both in the long term and in response to drought events, as part of the NSW Government's Metropolitan Water Plan.[2]

Under the Metropolitan Water Plan, SDP is required to operate with the objective of maximising production and supplying Sydney Water Corporation's (Sydney Water) area of operations when dam levels fall below a specified point (currently 60%) and continue to do so until dam levels rise to a certain point (currently 70%). Throughout this Final Report, for simplicity, we refer to this range of dam levels in which SDP must operate as **'drought',** consistent with SDP's drought response role.

Currently, Sydney Water is SDP's only customer and pays all of SDP's fixed costs, when the plant is either shutdown or operating. SDP's costs are passed on to end-use water customers through Sydney Water's residential and non-residential prices (which are subject

1 We determine SDP's prices in accordance with a standing Ministerial reference under section 52 of the *Water Industry Competition Act 2006* (WIC Act). We received the initial Terms of Reference on 6 May 2011. The initial Terms of Reference was replaced by the current Terms of Reference on 16 February 2012 (see Appendix A).

2 In July 2007, Sydney Water was directed by the then Minister for Water Utilities, under section 20P of the *State Owned Corporations Act 1989*, to construct and operate the desalination plant and associated infrastructure. In 2007, IPART was subsequently directed, under section 16A of the IPART Act, to include in its 2008 determination of maximum prices for Sydney Water an amount representing the efficient costs of the requirements imposed on Sydney Water. The Metropolitan Water Plan was first developed in 2004 in response to indications a drought was taking hold. The Metropolitan Water Plan was updated in 2006 due to the deepening drought, where it identified a role for a desalination plant. See IPART, *Review of prices for Sydney Water Corporation's water, sewerage, stormwater and other services from 1 July 2008 – Determination and Final Report*, June 2008, Appendix B. NSW Government, Metropolitan Water Directorate, *Updating the Plan*, at https://www.metrowater.nsw.gov.au/planning-sydney/updating-plan, accessed on 22 June 2017.

to a separate IPART price determination). **The cost of SDP will go down in 2017-18 in a typical Sydney Water customer's annual bill**:[3]

- When the plant is shutdown, the yearly cost of SDP per customer (in shutdown mode) falls 12% from $96.78 in 2016-17 to $85.51 in 2017-18.
- When the plant operates, the yearly cost of SDP per customer (in operation mode) falls 3% from $134.75 in 2016-17 to $130.42 in 2017-18.

In operation mode, SDP's costs decrease on average by 1.4% each year over the determination period. This is because estimates of benchmark energy prices decrease over the period. If the plant remains shutdown it uses little energy. SDP's costs during shutdown would increase on average by 0.4% each year over the 5-year determination period, which is less than our 2.5% estimate of the rate of inflation.

In 2017-18, the plant is expected to be shutdown, given current dam storage levels of 94%.[4] SDP went into water security (shutdown) mode after its proving period in June 2012, as dam storage levels were 98%. It has remained in water security mode since.

The plant is currently in a state of care and maintenance following significant damage from a storm event that occurred on 16 December 2015. **The damage to the desalination plant is fully covered by SDP's insurance and will not affect prices.** We understand from SDP that the plant is expected to be reinstated and operable from 13 December 2018.

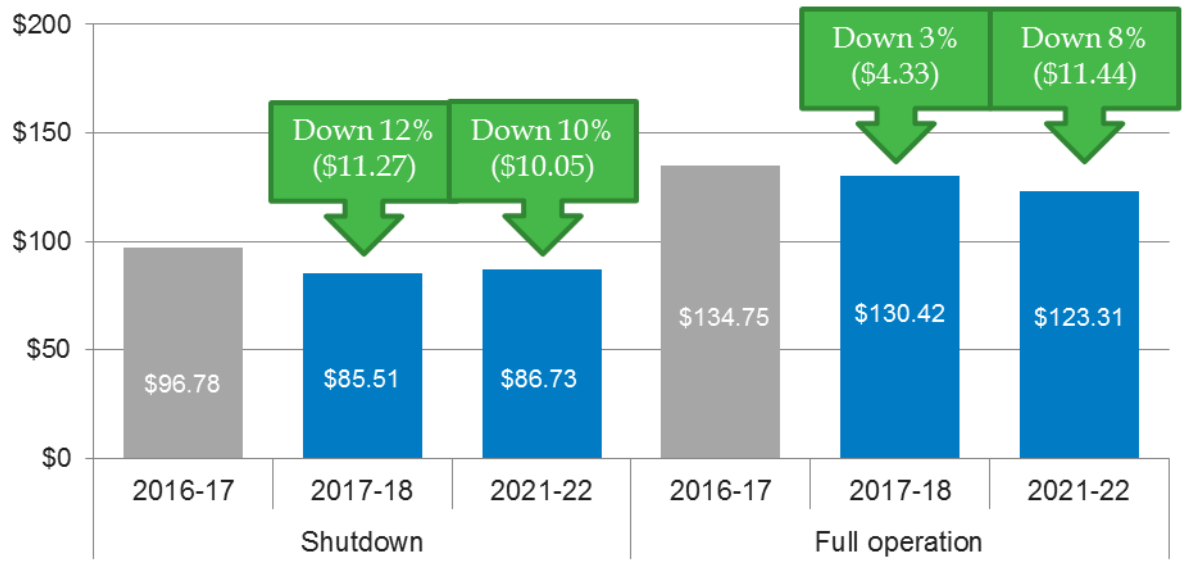
From 2018-19 onwards, if drought were to occur and the plant were called into operation, Sydney Water customers would pay, on average, an additional $37.49 in their annual water bill. This recovers SDP's costs of producing and supplying water, as well as the additional fixed operating costs needed to run the plant.

Figure 1.1 shows how the costs of SDP for a typical Sydney Water customer are expected to fall.

3 Customers would pay the 2017-18 costs of SDP in 2018-19, given the one year lag in the cost pass-through mechanism under the Sydney Water 2016 Determination. These costs are expressed in $2017-18 for simplicity.

4 WaterNSW, Sydney's dam level total at Thursday 8 June 2017, http://www.waternsw.com.au/home, accessed on 8 June 2017.

Figure 1.1 Annual cost of SDP for a typical Sydney Water customer ($/year, $nominal) – with inflation



Note: The full operation customer impacts assume that membranes are replaced on 1 July 2017.
Data source: IPART analysis.

We have set prices to allow SDP to recover its prudent and efficient costs of delivering its services based on its operating environment. We engaged expert consultants to assist us in reviewing SDP's capital and operating expenditure proposals.

We have designed a regulatory framework and assessed SDP's efficient costs through the lens of SDP's primary role of drought response. Accordingly, **when the plant is shutdown, SDP's expenditure is limited to essential maintenance activities only**. Any need to maintain a higher level of service is ancillary and so we have removed higher cost short-term shutdown modes. We have reinforced this by not including significant plant testing costs proposed by SDP in the upcoming price path. We have also reduced expenditure in shutdown by:

- deferring the cost of installing an additional pump until it is required
- applying efficiency targets to SDP's corporate costs, and
- ensuring the cost of replacing membranes is paid for only when needed.

After allowing for movements in market interest rates, **we have reduced SDP's proposed revenue requirement over the 5-year determination period by $44.5 million** (or 5.1%) – ie, from $877.7 million to $833.2 million.[5] These savings include our adjustments to SDP's proposed operating and maintenance costs. SDP, in its submission to our Draft Report, accepted many of these adjustments.

5 SDP proposed a revenue requirement of $852.7 million over the 5-year determination period. This was based on a proposed Weighted Average Cost of Capital (WACC) of around 4.5%, in line with our biannual WACC update from August 2016. Since then several key WACC parameters have increased to reflect current market conditions, resulting in a WACC of 4.7%. Controlling for movements in the WACC, SDP's proposed revenue requirement would be about $877.7 million over the 5-year period (ie, based on our WACC of 4.7%).

Should the plant be called into operation, SDP's required revenue would be about $237.4 million per year. On average, it costs about $70.8 million more per year to operate the plant compared to when it is shutdown. This is due to the energy intensive nature of the desalination process, which explains about 70.5% of this increase (ie, $49.9 million). Benchmark energy costs have increased significantly since the 2012 Determination because of the increase in the 'black' energy component of the benchmark price.[6] SDP is required to use 100% renewable energy as part of the planning approval for the plant.[7] Consistent with the Terms of Reference for our price determination, we have also included an allowance in prices over the 2017 determination period for the losses made on the sale of SDP's surplus energy while it was shutdown over the 2012 determination period.

SDP's prices include all necessary costs to ensure that the plant can respond effectively to drought, if required to do so over the next five years. In line with our expenditure consultant's recommendations, we have allowed for the costs of a full set of membranes on the first restart of the plant. This is because the plant has been in a prolonged period of shutdown (since July 2012) and the stock of membranes will be reaching the end of its asset life (8 years) during the 2017 determination period. We have also decided to capitalise the costs so that they are recovered gradually over the life of the membrane stock, rather than upfront as a one-off payment. This approach ensures these costs (should they occur) would be subject to a review of prudence and efficiency by our expenditure consultant at the next price review.

The 2017 Determination also strengthens financial incentives[8] to ensure that SDP maximises its supply during drought. But we have been mindful of the difference between events that affect the plant's capacity to supply during drought that are **within** SDP's control and those that fall **outside** its control. Where SDP can insure, on reasonable commercial terms, against events that may impede its ability to maximise supply during drought, we have maintained provisions to reduce SDP's fixed charges, as this provides the best value for water customers and allows SDP to recover its fixed costs through its insurance. This enhanced financial incentive would apply from 13 December 2018, when the plant is expected to be reinstated following the December 2015 storm event.

SDP's drought response role is reflected in the Network Operator's Licence it holds under the *Water Industry Competition Act 2006* (WIC Act) and in the Metropolitan Water Plan. The Metropolitan Water Plan was updated on 19 March 2017.[9] Under the new Plan, the 'on' and 'off' triggers for the desalination plant have been lowered to run the water supply system more cost effectively, taking account of changes in demand over the medium term.[10] SDP is

6 The benchmark energy price comprises mainly the wholesale market cost of energy (ie, 'black' component) and the cost of renewable energy certificates arising from the planning approval for the plant that required 100% renewable energy use (ie, 'green' component).

7 The project approval for SDP was granted under the *Environmental Planning and Assessment Act 1979*. IPART, *Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2012 - Final Report*, December 2011, p 17.

8 The 2012 Determination established an abatement mechanism that applies to SDP's fixed charges when it produces volumes of water less than the plant's full production capacity under the 70/80 rule – ie, when it is called into operation when dam storage levels fall to 70%, and until they rise to 80%. The objective of the abatement mechanism is to provide a financial incentive to SDP to respond fully to drought. But under the 2012 Determination, SDP's fixed charges are not abated when it is shutdown, or restarting, even during drought.

9 The Hon Don Harwin MLC, Minister for Resources, Minister for Energy and Utilities, *New Water Plan to save Greater Sydney*, Media release Sunday 19 March 2017.

10 NSW Government, *2017 Metropolitan Water Plan*, March 2017, p 24.

to operate in drought response[11] when the total dam storage level is below 60% (previously 70%) and continue to do so until the total dam storage level reaches 70% (previously 80%).[12]

While our price review started under the previous operating rules, our final decisions take account of the new operating rules. However, the 2017 Determination will give effect to the new operating rules only when SDP's Network Operator's Licence is updated to reflect the 2017 Metropolitan Water Plan. Our expenditure consultant noted that any changes in the rules causing the plant to operate less frequently are not likely to impact on the findings on operating modes and efficient costs.[13] In addition, we have accommodated new provisions under the Metropolitan Water Plan that allow SDP the option of running the plant for a minimum period of 14 months even if storage levels return to above the designated 'off' point for the plant.[14]

While SDP's emergency response role is ancillary to its primary purpose of responding to drought, we have also made changes to the regulatory framework to better accommodate this function. We have introduced financial incentives similar to those that apply in drought to incentivise SDP to respond to an emergency, if required to do so. These incentives are, however, subject to SDP agreeing levels of supply with Sydney Water. SDP is available to supply water to Sydney Water if required for public health, network stability, unavailability or maintenance in Sydney Water's area of operations.[15] The 2017 Metropolitan Water Plan has also made this role explicit.[16]

Finally, we have decided to use a principles based approach to share SDP's costs in line with those who create a need for the plant to **exist** and the purpose for which the plant is **called** into operation.

Impactors that directly affect Greater Sydney's water storage levels will now pay a proportionate share of the base costs of maintaining the plant as a form of drought insurance premium or water security payment.[17] Impactors are bulk water users drawing from WaterNSW's dams serving Greater Sydney and SDP's plant.

If SDP responds to drought, the additional fixed costs needed to operate the plant would also be paid for by impactors. However, outside of drought, these additional fixed costs would be paid for by direct users of SDP (or 'beneficiaries'). This is because the supply of desalinated water under these circumstances is a discretionary service. The cost sharing rules result in an efficient outcome when allocating costs to impactors and beneficiaries in and out of drought.

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11 The Metropolitan Water Plan does not define 'drought' according to the desalination plant's trigger levels. However, the desalination plant, along with other water sources, is accessed as the water levels in dams reduce. Therefore, the plant is a drought response measure, aimed at securing supply of water. We refer to SDP's operating rules to distinguish between when the plant is operating in its drought response role and when it is not.

12 NSW Government, *2017 Metropolitan Water Plan*, March 2017, pp 28-29; and NSW Government, *2010 Metropolitan Water Plan*, August 2010, p 36.

13 Atkins Cardno, Expenditure Review – SDP, February 2017, p 7.

14 NSW Government, *2017 Metropolitan Water Plan*, March 2017, p 38.

15 SDP pricing proposal to IPART, October 2016, p 117.

16 NSW Government, *2017 Metropolitan Water Plan*, March 2017, p 38.

17 They would do so in proportion to their draw on the total water supply system. Total system draw is comprised of bulk water sourced from WaterNSW's dams supplying Greater Sydney and SDP's desalination plant (when in operation). This means SDP's fixed charges could be paid by bulk water users that do not necessarily receive direct supply from SDP.

SDP's prices are presented in Table 1.1 below. They are presented in 'real' $2016-17 – ie, they exclude the effects of inflation over 2017-18 to 2021-22. We note that prices in our Determination are in $2017-18 – ie, the prices outlined below adjusted for one year of inflation.[18]

Table 1.1 IPART's prices for the 2017 determination period ($2016-17)

	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2016-17 to 2021-22
							% change
Plant service charges ($/day)							
Base service charge	391,257	365,748	362,064	357,033	352,906	348,783	**-10.9%**
Incremental service charge	37,034	20,948	21,383	21,345	21,081	22,377	**-39.6%**
Pipeline service charge ($/day)	140,610	99,071	99,086	98,793	99,011	98,899	**-29.7%**
Membrane service charge ($/day)[a]	-	13,816	13,344	12,837	12,400	11,928	**-**
Transition to restart ($'000 per event)	6,053	13,933	12,652	12,031	11,735	11,622	**92.0%**
Transition to shutdown ($'000 per event)	1,588	1,686	1,686	1,686	1,686	1,686	**6.2%**
Water usage charge ($/ML)	687	841	715	654	625	614	**-10.5%**

a No membrane service charge applies if there is no restart in the 2017 determination period. The membrane service charge in this table assumes a first restart in 2017-18. Table 12.2 presents the complete schedule of membrane service charges by year of restart.

Note: The first year of the 2017 Determination is 2017-18. Results for 2016-17 are provided for comparative purposes.

1.2 Our review process

In making our pricing decisions, we have complied with our Terms of Reference (see Appendix A). These Terms of Reference require us to determine prices for two services:

a) the supply of non-rainfall dependent drinking water to purchasers, and
b) the making available of the desalination plant to supply non-rainfall dependent drinking water.

We have also taken into account a broad range of issues including the matters we must consider under the *Independent Pricing and Regulatory Tribunal Act 1992* (the IPART Act) and the *Water Industry Competition Regulation 2008* (see Appendix B).

SDP submitted its pricing proposal to IPART on 27 October 2016. SDP redacted certain information from the public version of its pricing proposal on the grounds of commercial confidentiality. At the Public Hearing, SDP disclosed some of the information that had been redacted from the public version of its pricing proposal. Accordingly, it resubmitted its pricing proposal to include some information that was originally redacted. No other changes have been made to SDP's revised pricing proposal.

18 The Determination then allows prices in $2017-18 to be updated for inflation from 2018-19 onwards. We have applied 2.1% inflation to $2016-17 prices to determine prices in $2017-18 (in the Determination).

We have referred to SDP's revised pricing proposal throughout this Final Report, which was made available on our website at the same time as we published our Draft Report. To avoid any confusion, we have marked SDP's original pricing proposal on our website as 'superseded'.

Also, available on our website is SDP's public submission to our Draft Report, as well as non-confidential responses received from other stakeholders. We have considered all submissions made to this review in making our pricing decisions.

As part of our review process, we have undertaken an extensive investigation and public consultation, including:

- releasing an Issues Paper in August 2016 to assist stakeholders identify and understand the key issues for review
- inviting SDP to make a pricing proposal in October 2016 detailing its proposed prices and future capital and operating expenditure necessary to maintain service levels and respond to regulatory demands
- inviting stakeholders to make submissions on the Issues Paper and SDP's pricing proposal by 11 November 2016[19]
- holding a Public Hearing in December 2016 to discuss a wide range of issues raised by SDP and other stakeholders
- engaging independent consultants to review SDP's:
  - capital expenditure, asset planning and operating expenditure proposals - WS Atkins International (Australia) Limited, in association with Cardno (Queensland) Pty (Atkins Cardno)[20]
  - proposed allowances for energy costs and the energy adjustment mechanism – Marsden Jacob Associates Pty Limited (Marsden Jacob)[21]
  - insurance coverage for material damage and business interruption - Atkins Cardno in association with Deloitte Consulting Pty Ltd (Deloitte) (confidential report),[22] and
- releasing a Draft Report and Draft Determination in March 2017 and inviting stakeholders to make submissions in response to the drafts by 18 April 2017.

Our reports, stakeholder submissions, the transcript from the Public Hearing, and consultants' reports are available on our website (www.ipart.nsw.gov.au).

19 A total of 6 written submissions were received from other interested parties.

20 Atkins Cardno's final report was finalised in February 2017 and published on our website in March 2017. We reengaged Atkins Cardno to respond to SDP's submission to our Draft Report and received a supplementary report in May 2017. This is also available on our website. Atkins Cardno in association with Deloitte Consulting Pty Ltd's (Deloitte's) final report was received in January 2017.. Much of the supplementary information on costs used in its analysis was provided to us by Sydney Water on a commercial-in-confidence basis. Therefore, we have not published this report on our website.

21 Marsden Jacob's final report was received in January 2017 and published on our website in March 2017. A supplementary report was received in May 2017 updating benchmark energy prices. This is also available on our website.

22 Atkins Cardno in association with Deloitte's final report was received in January 2017. Much of the information on SDP's insurance policies used in its analysis was provided to us by SDP on a commercial-in-confidence basis. Therefore, we have not published this report on our website.

Concurrent to this determination of SDP's maximum prices, we also reviewed the Methodology Paper[23] we published in 2012 setting out our approaches to provide SDP with an:

- energy adjustment mechanism (EnAM), and
- efficiency adjustment mechanism (EfAM).

We have released a **separate** 2017 Methodology Paper, which is also available from our website (www.ipart.nsw.gov.au).

1.3 Structure of this Final Report

The rest of this Final Report provides more information about our decisions, and SDP's pricing proposal:

- Chapter 2 discusses the regulatory framework within which we set maximum prices. Our main objective is to set prices to allow SDP to recover the efficient cost of providing its monopoly services over the life of its assets, as required by the Terms of Reference.
- Chapter 3 outlines the improvements we are making to SDP's incentives to maximise its production and supply of water during drought.
- Chapter 4 outlines how we have accommodated SDP's emergency response outside drought, including new incentives we have introduced to ensure that SDP is using its reasonable endeavours to respond to an emergency, if required to do so.
- Chapters 5 to 10 discuss the issues related to the steps in our approach for setting SDP's maximum prices:
  - Chapter 5 covers SDP's notional revenue requirement, which represents our view of the total efficient costs of providing SDP's monopoly services in each year of the 2017 determination period.
  - Chapters 6 to 8 cover SDP's efficient operating, capital and energy related expenditure.
  - Chapter 9 looks at how we calculated allowances for a return on assets and regulatory depreciation.
  - Chapter 10 discusses our decisions on price structures.
- Chapter 11 describes how the charges presented in Chapter 10 are to be shared in the event SDP serves multiple customers (ie, customers in addition to Sydney Water).
- Chapter 12 outlines how we have decided to capitalise the prudent and efficient cost of a full membrane replacement following the first restart of the plant.
- Chapter 13 presents price levels and assesses the implications of our pricing decisions on retail customers, SDP, general inflation, and the environment.

23 IPART, *Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms - Methodology Paper*, April 2012.

1.4 List of decisions

Our decisions are outlined in the chapters of this Final Report. For convenience, they are also listed below.

We have made decisions to:

Accommodating emergency response [14-18]

Notional revenue requirement [19]

– the plant in operation and water security (shutdown) modes, as shown in Table 5.1, and 58

– the pipeline across all modes of operation, as shown in Table 5.2. 58

Application of Energy and Efficiency Adjustment Mechanisms [20-21]

20 Include an allowance in prices over the 2017 determination period for the losses made on the sale of SDP's surplus energy while it was shutdown over the 2012 determination period of $28.8 million or $5.8 million per year (real $2016-17 and including financing costs). This is consistent with the Terms of Reference. 68

21 Include an efficiency carryover of $51,100 per annum for the first three years of the 2017 determination period based on applying the 2012 EfAM methodology. 72

Prudent and efficient past capital expenditure [22]

22 Include in the RAB over the 2012 determination period prudent and efficient capital expenditure for the plant and pipeline as set out in Table 6.1 and Table 6.2. Our decision accepts SDP's proposed costs. 74

Expenditure on plant and pipeline over the 2017 determination period [23-28]

23 Set the efficient level of SDP's operating expenditure (plant and corporate) in water security (shutdown) mode as outlined in Table 6.3. Our decision is $34.3 million (or 28%) lower than SDP's proposed costs. 77

24 Set the efficient level of SDP's operating expenditure (plant and corporate) in plant operation mode as outlined in Table 6.4. Our decision is $38.4 million (or 8%) lower than SDP's proposed costs. 78

25 Include in the RAB the forecast capital expenditure for the plant as outlined in Table 6.5 over the 2017 determination period. Our allowance is $12 million (or 484%) higher than SDP's total proposed costs. 80

26 Set forecast capital and operating expenditure over the 2017 determination period for the pipeline as outlined in Table 6.6. Our decision accepts SDP's proposed costs. 81

27 Set the efficient level of SDP's one-off operating expenditure (including energy) to transition to restart as outlined in Table 6.7. Our decision is on average $26.9 million (or 68%) lower than SDP's average proposed costs. 82

28 Set the efficient level of SDP's one-off operating expenditure (including energy) to transition to shutdown as outlined in Table 6.8. Our decision accepts SDP's proposed costs. 83

Membrane replacement expenditure [29-30]

29 Set SDP's prudent and efficient capital expenditure at $30 million for a full membrane replacement on the first restart in the 2017 determination period. These costs would be

Cost sharing rules [55-59]

Treatment of membrane replacement costs [60-63]

2 Refining the regulatory framework

In this chapter, we discuss the regulatory framework within which we set prices. We set prices to allow SDP to recover the efficient costs of providing its monopoly services over the life of its assets, as required by the Terms of Reference.

SDP's primary role is to respond to drought. Our expenditure consultant has thus set SDP's efficient costs with reference to this purpose, rather than SDP's ancillary emergency response role. Further, our expenditure consultant has simplified the plant's shutdown modes by eliminating redundant and more costly intermediate shutdown modes.

In our 2017 Determination, we have also broadened and strengthened the abatement mechanism to incentivise performance when SDP is **required** to operate the plant in its drought and emergency response roles. This mechanism operates to reduce SDP's fixed charges if it produces less than the specified volume of drinking water per day when the plant is required to operate.

Outside of drought and emergency response roles, we consider there are economic arguments in favour of allowing unregulated pricing agreements. But we are of the view that such agreements would contravene the financial indifference principle in the Terms of Reference. Prices must therefore be regulated.

In this chapter, we also discuss our decisions to not include a general cost pass-through mechanism and to set the determination period for a 5-year period.

2.1 Length of determination

We have made a decision to:

1 Adopt a 5-year determination period from 1 July 2017 to 30 June 2022.

We consider a 5-year determination period provides the most appropriate balance between certainty and flexibility for SDP. In forming our view, we have considered the following issues:

- **The confidence we can place in the utility's forecasts.** We have sufficient confidence in our forecasts of capital and operating expenditure for the next five years. While five years is longer than the determination period for most utilities that we regulate, we consider this is still appropriate for SDP, which is a single asset business. Moreover, we note that membrane replacement costs, a potential source of forecast expenditure uncertainty, have been capitalised. This will enable us to review the prudence and efficiency of this expenditure at the next price review.

- **The risk of structural changes in the industry.** We consider that significant structural change is unlikely in the next five years. We consider the changes to the SDP's operating rules resulting from the 2017 Metropolitan Water Plan can be accommodated through SDP's Network Operator's Licence and references to this licence within the 2017 Determination.
- **The need for price flexibility and incentives to increase efficiency.** We consider that a 5-year determination provides sufficient incentives to achieve efficiencies, while allowing for a timely reset of prices.
- **The need for regulatory certainty and financial stability.** A 5-year determination generally provides sufficient regulatory certainty while balancing revenue stability.

Stakeholder views on the length of determination

In its original pricing proposal and submission to our Draft Report, SDP supported a 5-year determination period.[24]

In its submission to our Draft Report, Sydney Water also supported a 5-year determination period, noting that many of the uncertainties it raised in its submission to the Issues Paper have now been resolved.[25]

Sydney Water argued in its submission to the Issues Paper for a shorter determination period due to considerable uncertainty around SDP's current operations. In particular, Sydney Water cited:

- the storm damage and repair to SDP's plant and equipment, and
- the review of the current Metropolitan Water Plan and SDP's operating rules.[26]

We have not included in prices costs associated with the damage to the desalination plant as a result of the storm event. SDP has indicated insurance will cover the repair and replacement of plant and equipment following the storm event.[27] Thus, the rebuild does not affect the Regulatory Asset Base (RAB) nor is there any insurance 'gap' arising from the storm event.

The Metropolitan Water Plan was recently updated and released on 19 March 2017.[28] The changes resulting to SDP's operating rules (outlined below) will be reflected in SDP's Network Operating Licence. Where relevant, the 2017 Determination has referred to the Network Operating Licence and therefore will incorporate these changes when they occur. The 2017 Determination also accommodates the discretionary minimum run time in the updated Metropolitan Water Plan.

Sydney Water also originally argued that a 2-year determination period may be needed for SDP to determine the costs of membrane replacement.[29] We consider the capitalisation of

24 SDP pricing proposal to IPART, October 2016, pp 25-26; and SDP submission to IPART Draft Report, April 2017, p 5.
25 Sydney Water submission to IPART Draft Report, April 2017, p 2.
26 Sydney Water submission to IPART Issues Paper, November 2016, pp 39-40.
27 Deloitte, *Insurance Review – SDP*, February 2017.
28 The Hon. Don Harwin MLC, Minister for Resources, Minister for Energy and Utilities, *New Water Plan to save Greater Sydney,* Media release Sunday 19 March 2017.
29 Sydney Water submission to IPART Issues Paper, November 2016, p 20.

membrane replacement costs adequately deals with this issue. Sydney Water has sought clarification of how any such replacements would change the membrane RAB.[30] We provide more detail on the membrane service charge in Chapter 12.

2.2 SDP's primary role is to respond to drought

The desalination plant is a key element in Greater Sydney's water security plan. It was constructed to ensure a secure water supply for the Greater Sydney region, both in the long-term and in response to drought events, as part of the NSW Government's Metropolitan Water Plan.[31]

The 2017 Metropolitan Water Plan lowered the 'on' and 'off' triggers for the desalination plant to run the water supply system more cost effectively, taking account of changes in demand over the medium term. SDP is to operate the plant in response to drought:[32]

- when the total dam storage level is below 60% (previously 70%), and
- continue to do so until the total dam storage level reaches 70% (previously 80%).[33]

This '60/70 rule' is designed to ensure SDP reduces the likelihood of end-use customers (ie, retail customers) facing water restrictions and to increase Greater Sydney's water security during droughts.[34]

SDP's drought response role is reflected in the Network Operator's Licence it holds under the WIC Act. During drought, the licence requires SDP to operate and maintain the plant "with the objective of maximising the production of drinking water for the exclusive supply into Sydney Water Corporation's area of operation".[35] The Network Operator's Licence for SDP will need to be updated to give effect to the revised drought triggers in the 2017 Metropolitan Water Plan.[36] Until and unless the Network Operator's Licence is

30 Sydney Water submission to IPART Draft Report, April 2017, p ii.

31 Sydney Water was directed by the then Minister for Water Utilities, under section 20P of the *State Owned Corporations Act 1989*, to construct and operate the desalination plant and associated infrastructure. IPART was subsequently directed, under section 16A of the IPART Act, to include in its determination of maximum prices for Sydney Water an amount representing the efficient costs of the requirements imposed on Sydney Water. The Metropolitan Water Plan was first developed in 2004 in response to indications a drought was taking hold. The Metropolitan Water Plan was updated in 2006 due to the deepening drought, where it identified a role for a desalination plant. See IPART, *Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2012 - Final Report*, December 2011, p 60; NSW Government, *2010 Metropolitan Water Plan*, August 2010, p 11; IPART, *Review of prices for Sydney Water Corporation's water, sewerage, stormwater and other services from 1 July 2008 – Determination and Final Report*, June 2008, Appendix B. NSW Government, Metropolitan Water Directorate, *Updating the Plan*, at http://www.metrowater.nsw.gov.au/planning-sydney/updating-plan, accessed on 22 June 2017.

32 The Metropolitan Water Plan does not define 'drought' according to the desalination plant's trigger levels. However, the desalination plant, along with other water sources, is accessed as the water levels in dams reduce. Therefore, the plant is a drought response measure, aimed at securing supply of water. We refer to SDP's operating rules to distinguish between when the plant is operating in its drought response role and when it is not.

33 NSW Government, *2017 Metropolitan Water Plan*, March 2017, pp 28-29; and NSW Government, *2010 Metropolitan Water Plan*, August 2010, p 36.

34 We also note that Sydney Water is required to maintain and comply with an agreed roles and responsibility protocol regarding the development and implementation of the Metropolitan Water Plan under its Operating Licence. IPART, *Sydney Water Corporation Operating Licence – Report to the Minister*, May 2015, pp 18-19.

35 See condition A2(b) of SDP's Network Operator's Licence.

36 Throughout this report, we generally refer to the "60/70 rule" as delimiting drought.

changed, our 2017 Determination will give effect to the previous operating rules (ie, 70/80 rule).

The desalination plant's primary purpose is to provide water supply during drought conditions as defined in its Network Operator's Licence.[37] The overall objective of our expenditure review, therefore, was to establish and recommend the most efficient way to deliver SDP's monopoly services, subject to SDP meeting its drought response role.[38]

Atkins Cardno, our expenditure consultant, observed that the plant's operating rules are fundamental in setting the mode of operation or shutdown, rather than any need to maintain a higher level of shutdown to respond to any emergencies as defined in the Water Supply Agreement with Sydney Water. In other words, our expenditure consultants examined the most efficient operation for SDP to fulfil its primary drought response, rather than its secondary emergency response role. In this latter case, SDP's response is to use 'reasonable endeavours'.[39]

Accordingly, in water security (shutdown) mode, Atkins Cardno considered that the cost driver is the licence requirement to maintain the plant in accordance with Good Industry Practice.[40] Expenditure, therefore, should be limited to essential maintenance activities and any periodic expenditure, such as membrane replacement and periodic maintenance, should be clearly justified in terms of scope, risk and time. This criterion also applies to significant plant testing costs proposed by SDP in the future price path.[41]

In developing our decisions, we have designed a regulatory framework and assessed SDP's efficient costs through the lens of SDP's primary role of drought response. We agree with Atkins Cardno that any need to maintain a higher level of service is ancillary. In its submission to our Issues Paper, WaterNSW opposed SDP becoming a more broadly available supply source outside the operating rules, supporting the view of SDP's primary role as a drought security measure and not a water supply measure.[42]

Nonetheless, we also recognise that the licence does not require SDP to cease operating the plant outside drought. Nor does it restrict SDP supplying customers in addition to, or other than, Sydney Water (other than small retail customers).[43] While ancillary to SDP's primary role as a drought response measure, our Determination accommodates these circumstances.

2.3 Strategic review of modes of operation

We have made a decision to:

2 Simplify SDP's modes of operation for pricing purposes to the following - water security (shutdown), restart, and plant operation. In doing so, we have:

37 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 23.
38 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 20.
39 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 7.
40 See condition A2(a)(i) of SDP's Network Operator's Licence.
41 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 7.
42 WaterNSW submission to IPART Issues Paper, November 2016, p 1.
43 SDP is authorised by the Retail Supplier's Licence granted to it under the WIC Act on 9 August 2010 to supply "any person other than a Small Retail Customer" within "Sydney Water Corporation's area of operations (as defined in the Sydney Water Operating Licence)". The term 'small retail customer' is defined under clause 5 of the WIC Regulation.

- removed the intermediate shutdown modes in the 2012 Determination – ie, short-term, medium-term and long-term shutdown
- redefined the shutdown period to begin from the 11th consecutive day of no production
- redefined the restart period so that it marks the recommencement of activities associated with starting up the plant, and
- retained the definition of plant operation period in the 2012 Determination (apart from consequential changes following amendments to the definition of "Shutdown Period").

Our expenditure consultant, Atkins Cardno, conducted a strategic review of SDP's operating modes. It recommended that the defined modes of operation be simplified to:

- water security (shutdown) mode
- plant operational mode, and
- restart mode (distinguishing between first and subsequent restarts).[44]

Atkins Cardno observed that there are no clear circumstances where short, medium and long-term shutdown modes under the 2012 Determination would apply. Atkins Cardno recommended the prudent approach to minimise costs when the plant is not operating is for SDP to move to a water security (shutdown) mode.[45]

Atkins Cardno recommended water security (shutdown) mode as the base operating mode because it considers that SDP's Network Operator's Licence is clear in defining when the plant needs to be in operation or to be available – ie, in response to drought. Analysis of historical data shows that it is likely to take about one year for the dam levels to drop 10% in a drought; meaning that it would be a number of years following the break of a drought before the dam trigger level is likely to be reached again.[46] Atkins Cardno also noted that there are no clear protocols or definitions in place for determining any other mode of operation on an *ex-ante* basis - short, medium or long - and how any decision is made and agreed with all interested parties.

We support Atkins Cardno's recommendation to simplify SDP's operating modes. In particular, we agree that water security (shutdown) mode should be SDP's default or base operating mode, and we have restructured SDP's prices and set efficient costs to reflect this (see Chapter 5 to 8).

SDP's revised proposal is consistent with Atkins Cardno's recommendation. It agreed that simplifying the number of modes for pricing purposes to water security (shutdown), restart and plant operation reflects its proposed default position to transition to water security shutdown after a period of operation.[47] In its submission to our Issues Paper, SDP noted that:[48]

> In practice, it will generally make sense to always go into water security shutdown after a period of operation under the 70/80 rule. This is because the time it takes for the storages to drop below 70%, once they have reached 80%, is more likely to be greater than two years than less than two

44 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 7.
45 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 23.
46 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 23.
47 SDP submission to IPART Draft Report, April 2017, p 7.
48 SDP pricing proposal to IPART, October 2016, pp 115-116.

years (i.e. a long-term shutdown), given historical storage patterns….As a corollary, decisions about which modes to enter should be subject to an agreed protocol that the plant will always be placed into water security shutdown after a period of operation once the storages return to 80%, unless SWC (or another customer) requests otherwise.

However, SDP considered it would be beneficial to clarify the definition of a restart period to ensure there is no ambiguity.[49] We agree with SDP and present definitions of our modes of operation in Box 2.1.

Box 2.1 SDP's modes of operations for the 2017 determination period

We have simplified SDP's modes of operation to three periods:

1. shutdown
2. restart, and
3. plant operation.

We have made no changes to the definition of a plant operation period from that in the 2012 Determination (apart from consequential changes following amendments to the definition of "Shutdown Period"). SDP enters a plant operation period when the plant is producing and supplying desalinated water. Desalinated water is water suitable for purposes set out in SDP's Network Operator's Licence and Retail Supplier's Licence.

However, we have refined the definition of a restart period so that it marks the recommencement of activities associated with preparing the plant for the production of desalinated water following a shutdown. We agree with SDP that the definition under the 2012 Determination conveys the impression that a restart period only commences when desalinated water is produced, rather than when the initial activities to restart the plant commence. As a result, we have adopted SDP's proposed change to the definition of a restart period.

Given that we have eliminated the intermediate shutdown modes, we have defined a shutdown period to begin from the 11th consecutive day of no production. We refer to this as a 'water security (shutdown)' mode. It is therefore possible for a plant operation period to include up to 10 consecutive days of no production.

Our definition of a shutdown period complements refinements to the abatement mechanism we have also made to allow SDP to manage short-term fluctuations in output and period maintenance consistent with the plant's design parameters (see Chapter 3).

We outline the rationale for removing the intermediate shutdown modes in further detail below. We also outline Atkins Cardno's assessment of the length of time needed to restart from a prolonged water security shutdown.

2.3.1 Removing the intermediate shutdown modes

The 2012 Determination covered a range of modes for shutdown, with varying levels of operating expenditure, including:

- Short-term shutdown for 2 to 10 days.

49 SDP submission to IPART Draft Report, April 2017, p 8.

- Medium-term shutdown for 11 to 90 days.
- Long-term shutdown for 91 days to 2 years.
- Water security shutdown for more than 2 years.

Atkins Cardno noted that many of these modes are not relevant to the plant's primary objective to respond to drought or can be accommodated through appropriate changes to the regulatory framework.[50] Atkins Cardno's specific recommendations on each of the intermediate shutdown modes are:

- ***Short-term shutdown (2 to 10 days)***. Atkins Cardno formed the view that routine plant maintenance should be undertaken as part of normal operations and does not require a short-term shutdown mode. It noted that the plant can produce up to 266 ML per day, so a short-term outage could be managed through a modified abatement mechanism[51] that accommodates the plant's capacity to produce up to 266 ML per day.[52]
- ***Medium-term shutdown (11 to 90 days).*** Atkins Cardno assessed that it would be highly unlikely that medium term shutdown would arise due to the dam levels falling below 70% within 3 months since last above 80%. Therefore, this mode of shutdown is not supported by SDP's primary drought response role.[53]
- ***Long-term shutdown (91 days to 2 years).*** While relevant to the plant's drought response role, Atkins Cardno considers this mode does not provide any significant cost advantages compared to water security mode (ie, shutdown of more than 2 years). In the absence of any protocol to explain why a long-term shutdown mode should apply, Atkins Cardno recommended it prudent to minimise costs and move to the water security (shutdown) mode.[54]

We have accepted Atkins Cardno's recommendation to remove short, medium and long-term shutdown modes for pricing purposes. In doing so, we have refined the abatement calculation to align with the plant's design parameters so that short-term outages can be managed by SDP without a net financial penalty through abatement. We also agree with Atkins Cardno[55] that longer outages should be covered by SDP's business interruption insurance for the loss of revenue through the abatement mechanism. Our changes to the abatement mechanism that complement the streamlining of SDP's modes of operation are outlined in Chapter 3.

2.3.2 Endorsing an 8-month restart

SDP proposed an 8–month duration of restart from water security shutdown.[56] Atkins Cardno reviewed SDP's proposal and found it reasonable, given the scope of activities that have to be undertaken on restart.[57]

50 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 25.
51 The 2012 Determination established an abatement mechanism that applies to SDP's fixed charges when it produces volumes of water less than the plant's full production capacity when required to fulfil its drought response role (ie, less than the annual average of 250 ML per day, when dam levels are between 70% and 80%).
52 Atkins Cardno, *Expenditure Review – SDP*, February 2017, pp 22 and 25.
53 Atkins Cardno, *Expenditure Review – SDP*, February 2017, pp 22, 24 and 25. We note that this finding applies equally to the lower trigger level of 60/70 under the 2017 Metropolitan Water Plan.
54 Atkins Cardno, *Expenditure Review – SDP*, February 2017, pp 22 and 25.
55 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 25.
56 SDP pricing proposal to IPART, October 2016, p 10.

In particular, Atkins Cardno noted that a long period of water security (shutdown) mode, which the plant is currently facing, places great importance on the restart. During restart, there is a need to procure membranes, carry out essential asset replacement, recruit and train additional operators and test the individual processes and the complete works.[58] Atkins Cardno also considered that effective price regulation should allow SDP to make efficient use of water produced during restart.

We have designed our regulatory framework in accordance with Atkins Cardno's recommendations on efficient modes of operation. Specifically, in restart we have:

- Introduced an 8–month grace from abatement when SDP responds to drought and an emergency or network outage. This would allow SDP to enter a plant operation period and supply drinking quality water without penalty (abatement of its service charge) when ramping-up supply over the 8-month restart period.
- Removed from restart charges energy costs related to the production and supply of drinking water during a restart phase, to ensure no double recovery of these costs (ie, SDP can recover these variable costs through the water usage charge).
- Allowed SDP to procure a full set of membranes upon the first restart over the 2017 determination period. This removes the need to test the plant in shutdown and limits expenditure to essential maintenance activities.

We comment on the detailed restart activities and costs recommended by Atkins Cardno in Chapters 6 to 8.

2.4 Abatement framework: incentivising SDP to operate when required

In the sections below we outline our abatement framework. At a high level, we discuss when and how abatement applies to SDP's operations over the 2017 determination period. We also discuss which charges are subject to abatement, in the context of the changes we have made to SDP's price structures.

2.4.1 When and how abatement applies to SDP's operations

In our 2012 Determination, we introduced an abatement mechanism to provide SDP with a strong incentive to maximise production of drinking water during drought. This mechanism operates to reduce SDP's fixed charges if it produces less than the specified volume of drinking water per day when the plant is required to operate.

In our 2017 Determination, we have broadened and strengthened the abatement mechanism. In general, we have decided that abatement should apply across SDP's differing operation periods. However, we have focused abatement to incentivise performance when SDP is **required** to operate the plant, and not to penalise performance when the plant operates on a **discretionary** basis.

There are two key dimensions to the abatement mechanism:

57 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 24.
58 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 24.

- Whether the abatement factor should be affected by SDP's production levels.
- When the prevailing abatement factor should apply to SDP's fixed charges.

Under our 2017 Determination, we considered the application of three states of abatement outlined in Box 2.2.

Box 2.2 Abatement options across SDP's differing operation periods

We considered the application of the following three states of abatement to ensure SDP operates as expected, when required:

1. Full abatement:
   - SDP's level of production per day affects the abatement factor, and
   - the abatement factor is applied to SDP's daily fixed charges.
2. Partial abatement:
   - SDP's level of production per day **does not affect** the abatement factor, and
   - the abatement factor is applied to SDP's daily fixed charges.
3. No abatement:
   - SDP's level of production per day **does not affect** the abatement factor, and
   - the abatement factor **is not applied** to SDP's daily fixed charges.

We have applied full abatement when SDP is required to produce – specifically, in its primary drought response role and its ancillary emergency response role. This means SDP's performance at these times affects the abatement factor, which applies to SDP's fixed charges. This strongly incentivises SDP to operate the plant and ensure that it can supply water when required to do so.

Outside its drought and emergency requirements, operation of the plant is at SDP's discretion and we have decided that partial abatement applies. This includes supply to third parties outside drought and during the optional minimum run time provided to SDP under the 2017 Metropolitan Water Plan.

Under partial abatement, SDP's performance does not affect the abatement factor. This recognises that production is discretionary and flexible. However, SDP's fixed charges would continue to be affected by past performances when it was required to produce. That is, its prevailing abatement factor would be applied to its fixed charges. This provides a strong incentive for SDP to perform during drought and emergency response, so that it exits these periods having supplied volumes at required levels (drought) or agreed levels (emergency response).

In applying our framework, we have made some exceptions. For example, we do not consider it appropriate to abate SDP's fixed charges for poor performance during drought or an emergency response as a result of uninsurable events outside SDP's control. In these instances no abatement applies.

We also consider SDP should be provided grace from full abatement for up to 8 months to allow it sufficient time to ramp-up production to fulfil its drought and emergency response roles. In these instances partial abatement applies.

Our decisions on how abatement applies during drought and emergency response are outlined in detail in Chapter 3 and 4, respectively. Table 2.1 provides a high level summary of when and how abatement applies to SDP's operations under the 2017 Determination.

Table 2.1 When and how abatement applies

	Inside drought and inside emergency response		Outside drought and outside emergency response		
	During grace period	After grace period	Minimum run time	Supplying third party	Shutdown
Business as usual	Partial	Full	Partial	Partial	No
Insurable force majeure	Partial	Full	Partial	Partial	No
Uninsurable force majeure	No	No	No	No	No

Data source: IPART analysis.

2.4.2 Abatement continues to apply to fixed charges

We have made a decision to:

3 Continue to apply the abatement factor to daily fixed charges, which includes base, incremental and membrane service charges under our price structures.

4 Deem the Daily Volume on 364 Availability Days preceding the first Availability Day equal to 250 ML per day for the 2017 determination period where no prior history exists.

We have refined SDP's price structures (see Chapter 10), splitting its daily fixed charges for the plant into two components:

- **Base service charge** ($/day): reflecting the plant's base fixed costs when shutdown and operating.
- **Incremental service charge** ($/day): reflecting the additional fixed costs incurred by SDP when the plant operates.

We have also introduced a **membrane service charge** ($/day) to recover the capitalised costs of a full set of membranes if the plant is called into operation over the 2017 determination period (see Chapter 12).

The abatement mechanism will continue to abate the above daily fixed charges related to the plant. Therefore, under our new price structures, it would apply to the base, incremental and membrane service charges when the plant is in operation mode.

Sydney Water considered this should also be extended to the pipeline service charge.[59] We disagree. The pipeline service charge will not be subject to abatement under our 2017 Determination, as is currently the case. We consider the incentives in place to be sufficient under the application of the abatement mechanism to the existing charges. Moreover, SDP would likely require additional insurance coverage if the pipeline charge were to be abated.

59 Sydney Water submission to IPART Draft Report, April 2017, p 5.

2.5 Prices remain regulated outside drought

We have made a decision to:

5 Continue regulating SDP's prices outside drought for all customers.

As noted above, SDP is free to supply customers outside drought. In these instances, SDP might do so at volumes less than full production. This differs to SDP's primary role, which is to maximise production during drought.

In our Issues Paper, we acknowledged the difficulty in determining bespoke or specific prices for all potential supply circumstances outside SDP's prescribed drought response role. Thus we raised the possibility of introducing unregulated pricing agreements between SDP and its customers for supply outside drought. However, given the Terms of Reference under which we operate, we are unable to make this change to our regulatory framework.

2.5.1 Where SDP has limited monopoly power, economic arguments support unregulated pricing agreements

We consider that SDP and its customers should be able to make informed decisions in their own self-interest where SDP has limited monopoly power. Our view is that SDP has limited monopoly power when it operates outside drought because water is not scarce and there are other sources of water that are readily available.[60] In addition, SDP's customers are likely to be large sophisticated businesses with experience negotiating and assessing commercial agreements.[61]

Given this, we consider that SDP, Sydney Water and third-party customers would only enter into unregulated pricing agreements when all parties benefit.[62]

The exception to this, however, is when SDP operates in an emergency response role outside drought. In these circumstances, it is reasonable to expect that SDP would have monopoly power, which could prevent 'win-win' agreements from occurring if prices were negotiated. We discuss SDP's emergency response role in greater detail and how we have accommodated this role through our pricing framework in Chapter 4.

2.5.2 But unregulated pricing agreements are inconsistent with the financial indifference principle in the Terms of Reference

SDP sought unregulated pricing agreements when dam levels are high (ie, outside the 60/70 rule) with Sydney Water or other customers.[63] To remain consistent with our Terms of Reference, however, we have decided that SDP's prices outside drought will remain regulated to all customers.

60 IPART, *Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2017 – Issues Paper*, August 2016, p 39.

61 SDP is restricted from supplying small retail customers under its WICA licence.

62 We introduced this form of pricing flexibility in our recent determination of Sydney Water's retail prices. We allowed Sydney Water and its large non-residential customers to enter into unregulated pricing agreements for water and wastewater services. See IPART, *Review of prices for Sydney Water Corporation from 1 July 2016 to June 2020 – Final Report*, June 2016.

63 SDP pricing proposal to IPART, October 2016, p 31.

While, in principle, there is a strong economic argument for unregulated prices, we consider unregulated pricing agreements would be inconsistent with the financial indifference principle in the Terms of Reference. If SDP were to have the option to enter into unregulated pricing agreements, it would only be expected to do so at its benefit. Thus, it would no longer be financially indifferent as to whether or not it supplies water (see Appendix A).

SDP does not consider the financial indifference principle in the Terms of Reference prohibits unregulated pricing agreements. Rather, it considers that the financial indifference principle is directed only at SDP's operation under its drought obligation.[64] Nonetheless, in its revised proposal, SDP accepted our draft decision to regulate prices outside drought for all customers, given it is unlikely to be a material issue over the 2017 determination period.[65] It considers that the scope of services subject to price regulation should be reconsidered in future periods.

In contrast, Sydney Water supported our draft decision to continue to regulate prices for all customers, both inside and outside drought, in line with the financial indifference principle in the Terms of Reference.[66]

2.6 General cost-pass through mechanisms

We have made a decision to:

6 Not include a general cost pass-through mechanism in the 2017 Determination.

In our Issues Paper, we noted that cost pass-throughs should only be used in exceptional circumstances and asked if there was a case to manage other SDP costs through a cost pass-through mechanism.[67] SDP responded to this question by proposing a general cost pass-through mechanism to manage the risk of unforeseen and uncontrollable costs associated with extraordinary events (eg, natural disasters), regulatory changes (eg, Metropolitan Water Plan), and tax changes.[68] It cited the following reasons in support of its proposal:

- **IPART's strict cost pass-through criteria can lead to inefficient expenditure**. By limiting the scope of risks that can be passed through to customers, SDP has an incentive to make inefficient investments throughout the regulatory period (that are allowed in prices and paid for by customers) to insure itself against these risks.
- **Lack of control**. SDP has little if any control over these events occurring.
- **More cost reflective**. Allowing a general cost pass-through will allow SDP to avoid including speculative cost estimates in its expenditure forecasts for events that may or may not occur.

64 SDP pricing proposal to IPART, October 2016, p 31.
65 SDP submission to IPART Draft Report, April 2017, p 9.
66 Sydney Water submission to IPART Draft Report, April 2017, p 14.
67 IPART, *Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2017 – Issues Paper*, August 2016, p 61.
68 SDP pricing proposal to IPART, October 2016, p 41.

- **More consistent with other regulatory frameworks**. Other regulators, including the Essential Services Commission of South Australia (ESCOSA) and the Australian Energy Regulator (AER), provide general cost pass throughs. IPART provided cost pass through mechanisms in its 2010 and 2013 Electricity Retail Determinations.

In its submission to our Draft Report, SDP maintained the introduction of a cost pass-through mechanism to efficiently manage the risks associated with a number of unforeseen and uncontrollable events.[69] SDP also welcomed IPART's guidance on the event definitions and cost pass through processes to ensure they meet IPART's cost pass-through criteria and the Terms of Reference.[70]

SDP expressed disagreement with our draft decision and argued that:[71]

- it is not efficient to partially expose SDP to risks that it has little influence over (such as changes to licence conditions)
- SDP's proposed cost pass-through mechanism is not too general, given it is based on previous pass through mechanisms included in IPART determinations for electricity network and retail businesses
- the cost impacts associated with unforeseen and uncontrollable events are not symmetric (ie, unexpected gains will not necessarily offset unexpected losses)
- uncertainty in SDP's operating environment is not adequately addressed by references to the licence in SDP's Determination, and
- re-opening the determination is not an efficient and cost-effective alternative to manage the risk of unforeseen and uncontrollable events.

Our final decision is to not provide a general cost pass through mechanism in SDP's 2017 Determination. This decision is consistent with our cost pass-through criteria and with our recent 2015-16 decision for Sydney Water.[72]

Our criteria for cost pass-through mechanisms reflect our views on the efficient allocation of risk between regulated businesses and customers and also reflect the requirement that our water pricing determinations are self-executing. Our cost pass-through criteria are outlined in Box 2.3 below.

69 SDP submission to IPART Draft Report, April 2017, pp 20-21.
70 SDP submission to IPART Draft Report, April 2017, p 21.
71 SDP submission to IPART Draft Report, April 2017, p 12.
72 IPART Review of Prices for Sydney Water Corporation, Final Report, June 2016, pp 60-63.

