

Independent Pricing and Regulatory Tribunal

Review of prices for Sydney Desalination Plant Pty Ltd From 1 July 2017

Water — Issues Paper August 2016



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Invitation for submissions

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

Submissions are due by 11 November 2016.

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

You can also send comments by mail to:

Sydney Desalination Plant Price Review 2017 Independent Pricing and Regulatory Tribunal PO Box K35 Haymarket Post Shop NSW 1240

Late submissions may not be accepted at the discretion of the Tribunal. Our normal practice is to make submissions publicly available on our website <www.ipart.nsw.gov.au> as soon as possible after the closing date for submissions. If you wish to view copies of submissions but do not have access to the website, you can make alternative arrangements by telephoning one of the staff members listed on the previous page.

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

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

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1 Introduction

The Independent Pricing and Regulatory Tribunal (IPART) is currently reviewing the:

- maximum prices charged by Sydney Desalination Plant Pty Ltd (SDP), and
- the Methodology Paper¹ it published in 2012 setting out its approaches to provide SDP with an:
 - energy adjustment mechanism (EnAM), and
 - efficiency adjustment mechanism (EfAM).

We will make a new determination on the maximum prices for SDP's declared monopoly services to apply from 1 July 2017 (the 2017 Determination).² In December 2011, we released our first determination of the maximum prices SDP can charge its customers (the 2012 Determination).³ The 2012 Determination covers the period from 1 July 2012 to 30 June 2017.

1.1 What will this review include?

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 reference was replaced by the current reference on 16 February 2012 (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.

In doing so, we will consider SDP's prudent and efficient costs of providing these services, and the pricing principles set out in the terms of reference.

¹ IPART, Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms - Methodology Paper, April 2012.

² We are required under the terms of reference to set prices before the expiry of the current determination period - ie, before 1 July 2017.

 ³ IPART, Prices for Sydney Desalination Plant Pty Limited's Water Supply Services - Determination No. 2, December 2011.

We will also provide for an EnAM and an EfAM, as required by the terms of reference, using the approaches set out in the current Methodology Paper. The adjustments for each mechanism would be passed through into prices from 1 July 2017.

In addition, we will concurrently review this Methodology Paper to determine whether it remains appropriate for future determinations. Any changes or updates we decide to make to the Methodology Paper will not affect prices in the 2017 Determination. However, SDP will be responding to the incentives created by the Methodology Paper during the period of the 2017 Determination. This is why we have decided to review the Methodology Paper concurrent to this price review.⁴

1.2 How will we undertake these reviews?

The approach we will use for the review of SDP's prices will comply with our terms of reference, while still taking account of a broad range of issues consistent with the matters we must consider under the *Independent Pricing and Regulatory Tribunal Act* 1992 (the IPART Act) (see Appendix B).

As part of this approach, we set prices to allow SDP to recover its prudent and efficient costs of delivering its services based on its operating environment. We will engage expert consultants to assist us in reviewing SDP's capital and operating expenditure proposals.

We also make decisions on:

- the length of time for which we set prices
- the methodology we use to set SDP's revenue requirement
- the appropriate price structures for the desalination plant's different operation modes
- how to address incentives, risks and other uncertainties that SDP faces, and
- what reporting requirements are appropriate for SDP.

Finally, we consider the impacts of these decisions on SDP, customers and other stakeholders.

Our approach to providing for the EnAM and EfAM is outlined in Chapter 7.

1.3 What are the key issues for this price review?

A core theme in this Issues Paper is how to improve the efficient use of SDP. SDP is a drought response measure for the residents of greater Sydney. It provides an additional source of water when dam levels are low and currently operates under an intermittent "on" and "off" regime triggered by dam storage levels.

⁴ The terms of reference allows us to update the Methodology Paper from time to time.

We are considering how to improve SDP's operating flexibility, to enable it to better respond to droughts, while at the same time encouraging its efficient use when dam levels are high. In particular, we are seeking to identify whether there are opportunities for the price determination to assist in minimising the time it takes for the plant to reach full production during drought, and the costs of maintenance and capacity testing outside of drought.

We are looking at whether we should remove some of the price barriers to SDP's use when dam levels are high, while ensuring price structures remain costreflective and that SDP's water customers face prices that reflect the efficient costs of water provision. In particular, we are asking whether SDP should be able to sell drinking water to Sydney Water Corporation (Sydney Water) upon request when dam levels are high (ie, should we remove the nil price for any water supplied to Sydney Water by SDP when dam levels are high).

We are also considering refining the mechanisms for sharing costs between SDP's customers (in the event another party, in addition to Sydney Water, purchases bulk water from SDP), to reduce potential financial disincentives for third party use of SDP, which are present in the 2012 Determination.

We are likely to maintain many of the features of the 2012 Determination that apply to SDP in its drought response role, while seeking to improve SDP's operating flexibility in this role. We will seek to ensure that our regulatory settings create incentives that align with SDP's water security role, as outlined in the Government's Metropolitan Water Plan.

At all times, we are mindful that any changes in the 2017 Determination should enhance the overall long-term interests of stakeholders, in particular end-use water customers.

We are also examining the impact of the 16 December 2015 storm event on SDP, including considering what costs (if any) SDP should recover from its customers in situations when it is unable to be operated, and the costs of insurance arrangements.

1.4 How can stakeholders provide input to these reviews?

We invite all stakeholders and interested parties to make written submissions on the review of SDP's prices and the review of the Methodology Paper. On 8 August 2016, we received a preliminary position paper from SDP. This is available on our website. SDP will respond to our Issues Paper by 24 October 2016 with its pricing proposal, which we will place on our website so that stakeholders can review it and provide comments to us. Stakeholder submissions to our Issues Paper and SDP's submission are due by 11 November 2016.⁵ (Details on how to make a submission can be found on page iii.)

We will also hold a public hearing on 8 December 2016 to give stakeholders another opportunity to comment on the review of SDP's prices and the review of the Methodology Paper.

We will release separate Draft Reports on our Methodology Paper and SDP price review in March 2017 and will invite further comments from stakeholders and SDP. We will consider all these comments before making our Determination and publishing Final Reports on the Methodology Paper and our price review.

Table 1.1 provides an indicative timetable for the review. We will update this timetable on our website, as the review progresses.

Milestone	Timeframe
Release Issues Paper on the price review and Methodology Paper	29 August 2016
SDP's submission due on the Issues Paper	24 October 2016
Receive public submissions on Issues Paper and SDP's submission	11 November 2016
Public hearing	8 December 2016
Release Draft Determination and Draft Report	March 2017
Release Draft Methodology Paper	March 2017
Receive submissions to Draft Determination and Draft Report and Draft Methodology Paper	April 2017
Release Determination and Final Report	June 2017
Release Final Methodology Paper	June 2017

Table 1.1Timetable for the review of SDP's prices and the review of the
Methodology Paper

Note: These dates are indicative only.

1.5 Structure of this Issues Paper

This Issues Paper explains the process we will follow to conduct the review, the approach we will use to make our pricing decisions, and the key issues we will consider in making these decisions. It also sets out our preliminary views on some of these issues (where we have them).

⁵ Our review of SDP's prices is a 'significant pricing investigation' for the purposes of the *Water Industry Competition (General) Regulation 2008* (WIC Regulation). Therefore, our timetable for the review is designed to accommodate the additional procedural requirements that apply to an investigation for a significant pricing determination.

The Issues Paper is structured as follows:

- Chapter 2 provides context for the review by detailing the operating environment for SDP.
- Chapter 3 discusses the price structures for each mode of SDP's operations.
- Chapter 4 reviews the principles for sharing costs between multiple customers.
- Chapter 5 outlines the key pricing mechanisms that influence SDP's incentives to operate. It discusses how these may be adapted to enable greater operating flexibility for SDP.
- Chapter 6 provides an overview of our approach to setting SDP's revenue requirement. In this context, we also discuss the impact of the 16 December 2015 storm event on SDP's capital and operating expenditure, as well as SDP's energy costs.
- Chapter 7 discusses the application and review of the EfAM and EnAM.

All dollar figures quoted in this Issues Paper are in \$2016-17, unless stated otherwise.

Each of the chapters above outline the questions on which we particularly seek stakeholder comment. For convenience, these questions are also listed below. Stakeholders are also welcome to provide input on other issues related to our review.

1.6 List of issues for stakeholder comment

Price structure for fixed charges

1	Under the terms of reference, the prices for making the plant available should be a periodic payment. These prices should reflect fixed costs, including the fixed component of operating costs, a return of assets and a return on assets. Should we refine the current price structures for making the plant available by splitting the fixed charges into the following two components:	20
	 a base 'water security' charge reflecting the minimum costs of maintaining the plant (payable in all shutdown and operation modes), and 	20
	 mode-dependent incremental service charges reflecting the different fixed operating costs in each shutdown and operation mode? 	21
2	Are the current four shutdown (and restart) modes still appropriate?	21

Price structure for variable charges

3 Under the terms of reference, the prices for the supply of drinking water should reflect all efficient costs that vary with output.

27

	 Does the unit cost (per ML of output) vary depending on the amount of water produced? If so, should we set usage charges to accommodate varying levels of output? 	27
Pric	e structure for transition charges	
4	SDP currently has one-off transition charges to reflect the fixed costs when SDP is moving between modes.	29
	– Are the current transition charges still appropriate?	29
	 Should the transition charges be adjusted if SDP operates more flexibly outside its drought response role (ie, when dam levels are high)? If so, how? 	29
Pric	e structure for pipeline charges	
5	SDP has a separate charge for its pipeline asset (ie, distinct from the plant), which applies in all modes of operation.	29
	– Should we continue setting a separate charge for the pipeline?	29
	If so, should the pipeline charge vary by mode of operation?	29
	 How should pipeline charges be shared in the event SDP has multiple customers? 	29
Ref	ining the cost sharing principles	
6	How should SDP's base 'water security' costs be shared between customers?	32
	 Should SDP's base 'water security' costs continue to be shared between SDP's customers based on the user pays principle? That is, should this base charge be shared between Sydney Water and any other SDP customer based on their respective share of total drinking water supplied by SDP? 	32
	Or	
	- Should SDP's base 'water security' costs be shared between bulk water customers based on the impactor pays principle? That is, should this base charge be shared between Sydney Water and any other bulk water customers based on their respective share of total water system demand (being bulk water sourced from both dams supplying greater Sydney and the desalination plant)?	32
7	If the impactor pays principle applies to SDP's base 'water security' costs, are there any circumstances where bulk water customers should not contribute to these costs?	32

8	How should incremental fixed costs and usage charges be shared between SDP's customers?	36
	 Should the incremental fixed costs be shared between SDP's customers based on the user pays principle? That is, should the incremental charges be shared between Sydney Water and any other customers based on their respective share of water purchased from SDP? 	36
9	Is there a case for extending the impactor pays principle to all SDP's costs during drought – ie, incremental fixed costs and/or usage costs?	37
Pric	ing for greater operating flexibility	
10	How could prices (both fixed and usage charges) be set to allow greater operating flexibility to enhance efficiency?	38
Ref	ning the incentive mechanisms	
11	Is there a need to refine our regulatory settings to better align SDP's incentives to fulfil its water security role? In particular, should SDP be able to:	42
	 Operate at less than full capacity without penalty when ramping up production to fulfil its water security role ('soft' restart mode)? 	42
	 Sell drinking water to Sydney Water when transitioning to a shutdown mode after a period of operation fulfilling its water security role ('soft' shutdown mode)? 	42
	 Operate for a minimum run time when it is called into operation to fulfil its water security role? 	42
12	Is there a need to refine our regulatory settings to accommodate greater operating flexibility outside of SDP's water security role (ie, when dam levels are high)?	44
	 In particular, should SDP be able to sell drinking water to Sydney Water upon request (ie, should we remove the nil price for any water supplied to Sydney Water when dam levels are high)? 	44
13	Could greater operating flexibility outside of SDP's water security role provide system-wide benefits by lowering Sydney Water's costs or improving its service standards, ultimately benefiting Sydney Water's retail customers?	44
14	Are there any impediments to SDP and Sydney Water operating more flexibly and efficiently outside of SDP's water security role?	44
15	Are there any other circumstances when SDP should have operating flexibility?	44

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16	Is there a case to allow periodic partial testing of the plant when in extended shutdown to improve SDP's availability and reliability as a drought response measure? If so, what are the appropriate protocols for operating the plant in this capacity, such as the technically prudent:	47
	 frequency and duration of the testing period, and 	47
	volumes of drinking water produced during a testing period?	47
17	An abatement mechanism applies to SDP's fixed charges if it produces volumes of water less than the plant's full production capacity when it is fulfilling its water security role.	48
	 Are there current aspects of the abatement mechanism that need modifying? 	48
	 Is this financial incentive still relevant or are there other performance mechanisms that could better ensure SDP maximises supply when required? 	48
Len	igth of determination period	
18	Should the length of SDP's determination period continue to be set for five years?	51
Not	ional revenue requirement	
19	The revenue requirement represents SDP's total efficient costs of providing its monopoly services in each year of the determination period. SDP's costs, and thus its prices, vary depending on what operating mode it is in.	52
	 Should we continue using a 'building block' method to calculate SDP's revenue requirement? 	52
	 Should we continue to set mode-dependent notional revenue requirements? 	52
	 Should we continue to set a separate notional revenue requirement for SDP's pipeline? 	52
20	SDP's pricing proposal is due on 24 October 2016 and will be made available at our website for stakeholder comment. Does SDP's proposed revenue requirement in each mode of operation represent efficient costs, taking into	
	account its proposed:	52
	 operating and capital expenditure 	52
	 return on assets 	53
	 regulatory asset base 	53
	 regulatory depreciation and asset lives 	53

	 tax allowance, and 	53
	– return on working capital?	53
21	What scope is there for SDP to achieve efficiency gains over the 2017 determination period?	55
Red	covering efficient costs when SDP is inoperable	
22	The desalination plant sustained significant damage from a storm event on 16 December 2015. Since that time, the plant has been unable to operate (not capable of providing non-rainfall dependent drinking water).	57
	– What are the implications of this storm event on SDP's efficient costs?	57
	 Should we establish a new revenue requirement (and pricing mode) to account for when the plant is inoperable? 	57
	– Who should bear the SDP's costs if the plant is inoperable?	57
Ene	ergy costs	
23	What are SDP's efficient energy costs for the 2017 determination period?	60
24	Should we continue to pass through into prices SDP's fixed and variable network charges (as determined annually by the Australian Energy Regulator)?	60
Cos	st pass-through	
25	We consider that cost pass-through mechanisms should only be applied in exceptional circumstances and have outlined criteria to determine where cost pass-through mechanisms should apply.	61
	 Is there a case to manage any other of SDP's proposed costs through a cost pass-through mechanism? 	61
Ass	set lives	
26	Is there a case to reconsider the asset classes established in the 2012 review?	63
27	Is there a case to review SDP's asset lives as a result of the damage to the plant caused by the recent storm event?	63
Ene	ergy Adjustment Mechanism	
28	Is our proposed implementation of the energy adjustment mechanism for the current price review appropriate?	65

29	What aspects of the energy adjustment mechanism should be updated or amended for implementation at future price reviews?	70
Effic	ciency Adjustment Mechanism	
30	Is our proposed implementation of the efficiency adjustment mechanism for the current price review appropriate?	73
31	What aspects of the efficiency adjustment mechanism should be updated or amended for implementation at future price reviews?	75
32	Should we extend the efficiency carryover mechanism that we introduced for Sydney Water, Hunter Water and WaterNSW to SDP?	75

2 Context for the review

In reviewing the prices SDP can charge for its declared monopoly services, we need to take account of its operating and regulatory environment as well as our statutory framework and terms of reference. The sections below provide an overview of the key context for this review, including:

- SDP's drought response role
- its operating rules and licence requirements
- potential changes to these rules and requirements
- SDP's contractual agreements
- the terms of reference under which we make our determinations, and
- SDP's current price structure and pricing mechanisms, which we established to comply with the terms of reference in our 2012 Determination.

Appendix C provides a more detailed overview of SDP's characteristics, ownership, operating framework and licensing arrangements.

2.1 SDP's drought response role

The desalination plant is a key element in greater Sydney's water security plan. It was constructed from 2007 to 2010 as part of the NSW Government's Metropolitan Water Plan.⁶ This plan establishes the mix of water supply and demand management measures through which the NSW Government aims to ensure a secure water supply for the greater Sydney region, both in the long term and in response to drought events.

⁶ 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 Government's Metropolitan Water Plan was first developed in 2004 in response to indications a drought was taking hold. The 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 http://www.metrowater.nsw.gov.au/planning-sydney/updating-plan, accessed on 11 July 2016.

Within this plan, SDP's role is to provide a source of non-rainfall dependent drinking water that can be relied upon when Sydney's available water storage levels fall below a certain threshold.

Box 2.1 outlines SDP's operations to date.

Box 2.1 SDP is currently in water security mode

SDP produced its first desalinated drinking water in February 2010. The plant then ran continuously for two years, from 2010 to 2012, to prove plant capacity and reliability.

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, as dam storage levels have remained above 70%. Water security mode means that the plant is not producing drinking water, but is in a state of care and maintenance. Once operations commence, SDP anticipates it will take up to eight months for the plant to be ready to produce water.