Box 2.3 Criteria for cost pass-through mechanisms

Cost pass-through mechanisms should only be applied in situations where:

- There is a trigger event (to activate the cost pass-through), which can be clearly defined and identified in the price determination.
- The resulting efficient cost associated with the trigger event can be fully assessed including whether there are other factors associated with the trigger event that fully or partially offset the direct cost of the event.
- The resulting cost is assessed to exceed a materiality threshold.
- The regulated business cannot influence the likelihood of the trigger event or the resulting cost.
- 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.

We do not consider SDP's proposal for a cost pass-through mechanism for undefined extraordinary events, regulatory changes and tax changes, meets our criteria. Specifically:

- **Extraordinary events** (eg, natural disasters). While SDP cannot control if and when these events occur, it can decide whether or not to insure against these events (assuming they are insurable) and it can influence the costs resulting from these events. Therefore, it is efficient for SDP to be at least partially exposed to these risks.
- **Regulatory changes** (eg, Metropolitan Water Plan). SDP has an ability to influence the Metropolitan Water Directorate and it has some influence over the costs resulting from a change in the Metropolitan Water Plan. Therefore, it is efficient for SDP to be at least partially exposed to these risks.
- **Tax changes**. Although tax changes are generally considered suitable candidates for cost pass-throughs, SDP's proposal is too general to meet our cost pass-through criteria. To meet our criteria, SDP would need to identify a potential tax change, identify the efficient cost, and show the efficient cost exceeds a materiality threshold. We note that tax changes are considered in more detail in Chapter 9.

We consider the current limited use of specific targeted cost pass-throughs is appropriate because it achieves an efficient balance of risk between SDP and customers.

- The risk of introducing a general cost pass-through for 'unforeseen and uncontrollable events' is that, in practice, it may be debateable what 'uncontrollable' means. There is a risk that unforeseen cost increases will tend to be presented as 'uncontrollable' and passed through to customers, while unforeseen cost decreases will be presented as 'controllable' and retained by the business.
- While SDP may have limited ability to influence processes like the development of the Metropolitan Water Plan, it does have some ability to influence these processes. Therefore, a cost pass-through that shifts 100% of these risks onto customers may remove SDP's incentive to actively engage in these processes and may lead to less efficient outcomes.

- Further, the risk around unforeseen events is already shared between the regulated business and its customers. Our 5-year determination period for SDP means that SDP is potentially exposed to up to 5-years of cost changes (positive or negative) resulting from an unforeseen event. At the next price review, cost changes are assessed and, if prudent to pass through to customers, these cost changes are factored into prices going forward.

We continue to be open to consider specific targeted cost-pass throughs where they can be assessed against our criteria at a price review. We consider our current approach to setting efficient cost allowances is working effectively. This approach includes:

- **Expenditure reviews** to assess expenditure forecasts and attempt to identify any inefficient expenditure that a business may have included for the purpose of limiting its exposure to specific risks (as indicated in SDP's proposal).
- **Expenditure allowances** are assumed to be unbiased, so over the long-run unexpected cost increases are expected to offset unexpected cost decreases.
- Limited use of **cost pass-throughs** in circumstances that meet our criteria.
- The opportunity to **re-open the determination** if there is a significant change in costs.

SDP has requested further guidance on the types of costs that would qualify for a cost pass-through based on our cost pass-through criteria and the Terms of Reference. We offer guidance by way of a real life example. We continue to provide a cost pass-through for SDP's network energy costs. SDP's network energy costs clearly meet our cost pass-through criteria. That is:

- there is a trigger event (ie, AER issuing a new network price determination during the 2017 determination period)
- the cost being passed through can be assessed as being efficient and material
- SDP cannot influence the trigger event or the resulting cost
- the energy network cost pass-through is symmetric in that it passes through both increases and decreases in energy network costs, and
- the energy network cost pass-through is expected to result in prices that better reflect the efficient cost over time (ie, compared to us setting a fixed allowance for these costs).

This pass-through of SDP's energy network costs is discussed in Chapter 8.

We note that Sydney Water supported our draft decision not to include a general cost pass-through mechanism in SDP's 2017 Determination.[73]

73 Sydney Water submission to IPART Draft Report, April 2017, p 2.

3 Ensuring incentives are proportionate to SDP's drought response role

This chapter outlines our changes to the abatement mechanism to ensure that SDP's incentives reflect its drought response role. In particular, we have strengthened the abatement mechanism to apply more uniformly during drought. That is, full abatement has been extended to also apply in shutdown and restart periods when the plant is required to produce during drought.

We have been mindful of the difference between events that are **within** SDP's control and those that fall **outside** its control. This is because SDP is less able to respond to the incentives created by abatement during events outside its control. In these circumstances, we have balanced providing value for SDP's customers while ensuring SDP is not unduly exposed to risk. For situations where SDP could obtain insurance on commercially reasonable terms, we have continued to include provision for abatement of SDP's fixed charges. Where events are **uninsurable** (eg, acts of war), rather than **uninsured**, we have decided not to include provision to abate SDP's fixed charges.

In broadening the abatement mechanism, we have also decided to align the abatement mechanism with the design parameters of the plant by removing the 250 ML cap on daily volumes for calculation of the abatement factor applied to daily fixed charges. This would allow SDP to manage temporary fluctuations in output and short-term outages while responding to drought without a net financial penalty through abatement.

In this chapter, we have identified exemptions to the abatement mechanism to remove perverse incentives for SDP's operations, including allowing a 'grace period' when moving from shutdown into plant operation mode in response to drought. We also considered circumstances in which SDP is directed to reduce supply under law, or Sydney Water is unable to receive the full production capacity of desalinated water during drought.

We have also decided that partial abatement should apply to the 14-month minimum run time provided to SDP under 2017 Metropolitan Water Plan. This was not included in our Draft Report, as the 2017 Metropolitan Water Plan was released shortly before the publication of our Draft Report. According to the 2017 Metropolitan Water Plan, the 14-month minimum run time operates in response to drought only and is at SDP's discretion. It comprises an 8-month start-up period plus 6 months of production, even if dam levels rise above 70% during this period.[74]

74 NSW Government, *2017 Metropolitan Water Plan*, March 2017, p 38.

3.1 SDP must maximise output during drought

We have made a decision to:

7 Broaden the abatement mechanism to apply uniformly during drought from 13 December 2018. This means:

- SDP's fixed charges would be fully abated for shutdown and restart days during drought resulting from:
  - events within SDP's control, and
  - insurable events outside SDP's control.
- The daily volumes produced on these shutdown or restart days (ie, 0 ML) would be included in the abatement factor.
- The abatement factor would apply to SDP's fixed daily charges during these shutdown and restart days.

3.1.1 Abating inoperability during drought from 13 December 2018

The objective of the abatement mechanism is to provide a financial incentive to SDP to maximise its production and supply of water during drought.

SDP supports the retention of an abatement mechanism which appropriately incentivises it to maintain and operate the plant and ensure that it can supply water at full production levels when required to do so.[75] So does Sydney Water.[76]

We note the abatement mechanism in the 2012 Determination could mean that SDP's fixed charges are not abated during drought even if the plant is not supplying water. This is because, under the 2012 Determination, abatement only applied when the plant was operating – hence, SDP's fixed charges would not have been be abated when it was shutdown, or restarting, even during drought.

We support the continuation of the abatement mechanism. Where possible, we consider it should apply uniformly during drought. Thus, we have decided to broaden the abatement mechanism so that it applies **during drought** to:

1. Shutdown and restart days that result from events within SDP's control.
2. Shutdown and restart days that result from insurable events outside SDP's control.

In our Draft Report, we indicated our new abatement mechanism would operate from 1 July 2018. In response to our Draft Report, SDP proposed delaying the introduction of the abatement mechanism until 13 December 2018. This reflects the timeframe in the Agreed Reinstatement Plan for the December 2015 storm event.[77] We accept this proposal. The abatement mechanism is discussed in more detail below.

75 SDP pricing proposal to IPART, October 2016, p 35.
76 Sydney Water submission to IPART Issues Paper, November 2016, p 31.
77 SDP submission to IPART Draft Report, April 2017, p 58-59.

Sydney Water proposed abatement outside drought

In its response to our Draft Report, Sydney Water argued that abatement should apply to both services provided by SDP:

a) the supply of non-rainfall dependent drinking water to purchasers, and

b) the making available of the desalination plant to supply non-rainfall dependent drinking water.[78]

Sydney Water asserted that abatement is a standard feature of modern service contracts. It is an important mitigation against the risk that a provider will not perform to the level expected by customers.[79]

Sydney Water strongly believes the abatement mechanism should be extended to cover periods when SDP is not providing its availability service outside drought (eg, the plant could not respond if a restart trigger were to occur on the day). If not, Sydney Water's customers would be potentially exposed to ongoing payments even though a corresponding service had not been provided.[80] To expand the abatement mechanism outside drought, Sydney Water suggested the abatement mechanism could reference the plant's designed functions and purpose in water security mode, such as appropriate maintenance and testing (ie, rather than a measure linked to volumes of water supplied).[81]

We do not consider it practical to develop a new abatement mechanism to measure 'unavailability' when the plant is shutdown outside drought. We would not have had sufficient time to consult on this abatement mechanism between our Draft and Final Reports, nor to identify any unforeseen problems with its application. Sydney Water has recognised this, and has requested this option be considered at the next SDP price review.

More importantly, we have decided to limit full abatement to within drought episodes, because we consider this is a sufficiently strong incentive and proportionate to SDP's drought role – ie, when the plant is required to operate. Sydney Water also noted that abatement could be extended outside drought to SDP's emergency response role.[82] We consider there to be merit in this approach, because this represents another circumstance when the plant is required to operate. Chapter 4 provides more detail on the policy rationale and approach we have taken to abating SDP's emergency response role.

3.1.2 Shutdown and restart days within SDP's control: an appropriate and manageable increase in SDP's risk

We have decided to extend the abatement mechanism to shutdown and restart days during drought for events that are within SDP's control. It is efficient for SDP to be at least partially exposed to risks that it has the ability to control or influence. This provides it with an incentive to minimise the likelihood and cost of downside risk and maximise the likelihood and benefits of upside risk.

78 Sydney Water submission to IPART Draft Report, April 2017, p 15.
79 Sydney Water submission to IPART Draft Report, April 2017, p 15.
80 Sydney Water submission to IPART Draft Report, April 2017, p 16.
81 Sydney Water submission to IPART Draft Report, April 2017, p 16.
82 Sydney Water submission to IPART Draft Report, April 2017, p 5.

This approach also strengthens the incentive properties of our regulatory framework relative to SDP's role in water security. Arguably, if SDP manages the plant prudently, as per the requirements of its Network Operator's Licence, then its exposure to income loss through abatement should be limited.

Routine maintenance can be managed through increased flexibility in the abatement mechanism

Under our decision, SDP's fixed charges would also be fully abated when it is shutdown for routine maintenance during drought. But, we consider our decision to increase flexibility in the abatement mechanism (explained further below) means that SDP could manage these routine reductions in output, without a net financial penalty through abatement.

Specifically, we have removed the 250 ML daily cap on the abatement factor to allow SDP to manage temporary fluctuations in output while responding to drought. Given the plant's design parameters, this would provide SDP with up to 21 shutdown days a year and not be abated.[83] If the plant were to undertake more than 21 days maintenance, it would be operating below its design parameters.

Our refinement to the abatement mechanism to allow SDP to manage temporary fluctuations in output while responding to drought is discussed in more detail below.

3.1.3 Shutdown and restart days outside of SDP's control: relying on SDP's insurance provides better value for customers

We have also decided to fully abate SDP's fixed charges on shutdown and restart days during drought for events that are outside SDP's control, but which are insurable on commercially reasonable terms. This includes force majeure events such as tsunamis, storms and fires. This would reduce (abate) the service charge payable by SDP's customers (to the extent such events reduce SDP's supply during drought, and abatement therefore applies). It should also enhance the likelihood of the plant being able to fulfil its drought response role, while allowing SDP to recover its fixed costs (through insurance, rather than its service charges).

Industrial and Special Risks insurance provides cover for physical loss or damage to SDP's property as a result of, for example, fire, explosion, vandalism, weather perils, earthquake, or accidental damage. Typically, this policy covers the costs of replacement or reinstatement in the event of damage, and will also cover any resultant shortfall in revenue (ie, business interruption).

Where insurance is available on reasonable commercial terms, we consider it can be efficient for businesses to rely upon insurance to manage their risk. In the 2012 Determination, we included an allowance for SDP's Industrial and Special Risks insurance premiums, which was then incorporated into SDP's prices. Similarly, we have included an allowance in the 2017 Determination for SDP's insurance premiums to ensure that its coverage is sufficient

83 A 94% availability of the plant at 266 ML per day is equivalent to plant producing 0 ML per day on 6% of the days in a year (that is, 0.06 x 365 = 21.9 days rounded downwards to 21 full days), and 266 ML per day on the remaining 365 – 21 = 344 days of the year. The average production (available capacity) calculated over the period of 365 days in the schedule above is (0 x 21 + 266 x 344)/365 = 250.7 ML per day, which means that SDP's fixed charges are not abated.

given its operating environment (including our determination, and its abatement provisions).

Our decision should provide a financial incentive to SDP and its insurers to reinstate the plant as soon as possible following an insurable event that requires the plant to shutdown during drought. This is because SDP would be reliant upon its insurance payments during a period of inoperability to recover its fixed costs (rather than its service charges, which would be abated), and these payments would be limited in duration. Therefore, SDP would seek to have the plant in production as soon as possible. Similarly, the insurers would wish to minimise the business interruption payments under the policy and have the plant reinstated as quickly as possible.

Events that are uninsurable will not be abated

No abatement will apply to force majeure events for which insurance is not available on reasonable commercial terms (ie, that fall outside the scope of most insurance policies). We do not consider SDP should be exempt from abatement where it is insured or could be insured for a particular risk, or where an event is within its control. Rather, we are exempting SDP from abatement for uninsurable, not uninsured, events.

An example of this is following an earthquake:

- SDP is unable to supply drinking water for an entire 48 month drought episode.
- SDP could have insured on reasonable commercial terms against business interruption for the entire period, but instead chose to insure itself for a period of up to 36 months.
- SDP would be abated for the full 48 months, including 12 months for which SDP would not have insurance cover.

We consider that the risk of such events should remain with SDP. SDP, not its customers, is best placed to ensure that any recovery occurs in a timely fashion and to minimise any delays in plant repairs. If customers were to bear this risk, SDP would have little incentive to repair the plant as quickly as possible, as it could rely on its insurance or customers **at all times**.

We also consider this approach reflects what would occur in a competitive environment. An unregulated business (and not customers) is likely to bear the loss where it is affected by a force majeure event against which it could have insured itself, but did not.

We acknowledge that our approach does create some uncertainty for the parties. Determining what is uninsurable on reasonable commercial terms would be a question of fact and would likely require the assistance of an insurance expert. But we consider there is a trade-off between providing certainty for the parties and ensuring appropriate incentives in our Determination.

Sydney Water considered the Draft Determination may have inadvertently enabled SDP to avoid abatement for insurable and uninsurable force majeure events by referring to the Network Operator's Licence.[84] This is because the licence relaxes the obligation to maximise

84 Sydney Water submission to IPART Draft Report, April 2017, p 17.

the production of drinking water in certain circumstances. We have addressed Sydney Water's concerns in our drafting of the 2017 Determination.

3.1.4 Implications for the December 2015 storm event

We have decided that the changes to abatement should apply from 13 December 2018. This is the date from which we understand the plant will be reinstated, following the December 2015 storm event. The plant is currently being repaired because of this storm event.

We have decided to apply the above-mentioned changes to abatement from 13 December 2018, to ensure that SDP's fixed charges are not abated when the plant is inoperable because of the December 2015 storm event. We do not think it appropriate to abate SDP's fixed charges for an event that occurred in the 2012 determination period under which different abatement rules applied.

By applying abatement from 13 December 2018, we are also providing an incentive to SDP to ensure the plant is reinstated as soon as possible. From 13 December 2018, SDP would be penalised if the plant produced less than 250 ML per day if required to respond to drought (ie, under the 60/70 rule). This excludes the grace period from abatement when first moving from shutdown to plant operation in a drought episode, discussed in further detail below.

3.1.5 Stakeholder views on extending the abatement mechanism

SDP agreed with "the continuation of an abatement mechanism that provides SDP with strong financial incentives to operate at full capacity when called upon."[85] So too did Sydney Water.[86]

SDP further stated that strengthening the abatement mechanism, rather than introducing a new inoperable mode, is a better targeted and more proportionate way of ensuring that SDP's incentives reflect its drought response role.[87] It agreed that the abatement mechanism be broadened to apply to all days during a drought response period, regardless of the mode the plant is in.[88] SDP accepted that it is reasonable during a drought period for insurance rather than customers to bear the risk of loss of revenue from an insurable force majeure event. It sought an additional $1.1 million in operating expenditure allowances over the 2017 regulatory period to reflect increased business interruption coverage for abatement during drought following an insurable force majeure event.[89] SDP's proposed insurance coverage and premiums are discussed in detail in Chapter 7.

Both SDP and Sydney Water provided specific commentary on our decision to exempt uninsurable force majeure events from abatement. This is discussed below.

85 SDP submission to IPART Draft Report, April 2017, p 11.
86 Sydney Water submission to IPART Draft Report, April 2017, p i.
87 SDP submission to IPART Draft Report, April 2017, p 5.
88 SDP submission to IPART Draft Report - Appendices, April 2017, p 23.
89 SDP submission to IPART Draft Report - Appendices, April 2017, p 25.

SDP proposed linking uninsurable force majeure events to its Network Operator's Licence

SDP noted that our approach to uninsurable force majeure events created risks distinguishing between those events that are insurable and those that are not.[90] SDP considered that if assessments of 'uninsurable force majeure events' are left until the event has occurred (ie, an ex post assessment), then it is subject to significant regulatory risk, which translates into significant financial risk.[91]

SDP submitted that the definition of uninsurable force majeure event should be linked to its requirement to obtain appropriate insurances under its Network Operator's Licence.

- The WIC Act states that a licence may be not be granted unless the Minister is satisfied that (amongst other factors), "the applicant has made, and will continue to maintain, appropriate arrangements with respect to insurance".[92]
- As part of its licensing role, IPART (on behalf of the Minister) monitors SDP's insurances. SDP considered that anything outside of these insurance policies should be deemed to be an 'uninsurable force majeure event.'[93]
- SDP should therefore not be abated for events that are not *fully* covered by SDP's insurance (provided SDP is compliant with its Network Operator's Licence). This includes events for which coverage limits are exceeded, but which fall within the scope of its insurance policy.[94]

In effect, SDP is seeking to be exempt from abatement where it is **uninsured**, but compliant with its licence. This is broader than an exemption for **uninsurable** events only.

The advantage of this approach would be that SDP has certainty about how and when abatement should apply. Its current insurance policy has a list of exclusions as well as set coverage limits for its insured risks. The Network Operator's Licence requires SDP to maintain 'appropriate' insurance.[95] SDP argued that as its insurance is effectively deemed to be appropriate any force majeure event that falls outside these policies should not be abated.[96]

However, we consider there to be difficulties with SDP's proposed approach. In essence, it reduces the incentives created by abatement for SDP to operate, or be ready to operate, as soon as possible. This is because SDP would be covered for abatement at all times, either by its insurance (paid for by customers), or by customers (through unabated service charges).

Under SDP's proposal, an incentive would exist for SDP to reduce its insurance coverage and increase the proportion of risk borne by customers. This could occur by excluding specific risks (eg, flood) or by reducing the coverage provided for risks (eg, 36 months of business interruption coverage versus 48 months of business interruption coverage). It

90 SDP submission to IPART Draft Report, April 2017, p 11.
91 SDP submission to IPART Draft Report - Appendices, April 2017, p 27.
92 Section 10(4)(c) of the *Water Industry Competition Act 2006* (the WIC Act).
93 SDP submission to IPART Draft Report - Appendices, April 2017, pp 25-27.
94 SDP submission to IPART Draft Report - Appendices, April 2017, p 27.
95 See condition B3 of Schedule B in SDP's Network Operator's Licence (granted on 9 August 2010 and varied on 10 May 2013) available at http://www.sydneydesal.com.au/media/1132/varied-licence_sdp-network-operators-licence_may-2013.pdf.
96 SDP submission to IPART Draft Report - Appendices, April 2017, p 27.

could argue that what is required for 'appropriate' insurance coverage has decreased over time. This is because it would be exempt from any abatement outside of this insurance coverage. As such, SDP's proposal may result in perverse incentives, where its insurance coverage is progressively reduced, providing less value for customers.

As noted above, the WIC Act requires SDP to maintain appropriate arrangements with respect to insurance. We apprehend this is to require regulated entities to maintain a minimum level of insurance to protect their customers from the impact of adverse events. In administering the WIC Act on behalf of the Minister, we have maintained a light-handed approach to regulation, enabling regulated entities to determine their appetite for risk and their level of insurance up to a point (although IPART can require SDP to procure an expert report certifying the appropriateness of SDP's insurance).

The WIC Act licensing requirements address the need for a minimum level of insurance, ultimately in order to protect consumers. However, these requirements are not designed to determine how the risk should be shared between an entity and its customers beyond this minimum level of insurance.

In addition, should SDP's proposal be accepted, it may lead to SDP seeking a cost pass-through for the material damage for an uninsured force majeure event. For example, a storm event might occur again where the damage to the plant exceeded its insurance sub-limits. SDP may argue that it should not be abated if it had exceeded its limits for business interruption. It may also argue that any damage to the plant that falls outside its coverage limits should be borne by customers. This is a logical extension to its argument that it should only be held accountable for events for which it is fully insured.

Sydney Water also stated that further clarification is required for uninsurable force majeure events

Sydney Water also stated that further clarification is required. It considered that there are practical difficulties in identifying 'uninsurable force majeure events.'[97] For example, it submitted that it may be difficult for Sydney Water to identify an 'uninsurable force majeure event' given the confidentiality of insurance contracts. We think this submission is misinterprets our intention. While SDP's insurance contracts would help in identifying what is **insured**, we do not agree that they would be of assistance in identifying what was **insurable**.

Sydney Water also submitted that markets for insurance may change over time. As a result Sydney Water was concerned that the scope of events captured by our definition of 'uninsurable force majeure event' may itself change.[98] We think that this is an intended and desirable aspect of our definition.

Equally, Sydney Water was concerned that SDP could overstate the difficulty and/or cost of procuring insurance for certain types of events.[99] If SDP does this, it will be open to Sydney Water to seek its own expert advice on insurance markets to contradict SDP.

97 Sydney Water submission to IPART Draft Report, April 2017, p 17.
98 Sydney Water submission to IPART Draft Report, April 2017, p 17.
99 Sydney Water submission to IPART Draft Report, April 2017, p 17.

We consider our original policy position remains valid. We have amended the drafting in the 2017 Determination to provide further clarity to the parties on the policy intent. We consider that our changes to the definition improve clarity by expressly tying whether or not the abatement factor applies on a day to whether or not SDP could have insured against the consequences of a force majeure event for that day. That was implicit in the definition in the Draft Determination, but the proposed changes make it clearer.

3.2 Allowing SDP sufficient time to respond to drought

We have made a decision to:

8 Provide SDP with an option of a 'grace' period of up to eight months from full abatement when the plant first responds to drought. During the grace period partial abatement would apply, where:

- The daily volumes of production will not be included in the abatement factor for the grace period. The grace period commences on the day when dam levels first fall into drought.
- The abatement factor will, however, still apply to daily fixed charges during a plant operation period including for any plant operation period that falls within the grace period from abatement.
- SDP would be able to opt out of the grace period at its discretion.

We have decided to introduce a 'grace' period of up to eight months from abatement to enable SDP to supply water at less than full production levels without being penalised when it is moving from shutdown to plant operation mode. This grace period would start when dam levels fall to 60%.[100] The 8-month grace period aligns with our expenditure consultant's views and those in the 2017 Metropolitan Water Plan on the time it takes the plant to reach maximum production following a restart.[101]

If dam levels fall below 60%, SDP would issue instructions to its operating and maintenance (O&M) contractor to restart the plant. From restart, it takes up to eight months for the plant to become fully operational. During this period, the plant will progressively commence producing potable water that meets the standard required by Sydney Water.

SDP proposed introducing an 8-month 'grace period' so that it is not subject to abatement during the period between switching on and producing water at 100% of capacity.[102] Under the definition of a restart period in the 2012 Determination, the period ends as soon as SDP produces and supplies water to a customer.[103] As SDP would not yet be producing 250 ML per day, supplying water to Sydney Water as the plant is restarting would result in SDP's fixed charges immediately being abated. This provides SDP with a perverse incentive to

100 In fact, until and unless the SDP's Network Operator's Licence is changed, our Determination will give effect to the 70/80 rule, despite what the 2017 Metropolitan Water Plan says.

101 Ideally, abatement should commence as soon as the plant reaches full production. However, it is impractical to be precise as to the period of time this would take. An 8-month restart period is consistent with SDP's O&M contract, and our expenditure consultant's views. It is also consistent with the Metropolitan Water Plan – see NSW Government, *2017 Metropolitan Water Plan*, March 2017, p 38.

102 SDP pricing proposal to IPART, October 2016, p 36.

103 IPART, *Prices for Sydney Desalination Plant Pty Limited's Water Supply Services - Determination No. 2*, December 2011, p 60. This is apart from water that is supplied from storage.

withhold supply during the ramp-up period (eg, return it to the sea), in order to avoid being penalised through abatement.

We agree that the abatement mechanism should not penalise SDP when the plant is ramping up production to fulfil its drought response role. In our view, this penalty is unwarranted, as the plant's production is limited by technical factors outside SDP's control. In its response to our Draft Report, Sydney Water maintained its support for the 8-month grace period.[104]

3.2.1 How the 8-month grace period would apply

The grace period starts on the date of dam levels first falling below 60% since they were last above 70%. It does not apply on subsequent 'restarts' during an unbroken drought episode.

For clarity, during the grace period partial abatement would apply. That is, daily volumes of water produced during the grace period would **not** influence the calculation of the abatement factor (ie, the averaging formula that is applied to fixed charges). But the abatement factor would **still** apply to daily fixed charges during this period.

In other words, **past** performance during drought (rather than performance during the grace period) could nonetheless impact the fixed charges that SDP would receive in the eight month grace period through the abatement factor.

Following the 8-month grace period, full abatement would apply. That is, the daily volumes of production would begin to influence the calculation of the abatement factor. This means that SDP has eight months from the date of dam levels first falling below 60% since they were last above 70% to ensure its production levels reach 250 ML per day. Beyond that time period, it would be penalised for production levels below 250 ML per day.

3.2.2 SDP may opt out of the 8-month grace period

Since our Draft Report, we have decided that SDP may opt out of the 8-month grace period. Opting out of the grace period means that SDP would elect to have its fixed charges fully abated.

This would encourage SDP to maximise its production prior to the expiry of the 8-month grace period. We consider this would be in the interests of SDP's customers (through greater water supply at an earlier time) and SDP (by being able to manage future abatement at an earlier point in time).

3.2.3 Stakeholder views on the 8-month grace period

Sydney Water noted its support for the 8-month grace period.[105]

In its response to our Draft Report, SDP argued that the abatement factor should not apply to its service charges during the grace period (ie, against partial abatement).[106] SDP asserted

104 Sydney Water submission to IPART Draft Report, April 2017, p 3.
105 Sydney Water submission to IPART Draft Report, April 2017, p 3.

this was not consistent with SDP's Network Operator's Licence, which recognises SDP is not required to maximise production during restart.

According to SDP, the application of the abatement factor would be arbitrary and unduly punitive, as it effectively imposes penalties on SDP for failing to perform during the last year of one drought episode, which then continues into future drought episodes.[107] This is particularly so given our decision to implement an asymmetric carryover of the abatement factor (ie, that the abatement factor is only carried over if it is less than one – this is discussed in more detail in Section 3.3 below).[108] In other words, the application of the abatement factor means that SDP would at best recover its fixed charges in full and at worst recover only a proportion of those charges – it would never over-recover its fixed charges. As the volumes produced during the grace period are excluded, SDP would also not be able to influence the grace period in its favour.[109]

Given the 365-day averaging period, SDP states the carryover of the abatement factor would reflect only the last year of a drought period and not the production in the preceding period. It would also unduly penalise SDP if it were to undertake maintenance at the end of a drought response period.[110]

SDP states each drought response period should be considered a separate event, with the abatement factor reset to one at the conclusion of drought.[111] This argument is expanded in our discussion in Section 3.3 below.

We maintain our view that partial abatement during the grace period strengthens the incentive properties of abatement. It ensures SDP maximises its production during drought to prevent the future application of an abatement factor of less than one to its service charges. Our changes to the abatement mechanism enable SDP to offset any periods of maintenance or lesser production. Below we discuss our removal of the 250 ML cap on daily volumes for calculation of the abatement factor applied to daily fixed charges. As SDP notes, it has technical capacity to produce 266 ML 94% of the time, allowing approximately 21 days of maintenance a year. We also consider SDP would be able to monitor the dam levels sufficiently to plan when maintenance should best occur.

Our approach also ensures consistency across differing operation periods. The abatement factor is applied at all times of plant operation, including for third parties. In making our decision, we also considered a range of matters under section 15 of the IPART Act, including potential impacts on customers. We have consulted with SDP, Sydney Water and NSW Treasury on this issue and considered their responses.

106 SDP submission to IPART Draft Report, Appendices, April 2017, p 27.
107 SDP submission to IPART Draft Report, Appendices, April 2017, p 27-28.
108 SDP submission to IPART Draft Report, Appendices, April 2017, p 29.
109 SDP submission to IPART Draft Report, Appendices, April 2017, p 28.
110 SDP submission to IPART Draft Report, Appendices, April 2017, p 28.
111 SDP submission to IPART Draft Report, Appendices, April 2017, p 30.

3.3 Managing fluctuations in output during drought

We have made a decision to:

9 Align the abatement mechanism with the design parameters of the plant by:

- Removing the 250 ML cap on daily volumes for calculation of the abatement factor applied to daily fixed charges.
- Retaining the averaging period of 365 days for calculation of the abatement factor.
- Introducing a true-up of fixed charges to claw back any over-recovery of revenue over a single episode of drought, which:
  - includes holding costs calculated using the relevant WACC, and
  - is payable at the end of a drought response period.
- Resetting the abatement factor to one, if the plant exits drought with an abatement factor above one.
- Retaining and using the abatement factor, if the plant exits drought with an abatement factor of one or lower.

The desalination plant has technical capacity to operate at 266 ML per day, with 94% availability. This is equivalent to an annual average of 250 ML per day (or 91.25 GL per year). To avoid abatement under the 2012 Determination, and operate within the design parameters of the plant, SDP would either need to:

- run the plant to produce at least 250 ML per day during drought, or
- cease production and enter into a short-term shutdown mode (up to 10 days).

We agree with SDP that this is contrary to the intent of the abatement mechanism. Therefore, we have removed the 250 ML daily cap on the abatement factor to allow SDP to manage temporary fluctuations in output while responding to drought. To avoid any over recovery of revenue, and remove the incentive for SDP to push production above the technically optimal limit, we have also introduced a true-up of fixed charges paid over the duration of a drought episode (ie, for the period of time when dam storages are below 60% or until levels rise again above 70%).

3.3.1 Under the 2012 Determination, SDP cannot recover temporary losses by exceeding the 250 ML average daily capacity of the plant

The abatement mechanism reduces the daily water service charge[112] applicable on that day in plant operation mode if the average production of the preceding 365 days of production during drought is less than the plant's optimal capacity (ie, 250 ML per day).

The abatement mechanism under the 2012 Determination, however, was not symmetrical. SDP was penalised for any days on which the plant's output falls below optimal capacity ('unders') but not rewarded for any days on which production was above optimal capacity ('overs'). This is because the average daily volume for the past 365 production days was capped at the plant's optimal capacity.

112 Network charges are included in the fixed daily charge. The pipeline charge is not abated.

SDP noted in its pricing proposal that this is contrary to the intent of the abatement mechanism, which is to ensure that the plant runs at full capacity when needed.[113] To illustrate how a disproportionate penalty could arise under the current formulation of the abatement mechanism, we have constructed a simple example in Table 3.1 below that assumes a daily fixed charge of $100.

Table 3.1 Simplified example of loss of revenue under the 2012 Determination abatement mechanism

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Daily output, ML	250	250	250	250	240	265	250
Average output, ML	250	250	250	250	248	251	251
Abatement factor	100.0%	100.0%	100.0%	100.0%	99.2%	100.0%	100.0%
(Loss)/gain of revenue, $	-	-	-	-	(0.80)	-	-

Note: This example uses 5-day rolling average. The production is 10 ML lower on Day 5, and 15 ML higher on Day 6. The abatement factor is applied on Day 5, leading to $0.8 loss of revenue. There is no offsetting gain in revenue on Day 6 as the abatement factor is capped at one.

Data source: IPART analysis.

SDP also provided an example in its pricing proposal showing how it would be penalised for a two-week engineering fault that limited plant production to 150 ML per day, despite maintaining an aggregate volume of 250 ML per day delivered.[114] Specifically, SDP noted that the current abatement factor prevents it maximising production and results in a lost opportunity to build a production "bank" necessary to accommodate essential maintenance during prolonged periods of drought.[115]

We agree with SDP that the current abatement mechanism is not aligned with the design parameters of the plant. It can apply disproportionate financial penalties on SDP relative to SDP's performance during drought.[116]

3.3.2 Removing the cap on the abatement factor allows SDP to manage temporary fluctuations

Removing the cap on the abatement mechanism would allow SDP to over-recover its fixed charges when production is above average output of 250 ML per day, so that it can offset times when production falls below 250 ML per day and fixed charges are abated.[117]

This is illustrated in Table 3.2 below, again assuming a $100 daily fixed charge.

113 SDP pricing proposal to IPART, October 2016, p 35.
114 SDP pricing proposal to IPART (Appendices), October 2016, pp 25-26.
115 SDP pricing proposal to IPART, October 2016, p 35.
116 Under the 2012 Determination, SDP could avoid abatement during drought by entering shutdown mode for a period of time. However, as outlined above, as part of the 2017 Determination we have decided to extend the abatement mechanism to shutdown during drought.
117 To allow the plant to smooth out temporary fluctuations in output while responding to drought, we propose to remove the cap on the abatement factor (AC/TC) under the 2012 Determination, allowing the ratio to exceed one.

Table 3.2 Simplified example of removing the cap on the abatement factor for the 2017 Determination

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Daily output, ML	250	250	250	250	240	265	250
Average output, ML	250	250	250	250	248	251	251
Abatement factor	100.0%	100.0%	100.0%	100.0%	99.2%	100.4%	100.4%
(Loss)/gain of revenue $	-	-	-	-	(0.80)	0.40	0.40

Note: This example uses 5-day rolling average. The production is 10 ML lower on Day 5, and 15 ML higher on Day 6. The abatement factor is applied on Day 5, leading to $0.8 loss of revenue. There are offsetting gains in revenue on Days 6 as 7 as the abatement factor is not capped at one.

Data source: IPART analysis.

Modifying the abatement mechanism to allow SDP to manage short-term fluctuations in output also removes the need for shorter duration shutdowns. Within the 94% availability parameter, SDP would be able to recoup up to 21 days of lost production per year, and thus would manage its maintenance requirements without needing to enter the shutdown mode (ie, it could operate for 344 days at 266 ML and 21 days at 0 ML and not have its fixed charges abated; or any other combination that results in average production of 250 ML per day over the year).

Our expenditure consultant, Atkins Cardno, recommended elimination of short duration shutdown modes based on the plant's technical capacity to produce 266 ML per day at 94% reliability – ie, an average of 250 ML day.[118] Modifying the abatement mechanism to allow greater operating flexibility is consistent with Atkins Cardno's recommendation.

The 365-day averaging period continues to be appropriate for calculation of the abatement ratio. This measure relates to the design specifications of the plant (ie, that the plant produces an **annual** average of 250 ML per day).

3.3.3 A true-up is needed to manage potential over-recovery of fixed charges

Relaxing the cap on the abatement factor may result in over-recovery of fixed charges if the plant operates beyond its design parameters. That is, a period of prolonged production above the average daily output of 250 ML per day.

At most, SDP could over-recover 6.4% of its fixed revenue requirement. That is, 365 days of production at 266 ML (ie, leading to an abatement factor of 266/250=1.064). But we note it is unlikely that the plant would be run at this intensity.

118 To ensure the ongoing reliability of supply including 94% availability, Atkins Cardno assessed that procuring an additional drinking water station pump would be prudent before the first restart in response to the drought. See Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 59. This expenditure is addressed in Chapters 6 and 7, where we present our decisions on efficient operating and capital expenditure over the 2017 determination period.

To avoid over-compensation, and remove the incentive for SDP to push production above the technically optimal limit, we have introduced a true-up mechanism. This mechanism would claw back any over-recovery of revenue over the duration of a drought episode resulting from production above the average level of 250 ML per day (ie, for the period of time when dam storages are below 60% or until levels rise again above 70%). The true-up of fixed charges would also include holding costs, calculated using the relevant WACC and be payable at the same time as the transition to shutdown charge.

For clarity, the true-up mechanism is **asymmetric**. Any abatement penalties would not be refunded due to an abatement factor still below one by the end of drought. This would defeat the purpose and intent of the abatement mechanism.

Further, if the plant exits drought with an abatement factor less than one, it is retained and carries over into the next period when the plant is called into operation, consistent with the mechanism's current design. This retains a strong financial incentive for SDP to operate as required during drought. If the plant exits drought with the abatement factor above one, it is reset to one so that SDP does not continue over-recovering revenue the next time the plant is called into operation.[119]

Box 3.1 explains how the true-up mechanism would work.

Box 3.1 How the true-up mechanism would be implemented

We decided to implement the 'true-up' mechanism in the following way:

Step 1. *Determine if the refund is payable, and if so, its total amount*

- On the day when drought ends, SDP evaluates whether it has over-recovered fixed charges during the drought response period. The balance includes holding costs. If over-recovery is positive, this is the total amount of refund that is due to customers.

Step 2. *Determine which customers are eligible to receive the refund*

- On the day when drought ends, for each customer who is an impactor, SDP evaluates whether it over-recovered fixed charges during the drought period from each customer. The balance includes holding costs. If over-recovery from a customer has occurred, this customer becomes eligible to receive refund.

Step 3. *Distribute the total refund among eligible customers*

- Allocate the total refund amount determined in Step 1 to eligible customers determined in Step 2, in proportion to the customer's share of total impact on the days when over-recovery of charges occurred during the drought response period.

3.3.4 Stakeholder views on this issue

In its submission to our Draft Report, SDP reiterated its earlier support for the removal of the 250 ML cap on abatement volumes. It also continued to support the 365-day averaging period for the calculation of the abatement factor.[120]

119 We note that from day one of a subsequent drought period (or emergency response) the preceding 365 days of daily volumes is deemed to equal total capacity.

120 SDP submission to IPART Draft Report, Appendices, April 2017, p 23.

However, in SDP's view there is a strong argument that each drought should be treated as a separate event and SDP's performance reflected in financial incentives applying at the time of the event. This is particularly so, given the new operating rules in the 2017 Metropolitan Water Plan would effectively mean SDP operates less frequently than before, with greater time elapsing between drought response periods. As a result, it considers the abatement factor should be reset to one at the conclusion of each drought response period.[121]

If this approach was not adopted, then SDP considered that the carryover of the abatement factor should be symmetric. In this scenario, the true-up mechanism would not be required.[122] It does not view the application of an abatement factor above one to its service charges as an over-recovery of fixed charges.[123] SDP stated:

> It is clearly unreasonable for SDP to be penalised for poor performance over multiple droughts but not given an opportunity to offset such penalties with good performance over the same timeframe.[124]

We acknowledge the new operating rules in the 2017 Metropolitan Water Plan (ie, the 60/70 rule) would mean SDP operates less frequently than under the previous rules (ie, the 70/80 rule). But our view is that this does not alter the principled-approach we have taken to the abatement mechanism. Ensuring the abatement factor continues from one drought response period to another strengthens the incentives of our regulation. It ensures that SDP would produce sufficient water, even in periods of short duration, because of the potential for this to impact its service charges for future periods.

In making our decision, we also considered a range of matters under section 15 of the IPART Act, including potential impacts on customers. We have consulted with SDP, Sydney Water and NSW Treasury on this issue and considered their responses.

Sydney Water proposed a monthly averaging period for the abatement mechanism

Sydney Water supported the decision to remove the daily water volume cap for the calculation of the abatement factor.[125] But it proposed a monthly averaging period for the abatement mechanism.[126] In support of this approach, Sydney Water indicated redundancy in plant and equipment means that SDP can perform many maintenance activities (both planned and unplanned) without reducing drinking water production. According to Sydney Water, a 365-day averaging period for calculation of the abatement factor appears overly generous, and shorter averaging (eg, monthly) would provide a better incentive framework.[127]

We still consider our decision to reconcile the abatement mechanism over the duration of a drought period aligns better with the plant's design parameters. The desalination plant is not designed to operate in short monthly bursts, but rather produce an average output of 250 ML per day over a year. Our view is a monthly averaging period of abatement payments would not provide SDP with the flexibility it may require to manage the plant during

121 SDP submission to IPART Draft Report, Appendices, April 2017, p 29.
122 SDP submission to IPART Draft Report, Appendices, April 2017, p 29.
123 SDP submission to IPART Draft Report, Appendices, April 2017, p 29.
124 SDP submission to IPART Draft Report, Appendices, April 2017, p 30.
125 Sydney Water submission to IPART Draft Report, April 2017, p 4.
126 Sydney Water submission to IPART Draft Report, April 2017, p 18.
127 Sydney Water submission to IPART Draft Report, April 2017, p 4.

prolonged drought. We estimate that within a month SDP could at most offset 1.8 days of zero production without abatement.[128] If the plant needed to address an engineering fault that required a longer period of shutdown, a monthly averaging period would unfairly reduce the abatement factor. Further, we consider maintaining the 365-day averaging period prudent given that to date the abatement mechanism remains untested.

3.4 Abatement does not apply when SDP reduces production in order to comply with a law, binding direction or an order

We have made a decision to:

10 Exempt SDP from full abatement on any day when it is required to reduce production below 250 ML per day in order to comply with a law or a binding direction, order or similar made under a law.

The 2012 Determination provides that SDP's prices are not subject to abatement when it is "required to reduce production" other than because it is in breach of a contract pursuant to which it operates the desalination plant. In the 2017 Determination, we have clarified that this refers to a legal requirement to reduce production.

As noted earlier, we consider it would be unreasonable to penalise SDP for events outside its control. To be clear, partial abatement would still apply in these instances. SDP's charges would still be multiplied by the existing abatement factor on a day when it is required to reduce production below 250 ML per day in order to comply with a law or a binding direction, order or similar made under a law; but its performance on that day would not affect the calculation of the abatement factor on future days.

SDP supported our decision in its submission to our Draft Report.[129]

In its submission to our Draft Report, Sydney Water supported this exemption. But it noted that SDP may have discretion in how to comply with such a direction and this may require collaboration with other stakeholders in order to achieve the best response. It stated this aspect should be incorporated into the abatement mechanism.[130]

We do not consider this to be easily achieved in practice through the abatement mechanism. We consider Sydney Water and SDP are best placed to negotiate such arrangements among themselves.

128 A 94% availability of the plant at 266 ML per day is equivalent to plant producing 0 ML per day on 6% of the days in a year (that is, 0.06 x 365 = 21.9 days rounded downwards to a 21 full day), and 266 ML per day on the remaining 365 – 21 = 344 days of the year. The average production (available capacity) calculated over the period of 365 days in the schedule above is (0 x 21 + 266 x 344)/365 = 250.7 ML per day, which means that SDP's fixed charges are not abated. On a monthly basis, 21 days of zero production per year translate to 21/12 = 1.8 days per month. Therefore, within a month SDP could on average offset 1.8 days of zero production without abatement. Actual outcome will depend on the starting level of abatement factor.

129 SDP submission to IPART Draft Report - Appendices, April 2017, p 23.

130 Sydney Water submission to IPART Draft Report, April 2017, p 4.

3.5 Abatement applies when Sydney Water is unable to accept desalinated water

We have made a decision to:

11 Not exempt SDP from abatement when Sydney Water is unable to accept water on a day.

We have decided to maintain our approach that the determination should not exempt SDP from abatement when Sydney Water is unable to accept water. Rather, under these circumstances, we consider the onus should be on Sydney Water to reimburse SDP for any under-recovery of costs – including any loss of revenue under the Determination caused by the application of the abatement mechanism – through payment outside of the determination.

This should help ensure that, in such instances, the financial penalty rests with Sydney Water, rather than being passed through to its end-use customers in the form of an unabated service charge (and the SDP pass through mechanism in the Sydney Water determination). In turn, this would create an appropriate incentive for Sydney Water to ensure that it is ready to receive the full supply of water from SDP during drought.

Both Sydney Water[131] and SDP[132] accepted our decision but provided commentary on its substance.

In its submission to our Draft Report, SDP implied that our decision was analogous to allowing unregulated pricing agreements.[133] This is because our decision acknowledged that Sydney Water and SDP had entered into an agreement about what should happen when Sydney Water is unable to accept water on a day. We do not consider our decision to be analogous to allowing unregulated pricing agreements. We have continued to set the maximum prices that apply when SDP provides desalinated water or is making the plant available. SDP also considered it was not clear that our decision was consistent with the financial indifference principle under the Terms of Reference, but it did not elaborate on this point.[134] We consider that our decision is consistent with the principle that our prices should encourage SDP to be indifferent as to whether or not it supplies water.

Similarly, Sydney Water considered that it was best to enshrine any agreement in our Determination.[135] We disagree. As Sydney Water indicated, abatement is a feature of modern service contracts.[136] We consider that Sydney Water and SDP are sophisticated entities with significant experience in negotiating contracts. As such, both parties would be able to protect their interests when negotiating service provision in these circumstances.

Sydney Water also stated it should not be held accountable where its inability to accept water may, in turn, be due to the actions of another party.[137] If Sydney Water's inability to accept water were caused by the actions of a third-party, then Sydney Water could pursue that third-party outside of our Determination.

131 Sydney Water submission to IPART Draft Report, April 2017, p 4.
132 SDP submission to IPART Draft Report - Appendices, April 2017, p 27.
133 SDP submission to IPART Draft Report - Appendices, April 2017, p 27.
134 SDP submission to IPART Draft Report - Appendices, April 2017, p 27.
135 Sydney Water submission to IPART Draft Report, April 2017, p 5.
136 Sydney Water submission to IPART Draft Report, April 2017, p 15.
137 Sydney Water submission to IPART Draft Report, April 2017, p 5.

3.6 Enabling SDP to have a 14-month minimum run time during drought

We have made a decision to:

12 Relax the nil price to Sydney Water when the plant operates within the 14-month minimum run time.

13 Apply partial abatement during the minimum run time.

- The daily volumes of production will not be included in the abatement factor, but the abatement factor will still apply to daily fixed charges. Partial abatement will apply for that part of the 14 months that:
  - falls within the grace period, and
  - outside the grace period and outside drought.
- For clarity, full abatement will apply for that part of the 14 months that falls outside the grace period, but within drought.

The 2017 Metropolitan Water Plan provides for a 14-month minimum run time during drought. This was not included in our Draft Report, as the 2017 Metropolitan Water Plan was released shortly before the publication of our Draft Report. The 2017 Metropolitan Water plan states the purpose of the 14-month minimum run time is to mitigate the risks associated with the restart of the plant and provide certainty to the operator in terms of staff recruitment.[138]

According to the 2017 Metropolitan Water Plan, the 14-month minimum run time comprises six months of running the plant in addition to a maximum 8-month start-up:

> … even if storage levels return to above the designated 'off' point for the plant. Outside the new minimum run time, the 70 per cent (of storage levels) 'off' trigger then applies.[139]

This 14-month minimum run time applies at SDP's discretion. It would apply from the first time dam levels reach 60% in a drought episode for a period of 14 months. Where dam levels reach 60% multiple times in a single drought episode, the minimum run time would only apply once.

Our view is SDP would need to notify Sydney Water of its intention to 'opt-in' to the minimum run time. Conversely, SDP would need to notify Sydney Water of its intention to 'opt-out' of the minimum run time.

We have relaxed the nil price to Sydney Water outside the 60/70 rule in order to accommodate the minimum run time. We have also considered if and how abatement should apply to the minimum run time.

3.6.1 Abatement factor applies to the 14-month minimum run time

In considering whether abatement should apply to the 14-month minimum run time, we have consulted with SDP, Sydney Water and NSW Treasury on this issue and considered their responses.

138 NSW Government, *2017 Metropolitan Water Plan*, March 2017, p 38.
139 NSW Government, *2017 Metropolitan Water Plan*, March 2017, p 38.

As noted in Chapter 2, we have applied full abatement when SDP is **required** to produce – specifically, in its primary drought response role and its ancillary emergency response role. Outside these requirements, operation of the plant is at SDP's discretion and partial abatement applies.

The 14-month minimum run time is discretionary. In this sense, partial abatement would apply. That is, the abatement factor would be applied to the minimum run time but the volumes produced would not influence the calculation of the abatement factor. While this would enable SDP to retain discretion over the volume of water it produces as intended, this would not enable SDP to influence the abatement factor in its favour during the minimum run time.

An alternative argument may be made that fully exempting SDP from abatement better accords with this discretion (no abatement during a minimum run time). But we do not consider this retains a strong financial incentive for SDP to operate as required during drought. With partial abatement, **past** performance during drought (rather than performance during the minimum run time) could nonetheless impact the fixed charges that SDP would receive through the abatement factor.

Nor do we consider partial abatement to create a disincentive for SDP to exercise its minimum run time option. This because under our new abatement mechanism SDP has increased flexibility to manage the abatement factor that carries forward into future production periods, including a minimum run time. SDP can therefore prevent the future application of an abatement factor of less than one to its service charges.

Partial abatement is also consistent with the abatement regime applied during the grace period when SDP is ramping-up production in response to drought and, therefore, with the view that the minimum run time is simply the equivalent ramp-down period after drought.

3.6.2 How abatement would work during the 14-month minimum run time

As noted above, the 14-month minimum run time would comprise an 8-month start up period and a 6-month plant operation period. The 8-month start up or 'grace' period would be triggered by dam levels reaching 60%. This 'grace' period would then apply for eight months, regardless of dam levels. SDP would then have another 6 months of full production at its discretion.

During the 'grace' period, the abatement factor would apply to SDP's fixed charges. But the volumes produced would not affect the abatement factor. During the plant operation period the volumes produced would also **not affect** the abatement factor once dam levels have reached 70%. That is, outside the drought period partial abatement applies, similar to the grace period.

For clarity, the volumes produced would **affect** the abatement factor as long as dam levels have not yet reached 70%. That is, the plant would be operating in a drought period and full abatement applies, as outlined earlier in the chapter.

SDP may choose to opt out of the minimum run time at any point (and therefore shutdown). If it does so, abatement would cease to apply. SDP would need to notify Sydney Water of its intention to both 'opt-in' and 'opt-out' of the minimum run time.

4 Accommodating emergency response outside drought

While SDP's emergency response role is ancillary to its primary purpose of responding to drought, we have made changes to the regulatory framework to better accommodate this function. SDP is available to supply water to Sydney Water if required for public health, network stability, unavailability or maintenance in Sydney Water's area of operations.[140] The 2017 Metropolitan Water Plan has also made this role explicit.[141]

We have relaxed the nil price to Sydney Water in circumstances where SDP is required to produce water as part of its emergency response role. However, prices for water supplied in an emergency response remain regulated. Our view is that SDP would likely have monopoly power in these circumstances, which could prevent 'win-win' agreements from occurring if prices were negotiated.

We have also extended abatement to SDP's emergency response role. This acknowledges that abatement provides financial incentives for SDP's performance if called upon in this role. In making our decision, we also considered a range of matters under section 15 of the IPART Act, including potential impacts on customers. We have consulted with SDP, Sydney Water and NSW Treasury on this issue and considered their responses.

4.1 Pricing SDP's emergency response role

We have made a decision to:

14 Relax the nil price outside drought to Sydney Water in the exceptional circumstances specified in the Water Supply Agreement, which are to:

- mitigate the effects of a public health incident, or
- ensure security of supply or network stability during periods of outages, unavailability or maintenance on any water industry infrastructure in Sydney Water's area of operations.

In the 2012 Determination, we set a nil price for any water supplied to Sydney Water outside drought, effectively creating no financial incentive for SDP to supply Sydney Water outside drought, even where this could benefit both parties. In our Issues Paper, we questioned whether this pricing constraint should be relaxed. However, we noted that relaxing this pricing constraint would need to be contingent on Sydney Water not having to take water imprudently from SDP.[142]

140 SDP pricing proposal to IPART, October 2016, p 9.
141 NSW Government, *2017 Metropolitan Water Plan*, March 2017, p 38.
142 IPART, *Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2017 – Issues Paper*, August 2016, p 46.

4.1.1 Sydney Water objected to removing the nil charge except for the exceptional circumstances outlined in the Water Supply Agreement

Sydney Water considered the nil charge should remain in place, unless it has called for water under the specific circumstances outlined in the Water Supply Agreement and then only at regulated prices.[143] It has argued that broader removal of the nil price outside drought conditions would require an amendment to the current Water Supply Agreement, because under that agreement Sydney Water must accept all water supplied from SDP, even if it is at a higher price than other water sources.[144] In our Issues Paper, we noted this take arrangement as a potential impediment to SDP and Sydney Water operating flexibly outside the drought rule.[145]

Sydney Water did not support changing the Water Supply Agreement because it may trigger a re-assessment of the accounting treatment of the SDP lease.[146] This, in turn, could have significant implications for the financial position of Sydney Water, with negative impacts on its financeability.[147] Changes to the Water Supply Agreement would also incur significant transaction costs for all parties.

Removing the nil charge for exceptional circumstances only

We consider relaxing the nil price in line with Sydney Water's proposal better aligns our determination with the current Water Supply Agreement. It would also allow SDP to be paid when required under the Water Supply Agreement to operate the plant as an emergency response measure. As noted by SDP, the Water Supply Agreement requires Sydney Water to reimburse SDP the 'reasonable costs' for doing so, but the 2012 Determination prevents this.[148]

We did not relax the nil price uniformly outside drought conditions because we recognise Sydney Water's view that this would require changes to the Water Supply Agreement and in part have accounting implications. At the Public Hearing, SDP also agreed with Sydney Water that not changing the Water Supply Agreement is an important matter.[149] Further, we note that removing the nil price to Sydney Water outside the drought rule would also weaken SDP's incentives to seek third-party customers and increase SDP's dependence on Sydney Water.

One exception, however, is that we have relaxed the nil price to accommodate the optional 14-month minimum run time provided to SDP in the 2017 Metropolitan Water Plan. This is discussed in Chapter 3.

143 Sydney Water submission to IPART Issues Paper, November 2016, pp 34-35.
144 Sydney Water submission to IPART Issues Paper, November 2016, p 33.
145 IPART, *Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2017 – Issues Paper*, August 2016, p 46.
146 Sydney Water submission to IPART Issues Paper, November 2016, p 34.
147 Sydney Water submission to IPART Issues Paper, November 2016, pp 34-35.
148 SDP pricing proposal to IPART, October 2016, p 117.
149 IPART, SDP public hearing transcript, 8 December 2016, p 29.

Prices in an emergency response should be regulated

SDP proposed that the Determination allow SDP and Sydney Water to agree an appropriate charge if Sydney Water requests SDP to operate for emergencies.[150] In seeking an unregulated pricing agreement, SDP stated that its intention was that the agreement would be consistent with the terms of the Water Supply Agreement.[151]

We agree with Sydney Water that the supply of desalinated water under the specific circumstances outlined in the Water Supply Agreement should be regulated. In these circumstances, it is reasonable to expect that SDP would have monopoly power, which could prevent 'win-win' agreements from occurring if prices were negotiated.

SDP also supported the draft decision to remove the nil charge for supply of water in exceptional circumstances. However, it noted that the application of a regulated charge outside of drought will only allow SDP to recover the costs of the regulated services, namely an 8-month restart followed by full operation at design capacity. SDP argued that it would be unable to deliver alternative operational modes, such as a low flow mode, which incur different costs.[152]

We consider our charges are cost reflective and are therefore in keeping with SDP using reasonable endeavours to supply any amount of desalinated water within the shortest period of time. Similarly, they are consistent with Sydney Water having to reimburse SDP the reasonable costs of doing so, as stipulated under the Water Supply Agreement.[153] This is because the prices we have set reflect the efficient costs of service provision:

- the base service charge reflects SDP's efficient fixed costs when in water security (shutdown) mode
- the incremental service charges and one-off transition charges we set recover fixed costs incurred by SDP from operating the plant (regardless of volumes of water supplied), and
- the water usage charge we set reflects SDP's incremental costs (variable operating costs) of supplying each ML of water.

Our decision to review membrane costs ex-post if the plant operates in an emergency response also ensures that only the membranes required to respond to the emergency are paid for. Our price structures and cost sharing rules are outlined in detail in Chapters 10 to 12.

150 IPART, SDP public hearing transcript, 8 December 2016, p 29.
151 IPART, SDP public hearing transcript, 8 December 2016, p 29.
152 SDP submission to IPART Draft Report, April 2017, p 10.
153 SDP pricing proposal to IPART, October 2016, p 117.

4.2 Abatement also applies to water produced in an emergency response role

We have made a decision to:

15 Apply full abatement to SDP's fixed charges when it is producing water in response to an Emergency Response Notice from Sydney Water. That is, the abatement factor:

- applies to SDP's service charges and the volumes produced affect its calculation.

As noted in Chapter 2, SDP has an emergency response role under the 2017 Metropolitan Water Plan and the Water Supply Agreement. This requires SDP to make reasonable endeavours to supply Sydney Water with drinking water to mitigate the effect of a public health incident or to ensure security of supply or network stability in Sydney Water's area of operations. In these circumstances, the plant does not necessarily need to supply water at full capacity.

While SDP's emergency response role is ancillary to its primary purpose of responding to drought, we have made changes to the regulatory framework to better accommodate this function. We have introduced financial incentives similar to those that apply in drought to ensure that SDP responds to an emergency, if required to do so. These incentives are, however, subject to agreed levels of supply between SDP and Sydney Water.

In our Draft Report, we decided to exempt SDP's fixed charges from abatement if it was producing water in an emergency response role.[154] This is because the objectives of maximising production during drought do not apply to an emergency response role, where the plant may not need to supply desalinated water at full capacity.[155]

Since the release of our Draft Report, we have reconsidered if and how abatement should apply to SDP's emergency response role, in response to Sydney Water's submission that abatement should apply outside drought.[156] Sydney Water asserted that abatement is a standard feature of modern service contracts. It is an important mitigation against the risk that a provider will not perform to the level expected by customers.[157] In its submission to our Draft Report, SDP accepted our original decision not to abate its emergency response role.[158]

We consider there to be merit in Sydney Water's view. While the emergency response role may not require SDP to produce water at full capacity, it is nonetheless a situation where the production of water is important. As such, it is also enshrined in the 2017 Metropolitan Water Plan.[159] In an emergency response, Sydney Water, and its customers, would be relying upon the production of water by SDP.

We acknowledge that SDP is only required to use its reasonable endeavours to produce water in an emergency response role. But this does not mean that it should not be held

154 IPART, *Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2017 – Draft Report,* March 2017, p 41.
155 IPART, *Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2017 – Draft Report,* March 2017, pp 41-42.
156 Sydney Water submission to IPART Draft Report, April 2017, p 16.
157 Sydney Water submission to IPART Draft Report, April 2017, p 15.
158 SDP submission to IPART Draft Report - Appendices, April 2017, p 23.
159 NSW Government, *2017 Metropolitan Water Plan*, March 2017, p 38

accountable for the production of water, notwithstanding this lesser standard. Abatement may be an appropriate mechanism with which to provide incentives to SDP to produce the agreed amount of water in its emergency response role, in accordance with an Emergency Response Notice from Sydney Water.

In making our decision, we also considered a range of matters under section 15 of the IPART Act, including potential impacts on customers. We have consulted with SDP, Sydney Water and NSW Treasury on this issue and considered their responses.

We have thus decided to extend abatement to SDP's emergency response role, subject to modifications that recognise production in these circumstances is more flexible than within drought.

4.3 Abatement in an emergency response role mirrors the abatement arrangements that exist in drought

We have made a decision to:

16 Provide SDP with an option of a 'grace' period of up to 8 months from abatement when it is producing water in response to an Emergency Response Notice from Sydney Water:

- The daily volumes of production will not be included in the abatement factor for the grace period.
- The abatement factor, however, will still apply during the grace period.
- SDP is able to opt out of the grace period at its discretion.

17 Allow the denominator for the abatement factor to be the amount agreed between SDP and Sydney Water following the issue of an Emergency Response Notice. However:

- A cap would apply to the numerator in the abatement factor so that it could not exceed 110% of the value of the denominator.
- SDP can manage fluctuations in output during an emergency response period within the 10% cap.
- Fixed charges would be trued-up to claw back any over-recovery of revenue over a single emergency response episode.

18 Retain and use the abatement factor if SDP exits an emergency response period with an abatement factor of less than one.

We consider the abatement regime in emergency response should reflect that which operates in drought, subject to minor modifications. Notably, SDP and Sydney Water would be able to agree on the volumes used to determine the abatement factor.

Our view is Sydney Water's Emergency Response Notice (ie, its request for water) should embody the outcome of negotiations between the parties on how much water SDP should produce in such a situation. This is consistent with the intention of the Water Supply Agreement. It also reflects the approach we have taken to date, for example, by not including a membrane charge for emergency response.

Given that volumes produced during an emergency response need not be at full capacity and can vary, we have capped the numerator in the abatement factor so that it cannot not

exceed 110% of the value of the denominator. Much like the drought abatement mechanism, SDP can manage short-term fluctuations in output around the agreed volumes, but only up to the cap. A true-up will also apply to manage potential over-recovery of fixed charges (details of the true-up mechanism are outlined in detail in Chapter 3).[160]

We have also enabled SDP to respond to an emergency in a period up to eight months without penalty. This is consistent with Atkins Cardno's view of the scope of activities that have to be undertaken on restart (as discussed in Chapter 2). In circumstances where an emergency response may continue for more than eight months (eg, a planned outage or maintenance), the abatement mechanism would provide an incentive to SDP to produce sufficient water for Sydney Water's needs.

Last, we have maintained our decision to carry forward abatement factors into future periods of production if SDP exits an emergency response period with an abatement factor of less than one.

We note SDP opposed the carryover of the abatement factor from one drought response period to the next, and generally considered that whenever it is abated the factor should be reset to one at the conclusion of a production period. But we consider this to underpin the abatement mechanism and its incentives. It ensures that SDP would produce sufficient water, even in periods of short duration, because of the potential for this to impact its service charges for future periods.

Similar to the abatement mechanism that applies during drought, the new abatement regime for an emergency response would also only commence on 13 December 2018, once the plant has been reinstated.

160 We note that the true-up mechanism applied to an emergency response period would need to distinguish between impactors that pay the base service charge (including Sydney Water) and the beneficiary that pays as the incremental service charge (only Sydney Water).

5 SDP's revenue requirement

The notional revenue requirement (NRR) represents our view of the total efficient costs of providing SDP's monopoly services in each year of the 2017 determination period. We set prices to recover this amount of revenue. In this chapter, we present an overview of SDP's revenue requirement over the 2017 determination period when the plant is in water security (shutdown) and plant operation modes.

The revenue requirement we have set for SDP over the 2017 determination period reflects our decisions on:

- efficient operating and capital expenditure
- the value of the Regulatory Asset Base (RAB)
- the Weighted Average Cost of Capital (WACC) and allowance for return on capital
- regulatory depreciation, including asset lives, and
- taxation allowance for the plant and pipeline.

Our decisions on these cost items are covered in detail in Chapters 6 to 9.

Consistent with our Terms of Reference, SDP's NRR includes additional allowances for an:

- energy adjustment mechanism (EnAM), and
- efficiency adjustment mechanism (EfAM).

The EnAM passes through to customers, outside a core band, the gains or losses SDP incurs on the sale of the surplus energy it has contracted. The EfAM is an efficiency carryover mechanism that allows SDP to retain efficiency savings for up to five years from when they are realised. In this chapter, we also outline our decisions on these allowances and their impact on SDP's NRR.

5.1 Overview of SDP's notional revenue requirement over the 2017 determination period

We have made a decision to:

19 Set SDP's notional revenue requirement in each year of the 2017 determination period for:

- the plant in operation and water security (shutdown) modes, as shown in Table 5.1, and
- the pipeline across all modes of operation, as shown in Table 5.2.

As per the 2012 Determination, we use a building block method to calculate SDP's revenue requirement (see Appendix C). Unlike other water utilities, SDP's costs, and thus its prices, vary depending on what operating mode it is in.

We calculate SDP's revenue requirements for:

1. water security (shutdown) mode, and
2. plant operation mode.

The key difference in the NRR between water security (shutdown) and plant operation modes relates to the additional operating expenditure required to produce desalinated water (primarily, energy and chemical costs). The return on capital (funding costs) and return of assets (depreciation) for SDP are identical under both water security (shutdown) mode and plant operation mode.

We also separately determine the building block costs for the distribution pipeline. The pipeline costs (and prices) do not vary by mode of operation. The annual building block components for the plant and pipeline in plant operation and water security modes are presented in Table 5.1 and Table 5.2, respectively.[161]

Table 5.1 Plant – notional revenue requirement by building block ($million, $2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Water security (shutdown) mode						
Return on capital	58.2	56.3	54.4	52.6	50.7	272.2
Depreciation	43.0	43.1	43.1	43.2	43.3	215.6
Operating costs	18.0	17.8	17.7	17.1	16.9	87.6
Tax allowance	8.3	9.0	9.5	10.0	10.5	47.3
Return on working capital	0.2	0.2	0.2	0.2	0.2	0.8
EnAM	5.8	5.8	5.8	5.8	5.8	28.8
EfAM	0.1	0.1	0.1	0.0	0.0	0.2
Total NRR	**133.5**	**132.2**	**130.7**	**128.8**	**127.3**	**652.4**
Plant operation mode						
Return on capital	58.2	56.3	54.4	52.6	50.7	272.2
Depreciation	43.0	43.1	43.1	43.2	43.3	215.6
Operating costs	102.6	91.0	85.5	82.0	81.3	442.3
Tax allowance	8.3	9.0	9.5	10.0	10.5	47.3
Return on working capital	0.0	0.0	0.0	0.0	0.0	0.2
EnAM	5.8	5.8	5.8	5.8	5.8	28.8
EfAM	0.1	0.1	0.1	0.0	0.0	0.2
Total NRR	**217.9**	**205.2**	**198.3**	**193.5**	**191.5**	**1,006.5**

Note: Numbers may not add due to rounding.

Data source: IPART analysis.

161 We have set transition charges, which will reflect the efficient fixed one-off operating costs incurred when the plant movies from shutdown into operation mode and vice versa. These costs are not included in the NRR set out in this chapter.

Table 5.2 Pipeline - notional revenue requirement by building block ($million, $2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Plant operation and water security (shutdown) modes						
Return on capital	32.2	32.0	31.7	31.4	31.1	158.4
Depreciation	5.8	5.8	5.8	5.8	5.8	29.2
Operating costs	0.3	0.3	0.3	0.3	0.3	1.6
Tax allowance	-2.3	-2.0	-1.8	-1.5	-1.3	-8.8
Return on working capital	0.1	0.1	0.1	0.1	0.1	0.3
EnAM	0.0	0.0	0.0	0.0	0.0	0.0
EfAM	0.0	0.0	0.0	0.0	0.0	0.0
Total NRR	**36.2**	**36.2**	**36.2**	**36.1**	**36.1**	**180.7**

Note: Numbers may not add due to rounding.

Data source: IPART analysis.

The NRR over the five years of the 2017 determination period for the **plant** is:

- Water security (shutdown) mode: $652.4 million, which is $17.7 million, or around 2.6%, lower than SDP's proposal.
- Plant operation mode: $1,006.5 million, which is $23.0 million, or around 2.2%, lower than SDP's proposal.

The NRR for the **pipeline** is $180.7 million, which is $1.8 million (or 1.0%) lower than SDP's proposal in both plant operation and water security (shutdown) modes.

Combined, EnAM and EfAM add to NRR for the plant and pipeline about 3.6% in water security (shutdown) mode and 2.5% in plant operation mode.

5.2 Notional revenue requirement (plant and pipeline) in water security (shutdown) mode

In water security (shutdown) mode, SDP proposed a total revenue requirement (for plant and pipeline) of $852.7 million over the 2017 determination period (on average, $170.5 million per year).[162]

Our total plant and pipeline NRR in water security (shutdown) mode is $833.2 million, which is $19.5 million lower than SDP's proposal over the 5-year period. This is due to a combination of factors offsetting each other including:

- a higher WACC of 4.7% compared to SDP's proposed WACC of 4.5%[163], due to updated market parameters
- transferring prudent and efficient periodic maintenance from operating costs to capital costs to allow a review of these costs at the next price review
- reduced operating costs mainly related to the disallowed partial plant test, and

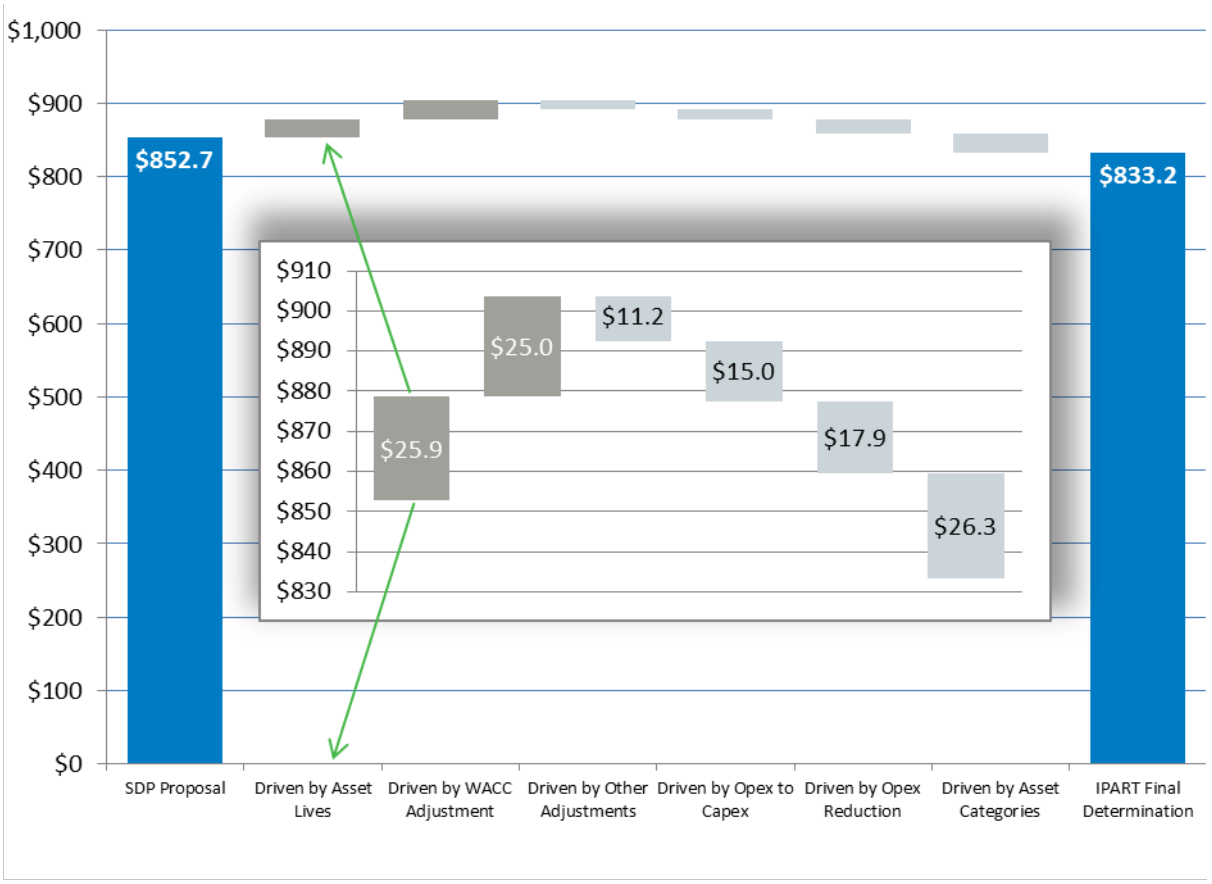
162 SDP pricing proposal to IPART, October 2016, p 55.
163 SDP pricing proposal to IPART, October 2016, pp 61-62.

- correcting existing asset lives and the classification of certain asset categories, which in net terms has had a relatively minor impact.

Overall, the higher WACC and adjustments to asset lives have offset many of our downward adjustments to SDP's proposed costs.[164] SDP's original WACC proposal of around 4.5% was based on IPART's biannual WACC update from August 2016.[165] Since then, several key WACC parameters have increased to reflect current market conditions.

Our NRR is shown in Figure 5.1, compared to SDP's initial proposed NRR.

Figure 5.1 Water security (shutdown) mode – IPART decision on notional revenue requirement (plant & pipeline) versus SDP proposed over the 5-year determination period ($million, $2016-17)



Note: The 'other adjustments' referred to in the figure relate to modelling related differences between SDP's proposal and IPART's analysis. The main components of this are: differences in the EnAM proposal and IPART's decision, updating working capital parameters, updating historical inflation for 2011-12 from 2.5% to 2.3%, and modelling discrepancies of around $4 million over the 2017 determination period.

Data source: IPART analysis and SDP pricing proposal to IPART, October 2016, p 55.

In annual terms our NRR is higher in 2017-18 and lower in all other years of the determination period than SDP's proposal. The profile of differences between SDP's and

164 Note that changing the WACC also affects the return on working capital, and the tax allowance. The impact on the return on working capital varies between the two modes due to the alternative operating cost profiles, and therefore the WACC impact varies marginally between the two modes of operation. The tax calculation is consistent between the two modes as operating costs are netted out of the tax calculation.

165 SDP pricing proposal to IPART, October 2016, pp 61-62.

our NRR estimates generally reflects lower efficient operating costs from 2018-19, and the removal of the partial plant test costs in 2020-21 and 2021-22.

On an NPV basis, our NRR of $708.4 million is $14.9 million lower than SDP's proposal of $723.4 million (using a real pre-tax discount rate of 5.7%).

Table 5.3 provides a yearly comparison of our NRR to SDP's proposed NRR.

Table 5.3 Water security (shutdown) mode – SDP proposed notional revenue requirement compared to IPART decision ($million, $2016-17)

	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	Total
IPART Decision							
Plant	143.4	133.5	132.2	130.7	128.8	127.3	652.4
Pipeline	51.5	36.2	36.2	36.2	36.1	36.1	180.7
Total	**194.9**	**169.7**	**168.3**	**166.8**	**164.9**	**163.4**	**833.2**
SDP Proposed							
Plant		130.6	132.1	131.1	139.4	137.0	670.2
Pipeline		36.6	36.6	36.5	36.5	36.4	182.6
Total		**167.2**	**168.7**	**167.6**	**175.8**	**173.4**	**852.7**
Difference							
Plant		2.9	0.1	-0.4	-10.6	-9.7	-17.7
Pipeline		-0.4	-0.4	-0.4	-0.3	-0.3	-1.8
Total		**2.4**	**-0.4**	**-0.8**	**-10.9**	**-10.0**	**-19.5**

Note: Numbers may not add due to rounding.

Data source: SDP pricing proposal to IPART, October 2016, p 55 and IPART analysis.

5.2.1 SDP's submission to our Draft Report

In response to our Draft Report, SDP revised its proposed NRR for the plant and pipeline in water security mode to $869.9 million over the 5-year period.[166] This is:

- $17.2 million more than SDP's original proposal, reflecting higher proposed funding costs in line with our draft WACC of 4.9%. This is partially offset by reductions in forecast operating expenditure, such as the exclusion of the partial plant test SDP had originally proposed and a 0.25% efficiency factor applied to corporate and labour costs.
- $22.2 million more than the NRR allowed for under our draft decision, reflecting a higher opening RAB, higher plant forecast operating expenditure and higher depreciation from a shorter pipeline asset life.

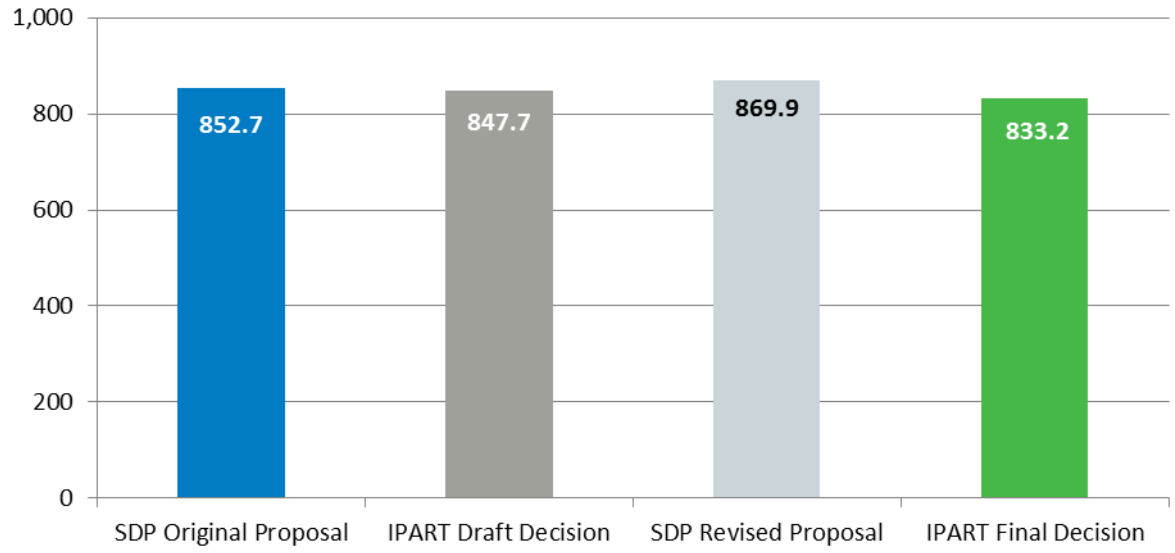
Since our Draft Report, we have updated the WACC to reflect latest market data, which has caused it to decrease by 20 basis points to 4.7% from the 4.9% used by SDP in its revised proposal. This explains most of the difference between SDP's revised revenue requirement and our final decision.

166 SDP submission to IPART Draft Report, April 2017, p 33. The figure includes an additional $3.7 million to the NRR presented in SDP's submission to the Draft Report, to account for additional insurance-related expenditure proposed by SDP in supplementary submissions that we received after April 2017.

In addition, we have maintained our draft decision on the asset life for new pipeline assets - ie, 120 years compared with SDP's proposal of 100 years. Differences in our WACC and pipeline asset life also have flow through effects to the tax allowance and return on working capital. SDP, in its revised submission, accepted many of our draft expenditure decisions.

Figure 5.2 compares our draft and final decisions on NRR to SDP's original and revised proposal.

Figure 5.2 Water security (shutdown) mode – SDP proposals versus IPART decision on notional revenue requirement over the 5-year determination period ($million, $2016-17)



Note: We have included the additional $3.7 million to the NRR presented in SDP's submission to the Draft Report to account for additional expenditure relating to insurance items proposed by SDP in supplementary submissions.

Data source: SDP pricing proposal to IPART, October 2016, p 55; SDP submission to IPART Draft Report, April 2017, p 33; and IPART analysis.

5.2.2 Compared to the 2012 determination period

When compared to the 2012 determination period, the NRR over the 2017 determination period is around 17.2% lower in water security (shutdown) mode. This is mainly due to calculating a better estimate of SDP's tax liability by moving from a pre-tax to a post-tax framework and the lower WACC over the 2017 determination period.

In the 2012 Determination, we set a real pre-tax WACC of 6.7%. Moving to a post-tax WACC framework has reduced the return on assets, because a tax allowance is now separately calculated. Broadly, this change accounts for around $170 million of the $255.8 million reduction in return on assets between the two determination periods. The reduction in the return on assets is offset by the introduction of a tax allowance of $38.4 million. The remainder of the reduction in the return on capital is the result of a lower WACC (on comparable terms to the 2012 Determination), and a declining asset base.

Our decision on total operating costs (plant and pipeline including energy) over the 2017 determination period is $89.2 million, which is $10.9 million higher than the

$78.3 million allowed for in the 2012 determination period. This is because lower operating costs for the plant in the 2017 determination period are offset by an increase in corporate costs compared to our 2012 Determination.

Table 5.4 provides a comparison of NRR by each cost component over the two determination periods.

Table 5.4 Water security (shutdown) mode – IPART 2012 Determination and 2017 Determination (plant & pipeline) ($million, $2016-17)

Building block	2012 Determination	2017 Determination	Difference	Difference (%)
Return on capital	686.4	430.7	-255.8	-37.3%
Depreciation	230.3	244.8	14.5	6.3%
Operating costs	78.3	89.2	10.9	14.0%
Tax allowance	0.0	38.4	38.4	
Return on working capital	11.3	1.2	-10.1	-89.7%
EnAM	0.0	28.8	28.8	
EfAM	0.0	0.2	0.2	
Total	**1,006.3**	**833.2**	**-173.1**	**-17.2%**

Note: Numbers may not add due to rounding.

Data source: IPART analysis.

5.3 Notional revenue requirement (plant and pipeline) in plant operation mode

In plant operation mode, SDP proposed a NRR of $1,212.1 million over the 2017 determination period (on average, $242.4 million per year).[167]

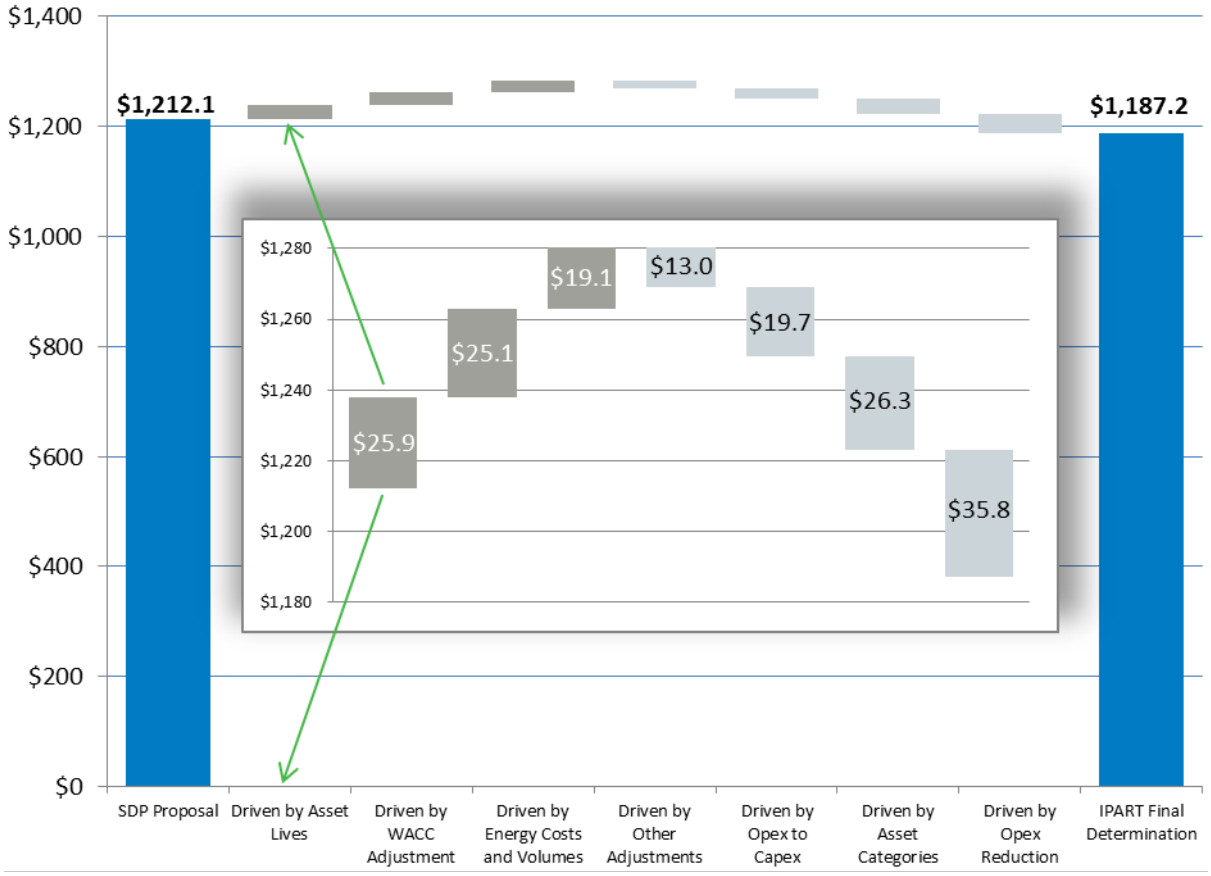
Our NRR in plant operation mode is $1,187.2 million, which is $24.8 million lower than SDP's proposal over the five-year period. This is due to the combination of factors which partially offset each other, including:

- a higher WACC of 4.7% compared to SDP's proposed WACC of 4.5%, due to updated market parameters
- higher energy costs due to higher benchmark unit prices, offset by lower benchmark volumes
- lower operating costs related mainly to chemicals and labour, and the removal of ongoing membrane replacement costs
- transferring prudent and efficient periodic maintenance from operating costs to capital costs to allow a review of these costs at the next price review, and
- correcting existing asset lives and the classification of certain asset categories, which in net terms has had a relatively minor impact.

Our NRR is shown below in Figure 5.3, compared to SDP's initial proposed NRR.

167 SDP pricing proposal to IPART, October 2016, p 55.

Figure 5.3 Plant operation mode - IPART decision on notional revenue requirement (plant & pipeline) versus SDP proposed over the 5-year determination period ($million, $2016-17)



Note: The 'other adjustments' referred to in the figure relate to modelling related differences between SDP's proposal and IPART's analysis. The main components of this are: differences in the EnAM proposal and IPART's decision, updating working capital parameters, updating historical inflation for 2011-12 from 2.5% to 2.3%, and modelling discrepancies of around $4 million over the 2017 determination period.

Data source: IPART analysis and SDP pricing proposal to IPART, October 2016, p 55.

In annual terms, our NRR is above SDP's proposal in 2017-18, but below SDP's in all other years of the 2017 determination period. The yearly differences between our NRR and SDP's proposal is due mainly to our benchmark estimates of energy costs, and adjustments we made to other components of SDP's proposed operating costs.

Notably, we removed operating costs relating to membrane replacement, capitalised prudent and efficient periodic maintenance costs, and reduced some operating costs line items such as chemicals and labour. These changes have a larger impact on SDP's NRR in plant operation mode than water security (shutdown) mode.

The decisions we have made on energy costs (see Chapter 8) have also significantly impacted SDP's NRR in plant operation mode, compared to water security (shutdown) mode. This is due to the energy intensive nature of the desalination process when the plant is producing potable water. Our use of benchmark unit prices has increased SDP's NRR over the first two years of the determination period. This is offset though by lower benchmark volumes. Overall, 21.3% of the NRR in plant operation mode relates to energy costs, compared to under 0.5% in water security (shutdown) mode.

On an NPV basis, our NRR is $1,011.5 million compared to SDP's proposal of $1,030.1 million (using a real pre-tax discount rate of 5.7%).

Table 5.5 provides a yearly comparison of our NRR to SDP's proposed NRR.

Table 5.5 Plant operation mode – SDP proposed notional revenue requirement compared to IPART decision ($million, $2016-17)

	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	Total
IPART Decision							
Plant	218.9	217.9	205.2	198.3	193.5	191.5	1,006.5
Pipeline	51.5	36.2	36.2	36.2	36.1	36.1	180.7
Total	**270.4**	**254.1**	**241.4**	**234.5**	**229.7**	**227.6**	**1,187.2**
SDP Proposed							
Plant		208.1	207.0	205.8	204.9	203.7	1,029.5
Pipeline		36.6	36.6	36.5	36.5	36.4	182.6
Total		**244.7**	**243.6**	**242.3**	**241.4**	**240.1**	**1,212.1**
Difference							
Plant		9.8	-1.8	-7.5	-11.4	-12.1	-23.0
Pipeline		-0.4	-0.4	-0.4	-0.3	-0.3	-1.8
Total		**9.3**	**-2.2**	**-7.8**	**-11.7**	**-12.4**	**-24.8**

Note: Numbers may not add due to rounding.

Data source: SDP pricing proposal to IPART, October 2016, p 55 and IPART analysis.

5.3.1 SDP's submission to our Draft Report

In response to our Draft Report, SDP revised its proposed NRR for the plant and pipeline in plant operation mode to $1,187.4 million over the 5-year period.[168] This is:

- $24.7 million less than SDP's original proposal, reflecting lower proposed energy and operating costs, partially offset by higher proposed funding costs in line with our draft WACC of 4.9%.
- $3.3 million less than the NRR allowed for under our draft decision, reflecting lower forecast operating expenditure (primarily energy costs), but a higher opening RAB and higher depreciation due to shorter pipeline asset lives.

SDP's revised NRR is similar to our final decision. This is because our lower cost of capital is largely offset by higher benchmark energy costs compared to SDP's revised proposal. Since the Draft Report, we have updated the following to reflect latest market information:

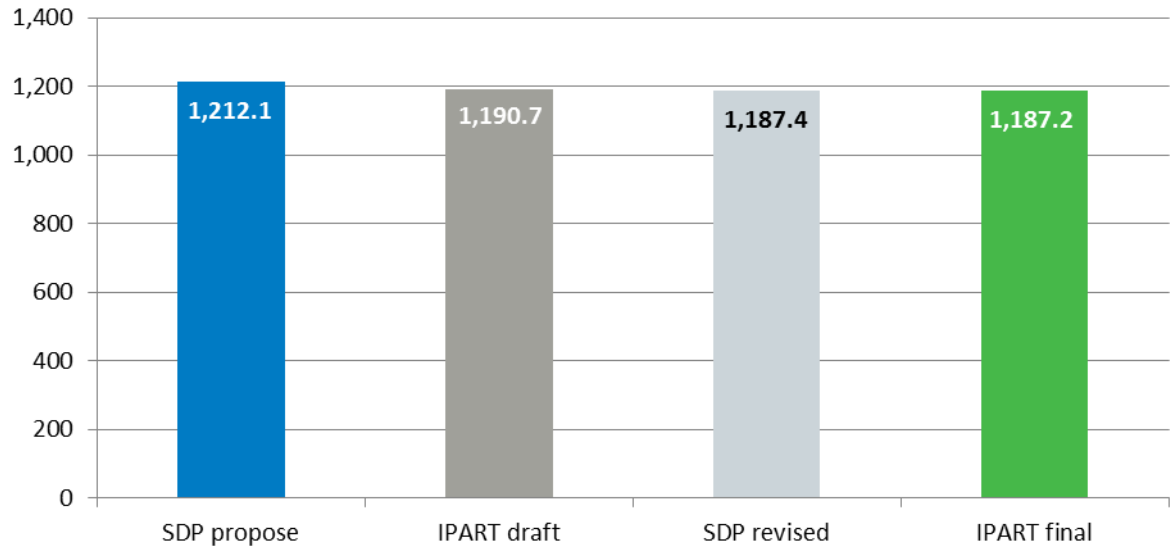
- the cost of capital (WACC), and
- benchmark energy prices.

168 SDP submission to IPART Draft Report, April 2017, p 36. The figure includes an additional $2.8 million to the NRR presented in SDP's submission to the Draft Report, to account for additional insurance-related expenditure proposed by SDP in supplementary submissions that we received after April 2017.

We have also maintained our draft decision on the asset life for new pipeline assets - ie, 120 years compared with SDP's proposal of 100 years. We have also made minor changes to operating and capital costs, based on our consultant's review of SDP's and the stakeholders' submissions to our draft expenditure decisions.

Figure 5.4 compares our draft and final decisions on the NRR to SDP's original and revised proposal.

Figure 5.4 Plant operation mode – SDP proposals versus IPART decision on notional revenue requirement over the 5-year determination period ($million, $2016-17)



Note: We have included an additional $2.8 million to the NRR presented in SDP's submission to the Draft Report to account for additional expenditure relating to insurance items proposed by SDP in supplementary submissions.

Data source: SDP pricing proposal to IPART, October 2016, p 55; SDP submission to IPART Draft Report, April 2017, p 36; and IPART analysis.

5.3.2 Compared to the 2012 determination period

When compared to the 2012 determination period, the NRR over the 2017 determination period is around 12.6% lower in plant operation mode. Again, this is mainly due to the lower WACC and a better estimate of SDP's tax liability which arises from moving to a post-tax framework from a pre-tax framework.

Operating costs have increased under the 2017 determination period. This reflects market movements in input costs, particularly energy. The energy cost allowance has increased by $29.7 million (or 13.3%) over the two determination periods, due to higher benchmark prices (note, this comparison assumed SDP would be in plant operation mode over the 2012 and 2017 determination periods). The increase in benchmark prices is mainly due to increases in wholesale energy (up 49%), which has been partially offset by a 12% decline in the renewable energy component of the benchmark price. This is discussed in further detail in Chapter 8.

Holding energy costs constant, operating costs have decreased significantly over the two determination periods. This is mainly due to our decision to capitalise prudent and efficient periodic maintenance and membrane replacement costs (outlined in Chapter 7).

Table 5.6 provides a comparison of NRR by each cost component over the two determination periods.

Table 5.6 Plant operation mode – IPART 2012 determination and 2017 determination periods (plant & pipeline) ($million, $2016-17)

Building block	2012 Determination	2017 Determination	Difference	Difference (%)
Return on capital	686.4	430.7	-255.8	-37.3%
Depreciation	230.3	244.8	14.5	6.3%
Operating costs	430.7	443.9	13.2	3.1%
Tax allowance	0.0	38.4	38.4	
Return on working capital	11.3	0.5	-10.8	-95.6%
EnAM	0.0	28.8	28.8	
EfAM	0.0	0.2	0.2	
Total	**1,358.7**	**1,187.2**	**-171.5**	**-12.6%**

Note: Numbers may not add due to rounding.

Data source: IPART analysis.

5.4 Revenue adjustments required by the Terms of Reference

The Terms of Reference requires us to treat demonstrated efficiency savings and energy gains or losses in accordance with our Methodology Paper for the EnAM and EfAM.[169]

In this section, we outline how we have calculated the adjustments for each mechanism and how these separate adjustments are to be passed through into prices from 1 July 2017.

The Terms of Reference allows us to update the Methodology Paper from time to time. Concurrently with the SDP price review, we have released a 2017 Methodology Paper.

5.4.1 Allowances for the energy adjustment mechanism

We have made a decision to:

20 Include an allowance in prices over the 2017 determination period for the losses made on the sale of SDP's surplus energy while it was shutdown over the 2012 determination period of $28.8 million or $5.8 million per year (real $2016-17 and including financing costs). This is consistent with the Terms of Reference.

The purpose of the EnAM is to pass through to customers any gains and/or losses outside a core band from the sale of SDP's surplus energy while it was shutdown (four year period from 2012-13 to 2015-16). Surplus energy includes electricity and Renewable Energy Certificates (RECs).

169 In April 2012, we released the *Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms - Methodology Paper*, April 2012, following consultation.

The 2012 Methodology Paper sets a threshold for the core band at plus or minus 5% of the total value of SDP's contracted energy. Gains (losses) on the sale of surplus energy when SDP is in shutdown or restart are shared on the following basis:

- SDP share: 100% within the threshold and 10% outside the threshold.
- Customer share: 90% outside the threshold.

Following our analysis, we have accepted SDP's proposed losses on the sale of its surplus energy

We have allowed a total EnAM allowance of $29.0 million or $5.8 million per year (including financing costs) over the 2017 determination period. This is based on:

- The recommendation of our consultant, Marsden Jacob, on the gains and losses eligible for inclusion in the EnAM,[170] and
- our application of financing costs.

This is equivalent to passing through $24.5 million (nominal and excluding financing costs) or 72% of SDP's losses from the sale of surplus energy from 2012-13 to 2015-16. Our EnAM allowances are consistent with SDP's proposed allocation of losses under the EnAM.[171]

The 2012 Methodology Paper states that we will include financing costs when calculating EnAM allowances to pass through into prices. Table 5.7 presents the customers' share of losses on the sale of SDP's surplus energy over the EnAM application period (ie, 2012-13 to 2015-16) before and after the application of 2012 financing costs. Table 5.8 presents our EnAM allowances for the 2017 determination period, including 2017 financing costs.

EnAM allowances represent about 3.6% (plant operation mode) of SDP's NRR over the 2017 determination period. This adds about $15,791 to SDP's daily fixed service charge.

Table 5.7 Gains and losses over the EnAM application period ($million)

	2012-13	2013-14	2014-15	2015-16	2016-17	Total
Customer share of losses excluding financing costs ($nominal)	**Commercial in Confidence**				-	24.5
Financing costs (%nominal)[a]	5.1%	4.7%	4.0%	4.5%	3.5%	
Customer share of losses including financing costs ($2016-17)	**Commercial in Confidence**				**-**	**28.0**

[a] This is the average based on the 12 months of data for each financial year. To apply half a year of financing costs (ie, to move a mid-year amount to an end-of-year amount), the financing cost rate for the relevant year (ie, i) is converted to a 6-month rate using the formula: $(1+i)^{0.5}-1$.

Note: We have redacted the annual information on customers' share of gains or losses because this information could be used to derive SDP's energy contract prices, which are commercial in confidence. Numbers may not add due to rounding.

Data source: RBA, Non-financial corporate BBB-rated bonds, Yield, 3 year target tenor. Series ID: FNFYBBB3M. IPART analysis.

170 Marsden Jacob, *Energy Review – SDP*, February 2017, p 1.
171 SDP pricing proposal to IPART, October 2016, p 47.

Table 5.8 EnAM allowances for 2017 determination period ($million, $2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
2017 financing costs (%real)[a]	1.2%	1.2%	1.2%	1.2%	1.2%	-
EnAM allowances including 2017 financing costs	**5.8**	**5.8**	**5.8**	**5.8**	**5.8**	**28.8**

[a] This is an average based on the last 12 months of available information (ie, May 2016 to April 2017), and converted to real using the RBA's current inflation forecast for 2016-17 of 2.0% (from RBA, Statement of Monetary Policy, May 2017, p 55, Table 6.1).

Note: Numbers may not add due to rounding.

Data source: RBA, Non-financial corporate BBB-rated bonds, Yield, 3 year target tenor. Series ID: FNFYBBB3M. IPART analysis.

We have found no evidence of manifest imprudence in SDP's management of surplus energy

According to our 2012 Methodology Paper, SDP must act to minimise its exposure to losses on the resale of surplus electricity and RECs. In the case of any 'manifest imprudence' that may arise on the part of SDP, we may exclude the affected transactions (in whole or in part) from the energy adjustment mechanism.[172]

Over the review period 2012-13 to 2015-16, SDP has:

- taken the spot market price for its surplus electricity, and
- gradually released its surplus RECs into the market at the prevailing market price.

With the assistance of our energy consultants, Marsden Jacob, we reviewed SDP's energy trading policy and activity and consider there is no evidence of manifest imprudence in SDP's management of its surplus energy over the review period. We have therefore included all of SDP's surplus energy transactions over the review period in the energy adjustment mechanism.

In response to our Issues Paper, Sydney Water suggested SDP could have more actively traded its surplus energy contracts, which would have reduced the losses passed on to Sydney Water's customers under the EnAM.[173] In our 2017 Methodology Paper, we have decided to enhance SDP's incentives to prudently manage its surplus energy over the 2017 determination period. Specifically, we propose to:

- Increase SDP's share of gains and losses outside the core band to provide SDP with a larger share of any gains it is able to achieve on the resale of its surplus energy.[174]
- Modify the prudence test from a test of 'no manifest imprudence' to a general test of 'the prudence of SDP's energy trading policy and activity'.[175]

Going forward, in applying this new test, IPART would need to assess whether SDP's approach to managing energy is prudent. Box 6.1 in Chapter 6 outlines our general approach to efficiency and prudence tests for expenditure. We note that our approach to assessing the prudency of SDP's surplus energy management will be tailored to the factors

172 IPART, *Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms - Methodology Paper*, April 2012, p 26.
173 Sydney Water submission to IPART Issues Paper, November 2016, pp 44-46.
174 IPART, 2017 *Methodology Paper - SDP*, June 2017, p 36.
175 IPART, 2017 *Methodology Paper - SDP*, June 2017, pp 41-42.

relevant to this activity. The 2017 Methodology Paper includes a discussion on how we intend to assess the prudency of SDP's surplus energy management at the next review.[176] We have accepted an amount equivalent to SDP's proposed energy trading costs of $0.52 million over the 2017 determination period to allow SDP to meet the strengthened prudency test.[177] This additional funding is not part of the EnAM allowance. Rather, we have included this additional funding in SDP's general operating expenditure allowance.

We note that in providing this additional funding, we are not prescribing how SDP should manage its surplus energy nor are we endorsing the trading strategies outlined in SDP's submission to our Draft Report (including its submission of a consultant report by Seed Advisory on energy trading). We will assess prudency at the next review and, as part of our prudency assessment, we will request that SDP demonstrate how it has prudently managed its surplus energy contracts. The 2017 Methodology Paper includes further discussion on our decision to provide additional funding to complement the strengthened prudency test.[178]

Subject to some modifications, we have followed our Methodology Paper to calculate EnAM allowances

The 2012 Methodology Paper states that we will account for financing costs through the EnAM. However, the Reserve Bank of Australia (RBA) corporate bond series identified in the 2012 Methodology Paper to undertake this process is no longer available.[179]

To address this issue, we decided to use a substitute RBA 3-year corporate bond series to calculate a present value of losses incurred over 2012-13 to 2015-16 to be passed through by the EnAM. We then used the most recent 12 months of this substitute series (adjusted to remove forecast inflation) to calculate annual EnAM allowances for the 2017 determination period. Box 5.1 provides more detail on the approach we undertook.

Our energy consultant, Marsden Jacob, reviewed and confirmed the accuracy of SDP's EnAM calculations and supporting information.[180]

176 IPART, 2017 Methodology Paper - SDP, June 2017, pp 41-42.
177 SDP submission to IPART Draft Report, April 2017, p 25. IPART, 2017 Methodology Paper – SDP, June 2017, p 42.
178 IPART, 2017 Methodology Paper - SDP, June 2017, p 42.
179 The Methodology Paper goes on to say that we will use the average of the corporate bond yield (with 1 to 5 years to maturity; BBB bond credit rating) at the end of each quarter of the year as published by the Reserve Bank of Australia." IPART, *Efficiency and Energy Adjustment Mechanisms, Methodology Paper*, April 2012, p 25.
180 Marsden Jacob, *Energy Review – SDP*, February 2017, pp 54-57.

Box 5.1 Steps in applying financing costs and calculating EnAM allowances

The following three steps show the process we adopted in arriving at our final EnAM allowances for the 2017 determination period (we provide illustrative examples under each step):

1. The customers' share of gains and losses for each year of the application period (assumed to be mid-year values) are escalated to a present value in the review year (assumed to be an end of year value for the review year). For example, the customers' share of gain or loss in 2012-13 (mid-year) will be escalated forward four and a half years to 2016-17 (end of year).

	2012-13	2013-14	2014-15	2015-16	2016-17	Total
Customer share excl. financing costs (mid-year)	$ 100	$ 100	$ 100	$ 100	-	$ 400
Annual financing costs (nominal)	4%	4%	4%	4%	4%	-
6 months of financing costs (nominal)	2%	2%	2%	2%	2%	-
Customer share incl. financing costs (end-of-year)	**$ 119**	**$ 115**	**$ 110**	**$ 106**	**-**	**$ 450**

2. An annuity is calculated over the 2017 determination period. The cash flows of this annuity (calculated as end of year values) are set such that the present value of the annuity as of 2016-17 (end of year) is equal to the present value of the customers' share of gains and losses as of 2016-17 (end of year).

	Present Value	2017-18	2018-19	2019-20	2020-21	2021-22
Annual financing costs (real)	-	1.5%	1.5%	1.5%	1.5%	1.5%
Annuity (end-of-year)	**$ 450**	**$ 94**	**$ 94**	**$ 94**	**$ 94**	**$ 94**

3. The cash flows of the annuity (end of year values) are each discounted back six months to arrive at EAM allowances (mid-year values).

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Annuity (end-of-year)	$ 94	$ 94	$ 94	$ 94	$ 94	$ 470
6 months of financing costs (real)	0.7%	0.7%	0.7%	0.7%	0.7%	-
EnAM allowance	**$ 93**	**$ 93**	**$ 93**	**$ 93**	**$ 93**	**$ 467**

In response to our Draft Report, SDP submitted that our EnAM allowances were below those it calculated.[181] We note that this is due to timing assumptions regarding when gains and losses are recognised.

In calculating final allowances for EnAM, we have decided that the most appropriate approach is to recognise gains and losses as mid-year amounts. This recognises that gains and losses on the sale of SDP's surplus energy are incurred throughout each year (not just at the beginning or end of the year). We have also decided to calculate the EnAM allowances as if they too occur at mid-year. This recognises that SDP will receive these amounts over the duration of each year (ie, not at the end of the year as previously assumed). Box 5.1 steps through the calculation process that we followed to apply financing costs to the customers' share of gains and losses and calculate annual EnAM allowances.

5.4.2 Allowances for the efficiency adjustment mechanism

We have made a decision to:

21 Include an efficiency carryover of $51,100 per annum for the first three years of the 2017 determination period based on applying the 2012 EfAM methodology.

[181] SDP submission to IPART Draft Report, April 2017, p 76.

SDP proposed to include $50,000 in its annual revenue requirement for the first three years of the 2017 determination period under the EfAM.[182] This efficiency gain reflects a reduction in insurance costs borne by SDP for its operator, Veolia.

We have decided to include this efficiency saving as part of the EfAM and apply it over the first three years of the 2017 determination period. The carryover period specified by the Terms of Reference for the EfAM is four years following the year in which the saving was achieved (ie, five consecutive years). The efficiency saving identified by SDP was achieved in 2015-16, which is the penultimate year of the 2012 determination period. By allowing SDP to retain this efficiency saving for the first three years of the 2017 determination period, SDP will have retained the saving for five consecutive years before the saving is passed on to customers through lower regulated prices from year four of the 2017 determination period.