On 16 December 2015, SDP sustained significant damage from a storm event that occurred in areas across Sydney. As a result, SDP is currently undertaking procurement processes to award a construction contract to repair the plant and equipment. SDP expects repairs will commence in October 2016 and will continue for 12 months. SDP reports that it has comprehensive insurance to support the repairs to the facility.

Source: SDP, *Operations*, at http://www.sydneydesal.com.au/how-we-do-it/operations/, accessed on 11 July 2016; and SDP, *Tornado FAQs*, at http://www.sydneydesal.com.au/faqs/#happening, accessed on 6 July 2016; and email from SDP, 14 July 2016.

2.2 SDP's operating rules and licence requirements

SDP's drought response role is reflected in the network operator's licence it holds under the WIC Act and in the Metropolitan Water Plan. The current version of the Metropolitan Water Plan, which was released in 2010, states that SDP is to:

- operate at full production and supply Sydney Water's area of operations when the total dam storage level is below 70%, and
- continue to do so until the total dam storage level reaches 80%.7

This '70/80 rule' is designed to ensure SDP reduces the likelihood of end-use customers (ie, retail customers) facing water restrictions and to increase Sydney's water security during droughts.⁸

⁷ NSW Government, 2010 Metropolitan Water Plan, August 2010, p 36.

⁸ 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.

As the Metropolitan Water Plan has no statutory force, SDP's network operator's licence⁹ incorporates the 70/80 rule as a condition of the licence. In particular, when operating under the 70/80 rule (ie, when storage levels fall below 70% and until they reach 80%), 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 the Sydney Water Corporation's area of operation".¹⁰

However, the licence does not require SDP to cease operating the plant when available storage reaches 80%. Nor does it restrict SDP supplying customers in addition to Sydney Water (other than small retail customers).¹¹ Notably, SDP may supply customers other than Sydney Water when dam levels are low.

Box 2.2 defines the terms 'under the 70/80 rule' and 'outside the 70/80 rule', which we will use throughout this review.

Box 2.2 Terminology used in this review to describe SDP's operating rules

As noted above, SDP is required to operate in a certain way in its drought response role. These requirements are triggered when available dam storages fall below 70% and continue to apply until dam storages reach 80%. For convenience, we refer to these requirements as the 70/80 rule.

We have also adopted the following terms to distinguish when SDP is operating in its drought response role from when it is not:

- '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. It must start operating like this when the total dam storage level is below 70% and continue until the total dam storage level reaches 80%.
- 'Outside the 70/80 rule' refers to when SDP is not operating in its drought response role. Outside this role, SDP can operate at any technically feasible fraction of capacity between 0% (shutdown) and 100% (full operation). It can operate like this at any time:
 - when the total dam storage level is above 80%, or
 - when the total dam storage level is between 70% and 80%, and available storage has not been below the 70% threshold since it was last equal to or greater than 80%.

The Metropolitan Water Plan is currently under review. Should SDP's operating rules change as a result, we will update our terminology used in this review to take into account any new operating requirements.

⁹ Granted under the WIC Act on 9 August 2010 and varied on 10 May 2013.

¹⁰ See condition A2(b) of SDP's network operator's licence.

¹¹ 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.

2.3 Potential changes to SDP's operating rules and licence requirements

Several other reviews are being undertaken at the same time as our price review, or are scheduled to be undertaken during the term of our 2017 Determination. These reviews may lead to changes in SDP's operating rules and licence requirements. For example:

- The Metropolitan Water Plan is currently being reviewed, as part of an adaptive management approach. This review will update the Plan, taking account of changes in demand and supply, as well as new data and research.¹²
- The Hawkesbury-Nepean Valley Flood Management Review, which commenced in 2013, was developed in response to concerns about flood risk. The Government recently announced its plans to raise the Warragamba Dam wall by 14 metres to help protect Western Sydney from floods.¹³
- The Metropolitan Water Directorate, within the Department of Primary Industries Water (DPI Water), recently completed a periodic review of the WIC Act, which resulted in extensive amendments to the WIC Act's licensing framework.¹⁴ However, the amendments will not commence until the Directorate finalises its current review of the regulations under the WIC Act.

If these reviews are finalised in the course of our review, we will consider their implications for SDP's operating rules and licence requirements in making our determination.

2.4 SDP's contractual agreements

SDP's operating framework comprises a set of agreements, which include:15

- an operating and maintenance agreement with Veolia Water Australia Pty Ltd (Veolia)
- contracts with subsidiaries of Infigen Energy Limited (Infigen) for the supply of electricity to power the plant and renewable energy certificates (RECs) to offset the plant's power use, and
- a non-exclusive water supply agreement with Sydney Water.

¹² NSW Government, Metropolitan Water Directorate, *Updating the Plan*, at http://www.metrowater.nsw.gov.au/planning-sydney/updating-plan/current-review, accessed on 11 July 2016.

¹³ Final approval of the project will come after the business case has been received, but the NSW Government is committed to alleviating the flood risks posed in the Hawkesbury-Nepean Valley. We note that SDP could be called on to contribute to water security if full supply levels are lowered on a short-term basis during the construction phase. See NSW Government, *Reducing flood risk in Western Sydney*, at https://www.nsw.gov.au/media-releases-premier/reducing-flood-risk-western-sydney, accessed on 11 July 2016.

¹⁴ Changes to the WIC Act licensing framework were passed by the NSW Parliament in October 2014, as the Water Industry Competition Amendment (Review) Act 2014.

¹⁵ SDP, Infrastructure Operating Plan, at http://www.sydneydesal.com.au/media/ 1156/00028213.pdf/, accessed on 13 July 2016.

2.4.1 Operating and maintenance agreement with Veolia

Veolia operates the plant under a 20-year Operating and Maintenance Contract (O&M Contract) with SDP.¹⁶ The O&M Contract provides that:

- Veolia will operate and maintain the plant in accordance with industry best practice and a detailed Operations Management Plan¹⁷
- the plant will provide drinking water in quantities directed by SDP, and
- the services performed by Veolia will meet technical requirements specified by SDP, including drinking water standards.¹⁸

Payments made under the contract cover the majority of the plant's direct operating costs, excluding energy supply costs.

The O&M Contract provides for various operating and shutdown modes, on which we based our prices in the 2012 Determination (discussed further below).

2.4.2 Energy and renewable energy certificate contracts

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.¹⁹ The project approval for SDP²⁰ included a requirement that the plant use 100% renewable energy.²¹ Any surplus RECs may be sold in the market.

2.4.3 Water supply agreement with Sydney Water

SDP was originally owned by Sydney Water. The NSW Government leased the plant in June 2012 to a consortium composed of Ontario Teachers' Pension Plan Board and The Infrastructure Fund.²²

¹⁶ SDP, Our History, http://www.sydneydesal.com.au/who-we-are/our-history/, accessed on 14 July 2016.

¹⁷ IPART, Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2012 - Final Report, December 2011, p 17.

¹⁸ SDP, Infrastructure Operating Plan, at http://www.sydneydesal.com.au/media/ 1156/00028213.pdf/, accessed on 13 July 2016, p 11.

¹⁹ SDP submission to IPART: review of prices for SDP, 8 July, 2011, p 3.

²⁰ The project approval for SDP was granted under the *Environmental Planning and Assessment Act* 1979.

²¹ IPART, Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2012 - Final Report, December 2011, p 17.

²² SDP, Ownership structure, at http://www.sydneydesal.com.au/who-we-are/ownershipstructure/, accessed on 11 July 2016; and NSW Government, Successful lease of the Sydney Desalination Plant announced, Media Release, 11 May 2012.

As part of the transaction in June 2012, Sydney Water signed a 50-year Water Supply Agreement with SDP.²³ This agreement has important implications for our price determination. In particular, it provides that:

- Sydney Water is obliged to take all drinking water supplied by SDP that meets the Australian Drinking Water Guidelines,²⁴ both under and outside the 70/80 rule,²⁵ and
- prices payable by Sydney Water for this water are regulated by IPART.²⁶

However, the agreement is non-exclusive and SDP may supply water to any third party.²⁷

2.5 Our terms of reference and the matters IPART must consider

In determining SDP's prices, we must comply with a range of pricing principles set out in the terms of reference (Box 2.3). 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.

²³ NSW Government, Successful lease of the Sydney Desalination Plant announced, Media Release, 11 May 2012.

²⁴ HMRC, NRMMC, Australian Drinking Water Guidelines Paper 6 National Water Quality Management Strategy, National Health and Medical Research Council, National Resource Management Ministerial Council, Commonwealth of Australia, Canberra, 2011, updated February 2016.

²⁵ Subject to some exceptions.

²⁶ NSW Government, Successful lease of the Sydney Desalination Plant announced, Media Release, 11 May 2012.

²⁷ IPART, Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2012 - Final Report, December 2011, p 19.

Box 2.3 Pricing principles for the determination of SDP prices

Under the terms of reference:

- The prices should be set so the revenue SDP is expected to generate will recover the efficient costs of providing the services over the life of the assets. These costs include operating costs, a return of assets (depreciation) and a return on assets:
 - The depreciation should reflect the economic lives of the assets.
 - In calculating the return on assets, an appropriate opening asset value should be determined, and then a rate of return that reflects the commercial risks faced by the asset owner in providing services.
- The prices and price structure should encourage SDP to be financially indifferent as to whether or not the plant supplies water:
 - The prices for the supply of non-rainfall dependent drinking water should reflect all efficient costs that vary with output, including variable labour, energy and maintenance costs.
 - The prices for making the plant available to supply non-rainfall dependent drinking water should be a periodic payment. These should reflect fixed costs, including the fixed component of operating costs, a return of assets and a return on assets. SDP should be 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.
- Any other matters that IPART may consider relevant.

The full terms of reference are available at Appendix A.

We must also consider a range of matters under the IPART Act in making a price determination.²⁸ In general, these matters mean we must seek to protect customers from paying for inefficient or unnecessary expenditure, while ensuring SDP raises adequate revenue to recover the efficient costs required to deliver its monopoly services and meet the required standards for quality, reliability, and safety.

2.6 Current price structures and pricing mechanisms

In the 2012 Determination, we met the terms of reference by setting 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

²⁸ Section 52 of the WIC Act has the effect that Part 3 of the IPART Act applies to our determinations of SDP's prices. Section 15 of the IPART Act is in Part 3 of that Act.

 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, including:

- ▼ four shutdown modes (Short Term, Medium Term, Long Term, and Water Security)
- four restart modes (equivalent to each Shutdown mode), and
- Plant Operation mode.

These service charges recover allowances for a full return on capital, depreciation and return on working capital, plus the efficient fixed operating costs of that mode. The water usage charge was set to recover our estimate of SDP's efficient variable operating costs when the plant is in full operation (Plant Operation mode).

One of the characteristics of the desalination plant is that costs can change from one year to the next even for the same operational mode.²⁹ As such, water usage and service charges were set at different levels for each year of the determination period.

In addition to water service charges, we set separate one-off payments to reflect the costs of transitioning between some modes of operation. Specifically, 'transition to shutdown' charges and 'transition to restart' charges were set to reflect the fixed costs of transitioning between the three longer shutdown periods.

We also included several pricing mechanisms in the 2012 Determination to align SDP's financial incentives with its operating environment:

- An abatement mechanism that applies when the plant operates under the 70/80 rule. This is intended to create a financial incentive for SDP to maximise its production of drinking water when dam levels are low (in line with its operating rules and licence condition).
- ▼ A nil water usage charge that applies when the plant supplies drinking water to Sydney Water outside the 70/80 rule. This is intended to remove the financial incentive for SDP to supply drinking water that Sydney Water is obliged to take (under its Water Supply Agreement) when dam levels are high.

²⁹ This is due to the schedule for replacement of membranes and other maintenance and replacement of items. See IPART, *Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2012 - Final Report,* December 2011, p 106.

A sharing rule for water service charges that applies in the event SDP serves multiple customers. This is intended to ensure that if SDP supplies water to third-party customers (in addition to Sydney Water) it can charge each customer a cost-reflective share of the relevant fixed costs. That is, fixed costs are shared according to each customer's use of the plant (ie, user pays principle).

These prices and pricing mechanisms aimed to ensure SDP could recover its costs in all shutdown and operation modes, and encourage SDP to be financially indifferent as to whether or not it supplies water.

For the 2017 Determination, we propose to continue to set separate prices for water usage and plant availability. However, as part of this review, we will consider refining the current price structure and pricing mechanisms to enhance the plant's responsiveness and operating efficiency. We also propose adopting an impactor pays principle to share SDP's relevant fixed costs between multiple customers. Under this principle, all bulk water users would contribute to the desalination plant as a water security measure if they draw on dam storage and not just SDP's direct customers or those drawing desalinated water (see Chapters 3, 4 and 5).

3 Refining the price structure

As Chapter 2 outlined, our terms of reference require us to set prices for SDP's declared monopoly services to ensure it can recover its efficient costs in all shutdown and operation modes, and encourage it to be indifferent as to whether or not it supplies drinking water.

For the 2012 Determination, we achieved this by:

- setting fixed charges for making the plant available to supply drinking water (water service charges), and a variable charge for supplying this water (water usage charge)
- allocating costs so that the fixed charges recover fixed costs and the variable charge recovers variable costs (ie, so that prices reflect the structure of underlying costs), and
- ▼ setting separate fixed charges for transitioning the plant to and from the different shutdown modes, and for using SDP's pipeline.

For the 2017 Determination, we propose to maintain this broad pricing approach. However, in this chapter we outline some options for refining the price structure to provide SDP with more pricing and operating flexibility where it enhances efficiency, particularly outside the 70/80 rule. We also consider whether separate transition and pipeline charges should continue to apply.

Chapters 4 and 5 focus on the options for refining our pricing approach to reduce barriers to supplying Sydney Water and third-party customers.

3.1 Price structure for making the desalination plant available

IPART seeks comment on the following

- 1 Under the terms of reference, the prices for making the plant available should be a periodic payment. These prices should reflect fixed costs, including the fixed component of operating costs, a return of assets and a return on assets. Should we refine the current price structures for making the plant available by splitting the fixed charges into the following two components:
 - a base 'water security' charge reflecting the minimum costs of maintaining the plant (payable in all shutdown and operation modes), and

- mode-dependent incremental service charges reflecting the different fixed operating costs in each shutdown and operation mode?
- 2 Are the current four shutdown (and restart) modes still appropriate?

In the 2012 Determination, we set fixed charges for making the desalination plant available **(\$/day)**. These charges reflect SDP's fixed operating and capital costs in four defined shutdown modes³⁰ and a plant operation mode:

- Short Term Shutdown (2-10 days inclusive)
- Medium Term Shutdown (11 to 90 days inclusive)
- Long Term Shutdown (91 days to 2 years inclusive)
- Water Security Shutdown (more than 2 years), and
- Plant Operation (when the plant is supplying water).

As part of this review, we propose to consider whether we can make these charges simpler and more transparent. In particular, we propose to consider:

- the merits of establishing a 'base' service charge for making the plant available that would apply in all shutdown and operating modes
- the merits of establishing mode-dependent 'incremental' service charges for making the plant available in each shutdown and operating mode, and
- the appropriateness of the current shutdown modes and associated protocols and charging arrangements.

3.1.1 Should we establish a base 'water security' charge for making the plant available?

One option we will consider is establishing a base service charge that reflects the minimum costs of making the plant available. This would be a regulated charge that applies in all shutdown **and** operation modes (regardless of whether SDP is operating under or outside the 70/80 rule).

The base service charge (water security) would:

- ▼ Reflect the fixed costs SDP incurs when the plant is in Water Security Shutdown mode (more than two years). 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 70/80 rule.
- Be 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 year.³¹

³⁰ Charges equivalent to each shutdown mode are also payable when SDP is in a restart mode. This is the period when it is restarting the plant after being in one of the shutdown modes but has not yet begun to supply drinking water. For ease of exposition, we do not refer to these charges in this chapter, given that they mirror shutdown charges.

³¹ We note that a tax allowance would also be 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.

3.1.2 Should we establish mode-dependent incremental service charges for making the plant available?

When the plant is in a shutdown mode other than Water Security Shutdown, SDP may incur additional (incremental) fixed operating costs to maintain the plant.³² To allow it to recover these costs, we could establish incremental shutdown charges to apply in addition to the base 'water security' charge when the plant is in one of the other shutdown modes. These incremental shutdown charges would reflect the difference between the fixed operating costs included in the base service charge and the fixed operating costs in each of the other shutdown modes.

When the plant is in full operation, SDP would receive fixed charges to include a base 'water security' charge (ie, common to all shutdown and operating modes)³³ and an incremental service charge specific to Plant Operation mode. Generally, when the plant is in Plant Operation mode, SDP would incur higher incremental fixed operating costs than in a shutdown mode.

All fixed charges would be based on the recovery of efficient costs. Figure 3.1 illustrates how this would work conceptually, assuming the current shutdown and operation modes are retained.

³² Under our 2012 Determination, these costs are reflected in the different water service charges that apply in different shutdown modes and restart mode.

³³ This continues to assume that the allowance for capital costs is the same for all operational modes, as per the 2012 Determination. The base service charge payable when the plant is operating may also include additional incremental service charges if SDP is in a different type of shutdown (or restart) mode.