While this efficiency saving relates to SDP uncovering a double counting of insurance costs, we consider this pass-through meets the objectives of the EfAM, by providing SDP with an incentive to identify and remove inefficiencies.

In response to our Draft Report, SDP accepted our EfAM allowance. Since the Draft Report we have inflated the $50,000 efficiency saving that was first achieved in 2015-16 from $2015-16 to $2016-17. This results in a small increase in the EfAM allowance from $50,000 per year to $51,100 per year.

Unlike the EnAM allowance, the EfAM allowance has a very minor impact on SDP's NRR and prices over the first three years of the 2017 determination period.

182 SDP pricing proposal to IPART, October 2016, p 65 and information submitted to IPART (communication with SDP, 2 December 2016).

6 Expenditure review

This chapter sets out our assessment of SDP's efficient level of expenditure over the 2017 determination period.

In making our decisions, we engaged Atkins Cardno to review the efficiency of SDP's proposed operating expenditure over the 2017 determination period. We asked Atkins Cardno to recommend any further efficiency savings that SDP should be able to achieve. In developing its recommendations, Atkins Cardno took into account international experience of desalination plants in shutdown modes and the effects of these long-term shutdowns on technical reliability of the plan and Good Industry Practice.[183]

We also assessed prudent and efficient capital expenditure over the 2012 determination period, to include into the opening RAB for the 2017 determination period. As with operating expenditure, we engaged Atkins Cardno to review SDP's historical and forecast capital expenditure and make recommendations on the amount of capital expenditure that should be included in the RAB.

Under the building block method, there is no explicit allowance for capital expenditure in the NRR. Instead, the prudent and efficient capital expenditure is added to the RAB and recovered through the allowances for a return on assets and regulatory depreciation.

All expenditures presented in this chapter include our decisions on efficient energy costs, which are presented separately in Chapter 8. Atkins Cardno reviewed SDP's efficient energy volumes in all operating modes. Efficient energy prices were reviewed by our energy consultant, Marsden Jacob. Therefore, all expenditure recommended by Atkins Cardno in this chapter includes Marsden Jacob's recommended benchmark energy prices.

6.1 Review of historical capital expenditure over the 2012 determination period

We have made a decision to:

22 Include in the RAB over the 2012 determination period prudent and efficient capital expenditure for the plant and pipeline as set out in Table 6.1 and Table 6.2. Our decision accepts SDP's proposed costs.

Our decisions on capital expenditure reflect our assessment of the efficient and prudent expenditure on capital works that should be included in the RAB, and hence recovered through prices. To decide how much capital expenditure is added to the RAB, we applied a prudence and efficiency test to SDP's actual capital expenditure over the 2012 determination period against the criteria in Box 6.1.

183 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 20.

Box 6.1 Efficiency test and prudence test

Efficiency test

In reviewing expenditure, the efficiency test is used to set how much of SDP's proposed expenditure (operating and capital) for the 2017 determination period will go into our determination of SDP's revenue requirement. The efficiency test should examine whether SDP's actual and proposed expenditure represents the best and most cost effective way of delivering the monopoly services.

The efficiency test examines whether the proposed capital expenditure represents the best way of meeting customers' needs (over the life of the asset), subject to the utility's regulatory requirements.

Prudence test

The prudence test assesses whether the decision to invest in an asset is one that SDP, acting prudently, would be expected to make in the circumstances existing at the time. The test assesses both:

- the prudence of how the decision was made to invest, and
- the prudence of how the investment was executed (ie, the construction or delivery of the asset), having regard to information available at the time.

In making our decisions, we drew upon the findings of our expenditure consultant, Atkins Cardno. Atkins Cardno found SDP's past capital expenditure over the 2012 determination period to be prudent and efficient. Most of the expenditure related to the replacement of the backup electricity supply, and was within the allowed capital expenditure of $1.7 million for the 2012 determination period.[184] Atkins Cardno recommended including $1.2 million of prudent and efficient capital expenditure between 2012-13 and 2016-17 in the plant's RAB.

Our decision on prudent and efficient capital expenditure over the 2012 determination period is presented in Table 6.1 and Table 6.2. Stakeholders did not comment on this issue.

Table 6.1 Prudent and efficient past capital expenditure – plant and corporate ($million, $2016-17)

	2012-13	2013-14	2014-15	2015-16	2016-17	Total
SDP actual	0.44	0.03	0.30	0.39	0.02	1.17
IPART decision	**0.44**	**0.03**	**0.30**	**0.39**	**0.02**	**1.17**

Data source: Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 57.

Table 6.2 Prudent and efficient past capital expenditure - pipeline ($million, $2016-17)

	2012-13	2013-14	2014-15	2015-16	2016-17	Total
SDP actual	0	0	0	0	0	0
IPART decision	**0**	**0**	**0**	**0**	**0**	**0**

Data source: Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 57.

184 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 56.

6.2 Review of forecast expenditure over the 2017 determination period

Atkins Cardno assessed SDP's proposed operating and capital expenditure for the plant and pipeline assets over the 2017 determination period. As noted above, we have updated Atkins Cardno's recommended expenditure to include Marsden Jacob's recommended final benchmark energy prices.

Over the five years of the 2017 determination period, Atkins Cardno[185] recommended the following adjustments in plant operating costs:

- In *water security (shutdown) mode*, a reduction of $38 million or 31% (from SDP's proposed $121.9 million to Atkins Cardno's recommended $83.9 million).
- In *plant operation mode*, a reduction of $41.8 million or 9% (from SDP's proposed $480.8 million to Atkins Cardno's recommended $438.9 million).

Many of the reductions in operating costs are due to Atkins Cardno reclassifying these costs as capital expenditure (ie, capitalising SDP's proposed periodic maintenance costs and ongoing membrane replacement costs subject to a prudence and efficiency review). This means that Atkins Cardno's recommended capital costs for the plant are higher than those proposed by SDP over the 2017 determination period.

Unlike the plant, pipeline expenditure does not vary by mode of operation. Atkins Cardno accepted SDP's forecast capital and operating expenditure costs for the pipeline.

SDP also incurs one-off operating costs when the plant transitions to and from shutdown. For these costs, Atkins Cardno recommended:

- In *transition to restart*, a reduction of $26.9 million or 68% (from SDP's proposed average restart charge of $39.3 million to Atkins Cardno's recommended average charge of $12.4 million).
- In *transition to shutdown*, no adjustment (Atkins Cardno accepted SDP's proposed $1.7 million one-off charge).

We have accepted Atkins Cardno's recommendations in full. Further to Atkins Cardno's recommendations, we have made additional allowances for SDP's insurance-related costs. We have also allowed for energy trading costs related to the Energy Adjustment Mechanism (EAM) in the 2017 determination period. These costs were not reviewed by Atkins Cardno. Below we present our decisions compared to SDP's proposed expenditure by mode. In the following chapter, we explain in detail the key expenditure adjustments and respond to SDP's submission to our Draft Report.

185 All Atkins Cardno recommended expenditure in this chapter includes Marsden Jacob's recommended benchmark energy prices. Therefore, the values reported in this chapter cannot be directly sourced from the public version of Atkins Cardno report.

6.3 Plant operating expenditure - water security (shutdown) mode

We have made a decision to:

23 Set the efficient level of SDP's operating expenditure (plant and corporate) in water security (shutdown) mode as outlined in Table 6.3. Our decision is $34.3 million (or 28%) lower than SDP's proposed costs.

SDP proposed $121.9 million in total operating costs in shutdown over the 2017 determination period.[186] This includes energy costs, as well as $42.0 million in corporate costs. [187]

Atkins Cardno recommended $83.9 million in operating costs in water security shutdown (including energy costs). This is a reduction of $38 million (or 31%), from SDP's proposal and includes the following adjustments:

- excluding SDP's proposed plant testing costs
- efficiency adjustment to corporate costs
- capitalising periodic maintenance subject to a prudence and efficiency review
- efficiency adjustments for labour and other fixed costs, and
- efficiency adjustments to maintenance of the deferred new pump for the drinking water pumping station.[188]

We accepted our consultant's recommendations. Further to Atkins Cardno's recommendations, we have made additional allowances for SDP's insurance-related costs. We have also allowed for energy trading costs in the 2017 determination period. Our decision on SDP's efficient operating costs in water security (shutdown) mode is presented in Table 6.3 below.

Table 6.3 Efficient fixed operating costs in water security (shutdown) mode - including energy ($million, $2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
SDP proposed	18.49	21.11	21.30	30.92	30.09	121.91
IPART draft decision	16.91	16.88	16.79	16.44	16.17	83.19
SDP submission to Draft Report[a]	17.85	18.09	18.07	18.50	18.04	90.54
IPART decision	**18.00**	**17.82**	**17.73**	**17.15**	**16.91**	**87.60**

a This includes an additional $3.7 million in insurance-related operating costs proposed by SDP in supplementary submissions that we received after SDP's submission to IPART Draft Report, April 2017.

Note: Operating costs include fixed and variable energy costs discussed in Chapter 8. They exclude pipeline costs.

Data source: SDP pricing proposal to IPART, October 2016, p 57; IPART, *Sydney Desalination Plant Pty Ltd - Review of prices from 1 July 2017 to June 2022– Draft Report*, March 2017, p 61; and Atkins Cardno, *Supplementary Expenditure Review – SDP*, May 2017, p 16.

186 SDP pricing proposal to IPART, October 2016, p 57.
187 SDP pricing proposal to IPART, October 2016, p 68.
188 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 41 and Chapter 6.

In its submission to our Draft Report, SDP accepted many of Atkins Cardno's recommendations, including disallowing the partial plant testing costs.[189] Sydney Water supported our consultant's recommendations in the Draft Report.[190]

However, SDP did contest the efficiencies applied to its corporate costs and labour and other fixed plant O&M costs.[191] Atkins Cardno reviewed SDP's submission and maintained all its recommendations, except for corporate costs (base year adjustment and efficiency factor).[192] Atkins Cardno recommended reinstating about $0.5 million in corporate costs over the 5-year determination period, compared to our draft decision.[193]

Between our draft and final decisions, we have also allowed the following additional corporate costs:

- $0.5 million over the 5-year determination period for SDP to undertake energy trading to manage its surplus energy under the updated mechanisms in the 2017 Methodology Paper (outlined in Chapter 5), and
- $3.2 million over the 5-year determination period of additional insurance costs for SDP to manage our abatement mechanism.

We explain these adjustments in further detail in Chapter 7.

6.4 Plant operating expenditure - operation mode

We have made a decision to:

24 Set the efficient level of SDP's operating expenditure (plant and corporate) in plant operation mode as outlined in Table 6.4. Our decision is $38.4 million (or 8%) lower than SDP's proposed costs.

Over the 2017 determination period, SDP proposed $480.8 million in operating costs in plant operation mode (including energy costs).[194] Compared to the 2012 Determination, this included an increase in plant O&M costs of $15.8 million, driven by:

- additional asset maintenance ($13.3 million), and
- changes in key input costs (eg, chemicals) ($3.2 million).[195]

SDP's proposed costs also include $46.2 million in corporate costs in plant operation mode over the 2017 determination period.[196]

Atkins Cardno recommended $438.9 million in operating costs in plant operation mode over the 2017 determination period (including energy costs). This included reductions of $41.8 million (or 9%), from SDP's proposed $480.8 million.[197]

189 SDP submission to IPART Draft Report, April 2017, p 39.
190 Sydney Water submission to IPART Draft Report, April 2017, p 6.
191 SDP submission to IPART Draft Report, April 2017, p 39.
192 Atkins Cardno, *Supplementary Expenditure Review – SDP*, May 2017, p 14.
193 Atkins Cardno, *Supplementary Expenditure Review – SDP*, May 2017, p 15.
194 SDP pricing proposal to IPART, October 2016, p 57.
195 SDP pricing proposal to IPART, October 2016, p 75.
196 SDP pricing proposal to IPART, October 2016, p 69.
197 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 45 and Chapter 8.

The recommended adjustments include:

- capitalising periodic maintenance subject to a prudence and efficiency review
- removing ongoing membrane replacement costs
- a reduction in variable costs for chemicals
- an efficiency adjustment to corporate costs, and
- efficiency adjustments to maintenance of the deferred new pump for the drinking water pumping station.

We accepted our consultant's recommendations. Further to Atkins Cardno's recommendations, we have made additional allowances for SDP's insurance-related costs. Our decision on SDP's efficient operating costs in plant operation mode is presented in Table 6.4 below.

Table 6.4 Efficient operating costs in plant operation mode - including energy ($million, $2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
SDP proposed	95.92	95.90	95.94	96.38	96.63	480.77
IPART draft decision	*87.13*	*85.91*	*84.62*	*83.84*	*83.95*	*425.45*
fixed operating costs	*24.72*	*24.85*	*24.78*	*24.33*	*24.54*	*123.21*
variable operating costs	*62.41*	*61.07*	*59.84*	*59.51*	*59.41*	*302.25*
SDP submission to Draft Report[a]	81.17	81.52	81.56	81.68	81.55	407.48
IPART decision	**102.57**	**91.00**	**85.50**	**82.00**	**81.26**	**442.34**
fixed operating costs	25.80	25.76	25.67	24.96	25.19	127.39
variable operating costs	76.77	65.24	59.83	57.04	56.07	314.95

a This includes an additional $2.8 million in insurance-related operating costs proposed by SDP in supplementary submissions that we received after SDP's submission to IPART Draft Report, April 2017.

Note: Operating costs include fixed and variable energy costs discussed in Chapter 8. They exclude pipeline costs. .

Data source: IPART, *Sydney Desalination Plant Pty Ltd - Review of prices from 1 July 2017 to June 2022– Draft Report*, March 2017, p 62, and Atkins Cardno, *Supplementary Expenditure Review – SDP*, May 2017, p 19.

In its submission to our Draft Report, SDP accepted many of Atkins Cardno's recommendations in plant operation mode, including:

- removing ongoing membrane replacement costs (due to our decision to allow capital expenditure for full replacement of membranes on restart)
- capitalising periodic maintenance costs
- a reduction in variable costs for chemicals, and
- deferral of the new pump for the drinking water pumping station.[198]

Sydney Water also supported our consultant's recommendations in the Draft Report.[199]

198 SDP submission to IPART Draft Report, April 2017, pp 42-43.
199 Sydney Water submission to IPART Draft Report, April 2017, p 6.

However, SDP again contested the efficiencies applied to its corporate costs and labour and other fixed plant O&M costs.[200] As noted above, Atkins Cardno revised its efficiency target and recommended reinstating about $0.5 million to corporate costs.[201]

We explain these adjustments in further detail in Chapter 7.

6.5 Plant capital costs - all modes of operation

We have made a decision to:

25 Include in the RAB the forecast capital expenditure for the plant as outlined in Table 6.5 over the 2017 determination period. Our allowance is $12 million (or 484%) higher than SDP's total proposed costs.

SDP proposed total capital expenditure of $2.5 million over the 2017 determination period. This is higher than the $1.7 million capital expenditure allowed in the 2012 Determination. SDP proposed a single profile of forecast capital expenditure in all modes.[202]

SDP's proposed expenditure mainly related to the installation of an additional pump in the plant's Drinking Water Pumping Station (DWPS). SDP was seeking some redundancy in delivery pump capacity to ensure water security and the ability to sustain supply in line with the plant's design parameters of 266 ML per day at 94% availability.[203]

Atkins Cardno recommended $14.5 million in capital costs over the 2017 determination period. This is $12 million (or 484%) higher than SDP's total proposed costs. The recommended adjustments include:

- deferring the cost of installing the additional pump in the DWPS, and review it ex-post rather than build it into water security capital expenditure, and
- capitalising expenditure on periodic maintenance, excluding the costs associated with defective hoses that should be replaced by warranty. [204]

These recommendations were supported by Sydney Water.[205]

In its submission to our Draft Report, SDP agreed to capitalising expenditure on periodic maintenance and the deferral of expenditure on the additional drinking water pump.[206] However, SDP disagreed with Atkins Cardno's adjustment to remove $3 million associated with the replacement of permeate hoses. SDP argued that hoses needed to be replaced due to general wear and tear, which was not covered by warranty.[207]

SDP also proposed additional capital expenditure for a membrane testing kit (a 'skid test' unit) to carry out high pressure testing of the membrane condition in situ. Its proposed

200 SDP submission to IPART Draft Report, April 2017, pp 39-40.
201 Atkins Cardno, *Supplementary Expenditure Review – SDP*, May 2017, p 14.
202 SDP pricing proposal to IPART, October 2016, p 104.
203 SDP pricing proposal to IPART, October 2016, p 105.
204 Atkins Cardno, *Expenditure Review – SDP*, February 2017, pp 59-60.
205 Sydney Water submission to IPART Draft Report, April 2017, p 6.
206 SDP submission to IPART Draft Report, April 2017, pp 46, 60.
207 SDP submission to IPART Draft Report, April 2017, p 61.

capital expenditure of $1 million was accompanied by additional operating expenditure to maintain the membrane testing unit ($0.15 million per year).[208]

Atkins Cardno reviewed SDP's submission and maintained its recommendation on prudent and efficient capital costs.[209] We accepted our consultant's recommendation. A summary of Atkins Cardno's recommendations and our decision on SDP's prudent and efficient capital expenditure in shutdown and plant operation modes is presented in Table 6.5 below. The adjustments applied to capital costs are also discussed in more detail in Chapter 7.

Table 6.5 Plant and corporate capital expenditure over the 2017 determination period – all modes ($million, $2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
SDP proposed	0.32	0.02	2.12	0.02	0.02	2.48
IPART draft decision	1.53	2.64	2.87	3.75	3.67	14.46
SDP submission to Draft Report	2.71	3.91	3.69	4.48	3.67	18.47
IPART decision	**1.53**	**2.64**	**2.87**	**3.75**	**3.67**	**14.46**

Data source: IPART, *Sydney Desalination Plant Pty Ltd - Review of prices from 1 July 2017 to June 2022– Draft Report*, March 2017, p 64, Atkins Cardno, *Supplementary Expenditure Review – SDP*, May 2017, pp 23-24.

6.6 Pipeline operating and capital costs - all modes of operation

We have made a decision to:

26 Set forecast capital and operating expenditure over the 2017 determination period for the pipeline as outlined in Table 6.6. Our decision accepts SDP's proposed costs.

Atkins Cardno made no adjustment to SDP's proposed pipeline operating costs of $1.6 million over the 2017 determination period.[210] SDP proposed no capital expenditure on pipeline, which Atkins Cardno accepted.[211]

We accept our consultant's recommendations and accordingly SDP's proposed pipeline expenditure presented in Table 6.6 below.

Table 6.6 Pipeline expenditure over the 2017 determination period - all modes ($million, $2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
SDP proposed						
Pipeline operating costs	0.31	0.32	0.32	0.32	0.32	1.59
Pipeline capital costs	0	0	0	0	0	0
IPART decision						
Pipeline operating costs	0.31	0.32	0.32	0.32	0.32	1.59
Pipeline capital costs	0	0	0	0	0	0

Data source: Atkins Cardno, *Expenditure Review – SDP*, February 2017, pp 9,11-13; IPART, *Sydney Desalination Plant Pty Ltd - Review of prices from 1 July 2017 to June 2022– Draft Report*, March 2017, p 65.

208 SDP submission to IPART Draft Report, April 2017, pp 56 and 61.
209 Atkins Cardno, *Supplementary Expenditure Review – SDP*, May 2017, pp 23-24.
210 SDP pricing proposal to IPART, October 2016, p 58.
211 Atkins Cardno, *Expenditure Review – SDP*, February 2017, pp 9, 11-12.

6.7 Transition to restart one-off operating costs

We have made a decision to:

27 Set the efficient level of SDP's one-off operating expenditure (including energy) to transition to restart as outlined in Table 6.7. Our decision is on average $26.9 million (or 68%) lower than SDP's average proposed costs.

SDP proposed a six-fold increase in the one-off transition costs to restart the plant from water security (shutdown) mode, compared to the allowance of $6.1 million in the 2012 determination period. SDP's proposed increase was mainly due to costs it considered were not accounted for over the 2012 determination period, such as:

- partial replacement of membranes (average $21.7 million)
- energy costs
- additional maintenance costs, and
- pipeline flushing costs ($0.6 million).[212]

These one-off costs range between $37.3 to $41.0 million per event, depending on the year of the restart during the 2017 determination period.[213]

Our decision, including energy costs, results in a reduction of $26.9 million (or 68%), from SDP's proposed average transition to restart charge of $39.3 million. Some of this reduction is driven by Atkins Cardno's recommendations to:

- capitalise full membrane replacement costs, and
- apply efficiency adjustments to chemical costs.

A significant proportion of the reduction, however, is due to what we have decided as appropriate 'fixed' energy costs to recover through the transition charge (ie, unrelated to production and supply of drinking water). In its submission to our Draft Report, SDP maintained that all the volume of energy it proposed in restart excludes any energy associated with the production of water.[214] We discuss the energy component of the one-off operating costs incurred by SDP on restart in further detail in Chapter 8, including our adjustments to these volumes.

212 SDP pricing proposal to IPART, October 2016, p 70.
213 SDP pricing proposal to IPART, October 2016, p 70.
214 SDP submission to IPART Draft Report, April 2017, p 40.

Our decision on SDP's efficient one-off transition to restart costs is presented in Table 6.7 below.

Table 6.7 One-off operating costs of transition to restart - including energy ($million, $2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22	Average
SDP proposed	37.27	38.40	39.37	40.23	40.98	39.25
IPART draft decision	9.65	9.58	9.50	9.49	9.48	9.54
SDP submission to Draft Report	17.38	17.38	17.38	17.38	17.38	17.38
IPART decision	**13.93**	**12.65**	**12.03**	**11.74**	**11.62**	**12.39**

Note: Total operating costs include energy costs discussed in Chapter 8.

Data source: IPART, *Sydney Desalination Plant Pty Ltd - Review of prices from 1 July 2017 to June 2022– Draft Report*, March 2017, p 63, and Atkins Cardno, *Supplementary Expenditure Review – SDP*, May 2017, p 18.

6.8 Transition to shutdown one-off operating costs

We have made a decision to:

28 Set the efficient level of SDP's one-off operating expenditure (including energy) to transition to shutdown as outlined in Table 6.8. Our decision accepts SDP's proposed costs.

SDP proposed no increase to the current allowance for transitioning to shutdown of $1.7 million per event. [215]

Atkins Cardno reviewed activities associated with shutting the plant down from plant operation mode into water security (shutdown) mode. It found that most of the costs are associated with flushing and cleaning of the reverse osmosis trains, feed pumps, post-treatment plant and pre-treatment plant, and capping the sea intake and outfall outlets. Atkins Cardno reviewed the input costs related to these activities, and found SDP's proposed costs to be efficient, proposing no further adjustments.[216]

We accepted our consultant's recommendations. The summary of Atkins Cardno's recommendations and our decision on SDP's efficient one-off transition to shutdown costs are presented in Table 6.8 below. There is no change from our draft decision on transition to shutdown costs.

Table 6.8 One-off operating costs of transition to shutdown ($million, $2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22
SDP proposed	1.69	1.69	1.69	1.69	1.69
IPART decision	**1.69**	**1.69**	**1.69**	**1.69**	**1.69**

Data source: IPART, *Sydney Desalination Plant Pty Ltd - Review of prices from 1 July 2017 to June 2022– Draft Report*, March 2017, p 64, Atkins Cardno, *Supplementary Expenditure Review – SDP*, May 2017, p 19.

215 SDP pricing proposal to IPART - Appendices, October 2016, p 59.
216 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 51.

7 Key expenditure adjustments over the 2017 determination period

In this chapter, we outline the key adjustments underpinning our expenditure decisions presented in Chapter 6. These adjustments are all based on the recommendations of our consultant, Atkins Cardno's, and include:

- excluding SDP's proposed plant testing costs
- capitalising a full membrane replacement on first restart
- capitalising periodic maintenance costs
- reducing SDP's proposed chemical costs
- adjustments for labour and other fixed costs
- efficiency adjustment to corporate costs, and
- deferring expenditure on a new pump for the drinking water pumping station and skid unit test.[217]

In addition, we discuss our treatment of costs related to damage caused to the plant by the December 2015 storm event, and our decisions relating to SDP's efficient insurance costs, particularly in relation to Industrial and Special Risks (ISR) policies. These costs were not reviewed by Atkins Cardno.

7.1 Exclusion of partial plant test in water security (shutdown) mode

SDP proposed a partial plant test to manage the operational risks associated with an extended period of water security (shutdown) mode. According to SDP, such a test would only be required once during the 2017 determination period.[218]

A key purpose of the partial plant test proposed in SDP's submission is to assess the performance of the existing Reverse Osmosis (RO) membranes after many years under chemical preservation. If the restart occurs in the year 2019-20, SDP requested funding for the replacement of 62.8% of the existing membranes and replacement of the further 21.6% during the first two years of operation.[219]

Atkins Cardno recommended removal of costs of SDP's proposed partial plant test ($17.5 million) from operating expenditure in water security mode.[220] Atkins Cardno considered that an alternative and efficient option is to replace **all** the RO membranes on full restart.[221]

217 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 41 and Chapter 6.
218 SDP pricing proposal to IPART, October 2016, pp 72-73.
219 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 40.
220 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 41.
221 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 9.

Atkins Cardno viewed an ex-ante partial plant test to assess membrane condition as redundant because it would not remove the need to replace membranes at the next restart.[222] The testing of the membranes against performance specification to ascertain performance does not need a partial plant test because all the RO membranes can be funded to be replaced for the full restart.[223] According to Atkins Cardno, the replacement of all the RO membranes with new RO membranes should ensure that the plant meets its drinking water quality obligations.[224]

Atkins Cardno noted that an 8-month period to restart the plant provides SDP with sufficient time to procure new membranes and address any residual vulnerability in the plant and equipment. [225] An 8-month period to recommission the plant is similar to the time allowed for new plant commissioning and performance testing of newly constructed large desalination plants.[226]

In its submission to our Draft Report, SDP agreed with Atkins Cardno's rationale for disallowing expenditure on a partial plant test over the 2017 determination period.[227] However, SDP maintained that the plant would nevertheless need testing in future price periods, because:

- the plant would be in full operation less frequently under the 2017 Metropolitan Water Plan rules, and
- financial penalties under the abatement mechanism would apply if SDP does not attain 100% output within eight months of entering a drought.[228]

While our decision only affects the 2017 determination period, Atkins Cardno also noted that carrying out a partial plant test to provide SDP with confidence in the mechanical and electrical integrity of the plant is not justified. Atkins Cardno cited the following reasons:

- The plant was fully commissioned and operated for a two year proving period which should have identified and remedied the typical new plant equipment supplier and constructor defects.
- The plant pumps, and actuated valves and major drives are regularly turned by hand except for the high pressure pumps.
- All of the high pressure pumps have been fully refurbished by the supplier.[229]

Further, Atkins Cardno noted that the operator ensures that the mechanical, electrical and civil, and safety assets all undergo regular inspection with routine and periodic maintenance which should enable the design lives to be achieved. Therefore, continuing to apply good asset management processes should reduce the risk of any major issues on restart.[230] Atkins Cardno has recommended sufficient allowances to ensure that all plant equipment can be well maintained and regularly serviced.

222 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 40.
223 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 39.
224 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 40.
225 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 42.
226 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 38.
227 SDP submission to IPART Draft Report, April 2017, p 39.
228 SDP submission to IPART Draft Report, April 2017, p 46.
229 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 40.
230 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 39.

Sydney Water also supported our decision to exclude costs associated with the partial plant test in the 2017 determination period.[231] In principle, Sydney Water supported that testing costs should be borne by all customers, but it considered testing in the 2017 determination period would form part of the insurance claim.[232]

7.2 Capitalising a full membrane replacement on first restart

We have made a decision to:

29 Set SDP's prudent and efficient capital expenditure at $30 million for a full membrane replacement on the first restart in the 2017 determination period. These costs would be payable at most once in the 2017 determination period. For clarity, this includes a restart:

- triggered by drought response, or
- discretionary use of the plant by third-party customers outside drought.

30 Not provide any further allowances for the ongoing replacement of membranes in the 2017 determination period.

In its October 2016 submission, SDP proposed to include an average of $21.7 million covering partial replacement of membranes on a restart during the 2017 determination period.[233] This amount was included in SDP's proposed one-off transition to restart costs (ie, as an operating cost). SDP also proposed additional expenditure for ongoing membrane replacement costs if the plant operates. Atkins Cardno estimated that SDP's proposed membrane replacement program would provide for replacement of 62.8% of membranes on restart and a further 21.6% over two years of operation. In total, SDP's proposed costs would provide for replacement of about 84.4% of all membranes over the two years of operation following a restart in 2019-20.[234]

Atkins Cardno reviewed SDP's proposed membrane replacement program and found it inefficient. By the time of restart, the existing membranes would be past their guaranteed asset life and their performance would be uncertain. Atkins Cardno instead recommended providing for a full membrane replacement at first restart ($30 million).[235]

Atkins Cardno also recommended that these costs be capitalised.[236] It indicated that the *Australian Accounting Standard* AASB 116 definition of capital expenditure supports the capitalisation of periodic maintenance payments and membranes. This standard indicates that capital expenditure is that which is expected to generate benefits over more than a year. As membranes fall within this definition, Atkins Cardno recommended they be capitalised.

We recognise that membrane replacement costs are critical to the plant's production and supply of any desalinated water. This is why we have accepted Atkins Cardno's recommendation to include the prudent and efficient costs of **full** membrane replacement in

231 Sydney Water submission to IPART Draft Report, April 2017, p 6.
232 Sydney Water submission to IPART Issues Paper, November 2016, p 35.
233 SDP pricing proposal to IPART, October 2016, p 70.
234 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 40.
235 Atkins Cardno *Expenditure Review – SDP*, February 2017, p 12.
236 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 52.

the allowed capital expenditure on first restart in the 2017 determination period.[237] Moreover, we note that if SDP experiences operational issues due to faulty membranes over the 2017 determination period, it should be covered by the manufacturer's warranty.

We will review actual membrane replacement costs, if the plant is triggered to restart in the 2017 determination period, at the next price review. We discuss this expenditure in Chapter 12. Below we outline Atkins Cardno's reasons for recommending a full membrane replacement at first restart in further detail.

7.2.1 Provision of full membrane replacement, given their existing age

No provision was made in our 2012 Determination for any membrane replacement costs in shutdown. The plant has been in water security (shutdown) mode since 1 July 2012. The membranes were installed before commissioning of the plant in 2010.

Early in the 2017 determination period, the stock of membranes will be reaching the end of its asset life (eight years). The manufacturer extends warranty on membrane conditions if membranes are preserved in shutdown using the agreed protocol. SDP has been following the agreed protocol for membrane storage.[238] Atkins Cardno noted that even following the storage protocol, the condition of the membranes cannot be ascertained past the guaranteed eight years.[239]

Atkins Cardno envisaged SDP's first restart in its drought response role, triggered by dam levels falling below the threshold prescribed by the Metropolitan Water Plant (currently 60%). It considered that within a restart period SDP can procure membranes, carry out essential asset replacement, recruit and train additional operators and test the individual processes and the complete works. Atkins Cardno considered that the 8-month duration was sufficient to restart from a prolonged water security shutdown, including ordering membranes and full plant testing.[240]

To calculate the efficient costs of a full membrane replacement, Atkins Cardno established a 'supplied to SDP's site' benchmark unit cost for membranes, and applied a further allowance for installation, spares, and membrane disposal.[241]

Providing the plant with full membrane replacement on first restart eliminates the need for the partial plant test in water security shutdown mode, ensuring operating cost savings in water security shutdown mode.

7.2.2 No provision for ongoing replacement of membranes during the 2017 determination period

A full membrane replacement on first restart allows further removal of costs associated with ongoing membrane replacement from SDP's proposed operating costs in plant operation

237 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 65.
238 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 64.
239 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 64.
240 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 23.
241 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 66.

mode, without any additional capital expenditure provision during the 2017 determination period.[242]

Atkins Cardno's proposed approach to membrane replacement in restart and plant operation mode results in cost savings over the 2017 determination period in all modes, irrespective of the year in restart.[243]

7.2.3 Stakeholder views on membrane replacement costs

In its submission to our Draft Report, SDP accepted our draft decision to provide full membrane replacement on the first restart in the 2017 determination period, and capitalise these costs.[244] It also accepted our draft decision not to provide additional capital expenditure for ongoing membrane replacement in plant operation mode.[245]

However, SDP noted that capitalising membranes is not consistent with *Australian Accounting Standards*.[246] SDP also argued that a tax allowance should be included in the membrane service charge, given that these costs are capitalised and recovered independent of other service charges (discussed in detail in Chapter 12).

Atkins Cardno reviewed SDP's submission to our Draft Report and maintained its recommendation to capitalise membranes. With warranted life of up to 8 years in full operation, Atkins Cardno considered that membranes clearly provide benefits over a number of years which is consistent with the definition of capital expenditure under accounting standards and should not be treated as operational consumables.[247]

The draft decision to capitalise membranes was also supported by Sydney Water.[248] Sydney Water queried, however, the likely process for on-going membrane replacement in future determination periods.[249] In its submission to our Issues Paper, Sydney Water argued that a cost pass-through of the capitalisation of the efficient costs would be more appropriate.[250]

We have maintained our draft decision to capitalise full membrane replacement on first restart as final. We agree with Atkins Cardno[251] and consider that capitalisation of membrane replacement is preferable to a cost pass-through mechanism as this allows for additional scrutiny of the expenditure and provides a strong efficiency incentive to SDP. We outline the treatment of membrane replacement costs in Chapter 12 and the likely process for on-going membrane replacement in future determination periods.

242 Atkins Cardno, *Expenditure Review – SDP*, February 2017, pp 50 and 62.
243 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 67.
244 SDP submission to IPART Draft Report, April 2017, p 39.
245 SDP submission to IPART Draft Report, April 2017, p 50.
246 SDP submission to IPART Draft Report, April 2017, p 50.
247 Atkins Cardno, *Supplementary Expenditure Review – SDP*, May 2017, p 20.
248 Sydney Water submission to IPART Draft Report, April 2017, p 7.
249 Sydney Water submission to IPART Draft Report, April 2017, p 7.
250 Sydney Water submission to IPART Issues Paper, November 2016, p 37.
251 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 52.

7.3 Capitalising periodic asset maintenance costs

SDP proposed to continue treating periodic asset maintenance costs as operating costs, as was the case under the 2012 Determination.[252] Atkins Cardno, however, recommended the capitalisation of all periodic asset maintenance.

The recommended capital expenditure allowance for periodic maintenance over the 2017 determination period includes adjustments for defects under warranty. Much like membranes, Atkins Cardno considered these costs should be recognised as an asset consistent with *Australian Accounting Standards* because they generate benefits over more than one year. Prudent and efficient capital expenditure is the same in water security (shutdown) and plant operation modes.[253]

Atkins Cardno found that unlike routine asset maintenance, periodic maintenance expenditure relates to significant expenditures involving replacement, renewal and/or refurbishment of items, which are proposed to take place on a cycle of multiple years. The inclusion of a 'de-minimus' threshold also reinforces the fact that it relates only to significant non-routine maintenance work and therefore the appropriateness of classifying periodic maintenance as capital expenditure.[254]

In its submission to our Draft Report, SDP agreed with our draft decision to capitalise periodic maintenance.[255] SDP also accepted setting the same level of efficient periodic maintenance costs in water security and plant operation modes, recognising that the new operating rules make it unlikely that SDP will be called into operation in the 2017 determination period.[256] This draft decision was also supported by Sydney Water.[257]

However, SDP again noted that capitalising periodic maintenance was not consistent with *Australian Accounting Standards*.[258] SDP also disagreed with Atkins Cardno's proposed adjustment to these costs to exclude $3 million for defective permeate hoses. SDP argued that hoses need to be replaced due to general wear and tear, which is not covered by warranty.[259]

Atkins Cardno reviewed SDP's submission to our Draft Report and maintained its recommendation on periodic maintenance as part of prudent and efficient capital costs.[260] Atkins Cardno reviewed additional information provided by SDP and maintained its position that it is not normal to require such extensive replacement of permeate hoses so early in the life of the plant. Atkins Cardno maintained its recommendation that these items are material defects and should be covered by the plant operator's warranties. Total recommended prudent and efficient capital expenditure is thus unchanged from our draft decision. [261]

252 SDP pricing proposal to IPART, October 2016, pp 71 and 74.
253 Atkins Cardno, *Expenditure Review – SDP*, February 2017, pp 60 and 62.
254 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 52.
255 SDP submission to IPART Draft Report, April 2017, p 39.
256 SDP submission to IPART Draft Report, April 2017, p 60.
257 Sydney Water submission to IPART Draft Report, April 2017, p 6.
258 SDP submission to IPART Draft Report, April 2017, p 49.
259 SDP submission to IPART Draft Report, April 2017, p 61.
260 Atkins Cardno, *Supplementary Expenditure Review – SDP*, May 2017, pp 19-21.
261 Atkins Cardno, *Supplementary Expenditure Review – SDP*, May 2017, p 21.

We have accepted our consultant's recommendation and maintained our draft decision regarding periodic asset maintenance costs.

7.4 Lower chemical costs in plant operation mode and restart

Atkins Cardno recommended reductions in chemical costs in plant operation mode and in transition to restart, compared to SDP's proposed costs.

Atkins Cardno used a bottom-up approach based on historical chemical usage data by the plant's operator, and best practices in procurement to establish the efficient quantities and efficient unit cost of chemicals. A 5% procurement efficiency was applied to the cost of chemicals in plant operation mode and restart.[262]

In its submission to our Draft Report, SDP agreed with our draft decision on chemical costs.[263] We have maintained this decision in setting final prices.

7.5 Adjustment to labour and other fixed costs

Atkins Cardno did not recommend efficiency adjustments to labour and other fixed costs in plant operation and restart modes, because:

- restart costs are associated with one-off activities which are not frequently repeated, so efficiencies are unlikely to be achieved within the same regulatory period, and
- in plant operation mode, there will need to be considerable time for the large number of new plant staff to be fully trained and experienced to ensure plant safety after a long period in water security mode.[264]

Atkins Cardno compared labour levels with desalination plants of similar design and output operating at full capacity. It concluded that SDP's proposed level of labour levels and expenditure is reasonable given the need to have three shifts and standby maintenance because of the risk of reduced output.[265]

However, in water security (shutdown) mode, Atkins Cardno recommended a 2.5% per year cumulative efficiency adjustment to labour and other fixed costs from year 2 to 5 of the 2017 determination period, through improved productivity and innovation.[266] This resulted in a reduction in SDP's proposed costs.

In its submission to our Draft Report, SDP disagreed with the 2.5% per year efficiency target. Instead, SDP proposed a 0.25% per year cumulative adjustment to these costs.[267] SDP argued that Atkins Cardno's proposal:

- Was not supported with evidence that SDP base year costs were inefficient (scope for 'catch-up' efficiencies when compared to other comparable entities operating in similar environments).

262 Atkins Cardno *Expenditure Review – SDP*, February 2017, pp 46-49.
263 SDP submission to IPART Draft Report, April 2017, p 49.
264 Atkins Cardno, *Expenditure Review – SDP*, February 2017, pp 43 and 46.
265 Atkins Cardno, *Expenditure Review – SDP*, February 2017, pp 43 and 46.
266 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 38.
267 SDP submission to IPART Draft Report, April 2017, pp 39, 42-43.

- Incorrectly assumed that "the likelihood of prolonged water security mode" would result in a negative change in labour costs despite the draft decision acknowledging the additional maintenance activity on site as the plant ages.[268]

Atkins Cardno reviewed SDP's submission to our Draft Report and maintained its recommendation on a 2.5% per year cumulative efficiency adjustment to labour and other fixed costs.[269] Atkins Cardno stated that with the management resources SDP now has in place and the likelihood of a prolonged water security (shutdown) mode, there is an opportunity to set and achieve realistic efficiency targets through greater productivity and the application of innovation and new technology.

We agree with Atkins Cardno that the target is achievable due to the accumulated experience SDP (and its operator) has gained in water security (shutdown) mode and have accepted our consultant's recommendation.

7.6 Efficiency targets applied to corporate costs in all modes

Our draft operating cost allowance included Atkins Cardno's recommendation to apply a 0.75% per year cumulative efficiency adjustment to SDP's proposed corporate expenditure in all modes. Atkins Cardno assessed that SDP should achieve and out-perform these efficiency targets through improved procurement, methods of working and innovation.[270]

On that basis, Atkins Cardno recommended a $2.4 million reduction in corporate costs in water security (shutdown) and plant operation modes.[271]

SDP was concerned the approach taken by Atkins Cardno to this aspect of its expenditure was related to future procurement savings which SDP had already obtained and factored into its forecast expenditure.[272] In its submission to our Draft Report, SDP rejected the 'catch-up' component of the efficiency adjustment (0.5% per year), arguing that it was already on the frontier. SDP agreed, however, with the 0.25% per year ongoing efficiency factor applied to its corporate costs.[273]

Atkins Cardno reviewed additional information provided by SDP on the components of corporate costs. Atkins Cardno concluded that there was a double counting of efficiencies by setting a lower base year cost and applying a catch-up efficiency. In its revised recommendation, Atkins Cardno:

- removed the 0.5% per year cumulative catch-up efficiency
- removed the one-off adjustment to cover SDP's additional costs to prepare its pricing submission to the 2022 price review
- increased and smoothed the baseline corporate costs to allow SDP to manage the timing of this expenditure effectively, and

268 SDP submission to IPART Draft Report, April 2017, p 39.
269 Atkins Cardno, *Supplementary Expenditure Review – SDP*, May 2017, pp 15-16.
270 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 36.
271 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 36.
272 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 36.
273 SDP submission to IPART Draft Report, April 2017, pp 40-41.

- removed corporate expenditure identified as related to energy trading, ancillary charges and forecasting.

In total, Atkins Cardno's revised recommendation provided an additional $0.5 million for SDP's efficient corporate costs over the 5-year determination period, in both water security (shutdown) and plant operation modes.[274]

We have accepted our consultant's recommendations. Further to Atkins Cardno's recommendations, we have made additional allowances for SDP's insurance-related costs. We have also allowed for energy trading costs in the 2017 determination period (an additional $0.5 million over the 5-year determination period). Corporate expenditure related to ancillary charges and forecasting, removed by Atkins Cardno from the recommended costs, were not included because:

- our benchmark energy price includes provisions for ancillary and market charges (see Chapter 8), and
- the provision we have made for energy trading renders forecasting expenditure redundant.

7.7 Ex-post efficiency review of drinking water pump and skid test unit

We have made a decision to:

31 Not include in the RAB the prudent and efficient capital costs of an extra drinking water pump ($2.1 million) and a skid test unit ($1 million) given the uncertainty in timing of this expenditure. Rather, these costs would be re-assessed for efficiency and included (with holding costs at WACC) at the next review of SDP prices.

SDP proposed capital expenditure for an additional drinking water pump. Atkins Cardno recognised the lack of standby capacity in SDP's DWPS to deliver drinking water, presenting a risk to the reliability of supply. SDP proposed $2.1 million in capital expenditure to install an extra pump, to address this risk.[275]

However, Atkins Cardno considered it prudent and efficient to **defer** the cost of installing the additional pump and review it ex-post rather than build it into water security (shutdown) mode capital expenditure for the 2017 determination period.[276] It recommended removing $2.1 million capex from the prudent and efficient capital expenditure for the 2017 determination period. Due to the uncertainty of the need for and timing of any restart, it would be more appropriate to review the expenditure ex-post rather than to build it into water security capital costs for the 2017 determination period.

Atkins Cardno also recommended expenditure on portable skid test unit ($1 million) to carry out high pressure testing of the membrane conditions in situ. However, it considered it is only prudent to incur this cost in water security shutdown **following** the first restart for drought response in the 2017 determination period. A skid test unit is not required in the

274 Atkins Cardno, *Supplementary Expenditure Review – SDP*, May 2017, p 14.
275 SDP pricing proposal to IPART, October 2016, p 104.
276 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 59.

current shutdown period, as a full replacement of membranes is recommended on the plant's first restart in response to drought.[277]

In our Draft Report, we agreed with Atkins Cardno and considered that these costs were not critical to the plant's operations in its drought response role for the 2017 determination period, because:

- There were two existing pumps with a guaranteed technical reliability parameter that were tested during plant technical proving period in 2010-2012, had been properly maintained during shutdown, and were highly unlikely to fail simultaneously.
- A skid test unit would only be prudent to procure in the next water security shutdown, as full membrane replacement recommended on first restart eliminated the need to test the condition of the existing membranes in the current shutdown.

In its submission to our Draft Report, SDP considered that capital expenditure for the 2017 determination period should include a provision for the membrane testing kit. It proposed capital expenditure of $1 million accompanied by additional operating expenditure in water security mode to maintain the skid test unit of about $0.15 million per year.[278] SDP accepted, however, deferring the cost of installing the additional drinking water pump.[279]

Atkins Cardno reviewed SDP's submission and maintained that a portable skid test unit ($1 million) would be prudent to obtain when the plant shuts down **following** the first restart for drought response. A skid test unit is not required in the current shutdown period, as a full replacement of membranes is recommended on the plant's first restart.[280]

We accept our consultant's recommendation not to include the prudent costs of a skid test unit and an extra pump in the allowed capital expenditure for the 2017 determination period.

We recognise the high degree of uncertainty associated with the timing of these costs if they eventuate, and the probability of these costs not eventuating at all during the 2017 determination period. Customers will save by not servicing the additional capital and operating costs until the benefits are likely to be realised.[281] We have decided to include holding costs (based on our WACC decision) if any prudent capital expenditure on a skid test unit and an extra pump are incurred during the 2017 determination period, subject to the ex-post efficiency review, in the next price review.

7.8 Plant rebuild is fully insured

The damage to the desalination plant as a result of the December 2015 storm event is fully covered by SDP's insurance. Thus, there is no insurance 'gap'. At the Public Hearing, SDP stated it was not intending to pass-through these costs to its customers, which updated the position it took in its pricing proposal.[282]

277 Atkins Cardno, *Expenditure Review – SDP*, February 2017, pp 12 and 61.
278 SDP submission to IPART Draft Report, April 2017, pp 56 and 64.
279 SDP submission to IPART Draft Report, April 2017, p 39.
280 Atkins Cardno, *Supplementary Expenditure Review – SDP*, May 2017, p 22.
281 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 61.
282 IPART, SDP public hearing transcript, 8 December 2016, p 43.

Our insurance consultants confirmed the view expressed by SDP at the Public Hearing.[283] SDP has committed to having an operable plant by 13 December 2018, the date in the Agreed Reinstatement Plan that SDP has put in place with the NSW Government.[284]

Because SDP's insurance is covering the cost of repairs to the plant, there will be no change to the RAB or to asset lives. Our expenditure consultant has indicated that the insurance funded works for the December 2015 storm event will have a neutral effect on SDP's RAB and asset lives. Much of the insurance funded capital expenditure is likely to be repair work (rather than asset replacement) or relate largely to civil assets which have less of an impact on future renewal requirements than replacement of shorter asset life items would have. This therefore limits the impact on future prudent and efficient expenditure.

We consider our expenditure consultant's recommendation to be reasonable given that the purpose of the insurance cover (paid for through SDP's prices) is largely to protect SDP and its customers from the effects of events such as this. Since the December 2015 storm event will not change the RAB or asset lives, it will not impact SDP's prices (except to the extent that insurance premiums increase due to SDP having made a claim – see discussion below).

7.9 Efficient insurance costs

We have reviewed SDP's Industrial and Special Risks (ISR) policies and premiums for the 2017 determination period. ISR insurance provides cover for physical loss or damage to SDP's property as a result of, for example, fire, explosion, vandalism, weather perils, earthquake, or accidental damage. Typically, this policy covers the costs of replacement or reinstatement in the event of damage, and will also cover any resultant shortfall in revenue (ie, business interruption).

In our Draft Report, we questioned whether SDP's insurance premiums should be based on the Maximum Foreseeable Loss (MFL) value for the plant or the total asset value of the plant. The MFL is the largest financial loss that SDP could experience when its property is harmed or destroyed by an adverse event such as a fire or earthquake.

Upon further research, we agree with SDP that the MFL is likely to be the total asset value of the plant for a single asset business. We infer the MFL in 2012 was reduced because SDP was owned at that time by Sydney Water.

SDP proposed an increase in its business interruption coverage from 36 to 60 months in response to our Draft Report.[285] This increase is based on our changes to the abatement mechanism outlined in Chapter 3.[286] Aon, SDP's insurance broker, estimated the cost of this additional coverage to be approximately $1.1 million over the 2017 determination period.[287]

We agree with SDP that changes to our abatement mechanism may require SDP to increase its insurance coverage. In the 2017 Determination, we have extended abatement to apply when SDP is required to operate the plant:

283 IPART, SDP public hearing transcript, 8 December 2016, p 43.
284 SDP submission to IPART Draft Report, April 2017, p 15.
285 SDP submission to IPART Draft Report - Appendices, April 2017, p 26.
286 SDP submission to IPART Draft Report, April 2017, p 58-59.
287 We note that the additional $1.1 million applies to water security mode and plant operation mode.

- more uniformly during drought (ie, when the plant is unavailable), and
- outside drought when SDP operates in an emergency response.

However, we do not consider SDP's proposed coverage to be warranted. It is well above earlier benchmarks for business interruption loss established by its insurance broker, when it looked at water utility sector practices and organisations with a similar risk profile. Moreover the benchmarks were based on worst case scenarios similar to those underpinning SDP's proposed 60 months coverage.

In addition, we do not consider the increase in coverage to 60 months to be proportionate to the changes that we have made in the abatement mechanism. If we were to accept SDP's argument that its business interruption coverage is intended to apply **only** when it is abated, then we would need to consider the following when determining the maximum indemnity period for BI coverage:

a) the length of SDP's plant operation period (ie, drought period, emergency response[288]), and

b) the maximum period of reinstatement following a worst case scenario (ie, how long SDP would be inoperable for).

Abatement also results in a gradual reduction of fees over a year.

In other words, SDP would only need coverage when it is inoperable **and** it is required to produce water under the 60/70 rule or because of its emergency response role. This may be shorter than any overall period of inoperability.

Accordingly, we have based our allowance for insurance premiums on a level of business interruption coverage that reflects the earlier benchmarks submitted to us.

In total, our estimates increase insurance costs from our Draft Report by approximately $0.65 million ($2016-17) over the 2017 determination period. Our estimate of SDP's insurance premiums is based on a reduction in its proposed premiums in proportion to the reduced business interruption coverage. We have added these insurance costs to both water security (shutdown) and plant operation modes in line with SDP's proposal.[289] This recognises that SDP would be unable to retrospectively obtain business interruption coverage should a drought response trigger be reached during the period the plant is being reinstated.

In a supplementary email, SDP indicated it had not included in its proposed insurance costs a provision for its annual insurance broking costs. Nor did it provide cost estimates of the recent Government decision to defer the removal of the Fire Services Levy charge from insurance premiums.

We have included adjustments for these additional costs. We have estimated a provision for the Fire Services Levy in line with SDP's proposed methodology, however based on our efficient premiums. We included an amount equivalent to SDP's proposed insurance broking costs after reviewing a range of industry estimates.

288 As the 14-month minimum run time is discretionary, SDP would only be abated if it chose to operate. In this sense, its exposure to BI coverage would arguably be more limited than in a drought.

289 SDP submission to IPART Draft Report, April 2017, p 16.

In total, we allowed additional insurance-related costs over the 5-year determination period of:

- $3.2 million in water security (shutdown) mode, and
- $2.3 million in plant operation mode.

8 Energy costs

The cost of energy makes up a substantial proportion of SDP's operating costs when the plant operates.[290] This is because water desalination is an energy intensive process.

The four major elements of SDP's energy costs are:

1. The cost of energy required by the plant (ie, the wholesale market cost of energy).
2. The cost of renewable energy certificates arising from:
   - the planning approval for the plant that required 100% renewable energy use,[291] and
   - renewable energy schemes, which energy retailers in NSW are required to meet.
3. The cost of other energy components, including ancillary services and retail margins.
4. Network charges payable for the transmission of this energy over the network.

In this chapter, we outline our decisions on these cost allowances. We have set energy cost allowances to cover the first three of these components (wholesale energy, renewable energy, and other energy components). Our energy cost allowances reflect market-based benchmark prices and efficient benchmark volumes. We have maintained our approach to allow a cost pass-through mechanism for the fourth component (network charges).

8.1 Review of past energy use

Over the four years from 2012-13 to 2015-16, SDP used about 48% of the energy that had been forecast for shutdown mode in the 2012 Determination. As a result of this reduction in energy use, SDP made a saving of approximately $2.6 million. This is shown in Table 8.1.

While this saving was retained by SDP over the 2012 determination period, it has allowed us to reduce the efficient benchmark energy volume forecast for shutdown mode over the 2017 determination period, resulting in downward pressure on prices for customers (efficient benchmark energy volumes are outlined below).

290 In operation mode, the plant requires about $50 million in energy costs per year (based on our benchmark energy prices and volumes over the 2017 determination period – see Appendix D) to supply Sydney with about 15% of its water needs (http://www.sydneydesal.com.au/faqs/ accessed on 23 June 2017).

291 The project approval for SDP was granted under the *Environmental Planning and Assessment Act 1979*. IPART, *Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2012 - Final Report*, December 2011, p 17.

Table 8.1 Savings from reduced demand during 2012 determination period ($2016-17)

	2012-13	2013-14	2014-15	2015-16	2016-17	Total
Forecast benchmark volumes (MWh)	9,640	9,640	9,640	9,640	-	38,560
Forecast benchmark cost ($million)	1.2	1.2	1.2	1.2	-	4.9
Actual volumes (MWh)	6,327	4,846	4,505	2,722	-	18,400
Actual benchmark cost ($million)[a]	0.8	0.6	0.6	0.4	-	2.3
Savings (MWh)	3,313	4,794	5,135	6,918	-	20,160
Savings ($million)	**0.4**	**0.6**	**0.7**	**0.9**	**-**	**2.6**

[a] Actual benchmark energy costs are calculated using actual energy volumes and 2012 benchmark energy prices.

Note: Numbers may not add due to rounding. Actuals for the full year 2016-17 are not yet available.

Data source: IPART analysis. Marsden Jacob, *Energy Review – SDP*, February 2017, pp 9 and 29.

8.2 Energy cost allowances

We have made a decision to:

32 Set energy cost allowances as outlined in Table 8.2.

The energy cost allowances reflected in SDP's prices for the 2017 determination period are presented in Table 8.2.

These energy cost allowances reflect our decisions on energy prices and volumes and therefore reflect our market-based estimates of efficient energy costs over the 2017 determination period. Our benchmark unit energy prices have been developed by our energy consultant, Marsden Jacob.[292] Our benchmark energy volumes are based on advice from our expenditure consultant, Atkins Cardno.[293]

The energy cost allowances have been set by mode of operation, because SDP's energy costs vary by mode (ie, energy costs change as SDP transitions from shutdown, to restart, to plant operation). In addition, energy costs are also split into fixed and variable components so that they can be recovered through fixed or variable charges. For example, the variable energy cost in plant operation mode is recovered through SDP's water usage charge, whereas the fixed component is independent of volumes supplied and is recovered through daily base and incremental service charges.

292 Marsden Jacob, *Energy Review – SDP*, February 2017, p 48. Marsden Jacob, *Supplementary Energy Review – SDP*, May 2017, p 12.

293 Atkins Cardno, *Expenditure Review – SDP,* February 2017, pp 42, 44 and 50. Atkins Cardno, *Supplementary Expenditure Review – SDP, May* 2017, pp 16, 17-18 and 19.

Table 8.2 Energy cost allowances by mode of operation ($2016-17)

	2017-18	2018-19	2019-20 [a]	2020-21	2021-22
Shutdown					
- Fixed ($/day)	2,710.68	2,218.63	1,982.33	1,868.49	1,826.85
Transition to restart					
- Fixed ($ one-off payment)	7,066,572.80	5,779,200.00	5,160.960.00	4,863,129.60	4,754,176.00
Plant operation					
- Fixed ($/day)	4,140.36	3,386.04	3,023.79	2,849.28	2,785.44
- Variable ($/ML)	693.21	566.92	506.27	477.05	466.36

[a] 2019-20 will be a leap year with 366 days.

Note: There is no variable component in transition to restart. As soon as SDP supplies drinking water it moves to plant operation mode. Numbers may not add due to rounding.

Data source: Marsden Jacob, *Supplementary Energy Review – SDP*, May 2017, p 12. Atkins Cardno, *Supplementary Expenditure Review – SDP, May* 2017, pp 16, 17-18 and 19. IPART analysis.

Appendix D sets out how the energy cost allowances in Table 8.2 were calculated.

8.2.1 Compared to the 2012 Determination

Figure 8.1 and Figure 8.2 show our decisions on benchmark prices, volumes and allowed energy costs for the 2017 determination period compared to the 2012 determination period.

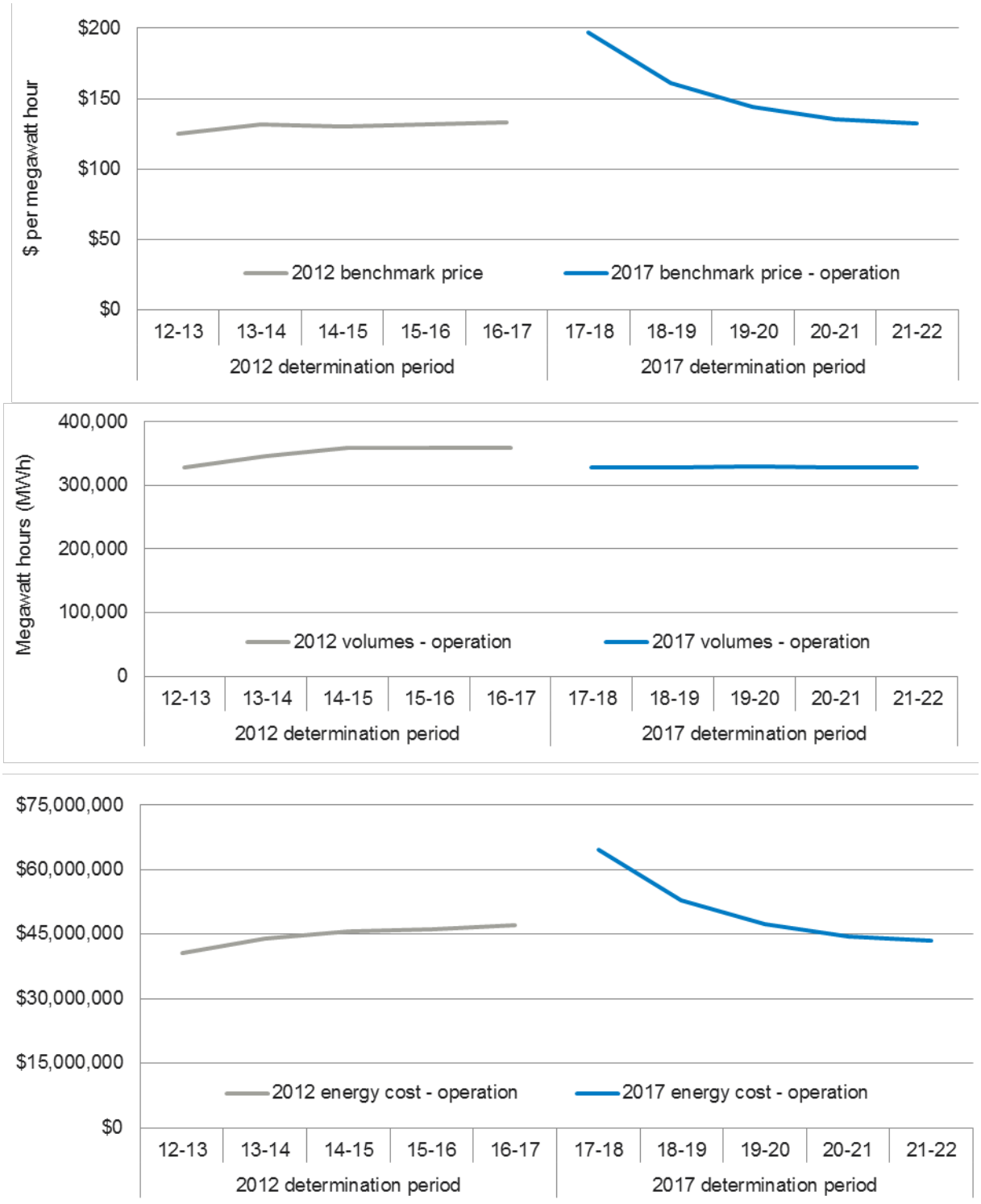
In plant operation mode, our energy cost allowances for the 2017 determination period have increased overall by $29.7 million or 13% compared to the 2012 determination period. This reflects:

- A 21% increase in benchmark prices compared to the 2012 determination period. This is driven by:
  - a 49% increase in the energy component of the benchmark price, and
  - a 12% decrease in the LGC component of the benchmark price.
- A 6% decrease in benchmark energy volumes compared to the 2012 determination period. This is driven by efficiencies identified by our expenditure review consultant.

In shutdown mode, our energy cost allowances for the 2017 determination period have decreased overall by $1.9 million or 33% compared to the 2012 determination period. This reflects:

- A 21% increase in benchmark prices compared to the 2012 determination period, for the reasons outlined above.
- A 44% reduction in benchmark energy volumes compared to the 2012 determination period.

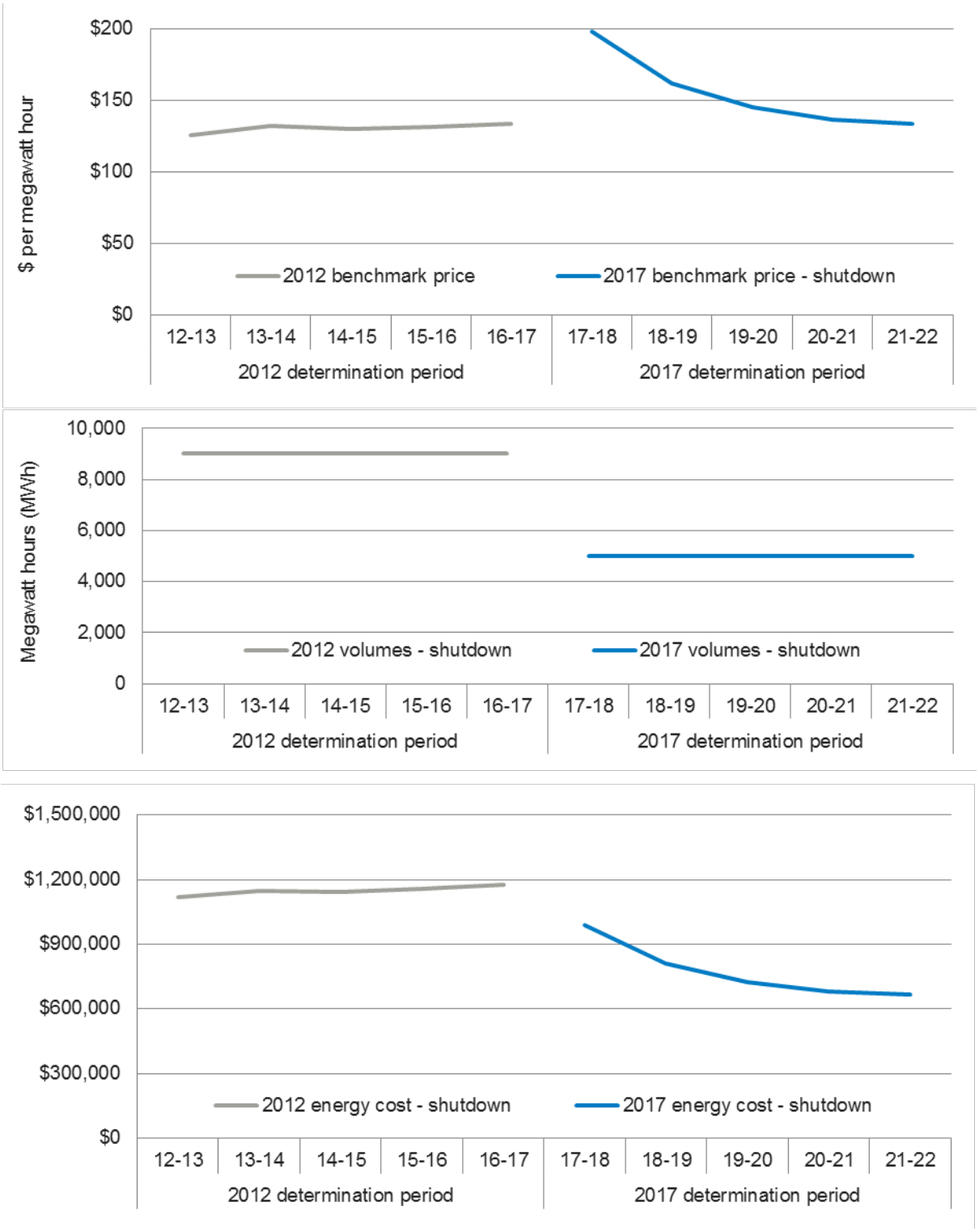
Figure 8.1 Benchmark prices, volumes and costs in plant operation ($2016-17)



Note: 2012 benchmark prices include the carbon price in 2012-13 and 2013-14 and exclude the carbon price in 2014-15 to 2016-17 since the carbon tax was repealed effective 1 July 2014 (http://www.environment.gov.au/climate-change/repealing-carbon-tax). This comparison involves converting all figures into $2016-17 and comparing totals over each determination period.

Data source: IPART analysis; IPART, *Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2012 - Final Report*, December 2011, pp 58 and 136; Marsden Jacob, *Supplementary Energy Review – SDP*, May 2017, p 12; Atkins Cardno, *Supplementary Expenditure Review – SDP,* May 2017, p 19.

Figure 8.2 Benchmark prices, volumes and costs in shutdown ($2016-17)



Note: 2012 benchmark prices include the carbon price in 2012-13 and 2013-14 and exclude the carbon price in 2014-15 to 2016-17 since the carbon tax was repealed effective 1 July 2014 (http://www.environment.gov.au/climate-change/repealing-carbon-tax). This comparison involves converting all figures into $2016-17 and comparing totals over each determination period.

Data source: IPART analysis; IPART, *Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2012 - Final Report*, December 2011, pp 58 and 136; Marsden Jacob, *Supplementary Energy Review – SDP*, May 2017, p 12; Atkins Cardno, *Supplementary Expenditure Review – SDP,* May 2017, p 19.

8.3 Approach to setting energy cost allowances

We have made a decision to:

33 Continue to set energy cost allowances based on benchmark estimates of efficient energy costs.

We have decided to maintain our approach of setting energy cost allowances based on an efficient benchmark, as we consider this is best regulatory practice. By de-linking energy allowances from actual energy costs, this maintains appropriate incentives for SDP to prudently and efficiently manage its actual energy costs now and in the future. If we moved to passing through SDP's actual energy costs, SDP would have little incentive to procure energy on a prudent and efficient basis and customers could be exposed to inefficient energy costs.

SDP proposed that we set energy cost allowances for the 2017 determination period based on SDP's energy contract prices.[294] The reasons presented by SDP are outlined in Box 8.1.

Box 8.1 SDP's proposal to pass through actual energy costs

The following arguments were made by SDP in support of using its contracted energy costs for the purpose of setting prices over the 2017 determination period:

- SDP expressed its view that its contract price is both an efficient and prudent instrument through which to procure energy to provide the water supply and water security services as envisaged under the Metropolitan Water Plan, whilst complying with its planning conditions for 100% renewable energy.
- SDP argued that its use of long-term contracting is prudent and that the competitive tender process used to procure these contracts means that the prices in these contracts should be considered efficient.
- SDP noted that while IPART has a history of setting energy cost allowances based on an efficient benchmark (eg, LRMC modelling) rather than actual energy costs in its 2010 and 2013 regulated retail electricity price determinations, the different operating contexts and regulatory objectives suggest that these approaches are not well suited to setting the energy cost allowance for SDP.
- SDP argued that using a 'point in time' market-based approach to set its energy cost allowance would negatively impact customers. SDP pointed to recent volatility in energy markets to support its argument that IPART's approach would provide SDP with a windfall gain and potentially shift risk onto customers.
- SDP also expressed the view that basing energy cost allowances on its contracts would ensure Sydney Water and customers are not required to manage year-on-year volatility in SDP's energy costs.

Data source: SDP pricing proposal to IPART, October 2016, pp 84-88.

294 SDP pricing proposal to IPART, October 2016, pp 84-86. SDP redacted its energy contract prices (and the associated proposed energy cost allowances) from its public submission because this information is commercial in confidence. Therefore, we are not able to quote either SDP's contract prices or its proposed energy cost allowances directly.

Sydney Water supported SDP's position that because SDP's energy contracts were secured following a competitive tender, and accordingly represent efficient energy costs, they should not be assessed at each price review.[295]

In response to our Draft Report:

- SDP stated that it did not agree with our draft decision to use a market-based benchmark price per unit of energy because this exposes SDP and customers to price volatility between determinations. SDP maintained its position that we should set energy cost allowances for the 2017 determination period based on SDP's energy contract prices which SDP characterises as its 'market tested long-term contracting costs'.[296]
- Sydney Water noted that the efficient benchmark energy prices recommended by Marsden Jacob are above the contract prices secured by SDP under its competitively sourced long-term energy supply contracts. Sydney Water suggested that we consider sharing some of the benefits (and risks) of SDP's energy contracts with customers.[297]

We have considered SDP and Sydney Water's proposals and submissions on this issue. We do not agree that passing through SDP's actual energy costs (in part or in full) would achieve an efficient allocation of risk between SDP and customers and, as a result, our view is that setting energy cost allowances based on SDP's energy contract prices is unlikely to be in the best long-term interests of SDP's customers.

We have decided to maintain our approach of setting energy cost allowances based on an efficient market-based benchmark for the following reasons:

- Our market-based energy cost allowances will better reflect the market price of energy over time. With our approach, customers can expect to pay the efficient market price of energy required to efficiently run the plant over time rather than SDP's contract costs which may or may not be efficient. While SDP's contract prices are fixed and are therefore less volatile than market price, the more relevant consideration is whether SDP's contracts are higher or lower than market prices, on average, over the long term.
- Under our approach, which we maintain over the 2012 and 2017 determination periods, SDP has a strong incentive to meet or beat our estimate of the market price because it is able to keep any gains it is able to generate by doing this. Under SDP's approach, SDP would no longer have a strong incentive to prudently manage its energy costs because these costs would be passed through to customers. We consider SDP's approach would result in an inefficient allocation of risk between SDP and customers and could lead to SDP's customers being exposed to inefficient costs.

We note that our approach to setting efficient benchmark energy costs is similar to our approach to setting an efficient benchmark cost of capital. A business will typically have a portfolio of debt at different prices and different maturities. When we consider the cost of debt for pricing purposes over the regulatory period, we do not pass through the actual costs of debt entered into by the regulated business in the past because this might result in:

- prices that do not necessarily reflect efficient market prices in the short term
- an inefficient allocation of risk between the regulated business and its customers, and

295 Sydney Water submission to IPART Issues Paper, November 2016, p 41.
296 SDP submission to IPART Draft Report, April 2017, p 54.
297 Sydney Water submission to IPART Draft Report, April 2017, p 21.

- the potential for inefficient costs to be passed through to customers over the longer term.

8.4 Methodology used to estimate benchmark unit energy prices

Our benchmark unit energy prices have been recommended by our energy consultant, Marsden Jacob. They include electricity, Large-scale Generation Certificates (LGCs), and all other components of energy costs (excluding network costs for which we are proposing to maintain the cost pass-through mechanism).

Marsden Jacob's benchmarks are based on current electricity and LGC forward market data (robust for the first three years of the 2017 determination period) and long-run marginal cost (LRMC) modelling to extrapolate these forecasts to the end of the 2017 determination period.

LRMC modelling was undertaken to establish the cost of providing energy, capacity and LGCs in each year of the 2017 determination period. This was in the context of pricing contracts that could be purchased for NSW over the 2017 determination period. Critical input variables in this modelling included demand, fuel costs, and capital cost assumptions.

Marsden Jacob employed two approaches to estimating the LRMC:

- An incremental approach (assuming existing supply capacity is able to meet SDP's load).
- A standalone approach (assuming new supply capacity is required to meet SDP's load).

These approaches generated a LRMC range which Marsden Jacob then used to extend or extrapolate market-based estimates out to the end of the 2017 determination period.[298]

Marsden Jacob's approach to developing benchmark prices was based on meeting SDP's load profiles under shutdown, transition, and operation modes.

Following our Draft Report, we re-engaged Marsden Jacob to re-estimate their benchmark prices based on:[299]

- the same methodology used in their February 2017 report, and
- up-to-date market and LRMC parameters.

We consider Marsden Jacob's updated benchmark prices are the best available forecast of energy market prices over the 2017 determination period.

8.5 Our benchmark energy unit prices

We have made a decision to:

34 Set efficient benchmark energy unit prices as outlined in Table 8.3.

Marsden Jacob recommended benchmark energy prices for three modes of operation:[300]

298 Additional information on Marsden Jacob's LRMC modelling is contained in: Marsden Jacob, *Energy Review – SDP*, February 2017, Chapter 7 and Appendix 4.
299 Marsden Jacob, *Supplementary Energy Review – SDP*, May 2017.
300 Marsden Jacob, *Energy Review – SDP*, February 2017, p 35.

- Shutdown, which assumes a flat load of 0.57 MW.
- Transition, which assumes a linear increase from 0.57 MW to 37.5 MW.
- Plant operation, which assumes a flat load of 37.5 MW.

Marsden Jacob developed two cases of benchmark prices. One case that includes the cost of over-contracting and another that excludes the cost of over-contracting.[301] We have decided to base our benchmark prices on the case that excludes the cost of over-contracting. The case that excludes the cost of over-contracting is less prescriptive in that it does not assume SDP meets its load by entering forward contracts. This uses the forward market curve as the market's best estimate of spot market prices going forward. We therefore consider the case excluding the cost of over-contracting provides the best forecast of spot market prices over the forecast period.

Table 8.3 sets out our benchmark energy unit costs for the 2017 determination period.

Table 8.3 Benchmark energy unit prices ($/MWh, $2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22
Shutdown	197.88	161.96	144.71	136.40	133.36
Transition	197.17	161.25	144.00	135.69	132.65
Operation	197.16	161.24	143.99	135.68	132.64

Data source: Marsden Jacob, *Supplementary Energy Review – SDP*, May 2017, p 12.

8.5.1 We are using up-to-date benchmark prices

In response to our Draft Report, SDP proposed that if we were to maintain our benchmark approach for the Final Report, we should update our benchmark prices to reflect up-to-date market information.[302]

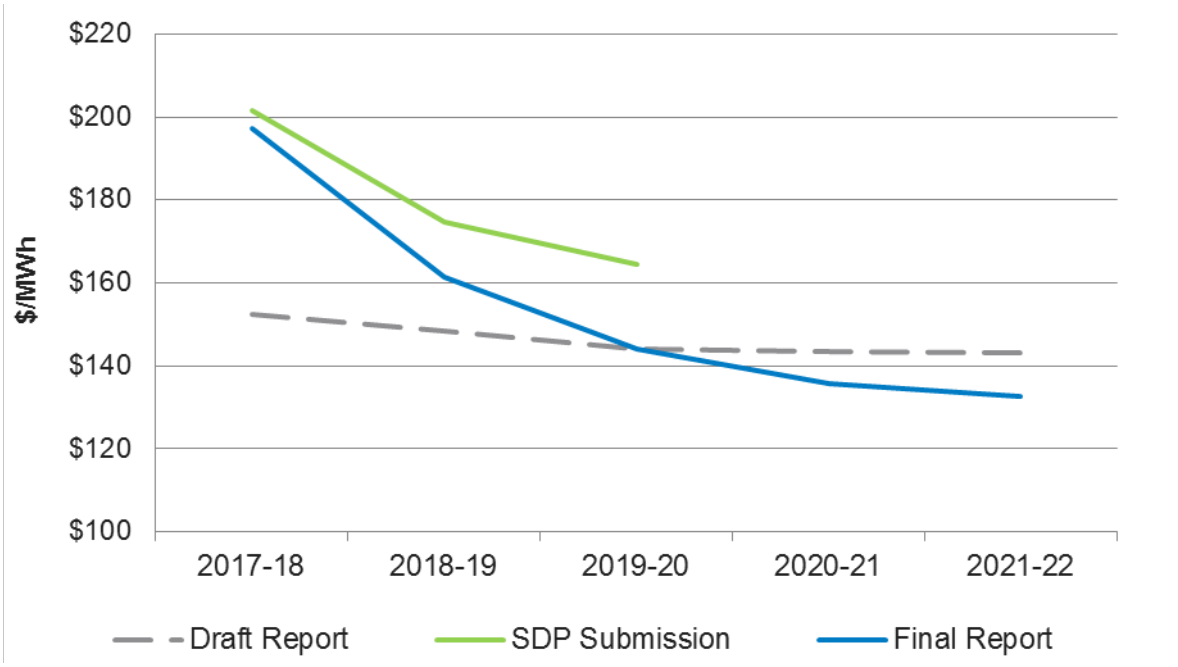
While we agree with SDP that we should use the most up to date market information when setting regulated prices, we note that the revised benchmark prices proposed in SDP's submission to our Draft Report were based on updating only one of several components of the benchmark price (ie, energy component).

Figure 8.3 shows how the benchmark price has changed since the Draft Report.

301 Forward contracts are traded in whole megawatt (MW) units. In order to meet a load of 0.5 MW, a market participant would need to purchase a forward contract for 1 MW (ie, 100% over-contracted). In order to meet a load of 49.5 MW, a market participant would need to purchase a forward contract for 50 MW (ie, 1% over-contracted). The degree (and potential cost) of over-contracting diminishes as the load increases.

302 SDP submission to IPART Draft Report, April 2017, p 54.

Figure 8.3 Comparison between draft and final benchmark prices



Data source: Marsden Jacob, *Energy Review – SDP*, February 2017, p 48. Marsden Jacob, *Supplementary Energy Review – SDP*, May 2017, p 12. IPART, SDP Price Review - Draft Report, February 2017, p 81. SDP submission to IPART Draft Report, April 2017, p 55.

Relative to the benchmark prices used in our Draft Report, the updated benchmark prices used in our Final Report are:

- Higher in the first two years of the 2017 determination period. This change is due largely to high gas forward market prices that are driving high electricity forward market prices in the early years of the 2017 determination period.
- Lower in the last two years of the 2017 determination period. This change is due largely to a sharp reduction in the large-scale generation certificate (LGC) forward prices in the latter years of the 2017 determination period.

Marsden Jacob's supplementary report includes a discussion of factors that, in Marsden Jacob's view, have affected the benchmark price since it was originally estimated in November 2016 to when it was updated in May 2017.[303] The following points summarise the discussion provided in Marsden Jacob's supplementary report:

- Energy swap contract prices have increased in the early years of the 2017 determination period because:
  - NSW had a very hot 2016/17 summer that resulted in many days of extreme demand and associated high spot prices.
  - The availability of gas was lower and prices higher than previously projected.
  - The bidding behaviour of a number of generators in the NEM has changed.
  - The closure of Hazelwood Power Station has impacted spot prices.
- The downward sloping energy swap contract outlook was due to:
  - The outlook of renewable generation development is higher than previously assessed.

303 Marsden Jacob, *Supplementary Energy Review* – SDP, May 2017, p 13.

- The expectation of increasing gas availability over the period.

- The fall in the LGC forward curve has been due to:
  - The outlook of renewable generation development is higher than previously assessed.
  - Some parties with LGC liabilities electing to pay the penalty price rather than purchase LGCs.
  - Higher energy prices which have the effect of lowering the LGC price required for renewable energy projects to be economic.

In response to our Draft Report, SDP claimed that Marsden Jacob's recommended benchmark prices were in $2015-16 and that we had mistakenly reported them to be in $2016-17.[304] We confirm that Marsden Jacob's recommended benchmark prices were and continue to be in $2016-17. Marsden Jacob has confirmed and clarified this in its supplementary report.[305]

8.5.2 Components of benchmark unit energy prices

Table 8.4 shows the components of the benchmark price for plant operation mode.

A full description of these cost components can be found in Marsden Jacob's report. In broad terms:

- Energy costs ($114.62/MWh) make up 58% of the total benchmark price in 2017-18. This represents a large increase from the (LRMC based) benchmark in 2016-17. Marsden Jacob cited high gas market prices and the closure of Hazelwood Power Station as issues that have affected energy market prices over the outlook period.
- Renewable energy costs ($75.21/MWh) consisting of LGCs, small scale generation certificates (STCs), and energy savings certificates (ESS), make up 38% of the total benchmark price in 2017-18. The main component of renewable energy costs in 2017-18 (ie, LGCs) is 8% lower than the (LRMC based) LGC benchmark in 2016-17.
- Other components ($7.33/MWh) consisting of retail margin, market fees, metering and data fees, ancillary services, and losses make up the remaining 4% of the total benchmark price in 2017-18. Together, these components are slightly higher in dollar terms than the benchmarks in 2016-17.

In developing these benchmark prices, Marsden Jacob assumed that the benchmark price included 100% renewable energy and that this was made up of 90% LGCs and 10% STCs.[306]

304 SDP submission to IPART Draft Report, April 2017, p 55 (see footnote to table 5.10).
305 Marsden Jacob, *Supplementary Energy Review – SDP*, May 2017, p 3.
306 Marsden Jacob, *Energy Review – SDP*, February 2017, p 21.

Table 8.4 Components of Marsden Jacob's benchmark price ($/MWh, $2016-17)

	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Energy (ex. losses)	48.90	114.62	88.61	78.63	73.79	71.99
REC / LGC	76.16	69.89	60.41	53.21	49.83	48.61
STC		3.38	3.24	3.24	3.24	3.24
ESS		1.94	2.06	2.13	2.13	2.13
Retail margin		5.00	5.00	5.00	5.00	5.00
Market fees	5.93	0.30	0.30	0.30	0.30	0.30
Metering / data		0.01	0.01	0.01	0.01	0.01
Ancillary services		0.25	0.25	0.25	0.25	0.25
Losses		1.77	1.36	1.21	1.14	1.11
Total [a]	**130.99**	**197.16**	**161.24**	**143.99**	**135.68**	**132.64**

[a] Refers to Marsden Jacob's benchmark unit energy price for plant operation mode. Numbers may not add due to rounding.

Data source: IPART, *Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2012 - Final Report*, December 2011, p 136 (note figures converted from $2011-12 to $2016-17). Marsden Jacob, *Supplementary Energy Review – SDP*, May 2017, p 12.

8.5.3 Compared to the 2012 Determination

Table 8.5 compares our efficient benchmark energy unit prices to the components of various alternative unit energy price estimates. Specifically:

- **IPART 2012 benchmark price:** this is the IPART allowed unit energy cost from the 2012 Determination for 2016-17, moved into $2016-17 based on actual inflation.
- **SDP original / updated market price:** SDP reported market-based estimates for the first three years of the 2017 determination period as part of its pricing submission. In response to our Draft Report, SDP presented a revision of our draft 2017 benchmark price with an updated energy component.
- **IPART draft / final 2017 benchmark price:** this is the estimate we have used in our draft and final reports to set energy allowances. These estimates were developed and recommended by our energy consultant, Marsden Jacob.

The benchmark is designed to reflect market prices. We note that Marsden Jacob's estimates are close to the market prices quoted and updated by SDP in its pricing proposal and submission to our Draft Report. Our final 2017 benchmark price is lower than SDP's updated market price because Marsden Jacob incorporated up-to-date information on LGC's in its update to the benchmark price.

Table 8.5 Comparing energy cost components ($/MWh, $2016-17)

	IPART 2012 benchmark	SDP original market price [a]	IPART draft 2017 benchmark price [b]	SDP updated market price [a]	IPART final 2017 benchmark price [b]
	2016-17	2017-18	2017-18	2017-18	2017-18
Energy	48.90	55.50	63.51	112.57	114.62
LGCs	76.16	82.63	77.06	77.06	69.89
Other	5.93	11.50	11.86	11.86	12.65
Total	**130.99**	**149.62**	**152.43**	**201.49**	**197.16**

[a] While SDP provided these market prices in its pricing proposal and submission to our Draft Report, SDP has maintained throughout this review that we should not set a benchmark price and should instead pass-through its energy contract price.

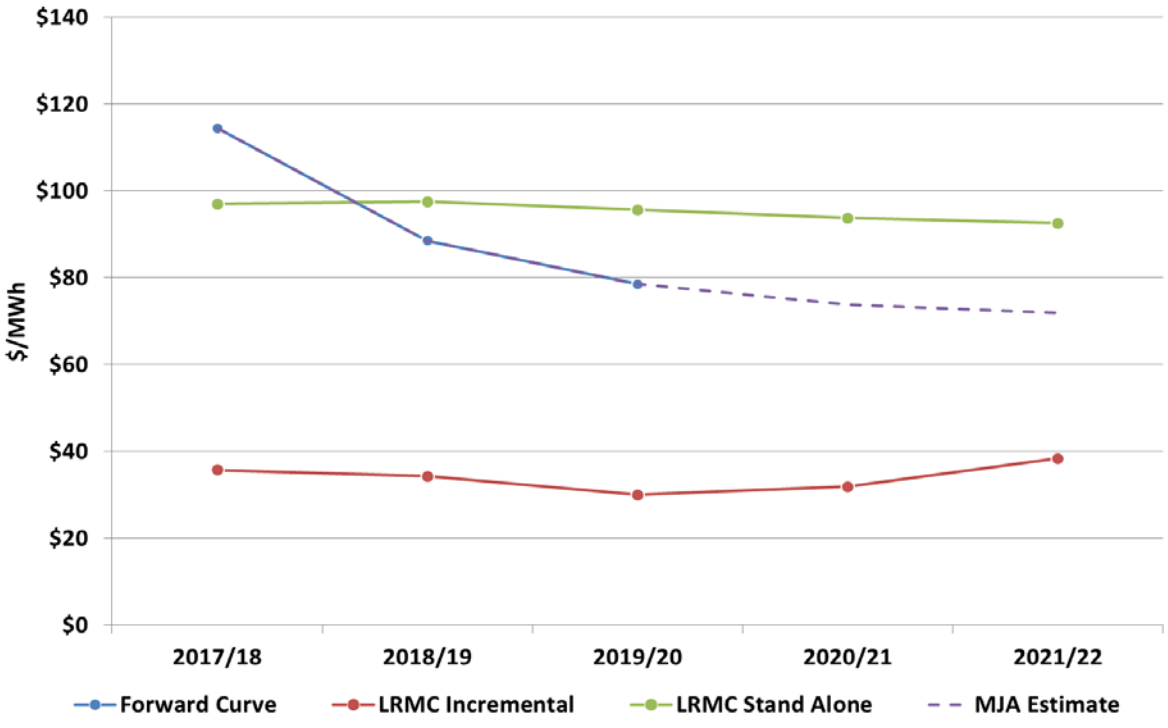
[b] Refers to Marsden Jacob's original and updated benchmark unit energy prices for plant operation mode.

Note: Totals may not add due to rounding.

Data source: IPART, *Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2012 - Final Report*, December 2011, p 136 (note figures converted from $2011-12 to $2016-17). SDP pricing proposal to IPART, October 2016, pp 93-94. Marsden Jacob, *Energy Review – SDP*, February 2017, p 48. SDP submission to IPART Draft Report, April 2017, p 55. Marsden Jacob, *Supplementary Energy Review* – SDP, May 2017, p 12.

Figure 8.4 illustrates Marsden Jacob's updated modelling of the energy component of the benchmark price, which is based on the forward market curve for the first three years of the 2017 determination period and then extrapolated over the remainder of the period based on incremental and stand-alone LRMC modelling.

Figure 8.4 Marsden Jacob's modelling of the energy component ($/MWh, $2016-17)

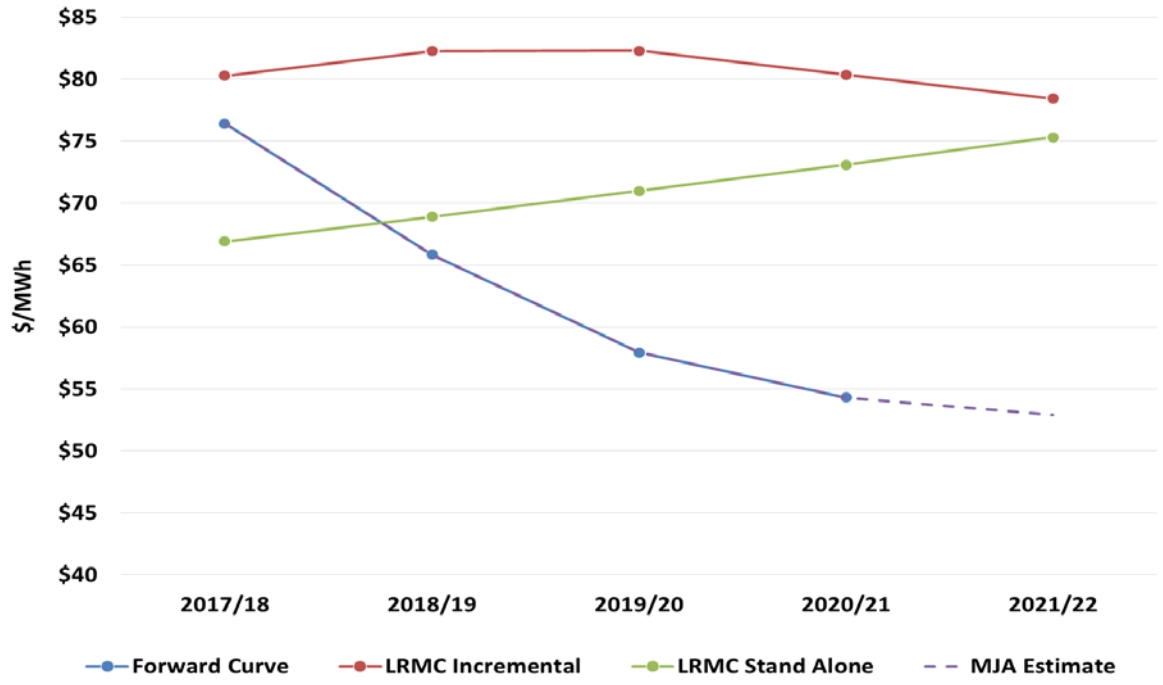


Note: The first three years of Marsden Jacob's estimate (2017-18 to 2019-20) are equal to the forward curve. We note that this figure is presented in $2016-17 while the figure presented in Marsden Jacob's supplementary report is in nominal dollars.

Data source: Marsden Jacob, *Supplementary Energy Review – SDP*, May 2017, pp 3 and 9.

Figure 8.5 illustrates Marsden Jacob's modelling of the LGC component of the benchmark price, which is based on a combination of forward market and LRMC modelling.

Figure 8.5 Marsden Jacob's modelling of the LGC component ($/MWh, $2016-17)



Note: The first four years of Marsden Jacob's estimate (2017-18 to 2020-21) are equal to the forward curve. We note that this figure is presented in $2016-17 while the figure presented in Marsden Jacob's supplementary report is in nominal dollars.

Data source: Marsden Jacob, *Supplementary Energy Review – SDP*, May 2017, pp 3 and 10.

8.6 Benchmark volumes

We have made a decision to:

35 Set benchmark energy volumes as outlined in Table 8.6.

Our benchmark energy volumes are based on our expenditure consultant, Atkins Cardno's, review and recommendations of SDP's energy requirements in each mode of operation.[307]

Atkins Cardno based its analysis of SDP's energy requirements in plant operation mode on the plant's proving period after construction.[308] The plant's proving period was the two years to June 2012. Atkins Cardno also made specific assumptions around technical aspects of plant operation and sea water quality.[309]

In shutdown, Atkins Cardno formed its estimate of SDP's energy requirements on the plant's actual energy use over the 2012 determination period.

We have accepted Atkins Cardno's benchmark energy volumes over the 2017 determination period, but for an adjustment to energy volumes in transition to restart.

Atkins Cardno's estimate of efficient energy consumption is 71,000 MWh for the complete transition to restart, which includes energy for the drinking water pumping station,

307 Atkins Cardno, *Expenditure Review – SDP*, February 2017, pp 41, 44 and 50. Atkins Cardno, *Supplementary Expenditure Review – SDP*, May 2017, pp 16, 17-18 and 19.
308 Atkins Cardno, *Expenditure Review – SDP*, February 2017, pp 41, 44 and 50.
309 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 49.

assuming an 8-month restart period.[310] In its February 2017 report, Atkins Cardno considered restart would include production and supply of 15,000 ML of drinking water.[311]

Once SDP supplies drinking water, it moves to plant operation mode and begins receiving an incremental daily service charge and a water usage charge for the water it supplies. Therefore, it is important the transition to restart charge only include energy costs that are unrelated to the production and supply of drinking water to not double count these costs.

In our Draft Report, of the total volume of 71,000 MWh estimated for restart, we estimated that 52,740 MWh related to the production and supply of 15,000 ML of desalinated water.[312] The remaining 18,260 MWh are considered 'fixed' (ie, unrelated to production and supply of drinking water) and what we have decided as appropriate costs to recover through the transition charge.

In response to our Draft Report, SDP accepted our draft decisions on energy volumes during water security and full operation mode but challenged our decision on the energy volume during transition to restart. SDP's position is that by removing an estimate of the 'variable' component of energy used during restart risks the 2017 Determination understating the energy requirements during restart.[313] SDP maintained its position that the efficient volume of energy required in restart is 79,652 MWh.[314]

Following our Draft Report, we re-engaged Atkins Cardno to consider SDP's response. In its supplementary report, Atkins Cardno maintained its recommendation that the efficient energy requirement for transition to restart is 71,000 MWh. Atkins Cardno revised its estimate of the volume of drinking water that could be produced and supplied during an 8-month transition to restart from 15,000 ML to 10,000 ML.[315]

Atkins Cardno noted that the actual delivery of 10,000 ML is not certain, as the membranes arrival to site could be delayed or other issues could delay water production meeting the export specification during the eight month start up. Atkins Cardno concluded that the variable energy requirements for 10,000 ML should not be deducted from the 71,000 MWh restart allowance and that an alternative approach would be to undertake an ex-post adjustment based on the actual volume of water delivered.[316]

We have decided to accept Atkins Cardno's recommendation on the efficient energy requirement for transition to restart of 71,000 MWh, but we have decided to maintain our approach of deducting from this total amount the variable component associated with the production and delivery of 10,000 ML of desalinated water. That is, our decision is to deduct 35,160 MWh[317] from the total 71,000 MWh resulting in an allowance of 35,840 MWh. Our reasons for maintaining this approach are:

310 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 43.
311 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 42.
312 This estimate is derived by applying the MWh / ML in full production mode (ie, 320,835MWh / 91,250ML = 3.516MWh / ML) to 15,000ML (ie, 3.516MWh x 15,000ML = 52,740MWh).
313 SDP submission to IPART Draft Report, April 2017, p 55.
314 SDP submission to IPART Draft Report, April 2017, pp 52 and 55.
315 Atkins Cardno, *Supplementary Expenditure Review – SDP, May* 2017, pp 16-18.
316 Atkins Cardno, *Supplementary Expenditure Review – SDP, May* 2017, pp 16-18.
317 That is, 3.516 MWh x 10,000 ML = 35,160 MWh.

- Our aim is to set cost-reflective charges for transition to restart (before drinking water is supplied) and plant operation (when drinking water is being supplied). Once the supply of drinking water commences, the plant moves to the 'plant operation' pricing schedule, where SDP receives an incremental service charge and a water usage charge per ML of water supplied. The water usage charge covers chemicals and energy to produce and supply drinking water. The 8-month grace period from abatement introduced in our 2017 Determination allows the plant to supply at less than full capacity without abatement when ramping up to full production.
- We do not want to over-compensate SDP through the one-off transition to restart charge by including variable energy costs in the transition charge. We also do not want to fund SDP to produce 10,000 ML of non-drinking water.
- We consider our approach provides SDP the energy required to get ready to supply drinking water and also provides a strong incentive for SDP to maximise the production of drinking water during the 8-month restart period.

Our benchmark energy volumes for the 2017 determination period are set out in Table 8.6.

Table 8.6 Benchmark energy volumes (MWh)

	2016-17	2017-18	2018-19	2019-20 [a]	2020-21	2021-22
Shutdown						
- Total (fixed)	9,000	5,000	5,000	5,014	5,000	5,000
Transition to restart						
- Total (fixed)	-	35,840	35,840	35,840	35,840	35,840
Plant operation						
- Fixed	-	7,665	7,665	7,686	7,665	7,665
- Variable	-	320,835	320,835	321,714	320,835	320,835
- Total	360,000	328,500	328,500	329,400	328,500	328,500

a 2019-20 will be a leap year with 366 days.

Note: Numbers may not add due to rounding.

Data source: IPART analysis. Atkins Cardno, *Expenditure Review – SDP*, February 2017, pp 41, 44 and 50.

8.7 Pass through of energy network charges

We have made a decision to:

36 Maintain the cost pass-through mechanism used in the 2012 Determination for SDP's energy network costs. However, we have:

- Updated the benchmark volumes used in the calculation of the Variable Network Charge.
- Capped the maximum demand used to calculate the capacity charge/s that feed into the Fixed Network Charge, from 1 July 2017 until SDP is first called into operation, to the lesser of:
- actual maximum demand used to calculate SDP's actual capacity charge/s, and
- benchmark maximum demand of 1,090 kilovolt-amps (kVA).

Under the 2012 Determination we established a methodology to pass-through variable and fixed network charges determined by the AER to SDP's customers. SDP passes through energy network costs via two pass-through mechanisms: a Variable Network Charge (VNC) and a Fixed Network Charge (FNC).

- The VNC is based on regulated network prices and benchmark energy volumes.
- The FNC is based on regulated network prices and actual maximum demand (ie, maximum demand recorded over the 12 months leading up to each billing month).

We decided to use a cost pass-through in the 2012 Determination because there was considerable uncertainty about potential changes in network prices over the 2012 determination period (as the AER's determination in place at that time was due to end in 2013-14).

We consider the cost pass-through mechanism has operated as intended over the 2012 determination period and we have decided to continue to use this method to pass-through SDP's network charges over the 2017 determination period. Similar to the 2012 determination period, SDP's network costs will become uncertain in the 2017 determination period. The AER sets network charges on a two-year basis, and its next determination will come into effect on 1 July 2017.

SDP supported the use of a pass-through mechanism given the significant uncertainty with electricity network prices over the medium term. SDP also argued that retaining the pass-through mechanism would maintain regulatory consistency in addressing the same issue across determinations.[318]

Sydney Water also supported the use of a pass-through mechanism, noting that any forecast of network charges during the previous price review for SDP would have been significantly higher than actual billed charges. [319] Further, Sydney Water stated that the unpredictability of network charges means that no forecast would be more efficient than a pass-through of actual charges.[320]

8.7.1 Benchmark volumes used in the pass through mechanism

We have updated the energy volumes used in the calculation of the VNC consistent with our decisions on SDP's efficient energy requirements by mode of operation over the 2017 determination period (outlined above).

In response to our Draft Report, Sydney Water discussed that, as part of the December 2015 storm related reinstatement works, it is likely that SDP's demand on the energy network will increase, resulting in higher capacity charges and FNC for a period of time following the re-instatement works. Sydney Water considers that the FNC in water security mode should not include additional demand charges related to storm-related reinstatement works and

318 SDP pricing proposal to IPART, October 2016, pp 37-38.
319 Sydney Water submission to IPART Issues Paper, November 2016, p 42.
320 Sydney Water submission to IPART Issues Paper, November 2016, p 42.

suggested a potential solution to this could be to base the FNC on a benchmark volume of energy rather than actuals during the relevant period.[321]

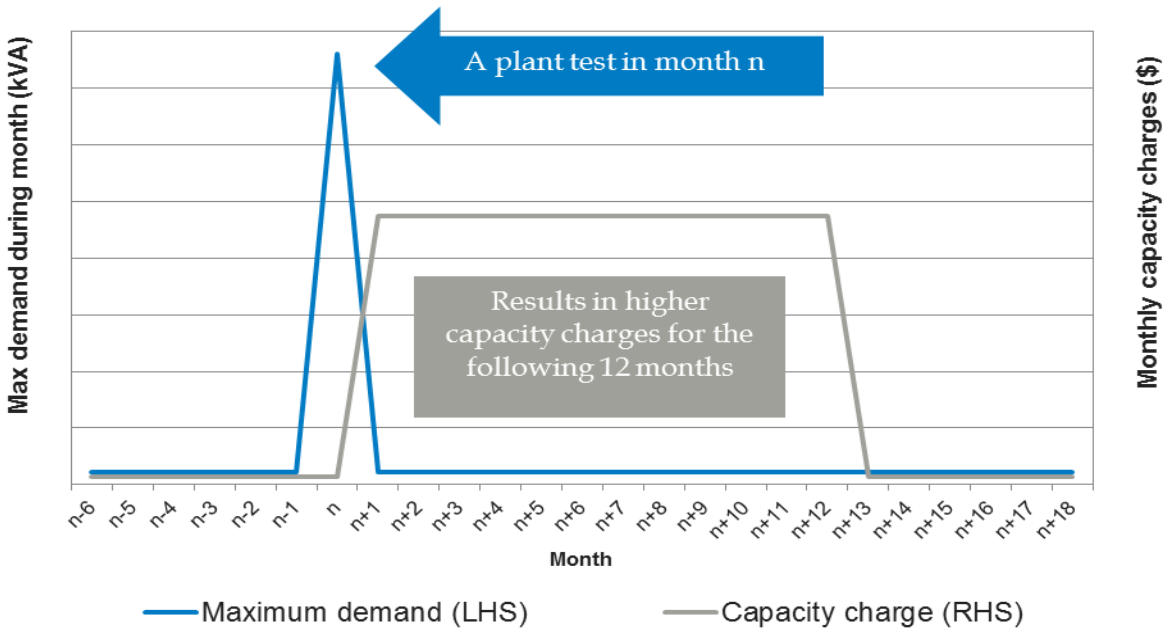
We have explored this issue and consider there is a case to temporarily cap the FNC. The reason for this is that unlike the VNC, we do not currently set a benchmark volume for the FNC. Therefore, if SDP increases its energy use while in shutdown (eg, by running a plant test):

- The VNC (based on benchmark energy volume) would not increase.
- The FNC (based on actual maximum demand) could increase.

SDP currently pays capacity charges on two network connections: a primary connection; and a secondary connection. We have analysed SDP's maximum demand over the period July 2014 to June 2016 and note maximum demand used to calculate capacity charges over that period is 1,090 kilovolt-amps (kVA). We have decided to use this maximum recorded maximum demand for the temporary FNC cap. We note the 1,090 kVA cap applies separately to each of SDP's capacity charges.

The capacity charges that feed into FNC are based on maximum demand occurring in a peak period recorded over a maximum period of the previous 12 months.[322] Therefore, a temporary increase in maximum demand in one month can result in higher capacity charges (and therefore higher FNC) for a period up to 12 months following the temporary increase in maximum demand. The impact on FNC of a temporary spike in maximum demand is illustrated in Figure 8.6.

Figure 8.6 A spike in demand leads to higher capacity charges for following 12 months



Note: This example is for illustration only. The actual increase in maximum demand associated with a potential rebuild related plant test may be greater or less than what we have assumed in this illustrative example.

Data source: IPART analysis.

321 Sydney Water submission to IPART Draft Report, April 2017, p 21.
322 Ausgrid, ES7 Network Price Guide, April 2017, p 10.

If we were to set a firm end date for the FNC cap and that rebuild-related spikes in maximum demand occur within the 12 months leading up to this firm end date, there is a risk that rebuild-related FNC costs could be passed-through to customers. Given the uncertainty about the timing of plant re-instatement works, we have decided to apply the FNC cap from 1 July 2017 until SDP is first called into operation mode. This will ensure SDP's FNC is capped at a level consistent with shutdown until it is next called into operation.

We have consulted with SDP on this issue and confirm that SDP:[323]

- Agrees with Sydney Water's proposal to temporarily cap the FNC.
- Accepts our proposal to set the FNC cap to maximum demand of 1,090 kVA.
- Accepts our proposal to cap FNC from 1 July 2017 until SDP is called into operation.

323 Email correspondence between IPART and SDP, 25 May 2017 and 31 May 2017.

9 Other building block components

To calculate the allowances for a return on assets and regulatory depreciation[324] in the revenue requirement, we need to determine three key inputs:

- the value of SDP's RAB, which represents the economic value of the assets used to deliver the monopoly services
- the appropriate asset lives and depreciation method for SDP's RAB, and
- the appropriate rate of return (ie, the WACC) on SDP's RAB.

In this chapter, we provide an overview of our decisions on these issues and their impact on SDP's NRR.

We also discuss our decisions on factors affecting the regulatory tax allowance and set out our findings on that tax allowance over the 2017 determination period.

9.1 The value of the Regulatory Asset Base

The RAB represents the value of SDP's assets on which we consider it should earn a return on capital and an allowance for regulatory depreciation. In determining the value of the RAB over the 2017 determination period, we have calculated:

- the opening RAB at 1 July 2017, by rolling the historical RAB forward from 2011-12 to 2016-17, and
- the value of the RAB from 1 July in each year of the 2017 determination period.

9.1.1 Calculating the opening RAB at 1 July 2017

We have made a decision to:

37 Set the opening RAB at 1 July 2017 by rolling the historical RAB forward from 2011-12 to 2016-17 as outlined in Table 9.1.

In calculating the opening RAB, we rolled forward the RAB over the 2012 determination period. This involved using the determined RAB at 1 July 2011[325] and making the following adjustments:

- adding prudent and efficient capital expenditure (see Chapter 6)
- deducting the regulatory depreciation we allowed in the 2012 Determination, and
- adding the annual indexation of the RAB.