Data source: We have escalated 2016-17 service charges into \$2016-17. See IPART, *Prices for Sydney Desalination Plant Pty Limited's water supply services*, - *Determination No. 2*, December 2011, and IPART calculations.

To further illustrate, Table 3.1 translates the current daily fixed charge for each operating mode under the 2012 Determination into the proposed base 'water security' charge and incremental service charges. For instance, currently SDP would receive a fixed charge of \$434,806 when it is in Medium Term Shutdown mode. Under our proposed structure, it would receive a base 'water security' service charge of \$391,257 and an incremental service charge of \$43,549 to reflect the additional fixed operating costs in Medium Term Shutdown mode compared to Water Security Shutdown.

Note: Daily fixed charges exclude pipeline charges and network costs. Each category of shutdown and operating mode has different operating costs. For example, Medium Term Shutdowns require chemical treatment of membranes for preservation and in Water Security Shutdown membranes can be disposed of and labour costs reduced. In a Medium Term Shutdown, there is a small aberration because there are some additional costs associated with preserving the membranes that are not incurred when the plant is shutdown. IPART, *Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2012 – Final Report*, December 2011, pp 55 and 110.

Mode	Duration	Current fixed charge	Proposed base service charge (water security)	Proposed mode- dependent incremental service charge
Plant Operation	When water is supplied	\$428,291	\$391,257	\$37,034
Short Term Shutdown	2-10 days inclusive	\$415,924	\$391,257	\$24,667
Medium Term Shutdown	11 days to 90 days inclusive	\$434,806	\$391,257	\$43,549
Long Term Shutdown	91 days to 2 years inclusive	\$406,473	\$391,257	\$15,216
Water Security Shutdown	More than 2 years	\$391,257	\$391,257	0

Table 3.1Current fixed charges structured as base service charge and
incremental service charges (per day, \$2016-17)

Note: In all operating modes, SDP also receives a charge for the pipeline and for network costs.

Source: IPART, *Prices for Sydney Desalination Plant Pty Limited's water supply services - Determination No. 2*, December 2011.

In our view, a price structure that includes a separate base service charge and incremental service charges would be more transparent, and better reflect the different fixed operating costs in each shutdown mode and operation mode. This option is not a significant departure from the 2012 Determination: rather, it is a different way of structuring the fixed charges to more clearly show the cost of making the plant available, and how the total cost varies in different modes of shutdown and operation.³⁴

Such a price structure may also assist in apportioning the fixed costs if SDP were to serve multiple customers, as discussed in Chapter 4.

3.1.3 Ongoing relevance of different shutdown modes

As outlined above, the 2012 Determination includes four defined shutdown modes, and a separate daily fixed charge applicable in each mode. It also includes a separate transition charge for each shutdown mode, which is applicable when the plant moves to that mode from Plant Operation mode or *vice versa*. These transition charges are discussed later in this chapter.

³⁴ Note that for the purpose of satisfying our terms of reference, the base 'water security' charge together with the incremental service charge constitute SDP's total fixed costs (transition charges aside) and prices for part (b) of the monopoly services "...making available of the desalination plant to supply non-rainfall dependent drinking water".

The 2012 Determination specifies that when SDP enters a shutdown mode, it is to charge its customers the applicable fixed charge for that mode for the **entire duration** of the shutdown. This means that following a period of operation (ie, when dam levels return to 80%), SDP must decide which shutdown mode it will enter, and then charge its customers the daily fixed charge for that mode from the day the plant ceases to supply water until the end of the defined duration of that mode³⁵ (See Box 3.1 for a worked example).

The 2012 Determination also includes a mechanism to correct for any over- or under-charging that results if the shutdown proves to be longer or shorter than SDP predicted. This mechanism enables SDP to recover any shortfall plus interest from a customer where SDP has charged less than it is entitled to under the determination. It also enables a customer to recover any overpayment plus interest if SDP has charged more than it is entitled to.

³⁵ Until it enters a restart mode from the relevant shutdown mode.

Box 3.1 Worked example of shutdown charges

In this box, we provide an example of how the shutdown charges under the 2012 Determination require SDP to correctly predict the duration of a shutdown period.

Assume after a period of operation dam storage levels reach 80% on 1 July 2012. SDP ceases operation in its drought response role and chooses to enter a Long Term Shutdown. It does so based on its expectation that dam storage levels will not fall to 70% and the plant will be not be called into operation for at least 91 days and up to two years.

However, on 1 July 2014, dam storage levels are still above 70% and the plant has not been called into operation since 1 July 2012. The duration of the shutdown proves to be longer than expected, and the appropriate shutdown mode becomes a Water Security Shutdown (more than two years).

From 1 July 2014, SDP would start levying Water Security Shutdown charges. However, it should have received these charges from 1 July 2012, to reflect the actual duration of shutdown as Water Security Shutdown (more than two years). Instead, SDP received Long Term Shutdown charges (comprising a transition to shutdown charge and daily shutdown charges) for the period from 1 July 2012 to 30 June 2014.

In the example, SDP's customers would need to recover a 2-year overpayment plus interest because SDP has charged more than it is entitled to. This is demonstrated below (we exclude the effects of inflation for simplicity).

Fixed charges under the 2012 Determination (\$2011-12)

	One-off transition charge (\$)	Daily	Daily charge (\$/day)	
		2012-13	2013-14	
Long Term Shutdown	277,502	393,689	385,927	
Water Security Shutdown	1,442,005	383,894	376,140	

Note: fixed charges exclude carbon costs, pipeline charges and network charges.

Over the period from 1 July 2012 to 30 June 2014, SDP would have received Long Term Shutdown charges of:

= \$277,502 + (\$393,689 x 365) + (\$385,927 x 365) = \$284,837,342

However, over the same period, SDP should have received Water Security Shutdown charges of:

= \$1,442,005 + (\$383,894 x 365) + (\$376,140 x 365) = \$278,854,415.

In this example, SDP is overpaid by \$284,837,342 - \$278,854,415 = \$5,982,927, and would have to refund its customers this amount with interest (clause 7(b) of the preliminary section of our 2012 Determination).

In the 2012 Determination, we defined four shutdown periods based on SDP's O&M contract. The likelihood of SDP entering these periods and its timing within a mode is difficult to predict, given the plant's operating regime and the high variability of rainfall in Sydney's catchments. In our Final Report on the 2012 Determination, we recommended that SDP develop clearer protocols for deciding which shutdown mode to enter, and indicated we would examine its progress during the 2017 review.

As part of our review, we propose to consider whether there is a continued need for four shutdown modes, and whether the current four modes remain appropriate. We will also review SDP's progress in developing clearer protocols for its decisions on entering shutdown mode, and consider whether the over and under charging mechanism should continue to apply, given our proposed refinement to the structure of service charges.

Our proposal to refine price structures may remove the need to price for the entire duration of the shutdown and protocols for deciding which shutdown mode to enter. We will investigate whether we can structure prices in a way that incremental service charges seamlessly transition from one shutdown mode to the next. That way SDP could avoid having to *predict* which shutdown mode it is entering, and charge according to the shutdown period in which it *actually* enters.

3.2 Pricing for the supply of drinking water

IPART seeks comment on the following

- 3 Under the terms of reference, the prices for the supply of drinking water should reflect all efficient costs that vary with output.
 - Does the unit cost (per ML of output) vary depending on the amount of water produced? If so, should we set usage charges to accommodate varying levels of output?

We propose maintaining the price structures under the 2012 Determination when the plant is supplying drinking water.

In the 2012 Determination, we set a water usage charge **(\$/ML)** that reflects the variable operating costs based on full production. The water usage charge applies for the supply of drinking water both under and outside the 70/80 rule. As Chapter 2 noted, SDP is required by its network operator's licence to supply water under the 70/80 rule, and to maximise its production when it is operating under this rule. However, it is not restricted from supplying water outside the 70/80 rule (ie, when dam levels remain above 80%).

For avoidance of doubt, SDP also levies fixed charges when the plant is operating. In line with the options proposed above, when the plant is operating either under or outside the 70/80 rule SDP would levy:

- ▼ a **base service charge (\$/day)** that reflects the fixed costs SDP incurs when the plant is in Water Security Shutdown mode (more than two years)
- ▼ an **incremental service charge (\$/day)** that reflects the additional fixed operating costs SDP incurs when the plant is in Plant Operation mode, and
- ▼ a water usage charge (\$/ML) that reflects the operating costs that vary according to the quantity of drinking water supplied.

3.2.1 Should we establish usage charges for varying levels of output?

As noted above, the 2012 Determination provided for only one operating mode – Plant Operation. It set SDP's water usage charge in this mode based on the variable costs of operating the plant at full production capacity (defined as SDP's nameplate capacity of 250 ML per day). This charge was calculated by dividing the total variable costs SDP would incur to operate the plant at this capacity for 1-year by the amount of water produced in that year. The variable costs comprise water treatment (chemicals and labour) and energy costs.

For the 2017 Determination, we will consider the case of setting a water usage charge when the plant supplies drinking water at less than its full capacity. We have identified several circumstances where this might be appropriate:

- If the plant is transitioning from a shutdown mode to a plant operation mode in response to dam levels falling below 70% (or the reverse, in response to dam levels rising to 80%). During this transition period, the plant is producing water of drinking standard, but is still ramping up to full production capacity (or the reverse).
- If the plant has been in Water Security Shutdown for an extended period. In this circumstance, SDP may benefit from operating flexibility to maintain its asset appropriately and sell volumes of water at less than full capacity over a defined period.
- If SDP supplies drinking water outside its drought response role, customers may demand volumes at less than full production.

Chapter 5 discusses the potential need for these modes of operation in further detail.

In considering this issue, we will assess whether the unit cost (per ML of output) varies depending on the amount of water produced. Operating at full capacity is likely to provide the efficient scale (ie, the least cost per unit of output). If we find that the unit cost varies significantly – for example, that it is more costly to produce 125 ML a day than 250 ML a day (on a per ML basis) – we may need to set a schedule of water usage charges based on different levels of output.
3.3 Should transition charges continue to apply?

IPART seeks comment on the following

- 4 SDP currently has one-off transition charges to reflect the fixed costs when SDP is moving between modes.
 - Are the current transition charges still appropriate?
 - Should the transition charges be adjusted if SDP operates more flexibly outside its drought response role (ie, when dam levels are high)? If so, how?

Because of the nature of the plant's operating processes, in the 2012 Determination we set one-off charges to reflect the fixed costs when SDP 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). These transition charges (to shutdown and restart) are shared between customers based on the historical use of the desalination plant.³⁶

We are seeking stakeholder input on whether transition charges should continue to apply in the 2017 Determination and, if so, the value of these charges, when they should be applied, and whether they should be shared between customers (if SDP were to have multiple customers) and how.

Given that we are now proposing to provide SDP greater operating flexibility and pricing flexibility outside of the 70/80 rule to enhance efficiency (Chapters 4 and 5), there may be less need for these transition charges to apply. If the plant operates more flexibly and supplies water more often outside the 70/80 rule, some of the one-off transition charges might change or become redundant. Some of the transition costs might also be paid for by third-party customers, in the event that SDP were to supply customers other than Sydney Water.

3.4 Should a separate pipeline charge continue to apply?

IPART seeks comment on the following

- 5 SDP has a separate charge for its pipeline asset (ie, distinct from the plant), which applies in all modes of operation.
 - Should we continue setting a separate charge for the pipeline?
 - If so, should the pipeline charge vary by mode of operation?
 - How should pipeline charges be shared in the event SDP has multiple customers?

³⁶ The share of the customer's contribution to the charge is based on a proportion of total desalinated water it purchased in the 12 months preceding that shutdown.

In the 2012 Determination, we set separate charges for the pipeline, which applied in all modes. At that time, the pipeline had not been transferred from Sydney Water to SDP and so the separate pipeline charge was established, in the event that the transfer was not completed.³⁷ While the pipeline has now been transferred to SDP, our preliminary view is that the separate charge should continue, as this facilitates component pricing and allows us to apply a different approach to sharing the pipeline costs between customers, if required.

3.4.1 Do we need mode-dependent pipeline charges?

In our 2012 Determination, we set the pipeline charge at the same level in all modes. We continue to favour the simplicity of this pricing approach.

However, in this review, we will be seeking information from our expenditure consultant on the maintenance and operating expenses for the pipeline in different modes of operation, and we will consider whether different pipeline costs should apply in different modes of operation.

If mode-dependent pipeline charges are warranted, we will consider how these charges should be structured, given our proposed price structure of separating base and incremental fixed charges for the plant.

3.4.2 Sharing the pipeline costs between multiple customers

Currently, pipeline charges are paid in full by Sydney Water. However, under our 2012 Determination, if a third-party customer purchases desalinated water either under or outside the 70/80 rule, it is required to pay a share of SDP's pipeline charges in all modes of operation.

Our preliminary view is that, where appropriate, we adopt a sharing methodology for the pipeline charges that is consistent to that adopted for plant charges. We discuss our proposed changes to sharing costs between multiple customers in Chapter 4.

³⁷ IPART, Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2012 - Final Report, December 2011, p 5.

It is important that SDP's customers pay their share of the plant's costs. In principle, we consider sharing SDP's costs among its customers to be reasonable and consistent with the way we regulate other water businesses.³⁸ If customers of SDP other than Sydney Water (ie, 'third-party' customers) emerge in Sydney Water's area of operation, then SDP's fixed costs should be shared between Sydney Water and these businesses.

In this chapter, we discuss how SDP's costs might be shared if it serves multiple customers. The 2012 Determination shares all costs based on each customer's proportionate use of SDP – ie, how much water each customer purchases relative to the nameplate supply of the plant (250 ML). In practice, this is likely to deter third-party customers, as the costs of SDP supplying water are high.

For the 2017 Determination, we propose sharing the base (water security) costs (ie, base service charge) among multiple customers based on the impactor pays principle. This approach recognises the purpose for which SDP was built and is continued to be funded, namely the provision of an additional supply of water when dam levels are low. It may also enhance efficiency by enabling greater use of the plant when dam levels are high, as costs will likely be lower for third-party customers.

The sections below discuss these aspects of our proposed cost sharing method in more detail. They also outline how incremental fixed costs and usage costs could be apportioned if SDP has multiple customers.

³⁸ For example, WaterNSW's fixed costs are recovered from large customers in proportion to their share of total volume of water supplied (ML) by WaterNSW for the month. See IPART, Water NSW Maximum prices for water supply services from 1 July 2016 in relation to Sydney Catchment Functions – Determination No. 3, June 2016, p 5.

4.1 How should 'water security' costs be shared between customers?

IPART seeks comment on the following

- 6 How should SDP's base 'water security' costs be shared between customers?
 - Should SDP's base 'water security' costs continue to be shared between SDP's customers based on the user pays principle? That is, should this base charge be shared between Sydney Water and any other SDP customer based on their respective share of total drinking water supplied by SDP?

Or

- Should SDP's base 'water security' costs be shared between bulk water customers based on the impactor pays principle? That is, should this base charge be shared between Sydney Water and any other bulk water customers based on their respective share of total water system demand (being bulk water sourced from both dams supplying greater Sydney and the desalination plant)?
- 7 If the impactor pays principle applies to SDP's base 'water security' costs, are there any circumstances where bulk water customers should not contribute to these costs?

4.1.1 Distinguishing between 'users' and 'impactors'

In Chapter 3, we proposed refining SDP's fixed charges in line with the option of a **base service charge** that reflects the fixed costs of SDP when in Water Security Shutdown.

Our preliminary view is that this charge should be shared based on the **impactor pays principle**. That is, this base charge should be shared between Sydney Water and any other bulk water customers³⁹ based on their respective share of **total water system demand**.⁴⁰ This is because it is consumption (or demand)

³⁹ The impactor pays principle would only apply to bulk water users. These bulk water users may also be retail water businesses, as is in the case of Sydney Water. For the purpose of this report, we are not examining how Sydney Water apportions its base service charge to its retail customers (ie, whether these charges are apportioned based on each customer's water use or averaged across customers under postage stamp pricing).

⁴⁰ Where total water system demand is comprised of bulk water sourced from WaterNSW's dams supplying greater Sydney and SDP's desalination plant. Outside the 70/80 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 70/80 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.

from Sydney's dams that creates the need for SDP as a water security measure.⁴¹ SDP's role as a water security and drought response measure is reflected in its operating rules and licence requirements.

As noted in Chapter 2, SDP was constructed as a drought response measure and operates under an intermittent "on" and "off" regime triggered by dam storage levels (ie, the 70/80 rule). When dam levels are high (ie, outside the 70/80 rule), SDP's default mode is "off". Nonetheless, customers must continue to pay the base service charge, which reflects SDP's fixed costs while in this mode.

In this light, the base service charge could be viewed as a 'drought insurance premium' that all customers in the greater Sydney area pay to ensure the plant is available to supply drinking water when dam storage levels fall below 70%. The impactor pays principle allocates costs according to which of the parties created the cost, or the need to incur the cost. That is, larger bulk water users have a greater impact on water security, thereby increasing the likelihood of deploying SDP. Under this principle, larger bulk water users should pay a higher share of the base service charge than smaller bulk water users, in direct proportion to their respective share of total water system demand.

Our proposed approach differs from the 2012 Determination, which shared all fixed costs based on a **user pays principle**. In the 2012 Determination, SDP's customers are required to pay a portion of SDP's fixed costs, even when the plant is in shutdown, based on their proportionate purchase of the total drinking water SDP supplied.⁴² Box 4.1 provides a worked example comparing how the base service charge is shared under each principle (impactor or user pays).⁴³

⁴¹ The construction of SDP was a Government decision in response to the millennium drought. Specifically, 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 prices an amount representing the efficient costs of the requirements imposed on Sydney Water. Since the transfer in ownership, SDP is still obliged to operate in a drought response role and remains an integral part of the Government's Metropolitan Water Plan. Moreover, IPART is required to price the 'making of the plant available' under its terms of reference.

⁴² In a shutdown mode, costs are allocated to each customer as a proportion of total desalinated water purchased in the 12 months preceding that shutdown.

⁴³ We note that this sharing rule also includes the incremental costs of other shutdown (and restart) modes, subject to the ongoing relevance of these modes.

Box 4.1 Sharing base service charges outside the 70/80 rule on an impactor pays principle

In this box, we provide an illustrative example of how sharing SDP's base service charge outside the 70/80 rule on an impactor pays principle would compare to the sharing rule under the 2012 Determination based on a user pays principle.

Consider two customers in the greater Sydney area who have a total water demand of 543,250 ML, being:

- Customer A whose water demand is 11,250 ML per year, and
- Customer B whose water demand is 532,000 ML per year.^a

SDP's annual Water Security Shutdown charge for 2016-17 is \$194.1 million (including pipeline charges).

Under the 2012 Determination, SDP's service charges during a shutdown period would be shared between the two customers according to the amount of desalinated water they each received in the 12 months preceding that shutdown.

Assume, for ease of exposition, that Customer A was drawing 11,250 ML per year from SDP preceding the shutdown period. And Customer B was drawing SDP's remaining capacity of 78,750 ML (SDP has a maximum capacity of about 90,000 ML per year).

Each customer under the user pays principle would pay according to their share of SDP's capacity:

- Customer A would pay SDP an annual fixed charge of \$24.3 million, reflecting a 12.5% share of SDP's capacity (ie, 11,250 ML / 90,000 ML), and
- Customer B would pay SDP an annual fixed charge of \$169.9 million, reflecting a 87.5% share of SDP's capacity (ie, 78,750 ML / 90,000 ML).

Alternatively, by applying the impactor pays principle, each customer would pay according to their share of total system water demand (ie, their draw on dam storage levels):

- Customer A would pay SDP an annual fixed charge of \$4.0 million, reflecting a 2.1% share of total system water demand (ie, 11,250 ML / 543,250 ML), and
- Customer B would pay SDP an annual fixed charge of \$190.1 million, reflecting a 97.9% share of total system water demand (ie, 532,000 ML / 543,250 ML).

^a This volume is Sydney Water's residential and non-residential water demand forecast for 2016-17. See IPART, *Review of prices for Sydney Water Corporation from 1 July 2016 to June 2020 – Final Report*, June 2016, p 145.

4.1.1 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.⁴⁴ If another customer were to enter the market, Sydney Water would still likely pay the majority of fixed costs, on behalf of its customers, as demonstrated in Box 4.1.

This is the case even with the increased competition from WIC Act licensees for retail water. These water businesses are currently primarily 'wholesale' customers of Sydney Water, purchasing potable water from Sydney Water to on-sell to their end-use customers. Accordingly, they would continue to pay SDP's costs, including the drought insurance premium, indirectly through Sydney Water's wholesale prices.

Nonetheless, we consider there to be benefits to introducing the impactor pays principle to SDP pricing. By doing so, we would be removing potential barriers to third parties using SDP and encouraging SDP's efficient use. This approach may benefit not only third-party customers directly, but also all water users in greater Sydney, by improving plant reliability and responsiveness (through greater use) and reducing the use of dam water. This is discussed in more detail in Chapter 5 and below.

4.1.2 Encouraging third-party customers

Sharing SDP's base service charge on an impactor pays principle would encourage third-party customers by:

- lowering third-party customers' share of SDP's fixed costs, and
- simplifying the price structure.

It would also reduce the risk to SDP that customers will be unable to pay their share of shutdown costs, as currently required under the 2012 Determination. These points are explained below.

Lowering fixed costs for third-party customers

As demonstrated in Box 4.1, third-party customers would pay a much lower share of SDP's fixed costs under the impactor pays principle than in the 2012 Determination. This is because each customer contributes according to their draw on total water system demand rather than their use of the plant's nameplate capacity (ie, resulting in a lower percentage applied to fixed costs).

⁴⁴ Sydney Water should also pay the incremental costs of other shutdown (and restart) modes, subject to the ongoing relevance of these modes.

Simplifying the cost sharing structure and removing financial disincentives

Applying the impactor pays principle simplifies the cost sharing structure for multiple customers. Under the 2012 Determination, the methodology for allocating fixed costs may have unintended consequences for third-party customers because:

- fixed costs during shutdown are 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 buys any amount of water from SDP on a day when dam levels are high (ie, outside the 70/80 rule), and there are no other customers, it becomes liable for the full daily fixed charge on this day.⁴⁵

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 of SDP's fixed costs for years to come after their actual use of the plant.⁴⁶ Our proposed approach potentially removes this financial disincentive to seek supply from SDP.

Reducing risk of non-payment of fixed costs during shutdown

As noted above, the 2012 Determination apportions fixed costs during shutdown according to preceding use of the plant. There is a risk that some customers would no longer be in existence when the plant moves from operation into shutdown, or after prolonged shutdown modes. As a result, SDP may have uncertainty around the long-term payment of its fixed costs in shutdown. Our proposed approach potentially reduces this uncertainty.

4.2 Sharing the costs of operating the plant between customers

IPART seeks comment on the following

- 8 How should incremental fixed costs and usage charges be shared between SDP's customers?
 - Should the incremental fixed costs be shared between SDP's customers based on the user pays principle? That is, should the incremental charges be shared between Sydney Water and any other customers based on their respective share of water purchased from SDP?

⁴⁵ 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.

⁴⁶ 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 return to 80% and SDP ceases to operate. SDP remains shutdown for five years, until dam levels once again reach 70% 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.

9 Is there a case for extending the impactor pays principle to all SDP's costs during drought – ie, incremental fixed costs and/or usage costs?

In line with the 2012 Determination, we propose that that incremental fixed costs and usage charges are paid for on a **user pays basis**.

4.2.1 When dam levels are high

If the plant is called into operation, SDP incurs additional fixed operating costs (discussed in Chapter 3). We propose that these costs be shared between customers on a **user pays basis** when dam levels are high (ie, outside the 70/80 rule) (see Figure 4.1).

Unlike for base service charges, the impactor pays principle should not apply to incremental fixed costs, as customers would initiate the deployment of the plant based on a commercial decision. That is, outside of SDP's prescribed drought response role (currently, the '70/80' rule), SDP's production of water would not be based upon declining dam levels or other water security issues.

Customers would also pay the variable costs of the desalinated water they have purchased.

4.2.2 When dam levels are low

When dam levels are low (ie, SDP is operating in its prescribed drought response role in response to lower dam levels), we also propose that customers continue to pay the **incremental** fixed operating costs relative to each customer's usage. That is, these costs should be shared between customers on a **user pays basis**. Customers would also pay the variable costs of the desalinated water they have purchased.

We note, however, there may be an argument that the impactor pays principle extends to all SDP's costs during drought – ie, incremental fixed costs and/or usage costs. This is because SDP is required to operate and maximise its production for the greater Sydney area when dam levels are low. As such, all water users during drought are impactors, and should contribute to SDP's operating costs regardless of whether they are a direct customer of SDP.⁴⁷

⁴⁷ In this context, by 'water users' we mean users of water from WaterNSW's dams supplying greater Sydney as well as users of the SDP in its drought response role. We do not mean users of water supplied from recycling schemes and other sources that do not draw on dam levels.

However, applying this principle to all SDP prices might lead to apparent perverse outcomes, where the price of desalinated water to SDP's direct customers is cheaper when dam levels are low and more expensive when dam levels are high.⁴⁸ It also adds complexity to the pricing structure for SDP.

For these reasons, our preliminary view is that **incremental fixed costs** and **usage charges** should be shared between customers on the same basis regardless of whether dam levels are high or low.

Figure 4.1 compares our proposed cost sharing rules to the 2012 Determination

Figure 4.1 Options for increasing SDP's pricing and operating flexibility



Note: The first column represents SDP's current status of being in Water Security Shutdown. The nil price refers to restriction under the 2012 Determination to sell water outside the 70/80 rule to Sydney Water. Arguments for relaxing this constraint are presented in Chapter 5.

4.3 Pricing flexibly to accommodate the potential use of the plant when dam levels are high

IPART seeks comment on the following

10 How could prices (both fixed and usage charges) be set to allow greater operating flexibility to enhance efficiency?

⁴⁸ SDP may supply customers other than Sydney Water when dam levels are low. This is because its licence condition only requires SDP to operate the plant with the objective of maximising the production of drinking water to Sydney Water's area of operation under the 70/80 rule.

If SDP supplies customers when dam levels are high (ie, outside the 70/80 rule), it might do so at volumes less than full production. The 2012 Determination currently sets prices for one plant operation mode – ie, at full production. For the 2017 Determination, we will consider the need for greater pricing flexibility to accommodate the potential for operating flexibility.

4.3.1 Are unregulated pricing agreements permissible when dam levels are high?

One approach to introducing pricing flexibility outside the 70/80 rule would be to allow unregulated pricing agreements between SDP and its customers. This would allow SDP and its customers to negotiate the price of the water usage charge and incremental fixed costs outside the 70/80 rule.⁴⁹

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 preliminary view is that SDP has limited monopoly power when it operates outside the 70/80 rule because water is not scarce and there are other sources of water that are readily available. In addition, SDP's customers are likely to be large sophisticated businesses with experience negotiating and assessing commercial agreements.⁵⁰

Given this, we consider that SDP, Sydney Water and third-party customers would only enter into unregulated pricing agreements when all parties benefit. The regulatory framework should not prevent these **'win-win'** agreements from occurring.⁵¹

At this stage, however, we consider unregulated pricing agreements could 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, they would only be expected to do so at their benefit. Thus, they would no longer be financially indifferent as to whether or not they supply water.

4.3.2 Setting a schedule of prices for varying levels of production

In the absence of unregulated pricing agreements, we would need to regulate prices for varying volumes of water supplied by SDP when dam levels are high (ie, outside the 70/80 rule). In doing so, we could define a number of plant operation modes and set a schedule of prices that allows SDP to charge customers at varying levels of production.

⁴⁹ We consider the base service charge should be regulated at all times.

 $^{^{50}~}$ SDP is restricted from supplying small retail customers under its WICA licence.

⁵¹ 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.

While this would help facilitate greater operational flexibility, it is a less flexible approach to pricing outside the 70/80 rule than allowing for unregulated pricing agreements. This is because we may have difficulty in determining prices for all potential supply circumstances outside SDP's prescribed drought response role.

We explore the benefits of operating flexibility and the current impediments to SDP's operations outside the 70/80 rule, especially in terms of supplying Sydney Water, in further detail in Chapter 5.

5 | Refining the incentive mechanisms

As Chapter 2 noted, the 2012 Determination established pricing mechanisms to align SDP's financial incentives with its operating environment. They include:

- An abatement mechanism that applies when SDP produces volumes of water less than the plant's full production capacity under the 70/80 rule (ie, less than 250 ML per day).
- A nil water usage charge that applies to any water SDP supplies to Sydney Water when dam levels are high (ie, outside the 70/80 rule).

As part of this review, we will consider refinements to these pricing mechanisms to provide SDP with greater operating flexibility, while still ensuring it delivers its declared monopoly services in the most efficient way. In particular, where it enhances efficiency, we propose relaxing these mechanisms to allow SDP to:

- ▼ operate at less than full capacity when ramping up production under the 70/80 rule
- sell drinking water to Sydney Water when transitioning to a shutdown mode after a period of operation under the 70/80 rule
- ▼ sell drinking water to Sydney Water upon request outside the 70/80 rule, and
- operate and sell drinking water outside the 70/80 rule to maintain its asset during a prolonged period in Water Security Shutdown.

The sections below discuss each of these options. We also discuss the need to maintain appropriate financial incentives for SDP to maximise production under the 70/80 rule.

We note that the EnAM will also affect SDP's incentives to operate, particularly in some modes of operation and circumstances. The interaction between the EnAM and SDP's operating incentives is discussed in Chapter 7.

5.1 Increasing SDP's operating flexibility when dam levels are low

IPART seeks comment on the following

- 11 Is there a need to refine our regulatory settings to better align SDP's incentives to fulfil its water security role? In particular, should SDP be able to:
 - Operate at less than full capacity without penalty when ramping up production to fulfil its water security role ('soft' restart mode)?
 - Sell drinking water to Sydney Water when transitioning to a shutdown mode after a period of operation fulfilling its water security role ('soft' shutdown mode)?
 - Operate for a minimum run time when it is called into operation to fulfil its water security role?

5.1.1 Enabling a 'soft' restart period

Currently, the abatement mechanism penalises SDP when it supplies drinking water at less than its full production capacity (defined as the desalination plant's nameplate capacity of 250 ML per day) when dam levels are low (ie, under the 70/80 rule).⁵² While this creates an appropriate financial incentive for SDP to perform its drought response role as intended, it may unduly penalise SDP when it is transitioning to full production from a shutdown mode.

According to SDP, when the plant is required to start operating after being in Water Security Shutdown, it takes up to eight months for the plant to become fully operational.⁵³ Around four months is needed for the plant to start producing water that meets the standard required by Sydney Water (ie, drinking water quality standard). From this time, it takes up to a further four months for the plant to reach its maximum production capacity.

Under the 2012 Determination, if SDP supplies Sydney Water (or another customer) in the period from when it starts producing drinking water to when it reaches maximum production, it is penalised through the abatement mechanism. In our view, this penalty is unwarranted as the plant's production in this period is limited by technical factors outside SDP's control. It may also encourage inefficient outcomes. For example, it may give SDP a financial incentive to withhold supply, and dispose of the drinking water it produces, until it reaches maximum production capacity.

⁵² Note that SDP would not be penalised by the abatement mechanism provided that it is at full production by the time dam levels reach 70%. However, any volume produced before dams reach 70% would be penalised as the usage charge to Sydney Water would be nil.

⁵³ SDP, *Operations*, at http://www.sydneydesal.com.au/how-we-do-it/operations/, accessed on 11 July 2016.

One option for addressing this issue in the 2017 Determination is to include a 'soft' restart mode of operation that allows SDP to supply volumes of less than 250 ML per day to Sydney Water (or another customer)⁵⁴, without financial penalty, as it ramps up to full production under the 70/80 rule. We would need to clearly define the parameters of a 'soft' restart mode, including:

- when it applies eg, four months after SDP is triggered into operation (when dam levels reach 70%) and is capable of supplying drinking water, and
- how long it applies eg, a period of four months, until the plant is capable of operating at maximum production capacity.

As noted in Chapter 3, we may also need to adjust SDP's charges⁵⁵ in this 'soft' restart mode to reflect its efficient costs in this low flow mode.

5.1.2 Enabling a 'soft' shutdown period and minimum run time

The current nil water usage charge penalises SDP when it supplies Sydney Water with any amount of water outside the 70/80 rule. However, following a period of operation under the 70/80 rule there may be a case for SDP to continue selling water in the following circumstances:

- When the plant is transitioning to a shutdown mode. The plant may produce residual amounts of drinking water as it progressively switches off operations.⁵⁶
- When dam levels rise to 80% shortly after supplying water under the 70/80 rule. As the plant may take up to eight months to commence supplying water, it may be more cost-effective providing a minimum run time than requiring SDP to switch off as soon as dam levels reach 80%.⁵⁷

To address these circumstances, we could include a 'soft' shutdown mode of operation and a 'minimum run time' to allow SDP to levy a positive variable water usage charge to Sydney Water for volumes of water supplied outside the 70/80 rule.

Again, we would need to clearly define the period during which the nil price should be relaxed in each instance. We may also need to adjust SDP's charges⁵⁸ to reflect its efficient costs in these modes.

⁵⁴ This is because the abatement mechanism applies to the supply of water in greater Sydney, rather than to Sydney Water per se.

⁵⁵ A 'soft' restart mode may have different variable and fixed charges from other modes. We will be engaging a consultant to undertake an expenditure review of SDP. Among other things, this review will examine different operating modes and the fixed and variable costs of each.

⁵⁶ There may also be water in SDP's storage tanks, which it may wish to supply.

⁵⁷ For example, a minimum run time may assist in proving plant capability and reliability, thereby avoiding maintenance costs in shutdown.

⁵⁸ A 'soft' shutdown mode may have different variable and fixed charges from other modes. We will be engaging a consultant to undertake an expenditure review of SDP. Among other things, this review will examine different operating modes and the fixed and variable costs of each.

We note that the need for a minimum run time is closely linked with SDP's ability to capacity test the plant during a prolonged shutdown. That is, if SDP is able to test the plant periodically whilst shutdown, then there may be less need for a minimum run time in the event dam levels rise to 80% shortly after being called into operation.⁵⁹ Providing SDP with greater flexibility to operate to maintain its asset outside the 70/80 rule is addressed in further detail in section 5.3 below. We will be engaging a consultant to undertake an expenditure review of SDP, which will examine the cost-effectiveness of a minimum run time, among other things.