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324 Regulatory depreciation is also known as 'return of assets', as the regulatory depreciation allowance returns the value of assets over their lives.

325 When we set the RAB at our 2012 determination, the figures we used for 2011-12 were forecasts. Therefore, we need to adjust the 2011-12 figures for our actual figures including our decisions on capital expenditure for 2011-12.

We also made corrections to the asset lives and category values used to establish the RAB in the 2012 Determination (discussed further below).

The historical RAB roll forward is presented in Table 9.1. Our opening RAB of $1,969.0 million (plant and pipeline) for the 2017 determination period is around $4.6 million below SDP's proposed opening RAB of $1,973.6 million.[326]

Table 9.1 RAB roll forward – 1 July 2011 to 30 June 2017 ($million, $nominal)

	2011-12[a]	2012-13	2013-14	2014-15	2015-16	2016-17
Plant						
Opening RAB	1,344.7	1,337.7	1,331.0	1,330.4	1,309.6	1,281.5
plus Capex	0.9	0.4	0.0	0.3	0.4	0.0
less Depreciation	38.8	39.3	40.5	41.1	41.5	42.4
plus Indexation	30.9	32.1	39.9	20.0	13.1	28.2
Closing RAB	**1,337.7**	**1,331.0**	**1,330.4**	**1,309.6**	**1,281.5**	**1,267.3**
Pipeline						
Opening RAB	632.3	658.6	669.6	684.7	689.9	691.7
plus Capex	16.6	0.0	0.0	0.0	0.0	0.0
less Depreciation	5.1	4.8	5.0	5.0	5.1	5.2
plus Indexation	14.7	15.8	20.1	10.3	6.9	15.2
Closing RAB	**658.6**	**669.6**	**684.7**	**689.9**	**691.7**	**701.8**

a 2011-12 is the final year of the 2008 determination period for Sydney Water, the original owner of SDP. Forecasts were used to roll forward the RAB in this year during the 2012 Determination of SDP's prices.

Note: Numbers may not add due to rounding.

Data source: IPART analysis.

RAB roll forward for 2011-12

We have made a decision to:

38 Roll forward the RAB from 1 July 2011 to 30 June 2012 by taking account of actual CPI, but not updating for actual capital expenditure.

Our standard regulatory practice is to roll forward the RAB from the beginning of the final year of the previous regulatory period to the end of the current regulatory period updating for actuals where they are available. In SDP's case, this requires rolling the RAB forward from 1 July 2011 to 30 June 2016, taking actuals into account.

However, the roll forward of the RAB from 1 July 2011 to 30 June 2012 is outside the current determination period and traverses the sale of the plant from Sydney Water to Government and then to the current owners.[327]

326 SDP pricing proposal to IPART, October 2016, p 60.

Consequently, SDP has not updated the 2011-12 RAB for actuals. The prices in SDP's submission are based on a 1 July 2012 opening RAB of $2,000.2 million ($2012-13), consistent with the RAB we set in the 2012 Determination. SDP reconfirmed in its submission to our Draft Report that it considers that neither the CPI nor capital expenditure should be updated for outcomes in 2011-12.[328]

We have maintained our decision to update the 2011-12 RAB for CPI outcomes only and not actual capital expenditure. SDP considers the reasons for our decision on capital expenditure apply equally to the CPI. However, we maintain the position that sophisticated bidders would reasonably expect CPI forecasts to be updated with outcomes. That is, it would be reasonable to expect the RAB to be indexed using actual CPI, but that the opening value of the RAB not be adjusted for actual capital expenditure in acknowledgment that bids for SDP were based on forecast capital expenditure. The intention is to reflect the real value of the RAB at time of sale (lease).

We also note that the difference between forecast and actual capital expenditure for 2011-12 would have a minor impact on prices over the 2017 determination period. The impact of the lower actual CPI (2.3% for 2011-12 compared to the 2.5% forecast used to set prices under the 2012 Determination) is to reduce the opening RAB as at 1 July 2012 by around $4 million compared to SDP's submission to our Draft Report.

2012 Determination - correcting asset category values

We have made a decision to:

39 Correct asset category values used in the 2012 Determination to roll the RAB forward from 1 July 2012 to 30 June 2017.

In the 2012 Determination, the asset values for some plant asset categories were inadvertently swapped. This happened in two instances:

- Project development costs and Pre-operations payments.
- Seawater intake and Seawater outlet.

The net impact is that SDP's depreciation profile was overstated by around $3 million ($2011-12) each year in the 2012 determination period. As shown in Table 9.2 below, this is because the larger asset value for project development costs of $115.9 million was assigned the much shorter pre-operations payments asset life of 20 years, instead of 44 years.

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327 Sydney Water was the original owner of SDP. On 9 May 2012, Sydney Water created two trusts: SDP Assets Trust and SDP Pipeline Trust (the Trusts). The assets associated with SDP (desalination plant, site and pipeline) were transferred to the Trusts on 31 May 2012, with SDP owning the units in the Trusts. Later on the same day, Sydney Water entered into a sale and leaseback arrangement with the Ministerial Holding Corporation for $1.9 billion. The units in the Trusts were then transferred to the Ministerial Holding Corporation. On 1 June 2012, the units in the Trust were then sold for $2.3 billion to a consortium of Hastings Funds Management Ltd (now the Infrastructure Fund) and Ontario Teachers' Pension Plan Board, the successful bidder in the private sector, for a 50-year term. Sydney Water Corporation, *Annual Report*, 30 June 2012, pp 50, 151 and 176.

328 SDP submission to IPART Draft Report, April 2017, p 70.

Table 9.2 Asset categories, values and economic lives ($million, $2012-13)

Category	Value[a]	Economic Life (new assets)
As per SDP's (then owned by Sydney Water) 2011 submission		
Project development costs	$115.9	44
Pre-operations payments	$10.0	20
Seawater intake	$205.0	90
Seawater outlet	$62.3	100
As per IPART 2012 Determination		
Project development costs	$10.0	44
Pre-operations payments	$115.9	20
Seawater intake	$62.3	90
Seawater outlet	$205.0	100

a The values presented are opening asset values as at 1 July 2012, based on IPART's analysis and are consistent with the other decisions presented in this report.

Data source: IPART analysis.

SDP did not raise this issue in its pricing proposal, but agreed with the draft decision to make this correction to asset category values in its submission to our Draft Report.[329] Therefore, we have corrected for this error by:

- placing the relevant depreciated values (as at 1 July 2017) into the correct asset categories from 1 July 2017, and
- making no retrospective adjustments in correcting for this issue.

This approach ensures that all asset categories, values and remaining lives align at the commencement of the 2017 determination period, resulting in an appropriate depreciation profile being calculated going forward.

SDP is financially indifferent on a present value basis as a result of this issue, as it would still fully recover the cost of its investment, although over a different timeframe. The lower RAB as at 1 July 2017 due to the higher depreciation profile would be offset by the quicker recovery of the assets. That said, SDP would better off on a cash flow basis as it would receive a faster payback for a higher valued asset than it otherwise should (eg, 24 years earlier).

Nonetheless, correcting for this modelling error results in a more appropriate depreciation profile over the 2017 determination period. It ensures that cash flows more closely align with the appropriate level of depreciation of the assets, and importantly prices that are more cost reflective.

329 SDP submission to IPART's Draft Report, April 2017, p 74.

2012 Determination - correcting asset lives

We have made a decision to:

40 Correct asset lives used in the 2012 Determination to roll the RAB forward from 1 July 2017.

In the 2012 Determination, new asset lives were applied to existing assets for all depreciating plant asset categories. Overall, this understated depreciation by about $4 million in each year over the 2012 determination period. If uncorrected, customers would continue to be better off up to the point where the assets should have expired.[330]

Although SDP's depreciation profile (and therefore allowance) has been understated over the 2012 determination period, it would be financially indifferent on a present value basis over the life of the asset because it would still fully recover its initial investment (ie, via the higher relative RAB as at 1 July 2017 and onwards).

In its submission to our Draft Report, SDP agreed with the decision to correct for this issue.[331] Therefore, again, we have corrected for this error to ensure that cash flows more closely align with the appropriate level of depreciation of the assets, and that resulting prices are cost reflective. Our correction is prospective in nature and will only affect the RAB roll forward from 1 July 2017 onwards. But to make this correction we need to recast the RAB from 1 July 2012 to establish correct asset lives over the 2017 determination period. This involves:

- establishing what the remaining economic lives were for existing assets as at 1 July 2012, and
- rolling forward the RAB from 1 July 2012 with the correct remaining economic lives to establish the remaining lives for existing assets as at 1 July 2017.

Our decision on asset lives compared to SDP's proposal is presented in Table 9.3.

Table 9.3 Remaining asset lives to apply to affected asset categories from 1 July 2017 (years)

Category	SDP Proposed	IPART Decision
Plant	25.0	22.0
Seawater intake	85.0	82.0
Seawater outlet	95.0	92.0
Pumping station	20.0	17.1
Pre-operations payments	15.0	12.1
Project development costs	39.0	36.0

Note: Table 9.3 also reflects the asset category swap addressed in Table 9.2 above.

Data source: SDP submission to IPART's Draft Report, April 2017, p 74.

330 The magnitude of the impact depends on the economic life of the asset class. For example, at 1 July 2012, depreciation for the pumping station using the new life of 20 years instead of the remaining life of 17 years leads to around a 15% understatement in depreciation paid over the 2012 determination period. At the other end of the spectrum, the outlet infrastructure has a new life of 100 years and a remaining life of 97 years, which equates to a 3% understatement.

331 SDP submission to IPART's Draft Report, April 2017, p 69.

Maintaining our standard practice of using allowed depreciation

We have made a decision to:

41 Maintain our standard practice of using allowed depreciation to roll forward the historical RAB.

In its original pricing proposal, SDP proposed[332] to recalculate depreciation over the period 1 July 2012 to 30 June 2017 based on actual prudent and efficient capital expenditure when rolling forward the RAB over this period.

Actual prudent and efficient capital expenditure over this period was lower than forecast during the 2012 Determination, albeit marginally (see Table 9.4). Therefore, SDP's proposal would result in the RAB being marginally higher at 1 July 2017 than if allowed depreciation was used.

Table 9.4 Historical capital expenditure ($million, $nominal)

	2012-13	2013-14	2014-15	2015-16	2016-17	Total
2012 Determination	0.5	1.1	0.0	0.0	0.0	1.6
Actual	0.4	0.0	0.3	0.4	0.0	1.1

Note: Numbers may not add due to rounding.

Data source: SDP pricing proposal to IPART (Information Return), October 2016 and IPART analysis.

It is our standard practice to roll forward the historical RAB using allowed depreciation. This is an important feature of our regulatory framework as it provides regulated entities with the incentive to not overestimate their forecast capital expenditure at a price review. Therefore, irrespective of the size of the impact on the RAB, we have used allowed depreciation to roll forward SDP's historical RAB given the incentives this approach provides.

In its submission to our Draft Report, SDP used allowed depreciation to roll forward its historical RAB.[333] SDP also noted an issue with the way allowed depreciation had been indexed from $2011-12 to $nominal in our Draft Report.[334] This issue resulted in our $nominal estimate of allowed depreciation being overstated, and therefore the opening RAB as at 1 July 2017 being understated. This indexing issue has been addressed, and is reflected in the historical RAB roll forward presented in Table 9.1.

9.1.2 Calculating the RAB over the 2017 determination period

We have made a decision to:

42 Adopt the value of the RAB in each year of the 2017 determination period as set out in Table 9.5.

To calculate the RAB in each year of the 2017 determination period, we rolled forward the RAB to 2021-22 by:

332 SDP pricing proposal to IPART (Information return), October 2016.
333 SDP submission to IPART's Draft Report, April 2017, p 71.
334 SDP submission to IPART's Draft Report, April 2017, p 69.

- adding $14.5 million of prudent and efficient forecast capital expenditure over the period, which is all plant related (discussed in Chapter 6), and
- deducting $250.4 million for regulatory depreciation (of which $220.6 million is plant related, and the remaining $29.9 million is for the pipeline).

This gives the forecast RAB for each year of the 2017 determination period, which we use to set SDP's return on capital and allowance for depreciation.

The RAB roll forward over the 2017 determination period is shown in Table 9.5 below.

Table 9.5 RAB roll forward – 2017 determination period ($million, $2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22
Plant					
Opening RAB	1,267.3	1,224.8	1,183.4	1,142.2	1,101.8
plus Capex	1.5	2.6	2.9	3.7	3.7
less Depreciation	44.0	44.1	44.1	44.2	44.3
Closing RAB	**1,224.8**	**1,183.4**	**1,142.2**	**1,101.8**	**1,061.2**
Pipeline					
Opening RAB	701.8	695.8	689.8	683.8	677.9
plus Capex	0.0	0.0	0.0	0.0	0.0
less Depreciation	6.0	6.0	6.0	6.0	6.0
Closing RAB	**695.8**	**689.8**	**683.8**	**677.9**	**671.9**

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

Our RAB is $1.4 million lower at the end of the 2017 determination period than that proposed by SDP in its submission to our Draft Report.[335] The differences leading to a lower RAB than SDP proposed are:

- The difference in the opening RAB as at 1 July 2017 resulting from updating the CPI for the outcome in rolling forward the RAB in 2011-12.
- Retaining the decision to set the pipeline remaining life at 115 years, compared with SDP's proposal of 95 years.
- Accepting Atkins Cardno's recommended capital expenditure profile, which was around $4 million lower over the 2017 determination period than SDP's revised proposal.[336]

335 SDP submission appendices to IPART's Draft Report - Appendices, April 2017, p 32.
336 SDP submission to IPART's Draft Report, April 2017, p 61.

9.2 Return on capital

We have made a decision to:

43 Apply a real post-tax WACC of 4.7% for the purposes of calculating an appropriate rate of return on SDP's assets.

44 Set an allowance for return on capital as outlined in Table 9.7.

We include an allowance for a return on assets in the revenue requirement. This represents our assessment of the opportunity cost of the capital invested to provide the regulated services. Our approach ensures that the business can continue to make efficient capital investments in the future.

To calculate this allowance, we multiply the value of the RAB in each year of the determination period by an appropriate rate of return. As for previous reviews, we have determined the return on capital using the WACC.

9.2.1 Rate of return

We have developed our current approach to setting the WACC in consultation with stakeholders in a number of reviews.[337] Our decision is to use our standard methodology for all parameters. We have selected the midpoint post-tax real WACC value of 4.7%.

The WACC is based on market data sampled to and including:

- 12 May 2017 for the risk free rate
- end April 2017 for the debt margin, market risk premium and inputs to uncertainty index, and
- May 2017 for the short-term inflation estimate.

[337] IPART completed a major review of the WACC in 2013 (IPART, *Review of WACC Methodology – Final Report*, December 2013). We also developed the method of estimating the debt margin and the inflation adjustment (IPART, *WACC - IPART's New Approach to Estimating the Cost of Debt – Fact Sheet*, April 2014; IPART, *New approach to forecasting the WACC inflation adjustment – Fact Sheet*, March 2015).

Our decisions on parameters and the post-tax real WACC are shown in Table 9.6.

Table 9.6 WACC parameters and WACC estimates

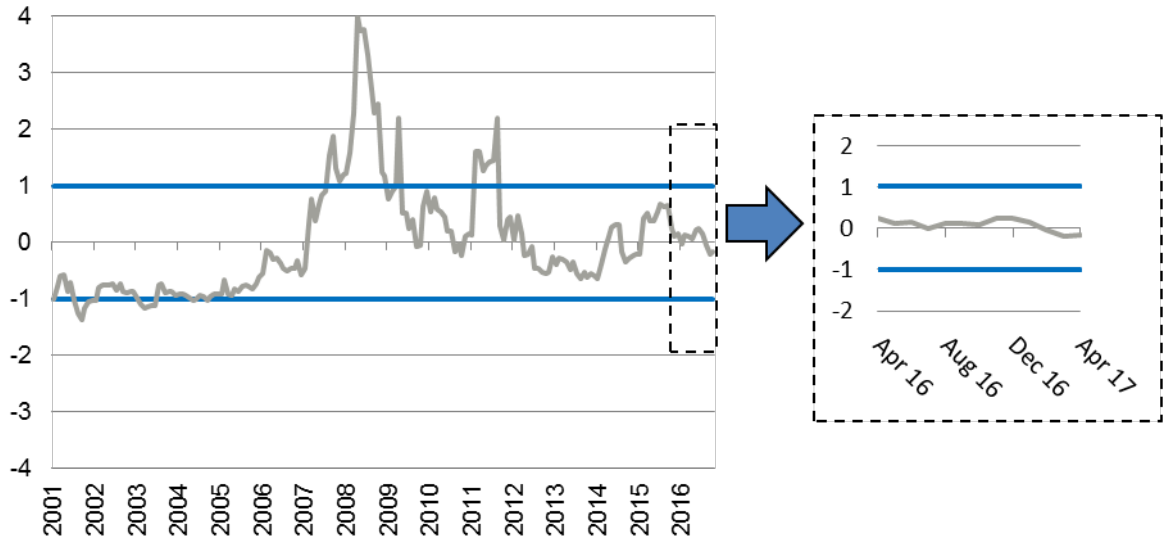
	Current Market Data	Long-term averages	Final WACC range		
			Lower	Midpoint	Upper
Market data					
Nominal risk free rate	2.6%	4.2%			
Inflation	2.4%	2.4%			
Debt margin	2.2%	3.2%			
Market risk premium	9.5%	6.0%			
WACC parameters					
Debt funding	60%	60%			
Equity funding	40%	40%			
Gamma	0.25	0.25			
Corporate tax rate	30%	30%			
Equity beta	0.70	0.70			
Cost of equity and debt					
Cost of equity (nominal post-tax)	9.3%	8.4%			
Cost of equity (real post-tax)	6.7%	5.9%			
Cost of debt (nominal pre-tax)	4.8%	7.4%			
Cost of debt (real pre-tax)	2.3%	4.9%			
WACC estimates					
Nominal Vanilla (post-tax nominal) WACC	6.6%	7.8%	6.6%	7.2%	7.8%
Post-tax real WACC	4.1%	5.3%	4.1%	**4.7%**	5.3%
Pre-tax nominal WACC	7.7%	8.8%	7.7%	8.2%	8.8%
Pre-tax real WACC	5.1%	6.2%	5.1%	5.7%	6.2%

Data source: IPART analysis.

As market uncertainty is currently within one standard deviation of the long-term average, we have selected the midpoint WACC value (Figure 9.1). We measure market uncertainty using our financial market uncertainty index. This is consistent with our decision rule for selecting a point within our range of WACC values, which was established as part of our 2013 review of the WACC.[338]

338 IPART, *Review of WACC Methodology – Final Report*, December 2013, p 4.

Figure 9.1 IPART's uncertainty index to end of January 2017



Data source: Thomson Reuters, Bloomberg.

Compared to the 2012 Determination, the post-tax real WACC has decreased by 90 basis points, reflecting the greater weight given under our present WACC methodology to current market data. Current data is now given equal weight to long-term average data. Since 2012 there has been a significant reduction in the risk-free rate. This has driven a reduction in the current cost of debt, despite a slight upward movement in the debt margin. It has also driven a reduction in the current cost of equity, despite an increase in the current market risk premium.

SDP originally proposed a WACC of around 4.5% based on our biannual WACC update from August 2016.[339] In its submission to our Draft Report, SDP adopted the 4.9% WACC that we used to set draft prices.[340]

Since then, several key WACC parameters have decreased to reflect current market conditions. SDP noted that it expects IPART to update the allowed rate of return using its current methodology, and the latest data available, in its final decision.[341]

9.2.2 Return on assets

Based on the RAB values set out in Table 9.5 and our decision to apply a WACC of 4.7%, the resulting return on capital is shown in Table 9.7 below. Our allowance for the return on capital is higher than proposed by SDP as a result of the higher WACC and higher capital expenditure (due to our decision to capitalise period maintenance costs – see Chapters 6 and 7).

339 SDP pricing proposal to IPART, October 2016, pp 61-62.
340 SDP submission to IPART's Draft Report, April 2017, p 67.
341 SDP submission to IPART Draft Report, April 2017, p 68.

Table 9.7 Allowance for return on capital - all modes ($million, $2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Plant						
IPART decision	58.2	56.3	54.4	52.6	50.7	272.2
SDP proposed	56.2	54.3	52.5	50.7	48.8	262.4
Difference	2.1	2.0	1.9	1.9	1.9	9.8
Difference %	3.7%	3.7%	3.7%	3.8%	3.9%	3.7%
Pipeline						
IPART decision	32.2	32.0	31.7	31.4	31.1	158.4
SDP proposed	31.1	30.8	30.4	30.1	29.8	152.1
Difference	1.2	1.2	1.3	1.3	1.4	6.3
Difference %	3.7%	3.9%	4.1%	4.4%	4.6%	4.1%

Note: Numbers may not add due to rounding.

Data source: SDP pricing proposal to IPART, October 2016, pp 57-58, and IPART analysis.

9.3 Regulatory depreciation

We have made a decision to:

45 Accept SDP's infrastructure based asset categories, with minor adjustments, as set out in Table 9.8 and

- adjust SDP's proposed new and existing asset lives as set out in Table 9.9, and
- set an allowance for regulatory depreciation as set out in Table 9.10.

An allowance for regulatory depreciation is included in the revenue requirement (and used in calculating the value of the RAB, as discussed above). This is intended to ensure that the capital invested in the regulatory assets is returned over the useful life of each asset.

To calculate this allowance, we determine the appropriate asset categories and lives for SDP's RAB, and the appropriate depreciation method to use.

9.3.1 Asset categories on an infrastructure basis

We have accepted SDP's proposal to revert back to an infrastructure based asset classification, given that it aligns with SDP's accounting and reporting systems. A CEMLND[342] asset categorisation was adopted in the 2012 price review only because it was consistent with how Sydney Water reported capital expenditure for regulatory purposes (ie, the then owner of the plant and pipeline).

However, we consider the pipeline RAB should be allocated across two asset categories - pipeline and non-depreciating. The non-depreciating assets consist of land and easements, and make up around $13 million of the $660 million of total pipeline capital expenditure.

342 CEMLND asset categorisation divides assets into the following: civil, electrical, mechanical, electronic, non-depreciating assets.

Our 2012 modelling aggregated the pipeline and non-depreciating assets into one category, despite SDP's 2012 submission identifying these two asset categories. We consider including a non-depreciating asset category to be consistent with SDP's proposed asset classes for the plant infrastructure.

Reverting to asset categories on an infrastructure basis has a negligible impact on SDP's NRR given that total capital expenditure over the 2012 determination period was $1.1 million in nominal terms. In its submission to our Draft Report, SDP accepted the reclassification of asset values that were transposed in the 2012 determination period.[343]

Table 9.8 Asset categories for the RAB roll forward from 1 July 2012

Desalination Plant Infrastructure – Existing Assets (as at 1 July 2012)		
IPART 2012 Determination	**SDP 2017 proposal**	**IPART 2017 decision**
Plant	Plant	Plant
Intake infrastructure	Intake infrastructure	Intake infrastructure
Outlet infrastructure	Outlet infrastructure	Outlet infrastructure
Pumping station	Pumping station	Pumping station
Pre-operations payments	Pre-operations payments	Pre-operations payments
Project development	Project development	Project development
Non-depreciating	Non-depreciating	Non-depreciating
Desalination Plant Infrastructure – New Assets (post 1 July 2012)		
IPART 2012 Determination	**SDP 2017 proposal**	**IPART 2017 decision**
Civil	Plant	Plant
Electrical	Intake infrastructure	Intake infrastructure
Mechanical	Outlet infrastructure	Outlet infrastructure
Electronic	Pumping station	Pumping station
Non-depreciating	Pre-operations payments	Pre-operations payments
	Project development	Project development
	Non-depreciating	Non-depreciating
Pipeline Infrastructure – Existing & New Assets		
IPART 2012 Determination	**SDP 2017 proposal**	**IPART 2017 decision**
Civil	Pipeline	Pipeline
Electrical		Non-depreciating
Mechanical		
Electronic		
Non-depreciating		
Corporate – New Assets (post 1 July 2012)		
IPART 2012 Determination	**SDP 2017 proposal**	**IPART 2017 decision**
N/A	Short lived assets	Short lived assets

Data source: IPART, *Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2012 – Final Report*, December 2011, p 74. SDP pricing proposal to IPART (Information Return), October 2016. IPART analysis.

343 SDP submission to IPART's Draft Report, April 2017, p 69.

9.3.2 Asset lives

We have accepted SDP's proposed new asset lives for the plant infrastructure, following their review by our expenditure consultant, Atkins Cardno.[344] However, we have not accepted SDP's proposal to adjust the asset life for the pipeline from 140 years (2012 Determination) to 100 years based on its design life.[345]

SDP reiterated its position on the pipeline asset life in its submission to our Draft Report.[346] SDP maintains that the pipeline design life is 100 years for both the land-based and below-sea parts of the pipeline. It considered that the land-based asset life of 140 years recommended by Atkins Cardno is purely assumption-driven.

We requested that Atkins Cardno reassess the appropriate asset life for the pipeline. In doing so, it noted that:

- The current assumption of 140 years is consistent with asset lives applied to Sydney Water's[347] water mains of a similar diameter in similar locations and environments within the Sydney Area.
- The under-sea section of pipeline is in a more aggressive environment than the land-based sections.
- Under the current plant operation mode, the design flow is 250 ML/d with a lower pumping head. This means that the pipeline is not under full design flows and pressures until the second stage of the desalination plant is operational. There is no indication that this will be needed in the short run.[348]

We are satisfied with Atkins Cardno's assessment and have decided to adopt its recommendation to set the asset life for new pipeline infrastructure at 120 years.[349] This reflects that half the length of the pipeline is land-based (140 years) and the other half is in a more aggressive environment under Botany Bay (100 years). We set asset lives on the principle of economic life (ie, over what period should the asset provide a service), and not on its design life. This is consistent with Atkins Cardno's rationale.

Also based on Atkins Cardno's recommendation, we have decided to set a 5-year asset life for new short lived corporate assets.[350] SDP proposed a shorter 3-year life for corporate assets.[351] This decision increased the existing life for short lived assets as at 1 July 2017 to 1.8 years from SDP's proposed 1.3 years.

We have made a number of adjustments to SDP's proposed existing asset lives. These are largely a result of the corrections made to modelling errors detected as part of the 2012 Determination (outlined earlier in this chapter).

344 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 68.
345 SDP pricing proposal to IPART, October 2016, p 62.
346 SDP submission to IPART's Draft Report, April 2017, p 75.
347 Review of prices for Sydney Water Corporation from 1 July 2016, IPART June 2016.
348 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 26.
349 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p. 14. Atkins Cardno, *Supplementary Expenditure Review – SDP*, May 2017, p 26.
350 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p. 14.
351 SDP pricing proposal to IPART (Information Return), October 2016.

Our decision on asset lives for existing and new assets is presented in Table 9.9.

Table 9.9 Asset lives for existing and new assets (years)

	Existing Assets		New Assets	
	SDP Proposed	IPART Decision	SDP Proposed	IPART Decision
Plant Infrastructure				
Plant	25.0	22.0	30.0	30.0
Intake infrastructure	85.0	82.0	90.0	90.0
Outlet infrastructure	95.0	92.0	100.0	100.0
Pumping station	20.0	17.1	25.0	25.0
Pre-operations payments[a]	15.0	12.1		
Project development costs[a]	39.0	36.0		
Membranes[b]				8.0
Pipeline Infrastructure				
Pipeline	95.0	115.0	100.0	120.0
Corporate Assets				
Short lived assets	1.3	1.8	3.0	5.0

a Pre-operations payments and Project development costs are pre-commissioning costs. No future capital expenditure will occur for these asset categories for the existing assets.

b The membranes asset category was not considered in the IPART, *Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2017 – Issues Paper*, August 2016, and therefore SDP has not made a proposal in relation to the appropriate economic life.

Data source: SDP pricing proposal to IPART (Information Return), October 2016. IPART analysis.

9.3.3 Return of assets (regulatory depreciation)

We have accepted SDP's straight-line approach to regulatory depreciation. This is consistent with our approach in previous reviews. We consider this method is superior to alternatives in terms of simplicity, consistency and transparency.

The difference between our allowances for regulatory depreciation and SDP's proposed values is due to a number of decisions we have made on asset lives and asset categories outlined above. In its submission to our Draft Report, SDP generally accepted our approach to calculating depreciation, with the exception of the economic life assumed for pipeline assets.[352]

352 SDP submission to IPART's Draft Report, April 2017, pp 74, 75.

Table 9.10 presents our draft decision on SDP's allowance for regulatory depreciation over the 2017 determination period.

Table 9.10 Allowance for regulatory depreciation - all modes ($million, $2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Plant						
IPART decision	43.0	43.1	43.1	43.2	43.3	215.6
SDP proposed	41.5	41.5	41.6	41.6	41.5	207.6
Difference	1.5	1.5	1.5	1.6	1.8	7.9
Difference %	3.7%	3.7%	3.6%	3.9%	4.3%	3.8%
Pipeline						
IPART decision	5.8	5.8	5.8	5.8	5.8	29.2
SDP proposed	7.2	7.2	7.2	7.2	7.2	36.2
Difference	-1.4	-1.4	-1.4	-1.4	-1.4	-7.0
Difference %	-19.3%	-19.4%	-19.4%	-19.3%	-19.3%	-19.3%

Note: Numbers may not add due to rounding.

Note: The allowance for regulatory depreciation differs from that used to roll forward the RAB. The difference is the depreciation used to roll forward the RAB is discounted to the mid-year point using the pre-tax WACC. This ensures that the cash flows received by SDP via prices over a year align in principle with the dollar basis of the NRR.

Data source: SDP pricing proposal to IPART, October 2016, pp 57-58, and IPART analysis.

9.4 Regulatory tax allowance

We have made a decision to:

46 Adopt the regulatory tax allowance as set out in Table 9.11.

We include an explicit allowance for tax, because we use a post-tax WACC to estimate the allowance for a return on assets in the revenue requirement. This tax allowance reflects the regulated business's forecast tax liabilities.

We calculate the tax allowance for each year by applying a 30% statutory corporate tax rate adjusted for franking credits to the business's (nominal) taxable income. For this purpose, taxable income is the notional revenue requirement (excluding tax allowance) less operating cost allowances, tax depreciation, and interest expenses. As part of calculating the appropriate tax allowance, the business is required to provide forecast tax depreciation for the determination period. Other items such as interest expenses are based on the parameters we use for the WACC, and the value of the RAB.

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.

The difference between our tax allowance and that proposed by SDP is mainly due to our higher WACC, which results in more taxable income (for plant and pipeline). In a supplementary submission to our Draft Report, SDP raised a technical issue around interest

expenses used to calculate the tax allowance.[353] We have calculated SDP's tax allowance consistently with our published method.[354]

Table 9.11 presents our decision on SDP's tax allowance for the 2017 determination period.

Table 9.11 Allowance for tax - all modes ($million, $2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Plant						
IPART decision	8.3	9.0	9.5	10.0	10.5	47.3
SDP proposed	7.1	7.8	8.3	8.9	9.3	41.4
Difference	1.2	1.2	1.2	1.2	1.2	5.9
Difference %	17.2%	15.4%	13.8%	13.0%	12.8%	14.3%
Pipeline						
IPART decision	-2.3	-2.0	-1.8	-1.5	-1.3	-8.8
SDP proposed	-2.2	-1.9	-1.7	-1.4	-1.2	-8.4
Difference	-0.1	-0.1	-0.1	-0.1	-0.1	-0.4
Difference %	3.0%	4.0%	5.5%	7.0%	8.8%	5.2%

Note: Numbers may not add due to rounding.

Data source: SDP pricing proposal to IPART, October 2016, pp 57-58, and IPART analysis.

9.4.1 Maintaining the current statutory corporate tax rate of 30%

We have made a decision to:

47 Maintain the current statutory corporate tax rate of 30% to calculate SDP's taxation allowance for the purposes of setting prices over the 2017 determination period.

We have decided to calculate SDP's tax allowance over the 5-year determination period using the current legislated corporate tax rate of 30%. As part of the Commonwealth Government's 2016-17 Budget, a schedule for progressively decreasing the corporate tax rates from 30% to 25% by 2026-27 was announced.[355] The 2016-17 Budget measure passed both houses of Parliament on 9 May 2017, however with amendments.[356] The amendments set the threshold for receiving the lower tax rate at turnover of $50 million annually. SDP's revenue in both modes will exceed this threshold over the 2017 determination period, and therefore the lower tax rate does not need to be taken into consideration at this point.

353 Email correspondence with SDP, 9 May 2017.

354 *The incorporation of company tax in pricing determinations, Other Industries – Final Decision*, December 2011

355 Australian Government, Budget 2016-17, Budget Paper No. 2, pp 40-41. http://budget.gov.au/2016-17/content/glossies/tax_super/html/tax_super-04.htm, accessed 1 February 2017.

356 www.legislation.gov.au/details/C2017A00041, accessed 5 June 2017.

9.4.2 Treatment of tax loss carryovers

We have made a decision to:

48 Adopt SDP's proposed approach to the treatment of tax loss carryovers for the distribution pipeline.

We have accepted SDP's proposal to remove the provision for the carryover of tax losses for the pipeline. That is, we have not set a zero tax allowance where a negative tax allowance is calculated.

We set separate NRRs (ie, building blocks) for SDP's plant and pipeline. Due to this separation, these assets are independently subject to carryover of tax losses in our model. SDP calculates its tax depreciation on an accelerated basis and provided its estimates for the purpose of calculating the tax allowance over the next regulatory period (ie, 2017 determination period). The tax depreciation estimates provided for the plant result in a positive tax allowance. However, the tax depreciation estimates provided for the pipeline result in a tax loss.

SDP has proposed that while separate tax allowances continue for the two broad asset classes, the treatment of accumulated tax losses be changed to recognise that 'SDP Pty Ltd' is taxed as a single entity. This allows tax losses for the pipeline to offset tax payable for the plant.

We agree with SDP's proposal as it will result in an aggregate tax allowance that is more reflective of SDP's tax position as a single entity. If we did not adopt SDP's proposal, we would be overcompensating SDP for tax and the pipeline prices would be too high.

9.5 Return on working capital

We have made a decision to:

49 Adopt 15 days for 'receivable days' to calculate SDP's working capital allowance.

IPART's default working capital parameters were used in setting prices for the Draft Determination.

For the Final Determination, we have set working capital parameters that reflect SDP's operating environment. This decision accepts SDP's proposed parameters with the exception of 'receivable days'. Given that SDP's billing cycle is 30 days, we have set the 'receivable days' to 15 days.

In line with our approach to calculating receivable days, the billing cycle (30 days in SDP's case) should be divided by two. This represents how long, on average, the regulated entity has to carry the revenue owing over repeated or consecutive billing periods.

10 Refining price structures

The Terms of Reference require us to determine prices for SDP's two monopoly services:

a) the supply of non-rainfall dependent drinking water to purchasers, and

b) the making available of the desalination plant to supply non-rainfall dependent drinking water.

In the 2012 Determination, we met the Terms of Reference by setting the following separate maximum prices for SDP's declared monopoly services:

- a **water usage charge** ($/ML) for supplying non-rainfall dependent drinking water, which reflects SDP's variable operating costs and applies only when the plant supplies water, and
- **water service charges** ($/day) for making the desalination plant available, which reflect SDP's fixed operating and capital costs and apply whether or not the plant supplies water.

Separate water service charges were set for a range of defined operation modes. In addition to water service charges, we set separate one-off payments to reflect the costs of transitioning between some modes of operation.

In this chapter, we discuss what charges we have set over the 2017 determination period, when they apply and what costs are recovered by each charge.

10.1 Overview of our price structures

For the 2017 Determination, we have decided to maintain our broad pricing approach adopted in the 2012 Determination and, where possible, improve the transparency of charging arrangements. We continue to set mode-dependent prices, but have simplified the modes on the advice of our expenditure consultant by removing the intermittent shutdown periods.

We have also decided to split the water service charge into a 'base service charge' and an 'incremental service charge'. We have further refined transition charges, distinguishing between restarts within and outside drought and in some circumstances, first and subsequent restarts.

SDP accepted our price structures and, in particular, our approach to splitting the existing water service charges into a base service charge and an incremental service charge.[357] Sydney Water was also supportive of the refinements we have made to the price structures for SDP's services. It considered these refinements should improve transparency and assist in setting appropriate cost sharing rules amongst water users.[358]

357 SDP submission to IPART Draft Report, April 2017, p 77.
358 Sydney Water submission to IPART Draft Report, April 2017, p 22.

An overview of our price structure by mode of operation is presented in Table 10.1. The sections below discuss each in turn.

Table 10.1 Price structures for the 2017 determination period by mode of operation

Mode	Water usage charge	Base service charge	Incremental service charge	Pipeline charge	Transition charge
Shutdown	☑ Only applies to water in storage[a]	☑	☒	☑	☑ Transition to shutdown
Restart	☑ Only applies to water in storage	☑	☒	☑	☑ Transition to restart
Plant operation	☑ Applies to water produced and supplied to customers	☑	☑	☑	☒

a Although the plant will not produce water during shutdown, we have decided to continue to enable SDP to supply water out of storage (ie, out of its storage tanks) after production has stopped. The 2012 Determination also allowed this provision.

10.2 Pricing for making the plant available (fixed charges)

We have made a decision to:

50 Split water service charges into:

- a base service charge ($/day), reflecting SDP's efficient fixed costs when in water security (shutdown) mode, and
- an incremental service charge ($/day), reflecting the difference in SDP's efficient fixed costs between water security (shutdown) and plant operation modes.

We have decided to retain water service charges for making the desalination plant available in accordance with our Terms of Reference. These charges recover allowances for a full return on capital, depreciation and return on working capital, plus the efficient fixed operating costs of each mode.[359]

But we have decided to split water service charges into a **base service charge** and an **incremental service charge** to increase transparency in SDP's fixed costs. This is a departure from the 2012 Determination.

10.2.1 Base service charge – water security (shutdown) mode

The base service charge reflects the fixed costs SDP incurs when the plant is in water security (shutdown) mode. These are the minimum costs of maintaining the plant so that it can reliably produce drinking water in a timely manner when required under the 60/70 rule.

359 Water service charges also include allowances for the Energy Adjustment Mechanism (EnAM) and the Efficiency Adjustment Mechanism (EfAM), as required by the Terms of Reference.

The base service charge is a fixed daily charge calculated by adding the annual fixed operating costs, return on capital, depreciation and return on working capital, and dividing by the number of days in a financial year.[360]

In its response to our Issues Paper, Sydney Water expressed support for this change but questioned whether the allocation of costs between the base and incremental service charges was appropriate.[361] Sydney Water clarified in its submission to our Draft Report that it was seeking to ensure that the base service charge includes all the costs needed to maintain the desalination plant in a state of readiness to be able to fulfil its drought response obligations – but no more.[362]

Based on the recommendations of our expenditure consultants, we are satisfied that we have set the base service charge to recover the efficient costs only during shutdown period and no more. This includes the minimum level of operating costs that are required for maintenance activities during water security shutdown.

Sydney Water is also seeking to ensure that the cost sharing rules for these charges send the appropriate price signals to all water users.[363] Our view is these costs are appropriately paid by impactors (including Sydney Water) when the plant responds to drought and other water security emergencies. Cost sharing is discussed in more detail in Chapter 11.

10.2.2 Incremental service charge – plant operation mode

The incremental service charge reflects the difference in SDP's fixed costs between water security (shutdown) and plant operation modes. In plant operation mode, SDP would receive the base service charge plus the incremental service charge.

The incremental service charge includes the following fixed operating costs:

- Corporate fixed costs - additional staff to manage relations with customers due to increased business activity.
- Plant fixed costs – extra labour (shifts) to carry out additional routine and periodic maintenance of the plant when it operates.

There is also a slight amount of fixed energy costs in the incremental service charges related to periodic and routine maintenance during operations. Most energy costs, however, are variable and are recovered through the water usage charge which is discussed below. Appendix D provides a breakdown of our energy allowances into fixed and variable components for each mode of operation.

In its submission to our Draft Report, SDP proposed we amend the sharing equation in the Determination so that an incremental service charge can be levied when a customer chooses not to take water after contracting with SDP to take water outside of drought.[364] We agree

360 We note that a tax allowance is included as a component of the fixed charge to reflect our move to a post-tax WACC framework. More details on this are provided in Chapter 6.
361 Sydney Water submission to Issues Paper, November 2016, p 18.
362 Sydney Water submission to IPART Draft Report, April 2017, p 22.
363 Sydney Water submission to IPART Draft Report, April 2017, p 24.
364 SDP submission to IPART Draft Report, April 2017, p 79.

with SDP that the incremental service charge is not avoidable when water is not taken in or outside drought and address this in further detail in Chapter 11.

10.3 Pricing for the supply of drinking water (usage charges)

We have made a decision to:

51 Retain a water usage charge ($/ML) for supplying non-rainfall dependent drinking water.

This charge reflects SDP's efficient variable operating costs and applies only when the plant produces and supplies water (ie, plant operation period). It mainly includes the costs of energy required for the production of desalinated water.

Although the plant will not produce water during shutdown, we have decided to continue to enable SDP to charge for water supplied out of storage (ie, out of its storage tanks) after production has stopped. The 2012 Determination also allowed this provision.

Similarly, we have enabled SDP to supply water out of storage during restart, consistent with the 2012 Determination. SDP considered that the ability to charge for water supplied out of storage under any mode during a drought should be retained to provide maximum flexibility.[365]

10.4 One-off transition charges (for restart and shutdown)

We have made a decision to:

52 Continue transition charges, which reflect the efficient one-off operating costs of moving from shutdown into plant operation mode and vice versa.

In the 2012 Determination, we set one-off charges to reflect the fixed operating costs SDP incurs when the plant is moving between modes – ie, moving into shutdown from plant operation or conversely moving out of shutdown into restart (on the way to plant operation mode).

The one-off restart and shutdown costs are additional to the NRR presented in Chapter 5 and are passed through only when the plant is required to restart or shutdown. These one-off costs have been calculated based on the advice of our expenditure and energy consultants (Chapter 6 and 8).

The one-off costs for a restart are significant and include additional operational staff labour, marine intake and outfall opening, chemicals, waste disposal, as well as a fixed energy component. Shutdown charges recover costs associated with flushing and cleaning of the reverse osmosis trains, feed pumps, post-treatment plant and pre-treatment plant, and capping the sea intake and outfall outlets, which are about six times less than those incurred when restarting the plant.[366]

Specifically, these charges do not recover variable energy costs for the production and supply of drinking water and therefore do not substitute for water usage charges. This

365 SDP submission to IPART Draft Report, April 2017, p 81.
366 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 43, and pp 50-51.

reflects our decision to allow SDP an 8-month grace period from abatement while ramping up production during a restart. That is, SDP can enter a plant operation mode and not be subject to financial penalty for up to 8 months if production is less than 250 ML per day. This allows it to recover its variable energy costs through the water usage charge as soon as the plant is ready to produce drinking water.

In it submission to our Draft Report, SDP accepted the continuation of one-off transition charges. However, SDP considered the level of the transition to restart charge is too low as it substantially under-estimates the volume of energy required in restart.[367] We disagree with SDP on this issue and outline our position in Chapters 6 and 8.

Membrane replacement costs are also excluded from these charges. Although triggered by a restart, we have made a decision to capitalise these costs and recover them through a separate daily service charge, discussed further in Chapter 12.

10.4.1 Transition charges are payable only once during drought or on notice by a customer outside drought

We have made a decision to:

53 Ensure transition charges (for restart and shutdown) are payable only once. Either:

- when triggered by dam storage levels when the plant is responding to drought, or
- upon notice by a customer to start or cease supply outside drought.

The transition charges are payable at most once upon request to restart or shutdown by a customer outside drought. We also distinguish between first and subsequent restarts within drought episodes.

When the plant is required to operate **in response to drought**, SDP will receive a restart payment on first restart when dam storage levels fall below the 60% trigger. Restart charges are not payable on subsequent restarts during the same drought episode when dam levels have not yet reached the 70% trigger. Therefore, during an unbroken drought episode, SDP would receive only one restart payment.

Transition to shutdown charges are also only payable once, when a drought ends. That is, these charges are payable on first shutdown when the dam storage levels exceed the 70% trigger. They are not payable if the plant shuts down when dam storage levels are still below 70% since the first restart.

We have decided that SDP should not receive subsequent transition payments for restarting and shutting the plant down during a drought because this is inconsistent with the plant's primary role to maximise production during drought. This aligns with our decision to strengthen the abatement mechanism so that SDP's charges are abated when shutting down within drought. Under the 2012 Determination, transition to restart and shutdown charges were payable for each shutdown or restart irrespective of dam levels.

367 SDP submission to IPART Draft Report, April 2017, p 82.

SDP accepted that only one transition to restart and transition to shutdown charge is levied during an unbroken drought period.[368]

Outside drought, the use of the plant is discretionary and the transition charges are paid once on request by a customer to restart and shutdown. If a customer requests the plant to restart outside drought, and the plant enters a shutdown for any reason during the term of the contract, no transition to restart (or shutdown) charges are payable in relation to this temporary shutdown.

10.5 Separate mode-independent pipeline charge

We have made a decision to:

54 Continue to set a mode-independent pipeline charge.

As in the 2012 Determination, we have decided to retain a separate charge for the pipeline, as this facilitates component pricing. The pipeline charge does not vary according to operating mode. The pipeline charge recovers allowances for a full return on capital, depreciation and return on working capital, plus the efficient fixed operating costs of the pipeline (ie, the NRR presented in Chapter 5).

SDP has consistently supported retaining a separate pipeline charge that does not vary by mode over the 2017 determination period.[369]

368 SDP submission to IPART Draft Report, April 2017, p 82.
369 SDP submission to IPART Draft Report, April 2017, p 82.

11 Refining cost sharing rules

In the previous chapter, we discussed what charges we have set over the 2017 determination period, when they apply and what costs are recovered by each charge. In this chapter we outline the decisions we have made on how these charges are to be shared.

The 2012 Determination shared all costs based on each customer's proportionate use of SDP – ie, how much desalinated water each customer purchases relative to the total volumes supplied. In practice, this is likely to deter third-party customers, as the costs of SDP supplying water are high.

For the 2017 Determination, we have decided to use a principles based approach to sharing SDP's costs. We employ the impactor and beneficiary pays principles in a hierarchy to create an efficient allocation of costs. This approach recognises the purpose for which the plant was built and is continued to be funded, namely the provision of an additional supply of water when dam storage levels are low. It also recognises that third parties may want to call the plant into operation commercially outside of drought.

We outline our decisions on rules for sharing membrane costs in Chapter 12. Our decisions on membrane sharing rules are consistent with our overarching principles and sharing rules in this chapter, but have regard to the complex timing of membrane replacement.

11.1 Cost sharing rules align with the plant's primary role to respond to drought

We have made a decision to:

55 Change the cost sharing rules to reflect the desalination plant's primary role as a drought response measure, such that:

- Base service charges (and pipeline service charges) are always paid for by impactors
- Water usage charges are always paid for by beneficiaries, and
- Incremental service charges and transition charges are paid by impactors when the plant operates as a drought measure (including any portion of the minimum run time that falls outside drought) and beneficiaries when it operates outside of drought.

We have changed cost sharing rules to align with the plant's primary role, which is to respond to drought and therefore the purpose for which it was built. Under our funding hierarchy[370], those who:

- cause the need for the desalination plant to exist always pay the base (and pipeline) service charge (**impactors**)

370 We have based our analysis of cost sharing on the Local Land Services framework which uses a hierarchy to determine who should pay. See IPART, *Review of funding framework for Local Land Services NSW – Draft Report*, September 2013.

- directly benefit from the plant's operation always pay the variable charges (**beneficiaries**), and
- call the plant into operation (or require it to stop operating) pay the transition and incremental service charges. This will change according to whether the plant operates as a drought measure (**impactors**) or commercially outside of drought (**beneficiaries**).

Our decision represents a significant change to the current cost sharing rules, but we note that currently Sydney Water is SDP's only customer and in practice would still pay most fixed costs for the foreseeable future. Under the 2012 Determination, fixed charges (both plant and pipeline) were allocated under the 'beneficiary' (or user) pays principle in proportion to the share of the plant's output.

Table 11.1 presents our cost sharing arrangements for SDP charges. The precise cost shares paid by different parties would vary depending on the charge in question and whether it was at a time of drought or not. In the sections that follow we outline our sharing rules in detail.

We address SDP's and Sydney Water's submissions on our cost sharing rules at the end of this chapter. No other stakeholder commented on our approach to sharing SDP's costs.

Table 11.1 Our cost sharing rules – who should pay for what?

Charge/cost	Inside drought - allocate to[a]	Outside drought - allocate to	Sharing rule - impactors	Sharing rule - beneficiaries
Base service charge (and pipeline charge)	Impactor pays	Impactor pays	Based on proportion of total system draw[b] "on the day"	N/A
Incremental service charge	Impactor pays	Beneficiary pays	Based on proportion of total system draw "on the day"	Based on proportion of draw from SDP "on the day"
Transition to restart charge	Impactor pays	Beneficiary pays	Once off charge – proportion of total system draw over the previous 12 months	Once off charge – the customer that calls SDP into operation (outside drought)
Transition to shutdown charge	Impactor pays	Beneficiary pays	Once off charge – proportion of total system draw over drought period	Once off charge – the customer that requires SDP to stop producing (outside drought)
Water usage charge	Beneficiary pays	Beneficiary pays	N/A	Charge per ML of water supplied by SDP

a Impactor pays principle also extends to any portion of the minimum run time that falls outside drought.

b Total system draw is any water sourced from WaterNSW Greater Sydney area dams and/or SDP.

11.2 Base service (and pipeline service) charges are always charged to impactors

The desalination plant exists as a non-rainfall dependant water source for Sydney during times when dams are low (the 60/70 rule). The plant's primary role is to act as insurance and augment Greater Sydney's water supply in the event of water scarcity. Therefore, SDP's base costs (and pipeline costs) are a form of drought insurance premium or water security

payment that should be paid by impactors who contribute to water scarcity in Greater Sydney.

Accordingly, we have decided that SDP's base service charge (fixed capital and operating costs when shutdown) should be recovered from anyone who draws water from both or either WaterNSW and SDP (ie, in proportion to their draw on the total water supply system).[371] This is consistent with the impactor pays principle, where those that create the need for a cost (ie, the desalination plant as a drought insurance/response measure) should pay for the cost.

11.2.1 What is an impactor?

We have made a decision to:

56 Define impactors so as to capture bulk water users who directly affect Greater Sydney's water storage levels and cause the need for SDP to exist. Specifically, impactors source water from dams supplying Greater Sydney (WaterNSW) and from the desalination plant (SDP) when it operates.

We define impactors so as to capture bulk water users who directly affect Greater Sydney's water storage levels.[372] Total system draw is comprised of bulk water sourced from dams supplying Greater Sydney (WaterNSW) and from the desalination plant (SDP) when it operates.[373]

Our definition means that:

- Outside drought (outside the 60/70 rule) - when the desalination plant's default position is 'off' - total system draw would include only bulk water sourced from WaterNSW's dams supplying Greater Sydney.
- In drought (under the 60/70 rule) - when the desalination plant is 'on' - total water system draw would also include water sourced from SDP, given that the plant is contributing to Greater Sydney's water security needs. This also applies when the desalination plant is 'on' outside of drought.

Both in and out of drought, total water draw excludes water sourced from recycling schemes or any other source that adds to water security. These water users are not impactors because they are not drawing on dam storage levels and therefore do not create the need for the desalination plant.

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371 IPART, *Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2017 – Issues Paper*, August 2016, p 32.

372 In full, our definition of "Impactor" is:
(a) Sydney Water Corporation; and
(b) any holder of a Retail Supplier's Licence:
(i) who is supplied water by Water NSW or SDP; and
(ii) whose Retail Supplier's Licence is subject to a condition requiring its holder to contribute to the costs of the Plant.

373 Outside the 60/70 rule, the desalination plant's default position is 'off' and total water system demand would relate only to bulk water sourced from dams. When the desalination plant is 'on' under the 60/70 rule it is contributing to Greater Sydney's water security needs and therefore part of 'total water system supply'. For the purposes of apportioning SDP's costs, 'total water system demand' should exclude water supplied from recycling schemes and any other sources that add to Sydney's water security.

We note that Sydney Water would not be disadvantaged under our definition of an impactor if a third-party customer decides to request supply from SDP outside drought. The third-party customer would be likely to become an impactor as soon as it starts drawing water from SDP, and therefore contribute to base service charges. This also means that any utility with a WICA licence and direct supply agreement with WaterNSW that bypasses Sydney Water could also be considered an impactor when they take water.

11.2.2 Compelling impactors to pay

Our sharing rules require SDP to be able to levy charges on impactors, which need not have water supply agreements with SDP. That is, an impactor could be a utility that draws only from WaterNSW's dams and therefore only has a supply arrangement with WaterNSW.

However, the Minister has an explicit power to add conditions to drinking water retailers' WICA licences, so as to compel them to pay SDP for the making available of the plant.[374] This is the case even where the WICA licensee is not a direct customer of SDP. This power was introduced in 2011, in contemplation of the privatisation of the plant.

In its submission to our Draft Report, SDP raised concerns about the practical implementation of being able to levy charges on impactors. Specifically, SDP noted that it may not be able to:[375]

- levy charges from impactors without a commercial relationship (contracted as customers)
- compel WaterNSW to provide usage information on a monthly basis to allow SDP to recover charges from impactors in a timely manner, and
- check or control for the creditworthiness of an impactor that has not contracted with SDP, unlike its direct customers.

We agree with SDP that IPART does not have the power to compel WICA licensees to pay SDP as impactors. However, as noted above, there is scope for the Minister to give effect to our cost sharing rules by way of WICA licence conditions.[376]

While SDP would like more certainty it is the Minister not IPART who is ultimately responsible for executing the WIC Act. For example, the Minister's licence condition compelling the WICA license holder to make reasonable endeavours to contract with SDP could include requirements to negotiate:

- payment terms, including default of payment, and
- provision of information to calculate charges.

The Minister has discretion over how the requirements of the WIC Act are executed. The implementation of our cost sharing rules is contingent on the Minister's decision. This means that Sydney Water will remain the default impactor if the Minister decides not to identify any other impactors through the addition of licence conditions.

374 WIC Act, section 13(2)(c)(ii).
375 SDP submission to IPART Draft Report, April 2017, p 85.
376 The Minister is able to require holders of retail supplier's licences to contribute to the costs of SDP's infrastructure under WIC Act. The Minister has express power to do so under s 12(2)(c)(ii) of WICA, which was introduced specifically with the privatisation of the desalination plant in mind.

While SDP will not have the power to undertake effective credit checks on impactors, we consider that this is mitigated by the statutory mechanism for impactors to be compelled to contribute to drought security costs and pay SDP as an impactor through a licence condition. We have therefore maintained our decision to share SDP's base service charges from WIC Act licence holders who draw water from both or either WaterNSW and SDP (ie, impactors).

11.2.3 Sydney Water would still pay most fixed costs in practice

Currently, Sydney Water is SDP's only customer and pays all of SDP's fixed costs. In practice, this is likely to continue for the foreseeable future, even with the proposed introduction of the impactor pays principle, because of Sydney Water's large share of the market.

This is the case even with the increased competition from WICA licensees for retail water. WICA licensees can either source water from Sydney Water, using its distribution network, or source water directly from WaterNSW. Both ultimately supply water in competition with Sydney Water. Currently, these WICA licensees are primarily 'wholesale' customers of Sydney Water, purchasing potable water from Sydney Water to on-sell to their end-use customers. Accordingly, they pay SDP's costs indirectly, including the drought insurance premium, indirectly through Sydney Water's wholesale prices without the need to identify them as impactors through their licenses.

11.2.4 'On the day' sharing rule

We have made a decision to:

57 Share base service (and pipeline service) charges between impactors based on their proportion of total system draw that day.

We consider our new sharing rules to be an improvement on those in the 2012 Determination. Under the 2012 Determination, the methodology for allocating fixed costs may have had unintended consequences for third-party customers because:

- fixed charges during shutdown and restart were allocated to each customer as a proportion of total desalinated water purchased in the 12 months **preceding** that shutdown, and
- if a third-party customer bought any amount of water from SDP on a day when dam levels were high (ie, outside drought), and there are no other customers, it would have become liable for the full daily fixed charge on this day.[377]

In practice, these sharing rules may not create financial incentives to seek supply from SDP, particularly when dam levels are high. For example, the 'historical' sharing rule effectively requires customers to pay a proportion or all of SDP's fixed costs for years to come after their actual use of the plant.[378]

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377 See clause 6 of Schedule 2 under the 2012 Determination as an example. IPART, *Prices for Sydney Desalination Plant Pty Limited's Water Supply Services - Determination No. 2*, December 2011, pp 24-25.

378 For example, assume SDP supplied water in 2012 to a third-party customer whilst operating in its drought response role. In 2013, dam storage levels returned to 80% and SDP ceased to operate. SDP remained shutdown for five years, until dam levels reached 60% in 2018, calling the plant into operation. The third-party customer in this example would pay a proportionate share of SDP's fixed costs for the entire duration that SDP is shutdown (ie, from 2013 to 2018) based on their consumption back in 2012.

Under our 2017 sharing rule, an impactor's share of the **daily** base service charge is proportionate to their **daily** share of total system draw. This 'on the day' sharing rule avoids some of the complications and unintended perverse outcomes created by the cost sharing rules under the 2012 Determination.

11.3 Water usage charges always paid for by beneficiaries

Under our sharing rules, those who take water directly from the desalination plant always pay the water usage charges associated with the plant's operation.

In principle, there is a case to extend the 'impactor pays' principle to SDP's variable charges when the plant is operating in drought. This is because the plant is called into operation under drought conditions to augment Sydney's water supply. However, doing this would create a perverse incentive for third parties to source water from SDP during drought. This is why our sharing rules allocate water usage charges to beneficiaries (direct users of SDP) at all times.

If impactors were targeted to pay water usage charges, Sydney Water could contribute to the variable costs of desalinated water supplied that it does not receive. In addition, Sydney Water could pay higher prices for dam water from WaterNSW because SDP's operation offsets (decreases) demand for WaterNSW water.[379] This would raise the per unit cost of dam water paid by Sydney Water to WaterNSW (ie, total cost per ML) and lower the per unit cost of desalinated water paid by a third party to SDP, creating a perverse incentive for the third-party to source water from SDP.

Sydney Water was concerned that it would cross-subsidise water taken by third parties, and ultimately make desalinated water sourced from SDP cheaper than dam water from WaterNSW.[380] A worked example of how this perverse incentive would arise if SDP's usage charge was levied on an impactor pays basis is shown in Appendix E.

11.4 Ongoing and one-off fixed operating costs paid by impactors during drought and beneficiaries outside drought

Transition and incremental service charges are allocated to those who **call** the plant into operation. That is, in drought impactors pay and outside of drought beneficiaries pay.

While impactors do not directly request the plant to operate in a drought, operation is triggered under the 60/70 rule to augment Greater Sydney's water supply. This is part of the plant's purpose for existing, as previously discussed. Therefore, the 60/70 operating rule calls the plant into operation on behalf of the impactors, requiring them to pay the transition and incremental service charges (ie, additional one-off and ongoing fixed operating costs when the plant is called into production).

379 WaterNSW's current determination contains an equation that adjusts (proportionately increases) WaterNSW's variable price to large customers (currently only Sydney Water) for every ML taken from SDP. This equation assumes that forecast demand for that year remains constant and any water taken from SDP must reduce water taken from WaterNSW by an equivalent amount. This ensures that WaterNSW's revenue requirement is unaffected by SDP operation.

380 Sydney Water submission to Issues Paper, November 2016, p 26.

Outside of drought the plant provides a discretionary service which can be called on by third-parties for commercial use or Sydney Water for emergency response.[381] Therefore, the plant is not responding to water scarcity, operating for the purpose of augmenting Sydney's water supply due to drought. Accordingly, beneficiaries pay SDP's transition and incremental service charges.

Our decision on who should pay incremental service charges is different from our preliminary position presented in our Issues Paper. We initially proposed levying charges to recover incremental service costs on a user (beneficiary) pays basis during drought. Sydney Water agreed with our preliminary position to allocate incremental service charges to beneficiaries.[382]

However, we did not address the sharing of transition charges in our Issues Paper. Sydney Water raised the issue of transition charges and made a case that these charges should be allocated to beneficiaries outside drought (outside the 60/70 rule) and allocated to impactors inside drought (inside the 60/70 rule).[383] Sydney Water argued that allocating transition charges to beneficiaries outside drought was to prevent its customers from subsidising the discretionary use of the plant by third-party customers.[384]

We agree with Sydney Water that transition charges should be allocated to impactors when the plant is responding to drought and to beneficiaries outside of drought (as outlined above). Based on Sydney Water's logic and consistent with our principles, it follows that incremental service charges should be allocated to impactors in drought, given that both transition and incremental service charges relate to calling the plant into operation.

11.4.1 Sharing ongoing incremental service charges – calculated 'on the day'

We have made a decision to:

58 Share incremental service charges 'on the day' between:

- impactors during drought based on their proportion of total system draw that day
- impactors during any portion of the minimum run time that falls outside drought based on their proportion of total system draw that day, and
- beneficiaries outside drought based on their proportion of desalinated water sold that day.

Like base service charges, incremental service charges are levied daily recovering the ongoing fixed operating costs to run the plant.

During drought, these charges would be shared between impactors based on their share of total system draw 'on the day'. That is, each impactor will be charged an amount equal to the proportion of water it draws from **WaterNSW and SDP** (compared to total water supplied by WaterNSW and SDP) for each day SDP operates.

381 As an example, if the plant supplies Sydney Water in an emergency response role outside drought then the incremental service charges and one-off transition to and from shutdown charges would be shared on a beneficiary pays principle.
382 Sydney Water submission to IPART Issues Paper, November 2016. p 27.
383 Sydney Water submission to IPART Issues Paper, November 2016, pp 27- 28.
384 Sydney Water submission to IPART Issues Paper, November 2016. p 27.

We also note that during any portion of the minimum run time that falls outside drought charges would be shared between impactors as well because this discretionary period of production is an extension of the plant being called into operation because of drought.

Outside drought, these charges will be shared between beneficiaries based on their total proportion of draw from **SDP** 'on the day'. That is, each beneficiary will be charged an amount equal to the proportion of water it draws from SDP (only) compared to total water supplied by SDP (only) for each day SDP operates.

In response to our Draft Report, SDP noted that our Draft Determination limited its ability to recover its costs outside of drought when water is not supplied (not due to SDP). SDP argued that its incremental service costs are not avoidable when water is not supplied during a period of operation (ie, as opposed to shutdown).[385]

We agree with SDP that its incremental service costs are not avoidable when water is not taken. We have amended the 2017 Determination so that when water is not supplied the sharing ratio for the incremental service charge is set equal to the most recent day water was supplied.

11.4.2 Sharing one-off transition charges

We have made a decision to:

59 Share one-off transition charges (to restart and shutdown):

- between existing impactors based on their total system draw over the 12 months prior to a restart for drought and the entire drought episode prior to the first shutdown after the end of drought, and
- equally by the beneficiaries that request the restart or shutdown outside drought (ie, issue a notice for SDP to start or cease supply).

Transition charges are one-off payments made to SDP to recover fixed operating costs of either recommencing or terminating supply (ie, for the plant transitioning to and from shutdown). Because they are not on-going payments, like incremental service charges, an 'on the day' sharing rule is inappropriate.

Allocating a significant one-off payment (transition charge) according to draw on a particular day could lead to a perverse outcome. This would occur when an impactor's/beneficiary's draw on the water supply network on that day is significantly different from its average/typical draw. This means that its contribution to these costs would not represent that customer's impact on the system.

How we apportion transition charges between impactors in drought and beneficiaries outside of drought is summarised below:

- Transition to restart charges:
  - Commencement of drought response, allocate on impactor pays principle using the total customer impact over the preceding 12 months.

385 SDP submission to IPART Draft Report, April 2017, p 79.

- Outside drought, allocate on beneficiary pays principle in equal shares to customer(s) who request the restart.

- Transition to shutdown charges:
  - Completion of drought response, allocate on impactor pays principle using the total customer impact over the period of drought.
  - Outside drought, allocate on beneficiary pays principle in equal shares to customer(s) who request the shutdown.

We have moved away from only using historical use of the plant to allocate these one-off charges (ie, as per the 2012 Determination) because it creates some uncertainty for SDP's cost recovery. Charging based on historical use of the plant would be based on previous users, not necessarily those that call plant into operation, which is inconsistent with efficient allocation of costs under the impactor and beneficiary pays framework.

Inside drought, SDP's transition to restart charges are shared between existing impactors based on their total system draw (from WaterNSW and SDP) over the 12 months preceding SDP commencing its transition to operation. This is a reasonable reflection of the impact each water user has had on the total system. Transition to shutdown charges are shared between existing impactors based on their draw over the entire drought episode. This is to reflect that total system draw can be greatly impacted by drought conditions, especially if restrictions are in place.

We also note that if any portion of the minimum run time falls outside drought the transition to shutdown charge would be shared between impactors as well because this discretionary period of production is an extension of the plant being called into operation because of drought.

Outside of drought, transition charges are shared equally between the beneficiaries (direct users of SDP) that request the restart or shutdown (ie, issue a notice for SDP to start or cease supply). This is appropriate because transition charges recover costs that are independent of volumes supplied to individual customers. As noted in Chapter 10, transition charges can be charged at most once to a requesting customer outside drought.

In response to our Draft Report, SDP considered that sharing the transition to restart charge equally between beneficiaries creates a disincentive for small users to source water from SDP alongside a large user.[386] SDP also noted that while it is true that transition charges recover costs that are independent of volumes supplied to individual customers, it does not follow that these joint costs should therefore be shared equally between such customers.[387]

While this may be the case theoretically, we consider that outside of drought SDP's general costs represent a greater disincentive to sourcing water from SDP compared to WaterNSW. We have therefore decided to maintain the current sharing rule for the transition to restart charge. Introducing an alternative rule based on volumes as proposed by SDP would also present practical challenges because it would need to be based on contracted amounts before water is supplied. We consider this would increase the complexity of the 2017 Determination with very little gain.

386 SDP submission to IPART Draft Report, April 2017, pp 85-86.
387 SDP submission to IPART Draft Report, April 2017, p 86.

11.5 Stakeholder views on cost sharing rules

Below we outline stakeholder views on cost sharing rules, and our response to their views.

11.5.1 SDP

SDP was not in favour of changing the cost sharing rules to an impactor pays basis in its initial pricing proposal.[388] However, at our Public Hearing it revised its view and agreed that sharing costs on an impactor pays principle is logical and better aligns with the plant's primary role to respond to drought.[389]

In its response to our Draft Report, SDP accepted our cost sharing rules. However, this acceptance is premised on the low likelihood of the emergence of any new customers (or impactors) during the 2017 determination period. In light of this, SDP provided feedback on practical concerns regarding the implementation of our cost sharing rules, requesting additional consultation and consideration at future reviews.[390]

Generally speaking, SDP believes that our cost sharing rules are too prescriptive outside of drought, undermining the emergence of new customers.[391]

We note SDP's view that our cost sharing rules outside of drought are prescriptive. As noted in Chapter 2, our preference is for unregulated pricing outside of drought. However, we are required to regulate SDP's prices in and outside of drought under the Terms of Reference.

11.5.2 Sydney Water

In response to our Issues Paper, Sydney Water supported the proposal to move away from recovering SDP's water security charge on a user pays basis toward an impactor pays basis.[392] Further, Sydney Water agreed more broadly with the possibility of third-party customers sharing the burden of SDP's costs.

However, Sydney Water and WaterNSW emphasised that SDP's sharing rules should not result in desalinated water becoming cheaper to buy than dam water, nor the cross subsidisation of desalinated water by Sydney Water for third-party customers.[393]

In response to our Draft Report, Sydney Water questioned whether our cost sharing rules would result in desalinated water becoming cheaper than dam water. Specifically, Sydney Water raised the following issues:[394]

- in our Draft Report, we did not account for treatment costs when comparing the costs between organisations in our examples (Appendix E), and

388 SDP pricing proposal to IPART, October 2016, pp 124-126.
389 IPART, SDP public hearing transcript, 8 December 2016, p 18.
390 SDP submission to IPART Draft Report, April 2017, pp 85-86.
391 SDP submission to IPART Draft Report, April 2017, pp 85-86.
392 Sydney Water submission to IPART Issues Paper, November 2016. p 27.
393 Sydney Water submission to IPART Issues Paper, November 2016. p 26. WaterNSW submission to IPART Issues Paper, November 2016, p 2.
394 Sydney Water submission to IPART Draft Report, April 2017, pp 24-26.

- as a result, the incremental service charge should be shared between beneficiaries during drought because not doing so could create a perverse incentive for third parties to source water from SDP during drought.

Sydney Water argues that our analysis of the cost sharing rules did not compare water from difference sources on a like-for-like basis.[395] That is, we did not include treatment costs associated with water sourced from WaterNSW.

We agree that it is not possible to make a proper comparison between the costs of water businesses unless we account for the cost of producing a comparable product. Based on available information, we estimate that average treatment costs would be approximately $375/ML or $0.38/kL.[396] We have incorporated these treatment costs into our examples in Appendix E.

In light of this, Sydney Water views possible scenarios where desalinated water could be cheaper than dam water (dollars per ML basis). Sydney Water concludes that this may lead to perverse outcomes (eg, an opportunistic water user switching to SDP during drought). Therefore, Sydney Water does not support sharing SDP's incremental service charges on an impactor pays basis during drought. Further, Sydney Water argues that since the costs needed to maintain and trigger the water security benefits of SDP have already been fully recovered from impactors (ie, through the base service charge), beneficiaries should pay for the cost of producing drinking water (ie, the incremental service and water usage charges).[397]

We do not agree with Sydney Water that our cost sharing rules create a perverse outcome. We have designed SDP's cost sharing rules so that the business drawing the most water from total system supply will pay the majority of SDP's fixed costs as the greatest impactor. This includes the incremental service charge, which should also be shared on an impactor pays basis during drought given that the plant is called into operation because of impactors. In addition, SDP's incremental service costs should not be shared on a beneficiary pays basis because it is not avoidable if water is not taken.

Accordingly, the average costs of water to a business ($/ML) do not allow for a direct comparison of the relative cost of desalinated water against dam water, because costs are shared based on SDP's purpose not on a commercial basis. If desalinated water were to have a lower marginal cost than dam water during drought this is not a perverse incentive as long as all businesses face similar incentives to take water from SDP during drought, reflecting SDP's purpose (offsetting demand for dam water during drought).

Therefore, we have not changed our decision to share incremental costs on impactor pays basis during drought. We have updated our examples in Appendix E with our final decisions on costs and cost sharing rules. Our examples demonstrate how costs will be shared between two customers (Sydney Water and Retailer A) in hypothetical situations.

395 Sydney Water submission to IPART Draft Report, April 2017, pp 24-26.
396 IPART analysis.
397 Sydney Water submission to IPART Draft Report, April 2017, pp 24-26.

12 Treatment of membrane replacement costs

In Chapter 6, we decided to allow for the prudent and efficient cost of a full membrane replacement only **once** at the time of a **first restart** in the 2017 determination period. This is the cornerstone of our consultant's (Atkins Cardno) recommendations, reflecting that:

- the plant has been in a prolonged period of shutdown (since July 2012), and the membrane stock is near the end of its guaranteed life, and
- providing a full membrane replacement on first restart eliminates the need for a partial plant test in water security (shutdown) mode.[398]

We also decided not to provide any further allowances for the ongoing replacement of membranes in the 2017 determination period (ie, in the event of subsequent restarts).

In this chapter, we outline our treatment of these costs over the 2017 determination period, should the plant restart and be called into operation. In particular, we have decided to capitalise the costs of a full membrane replacement on first restart in accordance with Atkins Cardno's recommendation,[399] and to introduce a separate daily membrane service charge to recover the capital costs of membranes over their asset life.

We consider a separate charge recovering membrane costs increases transparency of the membrane replacement program. Specifically, the charge is designed to accommodate the uncertainty of their timing, and ensure customers only pay for membranes when they are needed.

We apply different cost sharing rules for membrane service charges depending on whether the plant is called into operation for drought or commercially, outside drought. These cost sharing rules are consistent with those applied to SDP's other charges in Chapter 11.

Finally, we have decided not to make a provision for membranes needed in the event that the first restart over the 2017 determination period is in response to an emergency (ie, exceptional circumstances specified in the Water Supply Agreement). Rather, we would review these prudent and efficient costs ex-post at the next price review. We consider this to be in keeping with SDP using 'reasonable endeavours' in an emergency response.

12.1 Capitalising the costs of membrane replacement

We have made a decision to:

60 Establish a separate membrane asset base (membrane RAB) as set out in Table 12.1:

- with an opening value of $30 million in the year of first restart
- adopting an asset life for membranes of 8 years

398 Atkins Cardno, *Expenditure Review – SDP*, February 2017, pp 10 and 12.
399 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 12.

- not adding any further capital expenditure for the ongoing replacement of membranes, and
- rolling forward the membrane RAB until the membranes fully depreciate.

We have decided to capitalise the costs of a full membrane replacement on first restart in accordance with Atkins Cardno's recommendation,[400] and to introduce a separate daily membrane service charge to recover the capital costs of membranes over their asset life.

To capitalise membrane costs, we establish a separate asset base, a 'membrane RAB'. The membrane RAB has an opening value of $30 million in accordance with our decision on the prudent and efficient costs of a full set of membranes (see Chapter 6). Opening and closing values of the membrane RAB are calculated over an 8-year asset life, until the membranes are fully depreciated.

The RAB represents the value of SDP's stock of membrane assets on which we consider it should earn a return on capital and an allowance for regulatory depreciation. It assumes that a full membrane replacement occurs in 2017-18 and is calculated beyond the 2017 determination period, over the full life of the membranes (from 2017-18 to 2024-25).

SDP's annual required revenue for membrane costs is then calculated in each year as the sum of the:

- return on membrane assets, using our WACC of 4.7%
- return of membrane assets, using straight line depreciation over the 8-year asset life, and
- tax allowance for membrane assets.

Finally, the annual required revenue is converted to a daily service charge. Our decision on membrane RAB is presented in Table 12.1.

Table 12.1 Membrane RAB, revenue requirement and daily charges assuming a restart in 2017-18 ($'000, $2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22
Opening RAB	30,000	26,250	22,500	18,750	15,000
Depreciation	3,750	3,750	3,750	3,750	3,750
Closing RAB	26,250	22,500	18,750	15,000	11,250
Return on capital	1,378	1,206	1,033	861	689
Regulatory depreciation	3,665	3,665	3,665	3,665	3,665
Tax allowance	0	0	0	0	0
Total capital costs or required revenue	5,043	4,871	4,698	4,526	4,354
Daily charge ($/day)	13,816	13,344	12,837	12,400	11,928

Note: Numbers may not add due to rounding.

Data source: IPART analysis.

In its submission to our Draft Report, SDP accepted our decision to establish a membrane asset base, noting that this approach:

400 Atkins Cardno, *Expenditure Review – SDP*, February 2017, pp 12 and 52.

- facilitates capitalising membranes, and
- ensures that customers only pay membrane replacement costs when they are required.[401]

However, SDP noted that an allowance for tax also needed to be included in the membrane service charge.[402] SDP proposed adopting a pre-tax framework to simplify the process by removing the need to estimate a tax depreciation profile for the membranes.[403]

We agree with SDP and have included a tax allowance as part of the membrane service charge. To calculate the tax allowance, we have applied accelerated depreciation, consistent with the tax depreciation estimates provided by SDP for the plant and pipeline. This results in a zero tax allowance in all years of the 2017 determination period. This is because income for the first two years after membranes are purchased is entirely offset by the sum of accelerated depreciation and the benchmark interest expense, resulting in a tax loss. The accumulated tax loss for the first two years is not exhausted by the income earned later in the 2017 determination period.

12.2 Establishing membrane service charges

We have made a decision to:

61 Set separate charges to recover the capitalised costs of a full membrane replacement over the 2017 determination period, which includes the:

- schedule of membrane service charges as outlined in Table 12.2, and
- one-off charges for residual membrane costs as outlined in Table 12.3.

We have set a schedule of daily charges for membranes given that a restart could in principle occur in any year of the determination period. In practice, the restart is unlikely to occur during the first year of the 2017 determination period (2017-18) while the plant is inoperable following the December 2015 storm event. Atkins Cardno also assessed it unlikely that a dam level driven restart would happen before 2019-20.[404]

The schedule of daily membrane service charges over the 5-year 2017 determination period is presented in Table 12.2. These service charges are derived from Table 12.1. We note that the one-off transition to restart charge (average $12.4 million including energy costs, see Chapter 6) is payable on each restart in response to drought and excludes membrane costs. Therefore there is no double counting of membrane costs to customers.

401 SDP submission to IPART Draft Report, April 2017, p 73.
402 SDP submission to IPART Draft Report, April 2017, p 50.
403 SDP submission to IPART Draft Report, April 2017, p 65.
404 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 65.

Table 12.2 Membrane service charges over the 2017 determination period contingent on restart year ($/day, $2016-17)

Year of first restart	2017-18	2018-19	2019-20	2020-21	2021-22
2017-18	13,816	13,344	12,837	12,400	11,928
2018-19	n/a	13,816	13,344	12,837	12,400
2019-20	n/a	n/a	13,816	13,344	12,837
2020-21	n/a	n/a	n/a	13,816	13,344
2021-22	n/a	n/a	n/a	n/a	13,816

Data source: IPART analysis.

To allow SDP to recoup the full cost of the membrane replacement required at a restart, we have also decided to set a separate charge for any residual capital costs of membranes. This would be a one-off charge payable by the user (or users) on transition to shutdown following a period of operation **outside drought** (we explain the charging and cost sharing rules for membrane service charges below).

The residual costs payable at shutdown vary depending on which year the restart occurs during the 2017 determination period. Our decision on the **residual membrane charge** is presented in Table 12.3. These costs are also derived from Table 12.1.

Table 12.3 One-off residual membrane charge payable on shut down over the 2017 determination period contingent on restart year ($'000, $2016-17)

Year of first restart	2017-18	2018-19	2019-20	2020-21	2021-22
2017-18	26,250	22,500	18,750	15,000	11,250
2018-19	n/a	26,250	22,500	18,750	15,000
2019-20	n/a	n/a	26,250	22,500	18,750
2020-21	n/a	n/a	n/a	26,250	22,500
2021-22	n/a	n/a	n/a	n/a	26,250

Data source: IPART analysis.

12.3 Sharing rules for membrane replacement costs

We have made a decision to:

62 Apply the following charging rules for membrane costs:

- membranes paid for in full by impactors when the plant is triggered by drought
- membranes paid for in full by beneficiaries when the plant operates outside drought, and
- membrane costs revert to impactors if drought occurs before they are paid in full by beneficiaries.

Similar to SDP's other charges (Chapter 11), we employ the impactor and beneficiary pays principles in a hierarchy to create an efficient allocation of membrane costs. This approach recognises the purpose for which the plant is used (ie, in response to drought or for discretionary use outside drought).

Accordingly, we have decided that membrane service charges are paid in full on an impactor pays basis during drought (including any portion of the minimum run time that falls outside drought) and beneficiary pays basis outside drought. This is consistent with our decision on cost sharing rules for other charges.

12.3.1 Membranes for drought response are funded in full by impactors

A full replacement of membranes on first restart in response to drought is intrinsic to SDP's primary drought response role. Therefore, when the costs are triggered by a restart, we consider that they should be treated in the same way as the base service charge. That is, the daily membrane service charges are:

- shared on the impactor pays principle, and
- continue into plant operation period and a subsequent shutdown until the membranes are fully paid (ie, over the 8-year asset life).

Effectively, the membrane service charge becomes an add-on to the base service charge.

Should the plant restart during the 2017 determination period in response to drought, any actual membrane costs incurred by SDP would be treated like any other capital cost in the base service charge and subject to a prudence and efficiency test at the next determination period when rolling forward the historical RAB and its membrane component.

Sydney Water noted the possibility that some membranes may be replaced in 2017 or 2018 as part of storm-related reinstatement works.[405] Sydney Water considered that membranes funded by SDP's insurers should be excluded from the starting membrane RAB in the 2017 determination period.

In addition, Sydney Water commented that if SDP restarted (accompanied with full membrane replacement) and then continued to operate in the 2017 determination period, some further replacement of the membranes might be required, affecting the membrane RAB.[406] Sydney Water also raised the likely treatment of membrane replacement costs if the desalination plant were to operate for more than four years at some time in the future.[407]

As noted above, our decision to capitalise a full set of membranes on first restart includes a standard prudence and efficiency assessment at the next price review, similar to other capital expenditure items. Only prudent and efficient expenditure on membrane replacement will be accepted in the opening membrane RAB for the next price determination period. We would therefore adjust the membrane RAB ex-post for any membrane replacement funded by SDP's insurers during plant reinstatement work following the December 2015 storm event, and any holding costs using the relevant WACC.

12.3.2 Membranes paid for in full by beneficiaries outside drought

Much like incremental service charges, membrane service charges should be paid on a user or beneficiary pays principle for discretionary use of the plant outside drought. Moreover,

405 Sydney Water submission to IPART Draft Report, April 2017, p 27.
406 Sydney Water submission to IPART Draft Report, April 2017, pp 11-12.
407 Sydney Water submission to IPART Draft Report, April 2017, p 27.

because a restart outside drought is not intrinsic to SDP's water security role, we consider that **all** associated membrane costs should be borne by the beneficiary. That is, regardless of how long the plant is requested to operate, the full set of membranes should be paid for over their economic life.

This means that a third-party customer would pay a one-off charge on transition to shutdown (ie, by issuing a notice to cease supply) to recover the residual costs of membranes, as set out in Table 12.3.

The proposal to recoup all membrane costs from third-party customers for use of the plant outside drought is similar to SDP's proposal. SDP proposed that membrane costs be paid in full by third-party customers, however as a one-off payment at restart.[408] However, by capitalising membrane costs and paying for them over their useful life, our treatment of membranes allows the potential sharing of these costs in the event there are multiple customers using the plant simultaneously (although not sequentially) outside drought.

Our treatment of membranes would see a third-party customer pay out the residual membrane costs regardless of the terms of the supply (ie, duration and capacity). In its response to our Draft Report, SDP expressed concern the cost sharing rules for direct users outside of drought are excessively prescriptive. Specifically, SDP noted that the residual membrane service charge paid by beneficiaries would be a significant disincentive to new entrants, and potentially provide windfall benefits to impactors, should the membranes still be in service when the next drought commenced.

SDP proposed unregulated pricing agreements with customers outside drought to accommodate supply at varying levels of output.[409] As discussed in Chapter 2, we are unable to implement such agreements given our Terms of Reference. The prices we set reflect the efficient cost for the provision of SDP's services at full capacity, both in and outside drought.

We note that alternative sources of water are available outside drought, and the customer's decision to source water from SDP is a commercial decision. Also, we set the maximum charges that SDP can levy. SDP has an option outside drought to replace less than the full set of membranes where production is less than full capacity, and charge less than the maximum membrane service and residual charges outlined above.

12.3.3 No additional membrane costs payable at a subsequent restart

Membrane replacement costs are allowed only once in the 2017 determination period, on first restart of the plant in or outside of drought.

Membranes funded by a third-party customer on first restart outside drought could have a significant useful life left in them. Sydney Water customers (and other impactors) would therefore receive a windfall gain for the residual life of the membranes over the 2017 determination period. This is because the membranes could be used by SDP during drought but would have been paid outside of drought (ie, by a third-party customer, not by Sydney Water).

408 SDP pricing proposal to IPART, October 2016, p 70.
409 SDP pricing proposal to IPART, October 2016, p 31.

Equally, third-party customers would receive a windfall gain if they were to use the plant subsequent to a drought period of less than eight years (the life of the membranes). This is because membranes for drought response are funded in full by impactors.

Avoiding membrane costs under these circumstances does not reduce the unit cost of desalinated water below dam water and therefore incentivise inefficient use of the plant. As noted above, it is appropriate for impactors to pay for a full set of membranes on first restart in response to drought because it is difficult for SDP to predict the duration of a drought. SDP is required by its Network Operator's Licence to maximise production in response to drought.

At any subsequent restart of the plant, SDP would not be over-compensated for the fully funded membranes.

12.3.4 Membrane costs revert to impactors if drought occurs before they are paid in full

If drought occurs before membranes are paid in full by a third-party customer, the cost sharing rule would switch from beneficiary to impactor pays. The remaining costs of the membranes therefore would be paid in full by all impactors, as per Table 12.2.

Effectively, the stock of membranes paid by the third-party customer on a beneficiary pays basis outside drought 'changes hands' when the drought starts, now becoming intrinsic to drought response and thus shared using the impactor pays principle. The daily membrane service charges in this instance would be paid by impactors[410] and continue throughout the drought period and beyond into a subsequent shutdown until the membranes are fully paid (ie, over the 8-year asset life).

12.4 Ex-post review of membrane costs for emergency response

We have made a decision to:

63 Review the prudent and efficient capital costs of membranes associated with supply for emergency response to Sydney Water (ie, exceptional circumstances specified in the Water Supply Agreement) ex-post at the next determination period.

- Where appropriate, these costs would be rolled into the historical RAB, including holding costs using the relevant WACC.
- These membranes costs would be paid for in full by Sydney Water.

If Sydney Water requests SDP to restart in emergency, SDP must use its reasonable endeavours to supply any amount of desalinated water within the shortest period of time.

Notwithstanding their age, the existing membranes might still be fit to produce some quantity of desalinated water that can be treated to drinking water quality standard. This is

410 We note that in this circumstance if the third-party customer continues to draw supply from SDP, they are no longer classed as a beneficiary. They would therefore no longer pay for membrane costs based on their total proportion of draw from SDP 'on the day'. Instead, they would be classed as an impactor and be charged an amount for membranes equal to the proportion of water they draw from WaterNSW and SDP. Therefore, they do not avoid membrane costs.

particularly so if the emergency period is short. However, if the emergency is expected to be prolonged, it would be reasonable to expect some replacement of membranes on restart.

Due to uncertainties associated with the timing and nature of any emergency response, we recommend reviewing membrane replacement costs in this instance ex-post. At the next price review, we would assess the prudent and efficient capital costs of membranes associated with emergency response. This is consistent with our treatment of other capital cost items with uncertain timing (eg, skid test unit and an extra pump for the drinking water pumping station, see Chapter 7).

To ensure SDP is not underfunded for the membranes it might need for an emergency response, we would also reimburse any holding costs using the relevant WACC. The resulting membrane costs would be subsequently paid for by Sydney Water.

In its submission to our Draft Report, SDP accepted our decision to conduct an ex-post review of membrane replacement costs at the next price review in the event of an emergency response during the 2017 determination period.[411] This was also supported by Sydney Water, which commented that neither the occurrence of emergency events nor the specific costs needed for SDP to provide an emergency response can be known in advance.[412]

411 SDP submission to IPART Draft Report, April 2017, p 60.
412 Sydney Water submission to IPART Draft Report, April 2017, p 12.

13 Prices and impacts

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

- SDP's financial viability and shareholders
- general inflation
- the environment, and
- SDP's service standards.

We are satisfied that our 2017 Determination achieves an appropriate balance between these matters.

13.1 Prices over the 2017 determination period

We have made a decision to:

64 Set prices for the 2017 determination period as outlined in Table 13.1.

Our prices comprise the following charges:

- **Base service charge** ($/day) reflecting SDP's fixed costs for the plant when in water security (shutdown) mode. On an annual basis, this is equivalent to the NRR in water security (shutdown) mode.
- **Incremental service charge** ($/day) reflecting SDP's additional fixed costs when in plant operation mode. On an annual basis, this is equivalent to the NRR in plant operation mode (with all variable costs removed) less the NRR in water security (shutdown) mode.
- **Water usage charge** ($/ML) for supplying non-rainfall dependent drinking water. This charge reflects SDP's efficient variable operating costs when the plant is operating.
- **Pipeline service charge** ($/day) reflecting SDP's fixed costs for the pipeline, which are the same in water security (shutdown) and plant operation modes. On an annual basis, this is equivalent to the NRR for the pipeline.
- **Membrane service charge** ($/day) reflecting the capitalised costs of a full membrane replacement at restart.
- **Transition charges** ($/per event) reflecting the efficient fixed one-off operating costs incurred when the plant moves from water security (shutdown) into plant operation mode and vice versa.

SDP's prices are presented in Table 13.1 below. Our prices recover costs in the year they occur. As a result, there is no smoothing of the NRR or prices. We note that the prices are in 'real' $2016-17 – ie, they exclude the effects of inflation over 2017-18 to 2021-22 (in contrast, bill impacts include forecast inflation over 2017-18 to 2021-22). Prices in the accompanying

Determination are in $2017-18 – ie, the prices outlined in this chapter adjusted for one year of inflation.

Table 13.1 Prices for the 2017 determination period ($2016-17)

	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2016-17 to 2021-22
							% change
Plant service charges ($/day)							
Base service charge	391,257	365,748	362,064	357,033	352,906	348,783	**-10.9%**
Incremental service charge	37,034	20,948	21,383	21,345	21,081	22,377	**-39.6%**
Pipeline service charge ($/day)	140,610	99,071	99,086	98,793	99,011	98,899	**-29.7%**
Membrane service charge ($/day)[a]	-	13,816	13,344	12,837	12,400	11,928	**-**
Transition to restart ($'000 per event)	6,053	13,933	12,652	12,031	11,735	11,622	**92.0%**
Transition to shutdown ($'000 per event)	1,588	1,686	1,686	1,686	1,686	1,686	**6.2%**
Water usage charge ($/ML)	687	841	715	654	625	614	**-10.5%**

a No membrane service charge applies if there is no restart in the 2017 determination period. The membrane service charge in this table assumes a first restart in 2017-18. Table 12.2 presents the complete schedule of membrane service charges by year of restart.

Note: The first year of the 2017 Determination is 2017-18. Results for 2016-17 are provided for comparative purposes.

13.1.1 Compared to the 2012 Determination

Plant and pipeline service charges decrease because of a lower WACC and better estimate of tax allowance

Under our decisions, SDP's base and pipeline service charges decrease in 2017-18 compared to 2016-17. The base service charge decreases by 6.5% from 2016-17 to 2017-18, while the pipeline service charge decreases by 29.5%.

Over the 2017 determination period the base service charge continues to decrease, reflecting the fact that the return on capital is decreasing over this period.

The pipeline charge also reflects our decision to allow tax losses for the pipeline to offset tax payable on the plant. The impact of this change is a reduction in the overall required revenue via a negative tax allowance for the pipeline.

Incremental service charges decrease because of the capitalisation of periodic maintenance costs

The incremental service charge decreases by 43.4% from 2016-17 to 2017-18. This is almost entirely due to our decision to capitalise periodic maintenance costs. These costs are now recovered through the base service charge.

Membrane service charges would be introduced for the first time in the 2017 determination period

Membrane replacement costs were not included in the 2012 Determination, given the age of these assets at the time. If SDP restarts during the 2017 determination period, it is likely to need a full set of membranes which would add on average around $12,865 to SDP's daily service charges. The membrane replacement costs start at the time of the first transition to restart and then continue until they are paid in full. No membrane replacement costs are payable if SDP remains in shutdown for the duration of the 2017 determination period.

Water usage charges decrease over time

Water usage charges increase in 2017-18 by 22.5%, but then decrease over time. This largely reflects the movements in benchmark energy costs. Over the 2017 determination period, the benchmark energy cost declines, which results in a reduction in the water usage charge of 10.5% from 2016-17 to 2021-22.

The usage charge also decreases over time because of reductions in energy volumes recommended by our consultants. Our analysis indicates energy costs decline from approximately $693 per ML in 2017-18 to $466 per ML in 2021-22, or about 82% to 76% of the water usage charge in those years respectively.

Additional costs have been included in transition to restart charges

Additional costs have been included in transition to restart charges. In 2017-18, the transition to restart charge increases by 130.2% compared to 2016-17 under our final decisions. This reflects costs related to energy and pipeline flushing that were not included in the 2012 Determination, and changes in key input costs (eg, chemicals).

The energy costs in the transition to restart charges reflect the fixed energy costs associated with restarting the plant, and not the variable energy costs that depend directly on the volume of water produced in restart. These latter energy costs are captured by the water usage charge.

13.1.2 Compared to the Draft Report

Since the Draft Report, we have updated the following to reflect latest market information:

- the cost of capital (WACC), and
- benchmark energy prices.

We have also made minor changes to operating and capital costs, based on our consultant's review of SDP's and stakeholder submissions to our draft expenditure decisions. The charges mostly affected by these changes include:

1. Base and pipeline service charges – being fixed charges, both have reduced because of a decrease in the WACC to 4.7% compared to 4.9% in our Draft Report.
2. Water usage charge - is higher in the first two years but lower in the subsequent three years of the determination period. This is due to the updated benchmark energy prices.

3. Transition to restart charge - has increased significantly due to additional fixed energy requirements allocated to the restart period after considering SDP's submission and the recommendations of our consultant, Atkins Cardno.

13.1.3 Compared to SDP's proposed prices

SDP's proposed prices are presented in Table 13.2. Differences between SDP's prices and our prices derive from our decisions on SDP's efficient costs, which are identified in the NRR analysis in Chapter 5. This includes:

- Capitalising prudent and efficient periodic maintenance costs so that customers do not need to pay for these capital-related costs upfront.
- Disallowing a partial plant test in water security (shutdown) mode.
- Deciding to review ex-post capital expenditure contingent on uncertain future restart of the plant so that customers only pay for this if needed.

Factors that have increased our prices include a higher WACC than proposed by SDP and higher benchmark energy costs.

Our transition to restart charges are lower than SDP's because we have excluded energy costs for the production and supply of drinking water (these costs are recovered via the usage charge) and we have capitalised membrane costs and introduced a membrane service charge (see Chapter 12).

Since our Draft Report SDP revised its cost estimates and proposed prices. Its proposed prices increased from those originally proposed in Table 13.2, reflecting higher proposed funding costs in line with our draft WACC of 4.9%. This was partially offset, however, by reductions in forecast operating expenditure, such as accepting our decisions to exclude costs related to the partial plant test SDP had originally proposed and to apply a 0.25% efficiency factor to its corporate and labour costs.

Table 13.2 SDP's proposed prices for the 2017 determination period ($2016-17)

	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	% change 2016-17 to 2021-22
Plant Service Charges ($/day)							
Base service charge	391,257	357,809	361,921	358,074	381,872	375,375	**-4.1%**
Incremental service charge	37,034	40,424	33,195	32,197	7,576	10,666	**-71.2%**
Pipeline service charge ($/day)	140,610	100,332	100,237	99,811	99,900	99,659	**-29.1%**
Transition to restart ($'000 per event)	6,053	37,272	38,402	39,372	40,232	40,982	**577.0%**
Transition to shutdown ($'000 per event)	1,588	1,686	1,686	1,686	1,686	1,686	**6.2%**
Water usage charge ($/ML)	687	688	688	688	688	688	**0.2%**

Note: The prices in this table are based on SDP's proposal with the following modifications: the base charge is equivalent to SDP's proposed water security charge, and incremental charge is equivalent to SDP's proposed plant operation charge less SDP's proposed water security charge.

Data source: SDP pricing proposal to IPART, October 2016, pp 127-130.

13.1.4 The prices for the 2017 determination period meet the requirements of the Terms of Reference

In determining SDP's prices, we must comply with a range of pricing principles set out in the Terms of Reference (Appendix A). These principles require us to adopt a price structure that includes at least two components:

- a **variable charge** for the drinking water supplied to SDP's customers, and
- a **fixed charge** for making the plant available that applies whether or not drinking water is supplied to customers.

The pricing principles also set out very specific requirements on the type of costs to be recovered through these price components. Notably, fixed costs are recovered through service charges and variable costs recovered through usage charges.

Our prices in Table 13.1 meet these requirements.

13.2 Implications for retail customers

We note that in presenting customer bill impacts in this chapter, we present nominal dollar impacts – ie, **bill impacts including forecast inflation**. In calculating bill impacts for the 2017 determination period, we apply an inflation rate of 2.1% per annum (to $2016-17) for the first year of the determination period, and an inflation rate of 2.5% per annum for each year thereafter.

Sydney Water is SDP's only customer at present. As a result, we are considering the impact of our prices on Sydney Water's customers.

Our decisions result in reductions to the prices paid by Sydney Water's customers. Notably, the cost of SDP goes down in 2017-18 in a typical Sydney Water customer's annual bill:[413]

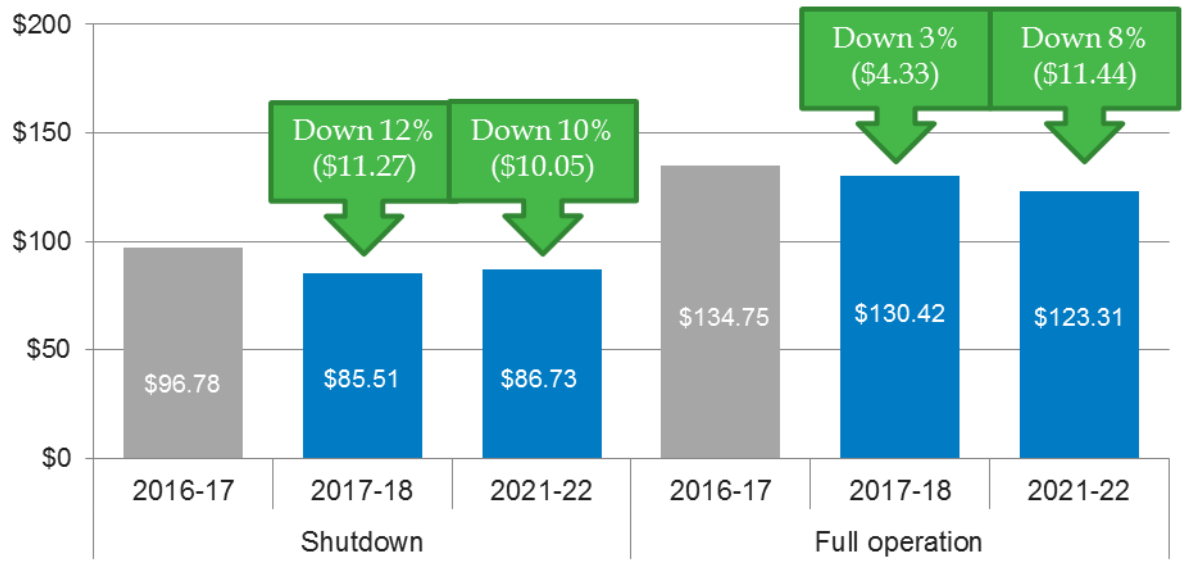
- When the plant is shutdown, the yearly cost of SDP per customer falls 12% from $96.78 in 2016-17 to $85.51 in 2017-18.
- When the plant operates, the yearly cost of SDP per customer falls 3% from $134.75 in 2016-17 to $130.42 in 2017-18.

In 2017-18, the plant is expected to be shutdown. From 2018-19 onwards, if drought occurs and the plant is called into operation customers would pay on average an additional $37.49 in their annual water bill. This recovers SDP's costs of producing and supplying water, as well as the additional fixed operating and membrane costs needed to run the plant.

If the plant were to operate over the entire 5-year period, SDP's costs would decrease on average by 1.4% each year. This is because our estimates of benchmark energy prices decrease over the period. If the plant remains shutdown it uses little energy. SDP's costs during shutdown would increase on average by 0.4% each year over the 5-year determination period, which is less than our 2.5% estimate of the rate of inflation.

Figure 13.1 shows how the costs of SDP for a typical Sydney Water customer are expected to fall as a result of our draft decisions.

Figure 13.1 Annual cost of SDP for a typical Sydney Water customer ($/year, $nominal) – with inflation



Note: The full operation customer impacts assume that membranes are replaced on 1 July 2017.
Data source: IPART analysis.

Customers also pay one-off transition costs if the plant is called into operation at some point over the 2017 determination period. The timing of transitions to restart and shutdown is uncertain and will depend on when future droughts occur and how long those droughts last. The impacts of these one-off transition costs are:

413 Customers would pay the 2017-18 costs at a one year lag, given the cost pass-through mechanism under the Sydney Water 2016 Determination. These costs are expressed in $2017-18 for simplicity.

- When SDP transitions to restart, a typical customer will pay on average an additional $6.25 in their annual water bill.[414]
- When SDP transitions to shutdown, a typical customer will pay on average an additional $0.88 their annual water bill.[415]

Table 13.3 shows how each component of SDP's charges are expected to flow through to a typical Sydney Water customer's bill. We have separated these impacts into:

- base charges, which apply in all modes of operation
- incremental charges, which apply in plant operation mode only, and
- transition charges, which apply when the plant transitions to restart or shutdown.

Table 13.3 Annual cost of SDP for a typical Sydney Water customer ($/year, $nominal) – with inflation

	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Base charges						
- Base service charge	71.19	67.28	67.61	67.31	67.44	67.57
- Pipeline service charge	25.59	18.23	18.50	18.63	18.92	19.16
Plant operation						
- Incremental service charge	6.74	3.85	3.99	4.02	4.03	4.33
- Membrane service charge[a]	-	2.37	2.40	2.43	2.46	2.49
- Water usage charge	31.23	38.69	33.29	30.90	29.87	29.76
Transition charges						
- Transition to restart	3.02	7.02	6.46	6.21	6.14	6.17
- Transition to shutdown	0.79	0.85	0.86	0.87	0.88	0.89
Cost in shutdown	**96.78**	**85.51**	**86.12**	**85.94**	**86.36**	**86.73**
Cost in plant operation	**134.75**	**130.42**	**125.79**	**123.29**	**122.72**	**123.31**

a The customer impact of membrane costs has been calculated by averaging the $/day membrane service charges in Table 2, multiplying this by the number of days in the relevant year, and dividing the result by the number of Sydney Water customers.

Note: Numbers, may not add due to rounding. Further, the forecast number of 20mm equivalent meters used to calculate the customer impacts in this table are consistent with Sydney Water's 2016 Determination. The CPI forecasts used to convert $2016-17 prices and customer impacts into $nominal are: the ABS published March to March All Capitals CPI of 2.1% for moving from $2016-17 to $2017-18, and the mid-point of the RBA target band of 2.5% for all remaining years.

Data source: IPART analysis.

13.3 Implications for SDP's financial viability and shareholders

We are satisfied our determination will not adversely affect the ability of SDP to operate, and maintain the assets required to deliver its regulated services over the 2017 determination period. Further, we are satisfied that this determination will enable SDP to earn a reasonable rate of return on its assets.

414 This represents the average bill impact from 2018-19 to 2021-22. 2017-18 is excluded from the average because the plant is expected to be shutdown.

415 Again, this represents the average bill impact from 2018-19 to 2021-22. 2017-18 is excluded from the average because the plant is expected to be shutdown

13.3.1 SDP is priced to be financially indifferent

Consistent with the Terms of Reference, our prices encourage SDP to be financially indifferent as to whether or not SDP supplies water to customers, including Sydney Water.

Notably, our water usage charge for the supply of non-rainfall dependent drinking water reflects all efficient costs that vary with output, including variable labour, energy and maintenance costs. The fixed charges for making the plant available to supply non-rainfall dependent drinking water are periodic payments. These reflect fixed costs, including the fixed component of operating costs, a return of assets and a return on assets.

Our base service charge applies to all modes of operation, which means SDP is entitled to charge for making the plant available to supply non-rainfall dependent drinking water irrespective of the levels of water in dam storages servicing Sydney or the availability of water from other sources.

13.3.2 Rate of return

Our pricing decisions mean that SDP is able to achieve the total NRR we have set for the 2017 determination period. Therefore, we expect that SDP will earn a real post-tax rate of return on its RAB of at least the benchmark rate of 4.7% over the 2017 determination period (see Chapter 9). This calculation is based on the assumptions we used in our modelling of the financial impacts of our pricing decisions, and depends on SDP achieving the efficiency targets we have set.

13.3.3 Financeability

Since the 2012 Determination, we have established a financeability test that we use to consider the effect of our regulated prices on the utility's financial sustainability.[416] We assess whether our decisions would enable the utility to raise finance consistent with an investment grade rated firm, over the regulatory period.

In our financeability assessment, we check whether a utility would achieve at least a Baa2 rating, based on our own financeability test. We have reviewed our approach to calculating the credit ratios we use in our financeability test, including Funds From Operations (FFO) Interest Cover, Debt Gearing, and FFO over debt.[417]

Table 13.4 shows SDP's financial ratios based on our prices. Our financeability test has been done on the basis of a revenue forecast that assumes no abatement events occur during the regulatory period. Table 13.5 shows our benchmark financial ratios.

416 The objective of our financeability test is to assess the short-term financial sustainability of the utility. Our financeability test requires us to construct financial statements for the regulated utility, use the utility's actual cost of debt and gearing levels to compute the financial ratios, compare the financial ratios against our Baa2 benchmark levels, make an overall assessment taking into account the financial ratios, financial statements and other relevant information which could affect financial sustainability. IPART, *Financeability tests in price regulation – Final Decision*, December 2013.

417 IPART, *Financeability ratios – Final Decision*, April 2015.

Table 13.4 SDP's financial ratios (based on RAB values)

Financial year ending 30 June	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
1. FFO Interest Cover	2.0	2.0	2.1	2.2	2.2	2.3
2. Debt / RAB	90%	84%	81%	78%	75%	72%
3. FFO / Debt	4.7%	4.5%	4.9%	5.2%	5.7%	6.2%

Note: For the Final Report, we are calculating the 2016-17 financeability metrics based on historical data. For the Draft Report, the 2016-17 metrics were calculated using inputs generated within the regulatory model. The Draft Report metrics were: FFO interest cover – 1.9, Debt/RAB – 90%, and FFO/Debt – 4.9%.