5.2 Increasing SDP's operating flexibility when dam levels are high

IPART seeks comment on the following

- 12 Is there a need to refine our regulatory settings to accommodate greater operating flexibility outside of SDP's water security role (ie, when dam levels are high)?
 - In particular, should SDP be able to sell drinking water to Sydney Water upon request (ie, should we remove the nil price for any water supplied to Sydney Water when dam levels are high)?
- 13 Could greater operating flexibility outside of SDP's water security role provide system-wide benefits by lowering Sydney Water's costs or improving its service standards, ultimately benefiting Sydney Water's retail customers?
- 14 Are there any impediments to SDP and Sydney Water operating more flexibly and efficiently outside of SDP's water security role?
- 15 Are there any other circumstances when SDP should have operating flexibility?

We consider that SDP's customers, including Sydney Water, should be free to choose to source water from SDP when dam levels are high (ie, outside the 70/80 rule). As discussed in Chapter 4, our initial view is that SDP has limited monopoly power when it operates outside the 70/80 rule. As a result, the decision to source water from SDP is at the customer's discretion, as these are commercial decisions made in parties' own self-interest.

For third-party customers, the supply of desalinated water outside the 70/80 rule is permissible under the 2012 Determination. We do not propose to change this. Chapter 4 discusses the sharing of costs for third parties.

⁵⁹ Nonetheless, there may still be benefits in establishing a minimum run time to minimise the transition costs for switching between modes, for example, through labour costs. It may also minimise the transition costs for switching between modes, for instance, by enabling SDP to hire staff for a fixed duration and avoiding redundancy and other labour costs that may arise in moving to a shutdown period from an operational period.

5.2.1 Enabling SDP to sell drinking water to Sydney Water upon request

In the 2012 Determination, we set a nil price for any water supplied to Sydney Water outside the 70/80 rule, effectively creating no financial incentive for SDP to supply Sydney Water outside this rule, even where this would benefit both parties.

Our preliminary view is that Sydney Water should be able to purchase drinking water from SDP outside the 70/80 rule. Increasing SDP's flexibility to supply Sydney Water outside the 70/80 rule could provide system-wide benefits by lowering Sydney Water's costs or improving its service standards, ultimately benefiting Sydney Water's retail customers. For instance, Sydney Water might decide that purchasing water from SDP is a cost-effective way for it to:

- meet service obligations while it deals with temporary maintenance issues in part of its network, or
- ▼ delay costly augmentation of a water treatment plant or other supply infrastructure.

5.2.2 The benefits of SDP operating when dam levels are high

Allowing SDP to operate more flexibly when dam levels are high provides direct benefits to the parties to whom water is supplied. However, indirect benefits may also accrue, particularly to SDP and Sydney Water, by reducing the time the plant spends in one of the shutdown modes. SDP could, for example:

- reduce maintenance costs in shutdown mode and therefore base service charges payable by customers
- reduce the costs of and time needed to transition the plant to restart mode and reach full capacity when dam levels fall below 70%, and
- improve the plant's general responsiveness to reach full production when required to do so either in its drought response role or responding to a potential water quality issue.

5.2.3 Sydney Water's purchase of desalinated water when dam levels are high must be prudent and efficient

Because Sydney Water is a provider of monopoly services itself, we set Sydney Water's retail prices and subject its bulk water costs to prudence and efficiency tests (to the extent that it proposes to pass these bulk water costs into its customers through its regulated retail prices). As a result, the onus and risk would be on Sydney Water to enter into supply arrangements with SDP that are in the long-term interests of its customers. In particular, any efficiencies resulting from greater operating flexibility outside the 70/80 rule should offset alternative

and less costly drinking water sources (ie, dam water sourced from WaterNSW and subsequently treated).⁶⁰

The scope of our review of Sydney Water's use of SDP outside the 70/80 rule would depend on whether SDP's prices are regulated or not:

- ▼ If SDP's prices were regulated when dam levels are high (ie, outside the 70/80 rule), we would assess whether, based on the circumstances at the time, it was a **prudent** decision by Sydney Water to source the desalinated water rather than water from another source. We would not need to assess the efficient costs of the bulk water supplied, as this would be reflected in the prevailing regulated prices.
- If prices were unregulated when dam levels are high (ie, outside the 70/80 rule), we would assess whether, based on the circumstances at the time, it was a **prudent** decision by Sydney Water to source the desalinated water rather than water from another source. We would also assess the **efficiency** of the unregulated prices.

Chapter 4 notes our preliminary view that unregulated pricing may be inconsistent with the terms of reference.

Impediments to SDP and Sydney Water operating flexibly outside the 70/80 rule

Allowing for operating flexibility outside the 70/80 rule may not be straightforward to implement given SDP's complicated operating environment (outlined in Chapter 2). There are also complex interactions to consider between SDP's and Sydney Water's determinations. In particular, removing the nil price to Sydney Water outside the 70/80 rule is contingent on:

- Sydney Water not having to take water imprudently from SDP, and
- Sydney Water not being able to pass these costs on to its retail customers without regulatory scrutiny.

Notably, we would need to consider how any form of operating flexibility provided to SDP relates to its Water Supply Agreement with Sydney Water. Under the current agreement, we understand that Sydney Water **must** accept drinking water provided by SDP at the delivery point, even when available storage levels exceed 80%.⁶¹ This contractual condition could 'force' Sydney Water to take desalinated water from SDP when it would otherwise be imprudent for it to do so (ie, prevent 'win-win' supply agreements from occurring).

⁶⁰ We note that any technical efficiencies gained through a 'low flow' mode outside the 70/80 rule would require appropriate downward adjustments to 'shutdown' and 'restart' payments and likelihood of these payments.

⁶¹ IPART, *Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2012 - Final Report*, December 2011, p 19.

We would also need to consider how any form of operating flexibility provided to SDP relates to Sydney Water's pass-through mechanisms of SDP costs. Currently, Sydney Water is able to pass through:

- the per kL cost of desalinated water if SDP is operating and supplying water to Sydney Water (into retail water usage charges),⁶² and
- any additional fixed costs not factored into Sydney Water's base operating costs (into retail water service charges after a 1-year lag).⁶³

This cost pass-through mechanism did not envisage SDP supplying Sydney Water outside the 70/80 rule. If we were to remove the nil charge, we would need to ensure that costs incurred by Sydney Water as a result of supply outside the 70/80 rule are not automatically passed through to its customers without regulatory scrutiny. If they are, then we may need to retrospectively assess and, where applicable, adjust operating costs related to SDP outside the 70/80 rule at a future Sydney Water price review.

5.3 Increasing SDP's operating flexibility in maintaining its asset

IPART seeks comment on the following

- 16 Is there a case to allow periodic partial testing of the plant when in extended shutdown to improve SDP's availability and reliability as a drought response measure? If so, what are the appropriate protocols for operating the plant in this capacity, such as the technically prudent:
 - frequency and duration of the testing period, and
 - volumes of drinking water produced during a testing period?

When in Water Security Shutdown, SDP's plant can be out of operation for extended periods of time (eg, in excess of five years). Given the nature of this asset, this could increase the risk of technical problems, and thereby the costs of addressing those technical problems, when it is required to restart under the 70/80 rule.⁶⁴

⁶² The water usage charge is increased by \$0.12 per kL in real terms over Sydney Water's 2016 determination period if SDP is operating. This uplift to the water usage charge is triggered if SDP is required to operate the plant under the conditions of its licence or operational approval (as in force at the relevant time) granted under the WIC Act. See IPART, *Review of prices for Sydney Water Corporation from 1 July 2016 to June 2020 – Final Report*, June 2016, Chapter 9.

⁶³ The service charge pass-through mechanism captures differences in SDP's service charges (fixed costs) due to SDP operating in different modes of operation than the assumed Water Security Shutdown mode factored in Sydney Water's base operating costs and any forecast error in the \$0.12 per kL estimate of the water usage charge adjustment. See IPART, *Review of prices for Sydney Water Corporation from 1 July 2016 to June 2020 – Final Report*, June 2016, Chapter 4.

⁶⁴ The portfolio and sequencing of drought management measures in the Metropolitan Water Plan are designed to cost effectively deliver a secure and sustainable water supply for greater Sydney – ie, the costs and benefits of 'operating' alternative drought management measures are compared to balance supply and demand. The deployment of SDP in a drought response role under the Plan's operating rules, therefore, may not necessarily fully consider asset risk in prolonged shutdown.

To improve SDP's availability and reliability as a drought response measure, there might be a case for periodic partial testing of the plant, or for operating it in a 'low flow' mode (production at volumes less than 250 ML per day) when it is in Water Security Shutdown. To test this, we would need to assess the cost difference between running the plant at some nominal level and not running the plant in this mode as part of our expenditure review. We would also need to compare the net benefits of capacity testing the plant against alternative risk mitigation measures. To this extent, we may need to consider the contractual arrangements during a prolonged period of shutdown between SDP and its operator, Veolia.

If we consider there is a case for periodic testing, we would also need to establish appropriate protocols for operating the plant in this capacity, such as the technically prudent:

- frequency and duration of the testing period, and
- volumes of drinking water produced during a testing period.

The costs of capacity testing, if deemed prudent on technical grounds, would need to be included in setting the appropriate fixed charges for the Water Security Shutdown mode. We would also set variable charges to reflect the efficient variable costs of the drinking water supplied in this mode (if different to full production).

5.4 Maintaining the financial incentive for SDP to maximise production when dam levels are low

IPART seeks comment on the following

- 17 An abatement mechanism applies to SDP's fixed charges if it produces volumes of water less than the plant's full production capacity when it is fulfilling its water security role.
 - Are there current aspects of the abatement mechanism that need modifying?
 - Is this financial incentive still relevant or are there other performance mechanisms that could better ensure SDP maximises supply when required?

Our preliminary view is the abatement mechanism should continue to apply whenever SDP is required to operate under the 70/80 rule, other than in the circumstances discussed in section 5.1 (ie, 'soft' restart and shutdown and minimum run time).

We consider that this financial incentive is important to ensure that SDP operates as intended and in accordance with its operating rules and the conditions of its network operator's licence (see Chapter 2). We do not consider the licence conditions on their own provide a strong enough incentive.⁶⁵

⁶⁵ As outlined in Chapter 2, the licence condition requires SDP to operate the plant with a view to maximising production, but not operate at full production.

However, there might be a need to refine the operation of the abatement mechanism to:

- ▼ manage short-term fluctuations in output around the plant's nameplate capacity of 250 ML per day, and
- distinguish between the plant operating under the 70/80 rule and outside this rule.

As part of this review, we seek stakeholder comments on the current form of the abatement mechanism, as well as its broader relevance and whether there are other performance mechanisms that better ensure SDP maximises supply when required under the 70/80 rule.

Box 5.1 outlines how the abatement mechanism currently works under the 2012 Determination.

Box 5.1 Water service charges and the 'abatement mechanism' under the 2012 Determination

Under our 2012 Determination, the abatement mechanism reduces SDP's fixed charge during a period of production, if average production over the preceding 365 days when the plant was required to maximise output is less than 250 ML per day.

The abatement mechanism involves multiplying the water service charge by:

Total capacity means the plant's capacity of 250 ML per day.

Available Capacity, for a day, means:

- a) where the relevant day is an 'Availability Day', the amount of desalinated water the plant produces averaged over the last 364 'Availability Days' plus the relevant Availability Day, or
- b) where the relevant day is an 'Unavailability Day', the amount of desalinated water the plant produces averaged over the last 365 'Availability Days'.

An Availability Day includes all days except:

- any day on which dam levels are:
 - equal to or greater than 80%, or
 - equal to or greater than 70% where dam levels are falling from at or above 80%
- any day during which SDP is required to reduce production at the plant below 250 ML, or
- any day on which the plant is shutdown or in a restart period.

5.4.1 Should the abatement mechanism be calculated on a daily basis?

The current abatement mechanism incentivises SDP to produce its nameplate capacity of 250 ML **per day** when operating under the 70/80 rule. However, in full production, the plant's actual daily volumes will experience fluctuations and deviate from its nameplate capacity – it can fall shy of 250 ML per day or produce volumes up to its technical maximum of about 260 ML per day. The abatement mechanism penalises SDP any time production falls below 250 ML per day, which is not offset when production is greater than 250 ML per day.

Our preliminary view is that the abatement mechanism should be more flexible and allow SDP to manage short-term fluctuations in output, whilst maintaining its drought supply obligations. For example, this could be achieved by calculating the abatement on a periodic basis (rather than daily) to allow SDP to achieve the 250 ML per day target **on average**.

We seek stakeholder comments on the appropriate way to reflect maximum supply (ie, full capacity) in the abatement calculation.

5.4.2 Should fixed charges be abated outside the 70/80 rule?

In its current form, the abatement factor is based solely on SDP's performance over days when the plant is required to maximise production under the 70/80 rule. This means that SDP is not penalised for operating in a low flow mode outside the 70/80 rule. However, if it failed to supply at full capacity under the 70/80 rule, SDP's fixed charges will be abated regardless of whether it is operating under the 70/80 rule or outside the 70/80 rule.⁶⁶

Although this general application of the abatement mechanism ensures that there is a strong incentive for SDP to maximise production during drought, we seek stakeholder comments on whether fixed charges should continue to be abated outside the 70/80 rule (ie, on Unavailability Days in Box 5.1).

Whether the abatement mechanism should continue to apply outside the 70/80 rule may depend, in part, on how it affects SDP's incentives to operate more flexibly outside the 70/80 rule.

⁶⁶ The abatement mechanism applies only to fixed charges when the plant is operating (ie, Plant Operation mode), and not to fixed charges in shutdown or restart periods.

6 Our approach to setting the revenue requirement

This chapter discusses our approach to setting SDP's revenue requirement (or, in other words, the efficient costs of providing its monopoly services). 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. As part of this process, we have requested that SDP prepare a pricing proposal, which will provide information on each of the issues outlined in this chapter.⁶⁷

We propose to use our standard approaches to determining the length of the determination period and SDP's revenue requirement over this period. More detail on our standard approach is provided in Appendix D. Below we discuss these elements of the price determination, as well as some detailed issues in relation to SDP's capital and operating expenditure.

We also discuss the potential implications of the 16 December 2015 storm event on SDP's costs and our prices.

6.1 Length of determination

IPART seeks comment on the following

18 Should the length of SDP's determination period continue to be set for five years?

In the 2012 Determination, the terms of reference for the review required that the determination period cover the period to 30 June 2017. Accordingly, we adopted a 5-year determination period from 1 July 2012 to 30 June 2017.⁶⁸

For the 2017 Determination, the amended terms of reference do not specify the length of the determination period.⁶⁹ Our preliminary view is that a 5-year determination would continue to strike the most appropriate balance between providing certainty to SDP and being responsive to changes in SDP's operating environment.

⁶⁷ In our letter dated 17 December 2015, we provided a Submission Information Package to SDP, providing guidance on our requirements for SDP in making its pricing proposal.

⁶⁸ IPART, Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2012 - Final Report, December 2011, p 118.

⁶⁹ See terms of reference, Appendix A.

In making our draft decision on this issue, we will consider the range of factors that typically influence the appropriate length of a determination period. These factors are outlined in Box 6.1.

Box 6.1 Factors we consider in deciding on the length of the determination period

In general, we consider the following factors when deciding on the length of the determination period:

- the confidence we can place in the utility's forecasts
- the risk of structural changes in the industry
- the need for price flexibility and incentives to increase efficiency
- the need for regulatory certainty and financial stability
- the benefits of aligning the determination with the term of the operating licence (where applicable), and
- the benefits of aligning the determination with the price determination of related utilities.

Longer determination periods have several advantages over shorter periods. For example, a longer period provides greater stability and predictability (which may lower the utility's business risk and assist investment decision making), strong incentives for the utility to increase efficiency and reduced regulatory costs.

However, longer determination periods also have disadvantages. These include increased risk associated with inaccuracies in the data used to make the determination, possible delays in customers benefitting from efficiency gains, and the risk that changes in the industry will impact the effectiveness of the determination.

6.2 Approach for calculating the notional revenue requirement

IPART seeks comment on the following

- 19 The revenue requirement represents SDP's total efficient costs of providing its monopoly services in each year of the determination period. SDP's costs, and thus its prices, vary depending on what operating mode it is in.
 - Should we continue using a 'building block' method to calculate SDP's revenue requirement?
 - Should we continue to set mode-dependent notional revenue requirements?
 - Should we continue to set a separate notional revenue requirement for SDP's pipeline?
- 20 SDP's pricing proposal is due on 24 October 2016 and will be made available at our website for stakeholder comment. Does SDP's proposed revenue requirement in each mode of operation represent efficient costs, taking into account its proposed:
 - operating and capital expenditure

- return on assets
- regulatory asset base
- regulatory depreciation and asset lives
- tax allowance, and
- return on working capital?

The notional revenue requirement represents our view of the total efficient costs of SDP providing its monopoly services in each year of the determination period. In general, we set prices to recover this amount of revenue.

As for the 2012 Determination, we propose to use a 'building block' method to calculate SDP's revenue requirement. Appendix D sets out the building block method in detail.