Table 13.5 Financial Ratio Benchmarks (for water utilities)

	Investment Grade				
Credit Ratio	**A3**	**Baa1**	**Baa2**	**Baa3**	**Ba1**
1. FFO Interest Cover	>2.9	2.3 - 2.9	1.7 - 2.5	1.4/1.5 - 1.7	<1.4 / 1.5
2. Debt / RAB	<60%	80-85%	60-91%	90-100%	>100%
3. FFO / Debt	>10%	>10%	6-10%	5-8%	<4%

Data source: Kanangra Ratings Advisory Services advice to IPART, see IPART, *Financeability tests in price regulation — Final Decision, December 2013*, p10.

Based on our analysis of SDP's credit metrics, and the improvement of these credit metrics over the 2017 determination period, we consider SDP to be financially sustainable:

- The first two metrics, FFO interest cover and Debt/RAB, are consistent with Baa2 (investment) grade in all years of the determination.
- The third metric, FFO/debt, is below investment grade for the first four years of the determination, but consistent with investment grade in the final year. This increasing trend arises because debt is forecast to be paid off during the period.

We do not expect a regulated entity will meet every benchmark in every year of a determination period.[418] SDP's own financeability assessment produces ratios that are very similar to those in Table 13.4 above.[419] SDP indicates that the FFO/Interest and Debt/RAB ratios meet the Baa2 benchmark for all years of the determination, but that FFO/Debt does not meet it for any of the years. SDP did not change its position on its financeability between its original proposal and the revised submission.

Based on its proposed revenue requirements, SDP expects its financial position to remain sustainable over the 2017 determination period. Our NRR is marginally lower than proposed by SDP in both water security (shutdown) and plant operation modes (see Chapter 5).

13.4 Implications for general inflation

Under section 15 of the IPART Act, we are required to consider the effect of our determinations on general price inflation. SDP costs contribute to general water costs in Greater Sydney as they are included in Sydney Water prices as a cost pass-through.

418 IPART, *Financeability tests in price regulation – Final Decision,* December 2013, pp 11-12.
419 SDP pricing proposal to IPART, October 2016, pp 131.

In our 2016 Determination of Sydney Water's prices, we included SDP's fixed costs based on the 2016-17 prices set in our 2012 Determination of SDPs' prices. The resulting Sydney Water prices contributed to the annual impact on general price inflation of -0.006% points (above the change in the CPI).[420]

Our decisions result in a $79.7 million reduction in SDP's fixed costs already included in Sydney Water prices.[421] This would reduce Sydney Water's target NRR and prices; however, the additional impact on general inflation would be very small.[422]

13.5 Implications for ecologically sustainable development

The NSW Government is responsible for determining any negative environmental impacts associated with SDP's activities, and for imposing standards or requirements on SDP to address these impacts.

In setting our prices, we have provided SDP with sufficient funding to meet its environmental and other obligations and to conduct its operations in accordance with Good Industry Practice.

The project approval for SDP was premised on ecologically sustainable development

SDP was constructed by Sydney Water from 2007-2010 as part of the NSW Government's Metropolitan Water Plan. It was constructed in response to the worst drought in 100 years, when Sydney's dam levels fell to 34%.[423] The desalination plant was intended to reduce the likelihood of end-use customers (ie, retail customers) facing water restrictions and to increase Sydney's water security during droughts.[424]

The project approval for SDP[425] included a requirement that the plant use 100% renewable energy.[426] SDP has entered into long-term 20-year contracts with Infigen to acquire fixed volumes of electricity and RECs at fixed real prices. SDP has contracted annual volumes of electricity sufficient to run the plant at full capacity. It has the ability to sell load back to the market if the plant's electricity demand is less than full capacity.[427]

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420 See IPART, *Review of prices for Sydney Water Corporation from 1 July 2016 to June 2020 – Final Report*, June 2016, p 237.

421 From $194.9 million in 2016-17 to $169.7 million in 2017-18, $168.4 million in 2018-19 and $166.9 million in 2019-20, a cumulative reduction of $22.2m+$26.5m+$28 = $79.7 million over 2017-18 to 2019-20, see Chapter 4. Sydney Water prices already included passing through $194.9 million per year x 4 years = $779.6 million of SDP's fixed charges over 2016-17 to 2019-20. Our draft decision results in removing $79.7 million from Sydney Water prices.

422 The impact on general price inflation of -0.006% points above resulted from $418 million (in $2016-17) reduction in Sydney Water's NRR over its 2016 determination period. The $80.8 million reduction due to SDP's lower fixed costs would contribute to an additional 80.8/418 = 19% impact, or -0.001% point reduction in general inflation (above the change in CPI).

423 SDP, *Our History*, at http://www.sydneydesal.com.au/who-we-are/our-history/, accessed on 4 July 2016.

424 We also note that Sydney Water is required to maintain and comply with an agreed roles and responsibility protocol regarding the development and implementation of the Metropolitan Water Plan under its Operating Licence. IPART, *Sydney Water Corporation Operating Licence – Report to the Minister*, May 2015, p 6.

425 The project approval for SDP was granted under the *Environmental Planning and Assessment Act 1979*.

426 IPART, *Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2012 - Final Report*, December 2011, p 17.

427 SDP submission to IPART: Review of prices for SDP, 8 July, 2011, p 3.

SDP holds an environment protection licence

The NSW Environment Protection Authority (EPA) is the environmental regulator of SDP. It has issued an environment protection licence that requires Veolia, in its management of SDP, to meet certain requirements such as water quality criteria for the outfall.[428] This licence is scheduled to be reviewed in October 2018.

SDP has undertaken a marine monitoring program

SDP conducted a six year Marine and Estuarine Monitoring Program to determine the impacts upon seawater quality and aquatic ecology as a result of its operation. The program's methodology was independently reviewed by experts from the CSIRO, UNSW and UTS and endorsed as robust. The program was designed to detect a change of 10% in the marine environment with 80% confidence.[429]

The Marine and Estuarine Monitoring Program concluded in 2014. The research has shown that, once discharged to the ocean, the seawater concentrate returns to normal temperature and salinity within 50-75 metres from the outlet. This is called the near field mixing zone. It has been found that there are no significant impacts on seawater quality or aquatic ecology from the seawater concentrate beyond the near field mixing zone and minimal impact within near field mixing zone during operation. [430]

13.6 Implications for SDP's service standards

Under our Determination, we expect SDP to achieve operating efficiency savings. We are satisfied that SDP can achieve these efficiency savings and thus can generate sufficient revenue to achieve service standards at or above those expected by customers and required under its licences.

SDP holds a Network Operator's Licence and Retail Supplier's Licence under the WIC Act. IPART administers and reviews these licences.

Our expenditure consultant, Atkins Cardno, concluded the main licence obligation is for the plant to be maintained consistent with Good Industry Practice.[431] Accordingly, in water security (shutdown) mode, Atkins Cardno considered this to be the main cost driver and undertook its expenditure review on this basis.[432] Our consultant confirmed that SDP has and is continuing to maintain the plant.[433] This is consistent with the findings of the WIC Act audit.[434]

428 EPA, *Licence summary*, at http://www.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=12904&id=12904&option=licence&searchrange=licence&range=POEO%20licence&prp=no&status=Issued, accessed on 22 June 2017.
429 SDP, Marine Environment, at http://www.sydneydesal.com.au/caring-for-the-environment/marine-environment/, accessed on 22 June 2017.
430 SDP, Marine Environment, at http://www.sydneydesal.com.au/caring-for-the-environment/marine-environment/, accessed on 2 March 2017.
431 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 33.
432 See condition A2(a)(i) of SDP's Network Operator's Licence.
433 Atkins Cardno, *Expenditure Review – SDP*, February 2017, p 33.
434 Risk Edge, *WICA Licence audit report*, July 2015.

Appendices

A Terms of Reference

The Hon. Greg Pearce MLC
Minister for Finance and Services
Minister for the Illawarra

Dr Peter J Boxall AO
Chairman
Independent Pricing and Regulatory Tribunal
PO Box Q290
QVB Post Office NSW 1230

Dear Dr Boxall

I write regarding the Terms of Reference for Referral of Sydney Desalination Plant Pty Ltd (SDP) to IPART under Section 52 of the *Water Industry Competition Act 2006*.

I note your previous request that the Terms of Reference be amended to provide for IPART to establish an efficiency gains and losses carryover mechanism for SDP. I understand that implementation of this mechanism would involve the preparation of a methodology paper, which would be subject to public consultation prior to finalisation and publication.

I am pleased to support this proposal subject to the methodology paper also including a mechanism to adjust SDP's revenue to accommodate significant gains and losses associated with the sale of surplus electricity and Renewable Energy Certificates (RECs).

Amended Terms of Reference, which refer to this mechanism as well as IPART's proposed efficiency carryover mechanism, are attached to this letter. For clarity, the intention of the proposed energy adjustment mechanism is that:

1. It would only apply to electricity and RECs that are not required by SDP when the desalination plant is not in full operation mode when complying with the plant's operating rules, as established by the Metropolitan Water Plan and subsequently included in SDP's Network Operator Licence under the Water Industry Competition Act.

2. It would ensure that SDP customers for water (in Sydney Water's Area of Operations) receive the benefit of significant gains and bear significant losses incurred as a result of the difference between the cost of electricity and RECs under SDP's contracts with Infigen and the market price for electricity and RECs arising from the sale of SDP's surplus electricity and RECs (in the circumstances described in point 1).

Level 36, Governor Macquarie Tower, 1 Farrer Place, Sydney NSW 2000
Phone: (61 2) 9228 5287 Fax: (61 2) 9228 5899 Email: office@pearce.minister.nsw.gov.au

3. For electricity, the mechanism would mirror the 'Calculation of Shortfall Adjustment' in SDP's Electricity Supply Agreement with Infigen, with the 'market price' defined as the half-hourly spot price and/or the price of a contracted 'available block'.

4. For RECs, the 'market price' would be the price shown in the Nextgen Greenroom Report, or another equivalent report.

I understand that IPART's intention is to publish its draft methodology paper in the near future, with the final paper due to be published by May 2012.

Yours sincerely

Greg Pearce MLC
Minister for Finance and Services
Minister for the Illawarra

16 Febry 2012

Terms of Reference for Referral of Sydney Desalination Plant Pty Limited to IPART under Section

52 of the Water Industry Competition Act

Background

On 29 June 2010 Sydney Desalination Plant Pty Limited (SDP) was granted a network operator licence in relation to the *desalination plant*. The Minister for Finance and Services has, under section 51 of the Water Industry Competition Act 2006, declared that SDP is a monopoly supplier in relation to the *water supply services* it provides under its network operator licence.

SDP is the only supplier of non-rainfall dependant drinking water in New South Wales. Currently, the primary purchaser of drinking water supplied from the desalination plant is Sydney Water Corporation. Sydney Water Corporation purchases bulk water from two main sources, the Sydney Catchment Authority and, since its commissioning, the *desalination plant*.

The *desalination plant* is a key element in Sydney's water security plan. Under its network operator licence, the *desalination plant* is required to maximise water production when dam storage levels in Sydney are below a prescribed threshold. Prices set by the Independent Pricing and Regulatory Tribunal (IPART) should therefore reflect the water supply services provided by SDP set out below:

(a) the supply of non-rainfall dependant drinking water to purchasers; and

(b) the making available of the *desalination plant* to supply non-rainfall dependant drinking water.

Matters for consideration - pricing principles

Unless indicated otherwise each *price determination* is to be consistent with the following pricing principles:

1. Maximum prices should be set so that expected revenue generated will recover the efficient costs of providing the services described at (a) and (b) above over the life of the assets. Costs include operating costs, a return on the assets and return of assets (depreciation).

2. In calculating the return on invested assets:

   i. The rate of return (or Weighted Average Cost of Capital) should reflect the commercial risks faced by the asset owner in providing the services.

   ii. IPART should determine an appropriate opening asset value.

3. Return of assets (depreciation) is to reflect the economic lives of the assets.

4. The structure of prices should encourage SDP to be financially indifferent as to whether or not it supplies water. As such the structure of prices should comprise separate charges for the different water supply services described at (a) and (b) above.

5. The amount of any adjustments under the mechanisms in principle 8 should each be separately quantified and published by IPART.

6. The charges for water supply services in (b) above should be a periodic payment and should reflect fixed costs including, return on assets, return of assets, and the fixed component of operating costs. SDP is to be entitled to charge for providing the water supply services in (b) above irrespective of levels of water in dam storages servicing Sydney or availability of water from other sources.

7. The charges for water supply services in (a) above should reflect all efficient costs that vary with output, including variable energy, labour costs, and maintenance costs.

8. For each *price determination* other than the first price determination:

   i. SDP should be allowed to carryover demonstrated efficiency savings, net of efficiency losses, in operating expenditure in providing the water supply services specified at (a) and (b) above for a period of 4 years following the year in which the efficiency saving was achieved.

   ii. In calculating the notional revenue requirement, IPART should determine the demonstrated efficiency savings and treatment of energy gains or losses in accordance with the Methodology Paper; and

   iii. A mechanism(s) is required to allocate the costs or benefits to SDP customers (in Sydney Waters area of operation) of actual gains or losses beyond a core band that result from the difference between SDP's costs of electricity and RECs under its contracts with Infigen and revenues from the sale of surplus electricity and RECs. The mechanism would only operate at times when:

   - the desalination is in Shutdown or in a Restart Period; and
   - SDP complied with its requirements to maintain and operate the desalination plant under clause A2 of its network operator licence.

9. Any other matters that IPART may consider relevant

Methodology Paper

IPART must publish on its website a methodology paper setting out its approach to implementing pricing principle 8 above **(Methodology Paper)** IPART may update the Methodology Paper from time to time.

Timing

The determination period is to cover the period to 30 June 2017.

For each successive price determination period, IPART is to make the price determination before the expiry of the current determination period.

B Legal requirements for this review

In conducting this review of SDP's prices, we must comply with:

- relevant sections of the *Independent Pricing and Regulatory Tribunal Act 1992* (IPART Act) which sets out matters that we must have regard to, and
- clause 24J of the *Water Industry Competition (General) Regulation 2008* (WIC Regulation) which sets out requirements that we must meet before issuing our Final Report.

B.1 How we complied with the IPART Act

B.1.1 Section 15(1) – Matters to be considered by Tribunal under this Act

In making determinations, IPART is required under section 15(1) of the IPART Act to have regard to the following matters (in addition to any other matters IPART considers relevant):

a) the cost of providing the services concerned

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

c) 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

d) the effect on general price inflation over the medium term

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

f) 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

g) 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

h) 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

i) the need to promote competition in the supply of the services concerned

j) considerations of demand management (including levels of demand) and least cost planning

k) the social impact of the determinations and recommendations, and

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

Section 15(1) of the IPART Act applies to IPART's determination of SDP's prices in the same way as it applies to prices for government monopoly services referred for determination under section 12 of the IPART Act (see WIC Act, section 52(3)). Table B.1 outlines the sections of the report that address each matter.

IPART has also had regard to certain matters listed in section 14A(2) of the IPART Act. Where IPART has had regard to those matters, they are also matters covered by section 15(1) of the IPART Act, and the relevant sections of the report are listed below.

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

Matters under section 15(1)	Final Report reference
a) the cost of providing the services	Chapters 5, 6, 7, 8, and 9
b) the protection of consumers from abuses of monopoly power	Sections 2.5, 3.1, and chapters 6, 7, 8, and 9
c) the appropriate rate of return and dividends	Sections 3.1.5, 9.2, and 13.3
d) the effect on general price inflation	Section 13.4
e) the need for greater efficiency in the supply of services	Section 2.2 and chapters 5, 6, and 7
f) ecologically sustainable development	Sections 2.2 and 13.5
g) the impact on borrowing, capital and dividend requirements	Sections 3.1.5, 9.2, and 13.3
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	Not applicable
i) need to promote competition	Chapter 2
j) considerations of demand management and least cost planning	Section 2.2
k) the social impact	Sections 2.2 and 13.2
l) standards of quality, reliability and safety	Section 2.2, chapters 5, 6, 7, and section 13.6

B.1.2 Section 16 – Report on financial impact if maximum price not charged

Section 16 of the IPART Act states:

> If the Tribunal determines to increase the maximum price for a government monopoly service or determines a methodology that would or might increase the maximum price for a government monopoly service, the Tribunal is required to assess and report on the likely annual cost to the Consolidated Fund if the price were not increased to the maximum permitted and the government agency concerned were to be compensated for the revenue foregone by an appropriation from the Consolidated Fund.

We have considered this requirement and, notwithstanding the reference to 'government monopoly service' which we note SDP does not provide, have formed a view that if SDP's maximum prices in its 2017 Determination were to increase and if SDP did not raise its prices to the maximum permitted, SDP would not be compensated for any revenue foregone by an appropriation from the Consolidated Fund and therefore there would be no cost to the Consolidated Fund.

B.2 How we complied with the WIC Regulation

Clause 24J of the WIC Regulation specifies that we must meet the following requirements prior to issuing our Final Report.

1. Before IPART issues its final report for a significant pricing investigation, IPART must:
   a) consider all submissions made to it on the draft report for the investigation that it considers material, and
   b) ensure that the matters referred to in subclause (2) are included in the report.
2. The final report must include the following matters:
   a) the pricing methodology applied for the determination of pricing that IPART has made,
   b) any significant methodological changes and the reasons for those changes,
   c) the assumptions that IPART has made for the determination and the reasons for those assumptions,
   d) IPART's response to submissions it has received on the draft report that IPART considers material, including the reasons for accepting or not accepting (whether wholly or in part) material submissions made by the investigated monopoly supplier.
3. The final report may include such other matters as IPART considers appropriate.

In issuing our Final Report, we have met all the requirements specified in clause 24J of the WIC Regulation.

Table B.2 Meeting of clause 24J matters by IPART

Requirement of clause 24J	How requirement has been met
1. Before IPART issues its final report for a significant pricing investigation, IPART must:	
a) consider all submissions made to it on the draft report for the investigation that it considers material	We have carefully and fully considered all submissions made to our Issues Paper, at the Public Hearing, and in response to our Draft Report. We also carefully and fully considered supplementary information provided by stakeholders that was provided to us (and to our expert consultants) on a commercial in confidence basis.
b) ensure that the matters referred to in subclause (2) are included in the report.	We have ensured that each of the matters referred to in subclause (2) are included and fully considered in the Final Report.
2. The final report must include the following matters:	
a) the pricing methodology applied for the determination of pricing that IPART has made	Our Final Report sets out our pricing methodology. Relevant chapters are: 2, 3, 4, 9, 10, 11, 12, and 13.
b) any significant methodological changes and the reasons for those changes	Our Final Report details and explains the reasons for changes to our methodology. Relevant chapters are: 2, 3, 4, 9, 10, 11, and 12.
c) the assumptions that IPART has made for the determination and the reasons for those assumptions	All assumptions made in our Determination are clearly stated and reasons for these assumptions are provided.
d) IPART's response to submissions it has received on the draft report that IPART considers material, including the reasons for accepting or not accepting (whether wholly or in part) material submissions made by the investigated monopoly supplier.	We accepted all submissions to our Issues Paper, at the Public Hearing and to our Draft Report. We have considered all submissions. Our Final Report acknowledges and responds to all material issues raised in submissions to our Draft Report.
3. The final report may include such other matters as IPART considers appropriate.	In addition to these clause 24J requirements, we have considered all matters that we are required to consider under section 15(1) (see Table B.1).

C Our building block approach to setting the revenue requirement

In this appendix, we provide information about our building block methodology for setting SDP's revenue requirement. This is our standard approach, which we used in the 2012 Determination and continue to use in the 2017 Determination.

C.1 Components of the building block

The NRR represents our view of the total efficient costs of SDP providing its regulated services in each year of the determination period. In general, we set prices to recover this amount of revenue.

This method to calculate SDP's revenue requirement involves determining, for each year of the 2017 determination period, an allowance for:

- **Operating expenditure,** which represents our estimate of the efficient level of SDP's forecast operating, maintenance and administration costs.
- A **return on the assets** SDP uses to provide its services. This amount represents our assessment of the opportunity cost of the capital invested in SDP, and ensures that it can continue to make efficient capital investments in the future. To calculate this amount, we need to decide on the efficient and prudent levels of SDP's past and forecast capital expenditure, the value of SDP's regulatory asset base (RAB), and the appropriate weighted average cost of capital (WACC).
- A **return of those assets (regulatory depreciation).** This allowance recognises that through the provision of services to customers, SDP's capital infrastructure will wear out over time, and therefore regulatory depreciation allows the cost of the RAB to be recovered throughout its expected life. To calculate this allowance, we need to decide on the appropriate asset lives and depreciation method.
- An **allowance for meeting tax obligations**. In the 2017 Determination, we use a real post-tax WACC to calculate the allowances for return on assets, and calculate the allowance for tax as a separate cost block. We consider this method accurately estimates the tax liability for a comparable commercial business. This represents a departure from the 2012 Determination, where we used a pre-tax WACC.
- An **allowance for working capital**, which represents the holding cost of net current assets.

D Calculation of energy cost allowances

Table D.1 shows how the energy cost allowances set out in Chapter 8 were calculated.

Table D.1 Calculation of energy cost allowances ($2016-17)

	2017-18	2018-19	2019-20 [a]	2020-21	2021-22
Shutdown					
- Benchmark price ($/MWh)	197.88	161.96	144.71	136.40	133.36
- Benchmark volume (MWh)	5,000	5,000	5,014	5,000	5,000
- Cost per year ($)	989,400	809,800	725,532	682,000	666,800
- Frequency (days)	365	365	366	365	365
- Allowance ($/day)	2,710.68	2,218.63	1,982.33	1,868.49	1826.85
Transition to restart					
- Benchmark price ($/MWh)	197.17	161.25	144.00	135.69	132.65
- Benchmark volume (MWh)	35,840	35,840	35,840	35,840	35,840
- Cost per transition ($)	7,066,573	5,779,200	5,160,960	4,863,130	4,754,176
- Allowance ($/transition)	7,066,572.80	5,779,200.00	5,160,960.00	4,863,129.60	4,754,176.00
Plant operation - fixed					
- Benchmark price ($/MWh)	197.16	161.24	143.99	135.68	132.64
- Benchmark volume (MWh)	7,665	7,665	7,686	7,665	7,665
- Cost per year ($)	1,511,231	1,235,905	1,106,707	1,039,987	1,016,686
- Frequency (days)	365	365	366	365	365
- Fixed allowance ($/day)	4,140.36	3,386.04	3,023.79	2,849.28	2,785.44
Plant operation - variable					
- Benchmark price ($/MWh)	197.16	161.24	143.99	135.68	132.64
- Benchmark volume (MWh)	320,835	320,835	321,714	320,835	320,835
- Cost per year ($)	63,255,829	51,731,435	46,323,599	43,530,893	42,555,554
- Frequency (ML)	91,250	91,250	91,500	91,250	91,250
- Variable allowance ($/ML)	693.21	566.92	506.27	477.05	466.36

a 2019-20 will be a leap year with 366 days.

Note: There is no variable component in transition because as soon as SDP supplies a ML of drinking water it is deemed to be in operation mode. Of Atkins Cardno's estimate of efficient energy required to restart of 71,000 MWh (which Atkins Cardno advises includes the production and supply of 10,000 ML of desalinated water), we have subtracted 35,160 MWh related to the production and supply of 10,000 ML of desalinated water (ie, assuming 3.516 MWh per ML consistent with full production mode). The remaining 35,840 MWh is assumed fixed and is recovered through the transition to restart charge.

Data source: IPART analysis.

E Examples of cost sharing rules

In this section we provide examples showing how our cost sharing rules work when SDP is in different modes in and outside of drought:

1. SDP not operating (shutdown) outside of drought.
2. SDP operating inside of drought, Retailer A takes all of SDP's water.
3. SDP operating inside of drought, Sydney Water takes all of SDP's water.
4. SDP operating outside of drought.
5. SDP operating inside of drought, where impactors share SDP's variable costs.

Our five hypothetical examples include two large water retailers in Sydney: the incumbent, Sydney Water; and a new entrant called Retailer A. All numbers are sourced from this report, and the current determinations for Sydney Water and WaterNSW.

We have included Example 5 to show what would happen if SDP's variable costs were to be shared between impactors (instead of beneficiaries in our rules) during a drought. Example 5 provides part of our justification for why variable costs are always paid by beneficiaries under our cost sharing rules.

The examples also show how WaterNSW's charges to Sydney Water are affected by the operation of SDP under WaterNSW's current determination.[435]

We responded to Sydney Water's concern about comparing costs on a like-for-like basis by including treatment costs in the examples below. We have provided a more detailed response to all of Sydney Water's concerns in our discussion in Chapter 11.

E.1 Example 1 – Cost sharing, SDP not operating (shutdown) outside drought

The purpose of this example is to show how our cost sharing rules work when SDP is not operating (in shutdown) outside of drought as discussed in Chapter 9.

In this example, SDP's base water security and pipeline costs are shared between Sydney Water and Retailer A in proportion to each organisation's relative share of total system demand. In this example total system demand is represented by demand for dam water from WaterNSW only, because SDP is in shutdown. Example 1 is summarised in Table E.1.

[435] IPART, *Water NSW Maximum prices for water supply services from 1 July 2016 in relation to Sydney Catchment Functions — Determination No. 3*, pp 5-8.

Table E.1 Example 1 – SDP not operating (shutdown) outside of drought ($million, $2016-17)

2017-18	Sydney Water	Retailer A	Total
Demand (ML)	448,183	91,250	**539,433**[a]
Demand share total (%)	83%	17%	**100%**
Transition to restart costs	-	-	**-**
Incremental service costs	-	-	**-**
Pipeline service costs	30.0	6.1	**36.2**
Membrane service costs	-	-	**-**
Variable costs	-	-	**-**
Base water security costs	110.9	22.6	**133.5**
Total SDP costs (A)	**141.0**	**28.7**	**169.7**
WaterNSW fixed costs	133.4	27.2	**160.5**
WaterNSW variable costs	33.3	6.8	**40.1**
Total WaterNSW costs (B)	**166.7**	**33.9**	**200.6**
Treatment Costs (C)	**168.1**	**34.2**	**202.3**
Total Costs (A)+(B)+(C)	**475.7**	**96.9**	**572.6**
Share of total costs	83%	17%	100%
$/ML	**1061.5**	**1061.5**	

[a] Total system demand is based on forecast demand for 2017-18 provided as part of the Sydney Water pricing review.

Note: Numbers may not add due to rounding.

Total water demand in 2017-18 is 539,433 ML, comprised of:

- Sydney Water total demand: 448,183 ML (83%) from WaterNSW, and
- Retailer A total demand: 91,250 ML (17%) from WaterNSW.

Under our cost sharing rules, SDP's base water security costs and pipeline costs would be recovered from impactors. SDP has no other costs during shutdown. Both retailers would be apportioned their share of the costs based on their relative share of system demand on the day the costs are accrued.

SDP's base water service and pipeline costs in 2017-18 are $169.7 million. We would apportion costs to impactors as follows:

- Sydney Water: $169.7 million × 83% = $141.0 million, and
- Retailer A: $169.7 million × 17% = $28.7 million.

Both Sydney Water and Retailer A source all water from WaterNSW. Under WaterNSW's determination, Sydney Water and Retailer A share WaterNSW's fixed charges ($160.5 million) for large customers based on the relative proportion of water supplied to each customer for 2017-18.

WaterNSW's variable price to large customers in 2017-18, when SDP is shutdown, is $74.39/ML.[436] Sydney Water pays $33.3 million through the variable price for 448,183 ML

[436] IPART, *Water NSW Maximum prices for water supply services from 1 July 2016 in relation to Sydney Catchment Functions — Determination No. 3*, pp 5-8 and IPART analysis.

of water from WaterNSW. Retailer A pays $6.8 million through the variable price for 91,250 ML of water from Water NSW.

We have included treatment costs in our scenarios to allow for a direct comparison of costs between businesses purchasing water from different sources. We use an average treatment cost of $375/ML for both Sydney Water and Retailer A. While in reality treatment costs will vary based on location and company, our examples are designed to demonstrate how SDP's costs are shared between users.

Our sharing rules outside of drought when SDP is shutdown result in a cost to each party of:

- Sydney Water: $1,061.5/ML, and
- Retailer A: $1,061.5/ML.

E.2 Example 2 – SDP operating inside drought, Retailer A takes all of SDP's water

The purpose of this example is to show how our cost sharing rules work when SDP is operating inside drought.

In this example, we assume that SDP is operating in drought for the entire year. We also assume that Retailer A has entered into an access agreement with SDP to purchase 100% of its water produced.

SDP's base water security, transition and incremental service costs are shared between impactors Sydney Water and Retailer A in proportion to the relative share of total system demand. SDP's variable costs are paid by Retailer A. Example 2 is summarised in Table E.2.

Table E.2 Example 2 – Cost sharing, SDP operating in drought, Retailer A takes all of SDP's water ($million, $2016-17)

2017-18	Sydney Water	Retailer A	Total
Demand (ML)	448,183	91,250	**539,433**[a]
Demand share total (%)	83%	17%	**100%**
Transition to restart costs	11.6	2.4	**13.9**
Incremental service costs	6.4	1.3	**7.6**
Pipeline service costs	30.0	6.1	**36.2**
Membrane service costs	4.2	0.9	**5.0**
Variable costs	-	76.8	**76.8**[b]
Base water security costs	110.9	22.6	**133.5**
Total SDP costs (A)	**163.1**	**110.0**	**273.0**
WaterNSW fixed costs	160.5	-	**160.5**
WaterNSW variable costs	40.0	-	**40.0**
Total WaterNSW costs (B)	**200.5**	**-**	**200.5**
Treatment costs (C)	**168.1**	**-**	**168.1**
Total costs (A)+(B)+(C)	**531.7**	**110.0**	**641.7**
Share of total costs	83%	17%	**100%**
$/ML	**1,186.3**	**1,205.1**	

a Total system demand is based on forecast demand for 2017-18 provided as part of the Sydney Water pricing review.

b Variable costs are highest in the first year and decrease over the determination period, to $65.4 million in 2018-19 and $56.1million in 2021-22.. Using subsequent years of the determination period would result in a lower $/ML for Retailer A compared with 2016-17.

Note: Numbers may not add due to rounding.

Total water demand for 2017-18 is 539,433 ML, comprised of:

- Sydney Water total demand: 448,183 ML (83%) from WaterNSW, and
- Retailer A total demand: 91,250 ML (17%) from SDP.

Under our cost sharing rules, SDP's base water security, pipeline, membrane, incremental service, and transition to restart charges would be recovered from impactors. This would be apportioned to each based on their relative share of draw on the water supply in the Greater Sydney area (ie, defined as bulk water sourced from dams supplying Greater Sydney (WaterNSW) and from the desalination plant (SDP) when it operates).

In total SDP's base water security, pipeline, membrane, incremental service, and transition to restart charges amount to $196.3 million in 2017-18 and would be apportioned to impactors as follows:[437]

- Sydney Water: $196.3 million × 83% = $163.1 million, and
- Retailer A: $196.3 million × 17% = $33.2 million.

Retailer A sources 100% of its water from SDP and pays an additional $76.8 million for the 91,250 ML of desalinated water from SDP.

437 These numbers do not include transition charges, however these would be apportioned on an 83/17 split under the impactor pays sharing rule. This would not impact the price per ML differential between Sydney Water and Retailer A.

Variable costs are highest in the first year and decrease over the determination period, to $65.4 million in 2018-19 and $56.1 million in 2021-22. We note that SDP's total variable costs represent a significant proportion of SDP's cost. Therefore, if we used costs from subsequent years of the determination Retailer A would have a lower $/ML than shown above.

While the average cost of sourcing water from SDP falls over the determination period, we do not consider that this creates a perverse incentive. Both Sydney Water and Retailer A face the same cost sharing rules and incentive to source water from SDP. We illustrate this in Example 3 below.

In Example 2, Sydney Water sources 100% of its water from WaterNSW. Under WaterNSW's determination, Sydney Water would therefore pay all of WaterNSW's fixed charges for large customers for 2017-18 ($160.5 million). It would also pay WaterNSW's $89.29/ML variable price to large customers, when SDP is in full production. This amounts to $40 million in total for the 448,183 ML water sourced from WaterNSW (which is $6.7 million more than when SDP is off).

Under our example Sydney Water would also pay approximately $168.1 million in treatment costs for water sourced from WaterNSW. This allows for a direct like-for-like comparison of Sydney Water and Retailer A's costs.

Our sharing rules result in a cost to each party of:

- Sydney Water: $1,186.3/ML, and
- Retailer A: $1,205.1/ML.

E.3 Example 3 – SDP operating inside drought, Sydney Water take all of SDP's water ($million, $2016-17)

The purpose of this example is to show how SDP's costs are shared between Sydney Water and Retailer A during drought when Sydney Water purchases all of SDP's water. This is in contrast to Example 2 where Retailer A purchases all of SDP's water.

In this example, we assume that SDP is operating in drought for the entire year. We also assume that Sydney Water purchases all of SDP's water.

SDP's base water security, transition and incremental service costs are shared between impactors Sydney Water and Retailer A in proportion to the relative share of total system demand. SDP's variable costs are paid by Sydney Water. Example 3 is summarised in Table 5.1.

Table E.3 Example 3 – SDP operating inside drought, Sydney Water takes all of SDP's water ($million, $2016-17)

2017-18	Sydney Water	Retailer A	Total
Demand (ML)	448,183	91,250	**539,433**[a]
Demand share total (%)	83%	17%	**100%**
Transition to restart costs	11.6	2.4	**13.9**
Incremental service costs	6.4	1.3	**7.6**
Pipeline service costs	30.0	6.1	**36.2**
Membrane service costs	4.2	0.9	**5.0**
Variable costs	76.8	-	**76.8**[b]
Base water security costs	110.9	22.6	**133.5**
Total SDP costs (A)	**239.8**	**33.2**	**273.0**
Demand share WaterNSW (%)	80%	20%	**100%**
WaterNSW fixed costs	127.8	32.7	**160.5**
WaterNSW variable costs	31.9	8.1	**40.0**
Total WaterNSW costs (B)	**159.7**	**40.8**	**200.5**
Treatment costs (C)	**133.8**	**34.2**	**163.5**
Total costs (A)+(B)+(C)	**533.4**	**108.3**	**641.7**
Share of total costs	83%	17%	**100%**
$/ML	**1,190.1**	**1,186.3**	

a Total system demand is based on forecast demand for 2017-18 provided as part of the Sydney Water pricing review.

b Variable costs are highest in the first year and decrease over the determination period, to $65.4 million in 2018-19 and $56.1million in 2021-22. Using subsequent years of the determination period would result in a lower $/ML for Sydney Water compared with 2016-17.

Note: Numbers may not add due to rounding.

Total water demand for 2017-18 is 539,433 ML, comprised of:

- Sydney Water total demand: 448,183 ML (83%) from WaterNSW and SDP, and
- Retailer A total demand: 91,250 ML (17%) from WaterNSW.

Under our cost sharing rules, SDP's base water security, pipeline, membrane, incremental service, and transition to restart charges would be recovered from impactors. This would be apportioned to each based on their relative share of total draw on Greater Sydney's water supply (ie, defined as bulk water sourced from dams supplying Greater Sydney (WaterNSW) and from the desalination plant (SDP) when it operates).

In total SDP's base water security, pipeline, membrane, incremental service, and transition to restart charges amount to $196.3 million in 2017-18. These charges would be apportioned to impactors as follows:[438]

- Sydney Water: $196.3 million × 83% = $163.1 million, and
- Retailer A: $196.3 million × 17% = $33.2 million.

438 These numbers do not include transition charges, however these would be apportioned on an 83/17 split under the impactor pays sharing rule. This would not impact the price per ML differential between Sydney Water and Retailer A.

Sydney Water takes 100%of SDP's water (91,250 ML) for 2017-18. Sydney Water pays an additional $76.8 million for this water.

Variable costs are highest in the first year and decrease over the determination period, to $65.4 million in 2018-19 and $56.1 million in 2021-22.

In this example, Retailer A sources 100% of its water from WaterNSW. Under WaterNSW's determination, Sydney Water and Retailer A would share WaterNSW's fixed charges ($160.5 million) for large customers based on the relative proportion of total water purchased from WaterNSW (80% and 20% respectively).

Both customers would also pay WaterNSW's $89.29 /ML variable price to large customers, when SDP is in full production. Sydney Water would pay $31.9 million in total for the 356,933 ML sourced from WaterNSW. Retailer A would pay $8.1 million for the 91,250 ML sourced from WaterNSW.

Under our example Sydney Water would pay approximately $133.8 million to treat 356,933 ML and Retailer A would pay $34.2 million to treat 91,250 ML of water from WaterNSW. Including treatment costs allows for a direct like-for-like comparison of Sydney Water and Retailer A's costs (when SDP is operating).

Our sharing rules result in a cost to each party of:

- Sydney Water: $1,190.1/ML, and
- Retailer A: $1,186.3/ML.

E.4 Example 4 – SDP operating outside of drought

The purpose of this example is to show how our cost sharing rules work when a third-party calls SDP into operation outside of drought.

In this example, we assume that SDP is operating outside of drought for the entire year. We also assume that Retailer A has entered into an access agreement with SDP to purchase 100% of the water it produces.

Only SDP's base water security and pipeline costs are shared between Sydney Water and Retailer A, in proportion to the relative share of total system demand. All incremental service charges, membrane charges, transition to restart and variable costs are paid by Retailer A. Example 4 is summarised in Table E.4.

Table E.4 Example 4 – SDP operating outside drought ($million, $2016-17)

2017-18	Sydney Water	Retailer A	Total
Demand (ML)	448,183	91,250	**539,433[a]**
Demand share total (%)	83%	17%	**100%**
Transition to restart costs	-	13.9	**13.9**
Incremental fixed costs	-	7.8	**7.8**
Pipeline service costs	30.0	6.1	**36.2**
Membrane service costs	-	5.0	**5.0**
Variable costs	-	76.8	**76.8[b]**
Base water security costs	110.9	22.9	**133.5**
Total SDP costs (A)	**141.0**	**132.1**	**273.0**
WaterNSW fixed costs	160.5	-	**160.5**
WaterNSW variable costs	40.0	-	**40.0**
Total WaterNSW costs (B)	**200.5**	**-**	**200.5**
Treatment costs (C)	**168.1**	**-**	**168.1**
Total costs (A) + (B) + (C)	**509.6**	**132.1**	**641.7**
Share of total costs	79%	21%	**100%**
$/ML	**1,137.0**	**1,447.5**	

a Total system demand is based on forecast demand for 2017-18 provided as part of the Sydney Water pricing review.

b Variable costs are highest in the first year and decrease over the determination period, to $65.4 million in 2018-19 and $56.1million in 2021-22. Using subsequent years of the determination period would result in a lower $/ML for Retailer A compared with 2016-17.

Note: Numbers may not add due to rounding.

As previously, Sydney Water sources 100% of its water from WaterNSW and Retailer A sources 100% of its water from SDP.

Total water demand for 2017-18 is 539,433 ML, comprised of:

- Sydney Water's total demand: 448,183 ML (83%) from WaterNSW, and
- Retailer A's total demand: 91,250 ML (17%) from SDP.

Under our cost sharing rules, SDP's base service and pipeline costs are recovered from impactors. This would be apportioned to each based on their relative share of draw on the water supply in the Greater Sydney area (ie, defined as bulk water sourced from dams supplying Greater Sydney (WaterNSW) and from the desalination plant (SDP) when it operates).

When operating outside drought, all other costs are recovered from beneficiaries, including transition to restart, incremental service charges, membrane charges, and variable costs. Transition costs would be apportioned to each beneficiary on an equal share basis. Incremental service costs would be apportioned on each beneficiary based on proportional of draw from SDP on the day. Given that Retailer A is the only beneficiary it will pay 100% of transition to restart, incremental service and variable charges. Retailer A will also pay all variable costs per ML of water supplied by SDP.

SDP's base water security and pipeline costs for 2017-18 are $169.7 million. Therefore, we would share costs between the impactors as follows:[439]

- Sydney Water: $169.7 million × 83% = $141.0 million, and
- Retailer A: $169.7 million × 17% = $28.7 million.

In addition, Retailer A pays $13.9 million in transition to restart costs, $7.8 million in incremental service costs, $5.0 million in membrane service costs and $76.8 million in variable costs for 91,250 ML of water from SDP ($103.4 million).

Sydney Water sources 100% of its water from WaterNSW. Like Example 2, Sydney Water would pay all of WaterNSW's fixed charges for large customers in 2017-18 ($160.5 million). This means that Sydney Water would pay $40 million in variable costs for the 448,183 ML water sourced from WaterNSW, based on the $89.29 /ML variable price to large customers, when SDP is in full production.

Sydney Water would also pay $168.1 million to treat 448,183 ML sourced from WaterNSW not allocated under SDP's cost sharing rules.

Our sharing rules result in a cost to each party of:

- Sydney Water: $1,137.0/ML, and
- Retailer A: $1,447.5/ML.

E.5 Example 5 – SDP operating inside drought, where impactors share SDP's variable costs

The purpose of this example is to show what would happen if we were to recover SDP's variable costs on an impactor pays basis while SDP is in full production in a period of drought.

In this example, we assume that SDP is operating in drought for the entire year. We also assume that Retailer A has entered into an access agreement with SDP to purchase 100% of its water production. All SDP costs are shared between Sydney Water and Retailer A in proportion to the relative share of total system demand. Example 5 is summarised in Table E.5.

439 These numbers do not include transition charges, however these would be apportioned on an 83/17 split under the impactor pays sharing rule. This would not impact the price per ML differential between Sydney Water and Retailer A.

Table E.5 Example 5–SDP operating inside of drought, where impactors share SDP's variable costs ($million, $2016-17)

2017-18	Sydney Water	Retailer A	Total
Demand (ML)	448,183	91,250	**539,433[a]**
Demand share total (%)	83%	17%	**100%**
Transition to restart costs	11.6	2.4	**13.9**
Incremental fixed costs	6.4	1.3	**7.6**
Pipeline service costs	30.0	6.1	**36.2**
Membrane service costs	4.2	0.9	**5.0**
Variable costs	63.8	13.0	**76.8[b]**
SDP base water security costs	110.9	22.6	**133.5**
Total SDP costs (A)	**226.9**	**46.2**	**273.0**
WaterNSW fixed costs	160.5	-	**160.5**
WaterNSW variable costs	40.0	-	**40.0**
Total WaterNSW costs (B)	**200.5**	**-**	**200.5**
Treatment costs (C)	**168.1**	**-**	**168.1**
Total costs (A) + (B) + (C)	**595.5**	**46.2**	**641.7**
Share of total costs	93%	7%	**100%**
$/ML	**1,328.6**	**506.2**	

a Total system demand is based on forecast demand for 2017-18 provided as part of the Sydney Water pricing review.

b Variable costs are highest in the first year and decrease over the determination period, to $65.4 million in 2018-19 and $56.1million in 2021-22.

Note: Numbers may not add due to rounding.

As previously, Sydney Water sources 100% of its water from WaterNSW and Retailer A sources 100% of its water from SDP.

If SDP's variable costs were shared on an impactor pays principle, then Sydney Water would contribute to these costs, in proportion to its system draw. Therefore, Retailer A pays $13.0 million for 91,250 ML of water from SDP. Sydney Water pays $63.8 million for water produced by SDP that is supplied to Retailer A.

Under WaterNSW's determination, Sydney Water would continue to pay all of WaterNSW's fixed charges for large customers for 2017-18 ($160.5 million). Sydney Water also continues paying the additional $40 million for the 448,183 ML of water it sources from WaterNSW.

Sharing SDP's costs during drought on an impactor pays basis alone results in a cost to each party of:

- Sydney Water: $1,328.6/ML, and
- Retailer A: $506.2/ML.

This represents a significant cross subsidy from Sydney Water to Retailer A. Retailer A's total costs are only 7% of total system costs while Sydney Water pays 93% of total system costs when it only demands 83% of water supplied. This could allow Retailer A to on-sell desalinated water to its retail or end-use customers at the prevailing market price and realise super normal profits.

We think that this creates a powerful perverse incentive for Retailer A to source water from SDP during drought for the purpose of realising super normal profits. Therefore, sharing variable costs on an impactor pays basis is inefficient and as discussed we have reverted to allocating SDP's variable costs to beneficiaries in and out of drought.

Glossary

2012 Determination	IPART, *Prices for Sydney Desalination Plant Pty Limited's Water Supply Services - Determination No. 2*, December 2011.
2012 Methodology Paper	IPART, *Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms*, Methodology Paper, April 2012.
2017 Determination	Determination of SDP's maximum prices from 1 July 2017, made in this review.
2017 Draft Determination	Draft Determination of SDP's maximum prices from March 2017, superseded by the 2017 Determination.
2017 Draft Report	IPART, *Sydney Desalination Plant – Review of prices from 1 July 2017 to June 2022, Draft Report*, March 2017.
2017 Methodology Paper	IPART, *Sydney Desalination Plant Pty Ltd - Energy Adjustment and Efficiency Carryover Mechanisms*, Methodology Paper, June 2017.
Sydney Water 2016 Determination	IPART, *Sydney Water Corporation, Maximum prices for water, sewerage, stormwater drainage and other services from 1 July 2016 – Determination*, June 2016.
2012 determination period	The period from 1 July 2012 to 30 June 2017.
2017 determination period	The period from 1 July 2017 to 30 June 2022.
The 60/70 rule (under the 2017 Metropolitan Water Plan)	New rules under the 2017 Metropolitan Water Plan, replacing the '70/80 rule'. Until and unless SDP's Network Operator's Licence is changed, our Determination will give effect to the 70/80 rule, despite what the 2017 Metropolitan Water Plan says.

The 70/80 rule (under the 2010 Metropolitan Water Plan)	Condition A2(b) of SDP's Network Operator's Licence (No.10_010) requires SDP to operate and maintain the desalination plant with the objective of maximising the production of drinking water for the exclusive supply into the Sydney Water Corporation area of operation beginning when the available storage in Sydney's water supply reservoirs falls below 70%, until the available storage rises to 80%. **'Under the 70/80 rule'** refers to when SDP is operating in its drought response role. In this role, SDP must operate to maximise its production and supply of drinking water in Sydney Water's area of operations. **'Outside the 70/80 rule'** refers to when SDP is **not** operating in its drought response role.
Abatement mechanism	A pricing mechanism intended to create a financial incentive for SDP to maximise its production of drinking water when required under its operating rules.
AER	Australian Energy Regulator.
Base service charge (water security)	Daily fixed charge to reflect the costs of making plant available in water security (shutdown) mode.
Building block approach	IPART's standard methodology to establish notional revenue requirement.
Dam storage levels	Available storage in Sydney's water supply reservoirs as published on a weekly basis on the website of the WaterNSW (former Sydney Catchment Authority). If for any reason WaterNSW is unable to calculate or publish the available storage, the available storage is the amount of water as calculated and notified from time to time by such other authority as is nominated by the Minister.
EfAM	Efficiency Adjustment Mechanism in the 2012 Determination.

Efficiency Adjustment Mechanism	As per the Terms of Reference, SDP should be allowed to carryover demonstrated efficiency savings, net of efficiency losses, in operating expenditure in providing its water supply services for a period of four years following the year in which the efficiency saving was achieved. EfAM should be applied in accordance with the 2012 Methodology Paper.
EAM	Energy adjustment mechanism in the 2017 Methodology Paper.
ECM	Efficiency carryover mechanism in the 2017 Methodology Paper.
EnAM	Energy Adjustment Mechanism in the 2012 Determination.
Energy Adjustment Mechanism	As per Terms of Reference, energy adjustment mechanism is to provide for the carryover and pass-through to SDP's customers of gains or losses, outside a core band, associated with the sale of surplus electricity and RECs when the plant is in shutdown and restart modes only. EnAM should be applied in accordance with the 2012 Methodology Paper.
EPA	NSW Environment Protection Authority.
ESCOSA	Essential Services Commission of South Australia.
Financial indifference principle	Pricing principle under Terms of Reference, requiring that "the structure of prices should encourage SDP to be financially indifferent as to whether or not it supplies water. As such the structure of prices should comprise separate charges for the different water supply services."
FNC	Fixed Network Charge.
Force majeure event	As defined in the 2017 Determination.
GWh	Gigawatt-hour.

Good Industry Practice	As per SDP's Network Operator's Licence granted on 9 August 2010, as varied on 10 May 2013, means the exercise of that degree of skill, diligence, prudence and foresight that reasonably would be expected from a prudent desalination plant operator acting in accordance with good industry practice and applicable Australian and internationally recognised standards having regard to the Capacity of the Water Infrastructure, its duty, age and technological status.
IPART	Independent Pricing and Regulatory Tribunal of NSW.
IPART Act	*Independent Pricing and Regulatory Tribunal Act 1992* (NSW).
Impactor pays principle	The impactor pays principle allocates costs according to which of the parties created the cost, or the need to incur the cost.
Incremental service charges	For the 2017 Determination, daily fixed charges in plant operating mode over and above the base service charge in water security shutdown.
Infigen	Infigen Energy Limited.
Infigen contracts	Electricity Supply Agreement and RECs Supply Agreement between Infigen and SDP.
LGCs	Large-scale generation certificates.
Long-term shutdown mode (2012 Determination)	Term for the operational mode where the plant is not producing water for between 91 days and two years.
LRET	Large-scale Renewable Energy Target.
LRMC	Long-run marginal cost.
MFL	Maximum Foreseeable Loss
Medium-term shutdown mode (2012 Determination)	Term for the operational mode where the plant is not producing water for between 11 and 90 days.
Membrane service charge	For the 2017 Determination, daily fixed charges to recover capital costs of membrane replacement.

2010 Metropolitan Water Plan	NSW Government, *2010 Metropolitan Water Plan*, August 2010.
2017 Metropolitan Water Plan	NSW Government, *2017 Metropolitan Water Plan*, March 2017.
ML	Megalitre.
MWh	Megawatt-hour.
Network Operator's licence	SDP's Network Operator's Licence (No.10_010) granted under the WIC Act on 9 August 2010, as varied on 10 May 2013.
Nil water usage charge	Applies when SDP supplies drinking water to Sydney Water outside the 60/70 rule, minimum runtime, and emergency response.
NRR	Notional revenue requirement
Notional revenue requirement	Revenue requirement set by IPART that represents the efficient costs of providing SDP's declared monopoly services.
O&M contract	Operating and maintenance contracts between SDP and Veolia (the plant operator).
Outside the 70/80 rule	See 'the 70/80 rule' above.
Pipeline charge	Separate daily fixed charge for SDP's pipeline.
Plant operation mode	Mode of operation when SDP supplies desalinated water to customers.
RAB	Regulatory Asset Base.
RBA	Reserve Bank of Australia.
RECs	Renewable Energy Certificates.
Restart mode(s)	In the 2012 Determination, the modes to transition from a corresponding shutdown mode into plant operation mode. For the 2017 Determination, the mode to transition from water security (shutdown) mode to plant operation mode.
RET	Renewable Energy Target.

SCA	Former Sydney Catchment Authority, now WaterNSW (Greater Sydney).
SDP	Sydney Desalination Plant Pty Ltd.
SDP's water supply services	Services declared by the Minister under section 51 of the WIC Act, 2 May 2011.
SDP's monopoly services	SDP's declared services referred to IPART under Terms of Reference are: (a) the supply of non-rainfall dependent water to purchasers, and (b) the making available of the desalination plant to supply non-rainfall dependent drinking water.
Short-term shutdown mode (2012 Determination)	Term for the operational mode where the plant is not producing water for between 2 and 10 days.
Shutdown modes	In the 2012 Determination, shutdown includes short-term, medium-term, mong-term and water security shutdowns. No water is supplied to customers (except for water from storage) under the 2012 Determination. For the 2017 Determination, we accepted only one shutdown mode or period. In this Report, we refer to this mode or period as 'shutdown, 'Shutdown period,' 'Water security (shutdown) mode' or 'Water security mode.'
Storm event	On 16 December 2015, SDP sustained significant damage from a storm event that occurred in areas across Sydney.
Sydney Water	Sydney Water Corporation.
Sydney Water's area of operation	Sydney Water Corporation's area of operation as defined in Sydney Water's Operating Licence, *Sydney Water Corporation Operating Licence, 2015-2020.*
Terms of Reference	Terms of Reference for Referral of Sydney Desalination Plant Pty Limited to IPART under section 52 of the *Water Industry Competition Act 2006*, 16 February 2012.
Third-party customer	SDP's customers other than Sydney Water.

Transition charges	One-off charges for SDP to transition from Plant operation mode to a shutdown mode, or from a shutdown mode to a corresponding restart mode.
Under the 70/80 rule	See 'the 70/80 rule' above.
Veolia	Veolia Water Australia Pty Ltd.
WACC	Weighted average cost of capital.
WaterNSW	WaterNSW is the organisation responsible for managing raw water supply across NSW by bringing together the Sydney Catchment Authority (SCA) and State Water Corporation (State Water) (at 1 January 2015).
Water security (shutdown) mode	Term for the operational mode where the plant is not producing water for longer than 11 days (under the 2017 Determination).
Water service charge	Fixed daily charge for making the desalination plant available (under the 2012 Determination).
Water Supply Agreement	Agreement between Sydney Water and SDP, June 2012.
Water usage charge	Variable water charge per ML of water supplied to SDP's customers.
WIC Act	*Water Industry Competition Act 2006* (NSW).
WIC Regulation	*Water Industry Competition (General) Regulation 2008* (NSW).