Unlike other water utilities, SDP's costs, and thus its prices, vary depending on what operating mode it is in. As a result, we need to calculate its annual notional revenue requirement for each mode of operation.

For the 2012 Determination, we set separate prices for each mode of operation. These prices were set to generate the full notional daily revenue requirement for the relevant mode. Figure 6.1 and Figure 6.2 illustrate the differences in revenue requirement between Plant Operation and Water Security Shutdown mode under the 2012 Determination.



Figure 6.1 Breakdown of SDP's 2016-17 revenue requirement of \$194.1 million in Water Security Shutdown Mode (\$2016-17)

Note: This pie chart is indicative of the breakdown of SDP's revenue requirement in Water Security Shutdown. The revenue requirement of \$194.1 million represents SDP's Water Security Shutdown fixed charges for 2016-17. SDP's charges are escalated from \$2011-12 to \$2016-17 using a March-on-March CPI. Data source: IPART modelling.



Figure 6.2 Breakdown of SDP's 2016-17 revenue requirement of \$269.4 million in Plant Operation mode (\$2016-17)

Note: This pie chart is indicative of the breakdown of SDP's revenue requirement in Plant Operation mode. The revenue requirement of \$269.4 million represents SDP's Plant Operation fixed charges for 2016-17 and variable charges assuming annual supply of 90,000 ML. SDP's charges are escalated from \$2011-12 to \$2016-17 using a March-on-March CPI.

Data source: IPART modelling.

For the 2017 Determination, we propose maintaining mode-dependent pricing for SDP. However, there may be additional modes of operation for the 2017 determination period which vary from the 2012 determination period. For example, below we discuss the potential impact of the 16 December 2015 storm event on SDP's revenue requirement, and whether there may be a need to price the fixed costs of an inoperable mode.

6.2.1 Setting the notional revenue requirement for the pipeline

We separately determined the building block costs for the distribution pipeline in the 2012 Determination, as the transfer of ownership of the pipeline from Sydney Water to SDP had not yet been completed. We propose to continue this approach in the 2017 Determination to facilitate component pricing.

Under the 2012 Determination, the pipeline prices were set to remain constant across each of SDP's modes. For the 2017 Determination, we will consider whether mode-dependent pricing should also apply to the pipeline.

6.3 Efficient operating and capital expenditure

IPART seeks comment on the following

21 What scope is there for SDP to achieve efficiency gains over the 2017 determination period?

For the 2017 Determination, we will set allowances for SDP's efficient operating and capital expenditure. We will also review the prudence and efficiency of the capital expenditure over the 2012 determination period against the criteria in Box 6.2.

As part of this process, we have requested that SDP provide relevant information about its actual and forecast expenditure in its pricing proposal. We will engage consultants to review this proposal. We will also consider the views of stakeholders, who will have an opportunity to respond to SDP's pricing proposal as well as to our Issues Paper. Chapter 1 outlines the timeframes for stakeholder responses.

For this review, some of the key considerations when assessing efficient costs will include, among other items:

- SDP has been in Water Security Shutdown since 2012 and could remain in this mode for extended periods over the 2017 determination period. We will consider the implications of this prolonged shutdown on maintenance schedules and capital expenditure.
- The 2010 Metropolitan Water Plan is currently being reviewed. This review may affect the triggers for SDP's use and its operating regime.
- The December 2015 storm event may prompt the need for an additional mode and accompanying set of prices as part of the 2017 Determination (eg, if the plant is inoperable). This storm event may also have implications for asset lives. This is discussed further in section 6.4.
- SDP is now a standalone business and no longer part of Sydney Water. Therefore, some of the allowances we set in the 2012 Determination may no longer represent the efficient costs of SDP's operation, particularly with respect to the allocation of corporate overheads.

Box 6.2 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.

6.3.1 The allocation of fixed and variable operating cost items

To satisfy the terms of reference, it is crucial that we gain a detailed understanding of all costs that vary with the production of desalinated water; and those costs that are fixed and do not vary with output. We also need to consider how these costs might differ between different modes of operation.

In the 2012 Determination, we allocated the operating cost items associated with the desalination plant into fixed and variable cost categories for each mode. We distinguished costs according to the following categories:

- Fixed operating costs, which include:
 - Baseline fixed costs, which are incurred regardless of whether or not the plant is operating (ie, all modes of operation).
 - Incremental fixed costs, which do not vary with the volume of water produced, but can be avoided in shutdown modes. As a general rule, more incremental fixed costs are avoided in longer term shutdown modes.
- Variable operating costs, which include those costs that are only incurred if the plant is operating and change broadly in proportion to the volume of desalinated water produced. These variable costs primarily comprise water treatment and energy costs.⁷⁰

⁷⁰ IPART, Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2012 - Final Report, December 2011, p 42.

Table 6.1 illustrates how SDP allocated costs into fixed and variable categories for Plant Operation mode for the 2012 determination period.

Table 6.1	SDP's allocation of operating costs into fixed and variable
	components in Plant Operation mode

Fixed costs	Variable costs	
insurance costs	water treatment costs (mainly chemicals and some labour)	
fixed labour costs	variable retail electricity charges	
periodic maintenance	variable network electricity charges	
fixed electricity costs	renewable energy certificate purchase costs	
projected electricity standby costs		
land tax and council rates		
audit and bank fees		
marine and estuarine monitoring program costs		
incremental changes in each of the above cost categories		
membrane replacement costs		

Source: IPART, *Review of prices for Sydney Desalination Plant Pty Limited from 1 July 2012 – Final Report,* December 2011, p 42.

In the 2012 Determination, we also separated out the one-off fixed cost items associated with shutting down and restarting the plant, in line with our decision to set separate prices to recover these costs.

For the 2017 Determination, we will reconsider the allocation of costs to fixed and variable categories. As noted, SDP is now a standalone business and as a result may have different costs in each mode to those set in 2012. In addition, new operating modes may be proposed for the 2017 Determination, which may require a different allocation of costs.

6.4 What are the efficient costs for SDP if the plant is inoperable?

IPART seeks comment on the following

- 22 The desalination plant sustained significant damage from a storm event on 16 December 2015. Since that time, the plant has been unable to operate (not capable of providing non-rainfall dependent drinking water).
 - What are the implications of this storm event on SDP's efficient costs?
 - Should we establish a new revenue requirement (and pricing mode) to account for when the plant is inoperable?
 - Who should bear the SDP's costs if the plant is inoperable?

As discussed in Chapter 2, the desalination plant sustained significant damage from a storm event on 16 December 2015. Since that time, the plant has been unable to operate. SDP anticipates repairs will commence in October 2016 and will continue for 12 months.⁷¹ Thus, it is unlikely that the plant will be available for use until October 2017. SDP reports that it has comprehensive insurance to support the repairs to the facility.⁷²

The storm event has potential implications both for SDP's current price review and for the previous determination. These are discussed below.

6.4.1 Should we establish a new pricing mode if the plant is inoperable?

Prior to the storm occurring, SDP was in Water Security Shutdown. After the storm occurred, SDP continued to receive daily fixed charges, as required under the 2012 Determination.

However, the actual fixed costs that SDP incurred following the storm event – ie, while inoperable (but excluding repairs), may differ from those incurred while in Water Security Shutdown. This is because Water Security Shutdown mode includes payments for a certain level of maintenance and testing in order to ensure plant reliability. It is possible these activities may not have occurred while the plant is inoperable. Conversely, other activities may have occurred, which are not reflected in the daily fixed charges for Water Security Shutdown.

For the 2017 Determination, we will consider SDP's efficient fixed costs in the scenario where the desalination plant is inoperable – ie, not capable of providing non-rainfall dependent drinking water. This may occur either as a result of the repairs to the plant following the recent storm event or for any future cause rendering the plant inoperable. We may then consider establishing a new pricing mode in the 2017 Determination to reflect the efficient fixed costs if the plant is inoperable. This is discussed further below.

As noted above, we intend to engage the services of a consultant to undertake an expenditure review. As part of this review, the consultant will examine SDP's actual and forecast costs following the storm and while the plant is being repaired.

No adjustment of operating expenditure over the 2012 determination period

Our current form of regulation allows businesses to keep gains and losses resulting from cost fluctuations during the regulatory period. This feature of our form of regulation is referred to as 'incentive regulation' because it provides a financial incentive for businesses to deliver cost savings.

⁷¹ SDP, *Tornado FAQs*, at http://www.sydneydesal.com.au/faqs/#happening, accessed on 6 July 2016; and email from SDP, 14 July 2016.

⁷² SDP, *Tornado FAQs*, at http://www.sydneydesal.com.au/faqs/#happening, accessed on 6 July 2016.

Accordingly, we do not consider it appropriate (ie, good regulatory practice) to true-up or adjust SDP's operating expenditure over the 2012 determination period to account for the storm event. Our view is that SDP should bear the upside and downside risk of fluctuations in its operating expenditure over the 2012 determination period.

6.4.2 Who should bear the loss of revenue if the plant is inoperable?

As part of the 2017 Determination, we will also consider what SDP's charges to Sydney Water (or other customers) should be in the event it is inoperable for a period of time (eg, due to an event such as the recent storm event).

For instance, there may be an argument that Sydney Water should not have to pay a fixed charge if the plant is inoperable, but rather SDP's efficient business interruption insurance costs should be included in its operating expenditure allowance (to be recovered via its prices if it is operable).

Alternatively, it may be considered more appropriate for Sydney Water (and its customers) to pay for SDP's efficient fixed costs while the plant is inoperable – particularly if SDP is unable to obtain business interruption insurance (or unable to obtain this insurance at reasonable cost).

As discussed in Chapter 2, the desalination plant is a key element of the NSW Government's Metropolitan Water Plan. Within this plan, SDP's role is to provide a source of non-rainfall dependent drinking water that can be relied upon if Sydney's available water storage levels fall below a certain threshold.

In considering what SDP's charges should be if the plant is inoperable, we will be asking our consultants to review the level of insurance coverage held by SDP and to determine what is prudent and efficient.

We will also consider stakeholder comments on the level of insurance coverage held by SDP and who should bear any residual costs associated with the plant being inoperable, both as a result of the recent storm event and in any other circumstance.

6.4.3 Capital expenditure for repairs incurred as a result of the storm event

As discussed above, SDP sustained significant damage to parts of the plant as a result of the storm event. It is our understanding that much of the damaged equipment will be replaced as part of an insurance claim by SDP.

As part of this review, we are requesting that our consultants consider the reinstatement plan for the insured assets after the storm event and provide recommendations on the appropriate asset lives, asset values and implications for the RAB.

We request that SDP provide information on its reinstatement plan for these assets. It should also provide information on the lives and values of new assets replacing storm damaged assets, and the proposed implications for its RAB. We will also consider stakeholder views on these issues.

6.5 Energy costs

IPART seeks comment on the following

- 23 What are SDP's efficient energy costs for the 2017 determination period?
- 24 Should we continue to pass through into prices SDP's fixed and variable network charges (as determined annually by the Australian Energy Regulator)?

Desalination is an energy intensive process and the costs of energy are a significant proportion of SDP's operating costs. The three major elements of SDP's electricity costs are:

- the price and volume of energy that SDP requires or the wholesale market cost
- the network charges payable for the transmission of this energy over the network, and
- the costs of renewable energy arising from the planning approval for the plant.

SDP's energy costs have been estimated to comprise over 32.4% of the plant's operating costs in Plant Operation mode.⁷³ The purchase of Renewable Energy Certificates (RECs) has been estimated to comprise an additional 23.7% of operating costs.⁷⁴

In the 2012 Determination, we decided to adopt benchmark estimates of efficient energy costs, rather than use the contracted energy price between SDP and Infigen. We did so because it:

- de-linked prices and actual costs, such that the business is provided with incentives to manage its costs efficiently, and
- is consistent with outcomes expected in a competitive market.

We also recognised that contracts for the supply of energy and RECs can be subject to renegotiation.

The benchmark energy costs were estimated by our consultant. The expected wholesale energy prices were based on the Long Run Marginal Costs (LRMC) of generation as a long-term proxy for market prices. REC prices were based on the LRMC of meeting the renewable energy target as a proxy for market prices.

⁷³ IPART, Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2012 – Final Report, December 2011, p 57.

⁷⁴ IPART, Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2012 – Final Report, December 2011, p 57.

For the 2017 Determination, we will undertake a similar process to establish an efficient allowance for SDP's energy costs. We will engage consultants to advise us on efficient energy costs, including an assessment of how these relate to SDP's actual energy costs. We will also review the efficient volumes of energy for each of SDP's operating modes, including where new operating modes may arise.

6.5.1 Pass-through of network costs

In the 2012 Determination, we decided to pass through the fixed and variable network charges as determined annually by the Australian Energy Regulator (AER), rather than include estimates of these costs in the operating expenditure cost blocks. The cost pass-through of network costs would better reflect the efficient cost of service than IPART's estimate of these costs and is symmetric in that it applies to both increases and decreases in network charges as determined by the AER. We considered the fixed and variable network charges incurred by SDP met our criteria for cost pass-throughs, as outlined in Box 6.3.

We propose to continue this approach to network energy costs in the 2017 Determination, as the reasons for the cost pass-through continue to apply.

6.6 Cost pass-through mechanisms

IPART seeks comment on the following

- 25 We consider that cost pass-through mechanisms should only be applied in exceptional circumstances and have outlined criteria to determine where cost pass-through mechanisms should apply.
 - Is there a case to manage any other of SDP's proposed costs through a cost pass-through mechanism?

Generally, we set efficient operating and capital expenditure allowances for the regulatory period with an expectation that costs can fluctuate up and down, some new costs will arise, and some expected costs will not occur. If there is no bias in the forecasts, we would expect the gains from underspends to offset the losses from overspends over the long term.

There are some exceptions to this. Where there is a significant cost that may or may not occur during the regulatory period, and if the business can have no meaningful influence over whether the cost is incurred or how big the cost will be, there can be a case to provide a cost pass-through for these costs. Cost passthrough mechanisms allow the efficient costs of uncertain and uncontrollable events that arise during the regulatory period to be passed through to customers within the regulatory period. We consider that cost pass-through mechanisms should only be applied in exceptional circumstances. Box 6.3 outlines the criteria to determine where cost pass-through mechanisms should apply. We will apply these criteria to any proposal from SDP or stakeholders on cost pass-throughs for the 2017 Determination, subject to consideration of stakeholder views.

Box 6.3 Criteria for cost pass-through mechanism

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 that fully or partially offset the direct cost of the event.^a
- 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 both cost increases and cost decreases (in cases where the risk can result in both cost increases and cost decreases).
- It is clear that the cost pass-through will result in prices that better reflect the efficient cost of service.
- a Under the IPART Act, the costs to be passed through must be specified in the price determination.

6.7 Moving to a post-tax weighted average cost of capital

The building block revenue requirement includes an allowance for a return on assets. This represents our assessment of the opportunity cost of capital the regulated business (or its owner) has invested to provide the regulated services. It ensures that the regulated business (or its owner) 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 intend to determine the rate of return using a weighted average cost of capital (WACC).

For the 2017 Determination, we intend to use a real post-tax WACC to calculate the allowance for a return on assets, and provide for an explicit tax allowance as a separate cost building block. In 2012, we used a real pre-tax WACC while noting our intention to use a real post-tax WACC for future price setting determinations. This reflected our 2012 decision on the treatment of tax in setting the WACC for price setting purposes, which was unable to be incorporated into the 2012 Determination due to the lack of consultation with stakeholders on this issue. We intend to use our current methodology and process for calculating the WACC, which has been revised since the 2012 Determination. We have developed our current approach to setting the WACC in consultation with stakeholders in a number of reviews.⁷⁵

Allowance for tax

We are introducing a tax allowance in the 2017 Determination, because we are moving to a post-tax WACC. This reflects the regulated business' forecast tax liabilities.

As part of calculating the appropriate tax allowance, SDP is required to provide forecast tax depreciation for the determination period. Other items such as interest expenses are based on the parameters used for the WACC, and the value of the RAB.⁷⁶ More information is provided in Appendix D.

6.8 Reviewing asset lives

IPART seeks comment on the following

- 26 Is there a case to reconsider the asset classes established in the 2012 review?
- 27 Is there a case to review SDP's asset lives as a result of the damage to the plant caused by the recent storm event?

In each determination period, we set an allowance for regulatory depreciation to ensure that the capital invested in the regulatory assets is returned over the useful life of each asset. In 2012, we used the straight-line depreciation method and accepted SDP's proposed weighted asset lives based on advice from our consultant. More details on this approach are provided in Appendix D.

For the 2017 Determination, we need to determine the appropriate lives for the assets in SDP's RAB, and the appropriate depreciation method to use. In doing so, we may also need to reconsider the asset classes established in the 2012 review. We will also need to factor in the replacement of assets through insurance remedial work undertaken as a result of the damage to the plant caused by the recent storm event, as well as the impact of long periods of shutdown on the plant's asset lives.

⁷⁵ We completed a major review of the WACC in 2013 (IPART, *Review of WACC Methodology – Final Report*, December 2013). More recently, we 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). We also release bi-annual financial market updates on our website. The latest update for 24 August 2016 can be accessed at http://www.ipart.nsw.gov.au/Home/Industries/Research/Market_Update

⁷⁶ The nominal cost of debt is the sum of the nominal risk-free rate and nominal debt margin.

6.9 SDP's reporting requirements

To undertake our price monitoring role, we require certain information from SDP.⁷⁷ Under the WIC Act, regulated entities are required to provide information requested by IPART.⁷⁸ In the 2012 Determination, we developed a reporting framework which included SDP submitting a completed Annual Information Return (AIR) and information on daily plant availability and production levels to IPART.⁷⁹ This information was not for public release, and is similar to information we collect from other regulated water utilities.

IPART's practice during the term of the 2012 Determination has been to write each year to SDP to notify it of our annual information provision requirements.

Our position is to maintain similar reporting requirements over the 2017 determination period.

⁷⁷ Under WIC Act, ss 16(7), 52(3) and 85(1).

⁷⁸ Under WIC Act, s 87; WIC Regulation, Schedule 1, cl 1(1).

⁷⁹ IPART, Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2012 - Final Report, December 2011, p 33.
7 Energy and Efficiency Adjustment Mechanisms

As noted in Chapter 1, the Government⁸⁰ amended the terms of reference to provide for in SDP's pricing determinations an:

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

The terms of reference requires us to determine demonstrated efficiency savings and treatment of energy gains or losses in accordance with our Methodology Paper for the EnAM and EfAM.⁸¹

In this Chapter, we outline how we intend to calculate the adjustments for each mechanism and how these separate adjustments would 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 intend to update the Methodology Paper, where appropriate and subject to stakeholder views. We invite consultation on the Methodology Paper to be applied in future SDP price determinations.

7.1 Implementing the energy adjustment mechanism

IPART seeks comments on the following

28 Is our proposed implementation of the energy adjustment mechanism for the current price review appropriate?

⁸⁰ On 16 February 2012, the Minister administering the WIC Act amended the initial terms of reference issued to IPART on 6 May 2011.

⁸¹ In April 2012, we released the *Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms - Methodology Paper*, April 2012 (Methodology Paper), following consultation.

7.1.1 What does the energy adjustment mechanism set out to achieve?

The EnAM 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.⁸²

SDP incurs these gains and losses, not as the result of our price structures, but because of the avenues available to SDP to deal with surplus electricity and RECs within the constraints of its Infigen (energy) contract arrangements.

As noted in Chapter 2, SDP has entered into long-term contracts to acquire fixed minimum volumes of electricity and RECs at fixed prices. However, when the plant is not operating, the minimum quantity of electricity under the contract applies and SDP is exposed to the risk of reselling electricity that is not needed at an uncertain price. Notably, when the market price of electricity is below its contract price, SDP incurs a loss on the resale of surplus electricity in any of the shutdown or restart modes. On the other hand, in the event that the market price exceeds the contract price, SDP makes a gain on the resale of surplus electricity.

The Government decided that not all of SDP's gains and losses on surplus energy should remain with SDP. It amended the terms of reference and required IPART to develop a methodology for calculating gains and losses and passing them through to prices, beyond a core band.

7.1.2 How is the energy adjustment pass-through calculated?

The 2017 Determination will be the first price determination to apply the EnAM. The EnAM clearly applies, given that SDP has been in Water Security Shutdown mode for the duration of the 2012 determination period (ie, shutdown).

We will calculate gains and losses only in respect of the first four financial years of the 2012 determination period (ie, 1 July 2012 to 30 June 2016), where actual data is available.⁸³ Box 7.1 outlines the steps we intend to take to calculate energy adjustment pass-through amounts.

We discuss some of the data sources and averaging periods we propose to use to calculate the pass-through amounts for electricity and RECs at Appendix E.

⁸² SDP has complied with its requirements to maintain and operate the desalination plant under clause A2 of its network operator licence granted under the WIC Act on 9 August 2010 and varied on 10 May 2013. See IPART, Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms - Methodology Paper, April 2012, p 25.

⁸³ The last year of the 2012 determination period is excluded from the EnAM calculation because it is a forecast year (ie, 2016-17).

Box 7.1 How we intend to calculate pass-through amounts for EnAM

In accordance with the Methodology Paper and our terms of reference, we intend to calculate pass-through amounts as follows:

- 1. Establishing the annual Infigen Contract costs for electricity and RECs the contract cost of the minimum contract volume.
- Calculating the annual Resale Gain or Loss for electricity and RECs the difference between the market and contract price multiplied by the surplus quantity.
- Calculating the annual Excess Resale Gain or Loss the resale gain or loss outside of the core band and threshold for electricity and RECs:
 - a) the core band is a set value and defines a materiality threshold of 5% of the Infigen Contract costs (ie, as calculated in step 1)
 - b) after deducting the core band from the Resale Gain or Loss (ie, as calculated in step 2), 90% of the remaining gain or loss is allocated to customers (and carried forward as annual pass through amounts to the 2017 determined prices).
- Calculating the Accumulated Excess Energy Resale Loss or Gain escalate the annual Excess Resale Loss or Gain for electricity and RECs to the end of the current determination period (ie, 2016-17) to account for inflation and holding costs.

7.1.3 Passing through surplus energy gains and losses into prices

SDP must act prudently 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 EnAM.⁸⁴

While the core band is designed to provide SDP with an incentive to act prudently (ie, such that it retains all gains or losses within the core band), we will engage an expert consultant to review and assess SDP's management of surplus energy.

In accordance with the Methodology Paper, EnAM adjustments will apply to the fixed cost component of prices independent of mode and scale of operation. This ensures that SDP recovers its energy shortfall regardless of how it operates over the 2017 determination period.

The notional revenue requirement over the 2017 determination period will be adjusted on a present value neutral basis to include the Accumulated Excess Energy Resale Loss or Gain (as calculated in step 4 in Box 7.1).

⁸⁴ IPART, Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms - Methodology Paper, April 2012, p 26.

Banking RECs

The ability to 'bank' RECs complicates the calculation of gains or losses because not all surplus RECs are necessarily sold upon receipt. SDP can experience hypothetical and realised gains or losses on surplus RECs. Hypothetical gains or losses are the difference between SDP's contract price for RECs and the market price for RECs at the time the RECs become surplus to SDP; whereas realised gains or losses relate to the difference between the market price for RECs at the time SDP actually sells the surplus RECs relative to the spot price assumed in the hypothetical calculation.

The Methodology Paper calculates the overall annual gain or loss on surplus RECs as the net amount of two components:⁸⁵

- 1. **hypothetical gain or loss** the gain or loss on the assumption that all surplus RECs acquired in the year are sold at the time of receipt at the spot price at the time SDP receives the surplus RECs, and
- 2. **realised gains or losses** gains or losses from RECs actually sold in the year by SDP relative to the spot price assumed in the hypothetical calculation.

Box 7.2 illustrates how this calculation would work in practice and how it provides greater transparency of SDP's management of surplus RECs.

Box 7.2 Shortfall adjustments for RECs: An illustrative example

Assume SDP receives RECs in January 2013 at a contract price of \$50 per REC. The spot price at the time is assumed to be \$35 per REC. If it chose to sell the RECs at this point in time, SDP would have made a \$15 loss on each REC. This is the **hypothetical loss**.

Instead, SDP banked these RECs until December 2013 and sold them at a spot price of \$45 per REC. SDP's **realised gain** is \$10 per REC (ie, the difference in the two spot prices).

Overall, therefore, SDP has made a net loss of \$5 per REC (ie, the sum of the hypothetical loss and realised gain). If this transaction was deemed prudent, we would pass through the net loss into SDP's prices, subject to the core band.

The overall gain or loss could be more simply calculated by subtracting the sale price from the contract price (ie, in the above example \$45 per REC minus \$50 per REC).

However, by calculating the overall gain or loss as the net amount of two components, we are able to track and assess SDP's management of surplus RECs in a more transparent manner. In this example, it is made clear that SDP's decision to bank RECs offset some of the hypothetical loss.

⁸⁵ IPART, Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms - Methodology Paper, April 2012, p 24.

Accounting for financing costs

When accounting for financing costs in calculating pass through amounts, the Methodology Paper states 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.⁸⁶

However, the Reserve Bank of Australia (RBA) has discontinued this data series. As a substitute for the discontinued series, and to account for financing costs, we propose using either the RBA's:

- "non-financial corporate BBB-rated bonds yield 3 year target tenor", or
- "non-financial corporate BBB-rated bonds yield 5 year target tenor".87

Figure 7.1 presents the two series above on a comparative basis to the original series for the period in which they overlapped (ie, November 2012 to November 2013). Values on the x-axis represent the original series, while values on the y-axis show the relative values of the two alternatives compared to the original series at the same point in time. For example, the original series was 4.8% in April 2013. At the same time the 3-year series was 4.6% (blue point), and the 5-year series was 5.2% (red point).

The 3-year series appears to be a better match for the original series, and is an indicative average of the timeframe over which holding costs need to be calculated. The alternative 5-year series is, however, more reflective of the term of the regulatory period.

We are seeking stakeholder comments on which of the two series (or any other alternative) should be used to escalate pass through amounts to the end of the current determination period.

We are also seeking stakeholder comments on what discount rate to use for the net present value calculation when adjusting the notional revenue requirement over the 2017 Determination.⁸⁸ We propose that this discount rate be consistent with that used to escalate the historical resale gains or losses. We consider the most recent observation should be used for this purpose.⁸⁹

⁸⁶ Reserve Bank of Australia, Table F3 Capital Market Yields and Spreads - Non-Government Instruments. See IPART, Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms - Methodology Paper, April 2012, p 25.

⁸⁷ Reserve Bank of Australia, http://www.rba.gov.au/statistics/tables/#interest-rates, Aggregate Measures of Australian Corporate Bond Spreads and Yields – F3, accessed 12 August 2016.

⁸⁸ The Methodology Paper is not specific on this issue and says that revenue should be "discounted at the financing interest rate". See IPART, Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms - Methodology Paper, April 2012, p 25.

⁸⁹ For example, we could take the most recent quarterly observation available at the time of making the 2017 Determination. Alternatively, we could take the average at the end of each quarter of the most recent year.



Figure 7.1 Comparison of RBA data series to account for financing costs for historical energy resale gains or losses

Data source: http://www.rba.gov.au/statistics/tables/#interest-rates, Aggregate Measures of Australian Corporate Bond Spreads and Yields – F3, Non-financial corporate BBB-rated bonds – Yield – 3-year target tenor, Non-financial corporate BBB-rated bonds – Yield – 5-year target tenor, Corporate bond yield (with 1 to 5 years to maturity; BBB bond credit rating [no longer available]).

7.2 Review of the energy adjustment mechanism

IPART seeks comments on the following

29 What aspects of the energy adjustment mechanism should be updated or amended for implementation at future price reviews?

We have decided to review the EnAM methodology (as outlined in the Methodology Paper). The changes made to the EnAM as a result of this review will not affect the 2017 Determination, but will affect future price determinations.

Certain aspects of the EnAM are not open to consultation as they are prescribed by the terms of reference, including that the EnAM must:

- address SDP's risk exposure to actual gains and losses associated with the sale of surplus energy
- apply to both the costs of electricity and RECs
- be pegged to SDP's contracts with Infigen, and

 specify a core band beyond which gains and losses on the resale of surplus energy are shared between SDP and its customers.⁹⁰

Under the terms of reference, the EnAM also applies only when SDP is in a **shutdown or restart mode**, and has **complied with its requirements** to maintain and operate the desalination plant under its network operator licence.

As further context, Box 7.3 clarifies the (then) Government's intention of the EnAM.

Box 7.3 The intention of the energy adjustment mechanism

For clarity, the Minister administering the WIC Act further advised that the intention of the energy adjustment mechanism is that:

- 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).
- 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.

Source: Letter to IPART 16 February 2012. See full terms of reference at Appendix A.

7.2.1 What aspects of the EnAM methodology are under review?

At this stage, we have no firm views on what methodological aspects of the EnAM need amending. However, through our implementation of the EnAM when setting prices for the 2017 determination period, we may identify areas that require refinement.

⁹⁰ See terms of reference at Appendix A.

7 Energy and Efficiency Adjustment Mechanisms

Key issues we seek stakeholder input on include:

- calculation method for resale gains or losses
- threshold level and pass-through formula ie, the appropriate allocation of gains and losses on surplus energy between SDP and its customers
- treatment of unrealised gains or losses arising from the 'banking' of surplus RECs
- market price of electricity and RECs (data sources and averaging methods and periods), and
- interest rate used to account for financing costs.

Relationship between the EnAM and the Infigen Contracts

Currently, the EnAM will not apply in the event that:

- either party terminates the Infigen Contracts, or
- SDP assigns or novates the Infigen Contracts to a third party (other than to a person who purchases SDP's entire interest in the desalination plant).⁹¹

Notwithstanding the above, any loss or gain accruing to SDP as a result of the assignment or termination of one of the Infigen Contracts – including any payment received or made by SDP – is subject to the EnAM.

The EnAM is also premised on the continued operation of SDP's existing Infigen Contracts. Specifically, if any of the terms of the Infigen Contracts is amended, the EnAM will be based on the terms of the Infigen Contracts as at 31 March 2010.

We are interested in stakeholder views on whether gains or losses on termination of the Infigen Contracts should still be subject to the EnAM and whether the EnAM should allow for changes to the terms of the Infigen Contracts if they arise.

Relationship between the EnAM and SDP's incentives to operate

There may also be a need to consider how the EnAM interacts with SDP's incentives to operate, either as a result of new operating rules that arise as part of a new Metropolitan Water Plan or new operating modes proposed by SDP and/or other stakeholders.

In particular, the EnAM applies only in shutdown and restart modes. We are exploring ways to introduce greater operating flexibility for SDP outside the 70/80 rule as part of this review. If the EnAM does not apply when the plant is producing desalinated water outside the 70/80 rule, SDP may at times have an incentive to remain in shutdown mode.

⁹¹ IPART, Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms - Methodology Paper, April 2012, p 8.

7.3 Implementing the efficiency adjustment mechanism

IPART seeks comments on the following

30 Is our proposed implementation of the efficiency adjustment mechanism for the current price review appropriate?

7.3.1 What does the efficiency adjustment mechanism set out to achieve?

Under our standard 'price cap' form of regulation, businesses have an incentive to reduce costs below that assumed by the regulator in order to earn excess profits. This is an intended feature of the form of regulation and gives businesses an incentive to reveal efficiency savings, which can then be passed through to customers, through lower prices, at the next price review.

A shortcoming of this approach is that the business's incentive to achieve efficiency savings is not constant over time. That is, a permanent saving made in the first year of a 5-year regulatory period can be held for five years, whereas a saving made in the last year of a regulatory period can be held for only 1-year. This can result in businesses having an incentive to delay revealing efficiency savings from the end of a regulatory period to the beginning of the next period.

The EfAM is a regulatory tool used to equalise the incentive to achieve efficient savings over the regulatory period. That is, the EfAM ensures the business is able to retain efficiency savings for a fixed period of time (regardless of when these savings are achieved within a regulatory period) before they are passed on to customers through lower prices. Equalising the strength of the incentive over time should remove any potential incentive to delay efficiency savings and means that customers should benefit from efficiency savings sooner.

Under the terms of reference, we are required to implement an EfAM (see Box 7.4). The Methodology Paper sets out the design of the EfAM and how we intend to implement it as part of the 2017 Determination.

Box 7.4 EfAM is a requirement set out in the terms of reference

The terms of reference specify that for each price determination other than the first price determination:

- 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 four years following the year in which the efficiency saving was achieved.
- In calculating the notional revenue requirement, IPART should determine the demonstrated efficiency savings...in accordance with the Methodology Paper.

Water supply services provided by SDP refer to:

- 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.

Therefore, the terms of reference set out three key requirements of the EfAM:

- efficiency savings should be net of efficiency losses
- the mechanism should apply to both operating and non-operating modes, and
- the mechanism should allow efficiency savings to be held for four years following the year in which the efficiency saving was achieved.

7.3.2 How is the efficiency adjustment pass-through calculated?

SDP has the option to apply for an efficiency carryover in its price submission to this review. The Methodology Paper sets out that efficiencies must:

- be driven by management initiatives
- represent improvements in productive efficiency (ie, less input per unit of output), and
- be net of any efficiency losses (ie, represent true 'whole of business' efficiency savings that can be passed on to customers through lower prices).⁹²

The EfAM applies only to non-energy related operating expenditure. Efficiencies are also to be classified as either 'mode-specific' or 'general'. Mode-specific efficiencies are only carried over to the extent SDP continues to operate in that same mode during the carryover period. General efficiencies are to be carried over regardless of which operating mode SDP is in during the carryover period.

The onus is on SDP to demonstrate how any efficiency saving satisfies the criteria set out in the Methodology Paper. Stakeholders will have an opportunity to review and respond to any proposal from SDP for an efficiency carryover.

⁹² IPART, Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms - Methodology Paper, April 2012, pp 15-16.

We note that EfAM will not replace our assessment of SDP's operating expenses as part of the price review process. Rather, EfAM will be one of several factors taken into account when setting future operating expenditure allowances.

A challenge will be that we will not know actual expenditure in the last year of the current regulatory period. In our Methodology Paper, we propose to estimate the final year's costs based on the most recent information available at the time.⁹³

Appendix F provides illustrative examples of the key design features of the EfAM as set out in the Methodology Paper.

7.4 Review of the efficiency adjustment mechanism

IPART seeks comments on the following

- 31 What aspects of the efficiency adjustment mechanism should be updated or amended for implementation at future price reviews?
- 32 Should we extend the efficiency carryover mechanism that we introduced for Sydney Water, Hunter Water and WaterNSW to SDP?

The price review presents an opportunity for us to concurrently review, consult on, and if necessary update our EfAM methodology. Any updates to the methodology would apply to actual costs SDP incurs from 1 July 2017, and impact prices for the next regulatory period (ie, similar to the EnAM we are not proposing to change the methodology to apply in the current price review).⁹⁴

In particular, we are interested in whether there are any ambiguities or redundancies in our EfAM. Key issues we seek stakeholder input on include:

Efficiency savings and losses – the terms of reference state that efficiency savings are net of any efficiency losses. We understand this to mean that efficiency savings should result in lower overall costs and therefore lower prices for customers. However, the Methodology Paper says that efficiency gains and losses will be taken into account on a symmetrical basis.⁹⁵ This could be inferred to mean that the EfAM could carryover efficiency losses for five years before passing these on to customers. We consider there is a risk that allowing 'efficiency losses' to be included in the EfAM could result in upward pressure on operating cost allowances over time. If costs are driven up by poor management decisions, these increases should not be passed onto consumers.

⁹³ IPART, Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms - Methodology Paper, April 2012, p 27.

⁹⁴ The next regulatory period refers to prices set for SDP beyond this 2017 determination period.

⁹⁵ IPART, Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms - Methodology Paper, April 2012, p 20.

- Management initiative the Methodology Paper requires that efficiencies are linked to management initiatives and relate to SDP's internal productive efficiency. There might be difficultly demonstrating this in practice. We consider this design feature may become redundant if the EfAM is designed instead to clearly reflect permanent efficiency savings in future operating allowances. That is, the business in this case would only apply for a saving if it is confident that the saving is in fact permanent (ie, and would not need to demonstrate whether it is as a result of management initiatives).
- ▼ **Mode-specific** although mode-dependent efficiencies might apply in principle there might also be difficulties demonstrating this in practice. We question whether this aspect of the EfAM adds unnecessary complexity and therefore whether there are opportunities to improve this design feature.
- ▼ Impact of any existing incentive mechanisms between SDP and plant operator – the relationship between SDP (owner) and Veolia (operator) may have several implications for the application of the EfAM. Most relevant to our implementation of the EfAM is any underlying efficiency sharing arrangement built into the O&M contract. We seek input on whether there are any unintended consequences or limitations of applying the EfAM as currently designed given any efficiency sharing arrangements or agreements between SDP and its plant operator.

Efficiency carryover mechanisms applied to other IPART regulated water businesses

We introduced an efficiency carryover mechanism (ECM) in our recent price reviews for Sydney Water, Hunter Water and WaterNSW. Our ECM:

- ensures the businesses are able to retain permanent reductions in controllable operating expenditure for four years before they are passed on to customers through lower prices, and
- ▼ allows the businesses to retain temporary over and under spends in controllable operating expenditure.

We consider this ECM to be consistent with SDP's terms of reference and seek stakeholder comments on whether we should extend the ECM we introduced for Sydney Water, Hunter Water and WaterNSW to SDP (except we would have to extend the regulatory and holding periods from four to five years).[%] The ECM would also help overcome the challenge of us having to estimate the final year as currently proposed in our Methodology Paper.

Box 7.5 summarises the ECM developed through our 2016 price reviews for Sydney Water, Hunter Water and WaterNSW. Our Sydney Water Final Report includes more information on the ECM.

⁹⁶ Noting that the holding period under terms of reference is four years following the year in which the efficiency saving was achieved.

Box 7.5 IPART's Efficiency Carryover Mechanism

In our recent price reviews for Sydney Water, Hunter Water and WaterNSW, we introduced an ECM. The objective of the ECM is to equalise the existing incentive to achieve permanent cost savings over time as this is expected to be in the long term interests of customers.

The process for implementing the ECM at the next price review can be described in four steps:

- 1. Did the regulated entity permanently reduce total controllable operating costs below the allowance (\$X)?
- 2. In which year was this saving achieved (n)?
- Ensure the allowance in the next regulatory period is reduced to reflect the saving = \$X.
- 4. Carryover an efficiency benefit to the next regulatory period equal to \$X*(n-1) to ensure the regulated entity retains the benefit for four years.

Our ECM is asymmetric in the sense that while it equalises the incentive to achieve **permanent efficiency savings** over time, it preserves all other features of the current form of regulation, including:

- Permanent cost increases are held by the business until the next price determination and assessed by the regulator. If determined to be efficient, they are passed on to customers (through price increases as a result of an increase in the business's operating expenditure allowance). This provides an incentive to the business to avoid inefficient increases in costs because these will not be passed on to customers.
- Temporary over and under spends are retained by the business this provides an incentive for the business to manage within its budget.

Source: IPART, *Review of prices for Sydney Water Corporation from 1 July 2016 to 30 June 2020 – Final Report*, June 2016, pp 53-60.

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:

- 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.
- 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

A Terms of reference

- 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

Lon

Greg Pearce MLC Minister for Finance and Services Minister for the Illawarra

16 Febra 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 dependent 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 principles:

- 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).
- 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.
- The amount of any adjustments under the mechanisms in principle 8 should each be separately quantified and published by IPART.

A Terms of reference

- 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.
- 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 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 Matter to be considered under section 15 of the IPART Act

In making determinations, IPART is required under section 15 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
- standards of quality, reliability and safety of the services concerned (whether those standards are specified by legislation, agreement or otherwise).

C Overview of SDP

In this appendix, we provide a more detailed overview of SDP's characteristics, ownership, and licensing arrangements.

C.1 Characteristics of the desalination plant

SDP is a large scale reverse osmosis desalination plant located on the coast of Kurnell, 25 kilometres from Sydney's CBD. It can produce up to 250 ML of drinking water per day (average daily output), which is equivalent to about 15% of Sydney's total drinking water supplies.⁹⁷ SDP produces drinking water by forcing sea water through membranes at high pressure to remove the salt. This process requires considerable amounts of energy.

The Metropolitan Water Plan outlines the conditions under which SDP may be expanded to 500 ML per day capacity. The 2010 Metropolitan Water Plan currently states that SDP may be expanded in the event of a rare and extreme drought or in the longer term to supply a growing population.⁹⁸

SDP's major physical assets include:

- The desalination plant, which removes dissolved salts and other particles from seawater to produce freshwater. This is then treated to meet Australian Drinking Water Guidelines.
- The seawater intake and outlet tunnels and risers, sized for the plant's full potential capacity of 500 ML per day.
- A drinking water pumping station with an initial pumping capacity of 250 ML per day, and sufficient space to be scaled up to the full potential capacity of 500 ML per day.
- The 45 hectares of land on which the desalination plant and pumping station are located.

⁹⁷ SDP, Water supply, at http://www.sydneydesal.com.au/what-we-do/water-supply/, accessed on 6 July 2016.

⁹⁸ NSW Government, 2010 Metropolitan Water Plan, August 2010, p 57.

Drinking water is discharged to the Sydney Water network along an 18 kilometre pipeline also owned by SDP. This pipeline runs from the plant to the Sydney Water's main water supply at Erskineville under Botany Bay.⁹⁹

C.2 SDP's ownership structure

SDP is owned by the NSW Government.¹⁰⁰ On 1 June 2012, the Government undertook refinancing of SDP and entered into a \$2.3 billion pre-paid finance lease.¹⁰¹

The successful bidders were a consortium composed of Ontario Teachers' Pension Plan Board and The Infrastructure Fund.¹⁰² The 50-year lease includes all the assets associated with SDP - ie, the desalination plant, site and pipeline.¹⁰³ The objectives of refinancing were to:

- maximise the proceeds for the Government, subject to reliable and responsible operations of the plant, and
- create additional capacity for investment in other priorities.¹⁰⁴

As part of the transaction, SDP repaid outstanding debt, totalling \$1.8 billion, to NSW Treasury.¹⁰⁵ The Government indicated it received net proceeds of more than \$300 million from the refinancing.¹⁰⁶

At the conclusion of the lease, the residual assets will transfer from the Government to the lessee subject to:

- complying with water quality rules
- operating the plant in a safe and reliable way

⁹⁹ SDP, Infrastructure, at http://www.sydneydesal.com.au/how-we-do-it/infrastructure/, accessed on 6 July 2016.

¹⁰⁰ 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, 176.

¹⁰¹ Sydney Water Corporation, Annual Report, 30 June 2012, p 50.

¹⁰² SDP, Ownership structure, at http://www.sydneydesal.com.au/who-we-are/ownershipstructure/, accessed on 11 July 2016.

¹⁰³ Audit Office of NSW, NSW Auditor-General's Report, Financial Audit, Volume Six 2012, Focusing on Environment, Water and Regional Infrastructure, p 27.

¹⁰⁴ Sydney Water Corporation, Annual Report, 30 June 2012, p 50.

¹⁰⁵ Audit Office of NSW, NSW Auditor-General's Report, Financial Audit, Volume Six 2012, Focusing on Environment, Water and Regional Infrastructure, p 27.

¹⁰⁶ NSW Government, Successful lease of the Sydney Desalination Plant announced, Media Release, 11 May 2012.

C Overview of SDP

- expanding the plant if/as requested by the Government, and
- complying with all licences.¹⁰⁷

A schema of SDP's ownership structure is presented in Figure C.1.

¹⁰⁷ NSW Government, Successful lease of the Sydney Desalination Plant announced, Media Release, 11 May 2012.





Data source: Adapted from Audit Office of NSW, NSW Auditor-General's Report, Financial Audit, Volume Six 2012, Focusing on Environment, Water and Regional Infrastructure, p 27.

C.3 Licensing requirements for SDP

SDP's operations are governed by various legislative instruments, which influence its operations to varying degrees.

C.3.1 WIC Act Licences

SDP holds a network operator's licence and retail supplier's licence under the WIC Act. IPART administers and reviews these licences.

The licences include a range of obligations under the *Water Industry Competition* (*General*) *Regulation 2008*. In particular, SDP is obliged to prepare and implement licensing plans relating to:

- water quality
- infrastructure operation, and
- ▼ retail supply management.

There are specific requirements for these plans. For example, the water quality plan must be consistent with the 12 elements of the Australian Drinking Water Guidelines and show how the guidelines are addressed and will be implemented. There are also requirements regarding the content of and compliance with the plans. IPART audits SDP to ensure compliance with the plans.

The 70/80 rule

SDP's network operator's licence granted under the WIC Act gives effect to the 70/80 rule in the current Metropolitan Water Plan. The licence is subject to the following condition:

When Available Storage falls below 70%, the Licence Holder must, until the Available Storage¹⁰⁸ rises to 80%, operate and maintain the Water Industry Infrastructure with the objective of maximising the production of drinking water for the exclusive supply into the Sydney Water Corporation's area of operation (as defined in Sydney Water's Operating Licence).¹⁰⁹

¹⁰⁸ Available Storage is defined in the licence:

[&]quot;the available storage in Sydney's water supply reservoirs as published on a weekly basis on the website of the Sydney Catchment Authority. If for any reason the Sydney Catchment Authority 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."

¹⁰⁹ Condition A2(b) of the licence.

We note that this licence condition does not require SDP to cease operating the plant when available storage reaches 80%. But, when dam levels fall below 70% and until they rise to 80%, SDP **must** operate the plant with the objective of maximising the production of drinking water under the 70/80 rule.

If the forthcoming update to the Metropolitan Water Plan introduces a new operating regime for SDP, SDP's licence conditions may need to be amended accordingly (ie, even ahead of the transitioning of SDP's licences to the amended licensing framework, which is explained in more detail below).

SDP may supply customers other than Sydney Water

SDP is authorised to supply "any person other than a Small Retail Customer¹¹⁰" within "Sydney Water Corporation's area of operations (as defined in the Sydney Water Operating Licence)".¹¹¹

Review of the WIC Act

The Metropolitan Water Directorate recently completed a periodic review of the WIC Act. In response to the review, extensive changes to the WIC Act licensing framework were recommended and passed by the NSW Parliament in October 2014, as the *Water Industry Competition Amendment (Review) Act 2014* (Amending Act). Details of the main changes are outlined in Box C.1.

¹¹⁰ A person is a 'small retail customer' in relation to water supply if the maximum rate at which water is supplied, pursuant to one or more water supply contracts, to all premises that the person owns, leases or occupies is less than 15 megalitres per year: *Water Industry Competition* (*General*) *Regulation 2008*, cl 5(1).

¹¹¹ SDP is authorised to do so under its retail supplier's licence granted under the WIC Act.

Box C.1 Key features of the WIC Act amendments

The amendments to the WIC Act will:

- narrow the current licensing regime to focus on utility-like schemes, bulk water and sewerage facilities, and other prescribed infrastructure (including higher risk recycling schemes)
- provide for entity wide licensing and a separate scheme approval process
- bring metropolitan council schemes that meet these thresholds into the WIC Act
- remove barriers to entry for the private sector (including the current requirement for new entrants to source sufficient water other than from public water utilities)
- strengthen customer protections by improving the provider of last resort provisions and ensuring buyers are aware, when purchasing a property, if a private utility will provide water or sewerage services, and
- increase penalties so they are commensurate with the types of activities being regulated, and include review and appeal provisions.

Data source: Metropolitan Water Directorate, *Water Industry Competition Amendment (Review) Act 2014*, at https://www.metrowater.nsw.gov.au/water-industry-reform/wic-amendment-act, accessed on 14 July 2016.

The Metropolitan Water Directorate, within DPI Water, has indicated that commencement of the Amending Act has been delayed until mid-2017.¹¹² Before the Amending Act commences, the *Water Industry Competition (General) Regulation* 2008 will be revised to reflect the changes to the WIC Act.¹¹³ During this next phase of the review, stakeholders will be able to comment on the provisions that underpin the WIC Act framework.¹¹⁴

IPART is required to transition all existing WIC Act licences to the amending WIC Act framework. Contingent on the review of the WIC Act framework being finalised in time, we will consider its implications for SDP's licence and our determination of SDP's prices.

Five year review of SDP's licences

IPART is required to review SDP's WIC Act licences after five years. On 29 July 2015, we commenced our review of SDP's licences and made recommendations to the Minister. The Minister is currently considering our recommendations.

¹¹² IPART, Newsletter – Water Licensing and Compliance – Issue 3, June 2016, p 1.

¹¹³ Metropolitan Water Directorate, at https://www.metrowater.nsw.gov.au/water-industryreform/wic-amendment-act, accessed on 14 July 2016.

¹¹⁴ Metropolitan Water Directorate, at https://www.metrowater.nsw.gov.au/water-industryreform/wic-amendment-act, accessed on 14 July 2016.

Should the Minister accept our recommendations, we consider that the proposed minor changes are unlikely to have any material impact on SDP's operating costs. Rather, our recommendations focus upon ensuring that the licence is consistent with current standard licence conditions. These have been developed and implemented since SDP's licences were issued and are used as the base template for all new WIC Act licences and variations to licences. Where appropriate, we will ensure that any changes to the licence conditions are reflected in our review and determination of SDP's prices.

C.3.2 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.¹¹⁵ This licence is scheduled to be reviewed in October 2018.

¹¹⁵ EPA, *Licence summary*, at http://www.epa.nsw.gov.au/prpoeoapp/ Detail.aspx?instid=12904&id=12904&option=licence&searchrange=licence&range=POEO%20lic ence&prp=no&status=Issued, accessed on 6 July 2016.

D 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 2012 and propose to continue to use in 2017.

D.1 Components of the building block

The notional revenue requirement 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.

We propose to continue using a building block method to calculate SDP's revenue requirement. This method involves determining, for each year of the 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 revenue must recover the cost of maintaining the RAB. 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 will use a real post-tax WACC to calculate the allowances of a return on assets and regulatory depreciation, 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.

The sum of these allowances is the notional revenue requirement (see Figure D.1).



Figure D.1 Building block approach

D.2 Calculating SDP's notional revenue requirement for each mode of operation

The notional revenue requirement represents our view of the total efficient costs of SDP providing its monopoly services in each year of the determination period. In general, we set prices to recover this amount of revenue.

SDP's costs vary depending on whether it is in full operation mode or in one of its four shutdown modes. As a result, we need to calculate its annual notional revenue requirement for each mode of operation.

For the 2012 Determination, we calculated a notional daily revenue requirement when the plant is in full operation mode using the approach outlined above. We then calculated a notional daily revenue requirement when the plant is in each of the other modes (eg, one of the four shutdown modes) by:

- calculating SDP's efficient operating and maintenance expenditure when in this mode (eg, Water Security Shutdown), and
- substituting this expenditure for the operating expenditure in the notional revenue requirement for full operation mode.

Using this approach, we set separate prices for each mode of operation. These prices were set to generate the full notional daily revenue requirement for the relevant mode.

D.3 Return on assets and regulatory depreciation

To calculate the allowances for a return on assets and regulatory depreciation 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 to apply to SDP's RAB, and
- the appropriate rate of return (eg, using the WACC) on SDP's RAB.

In the 2012 Determination, we set a separate RAB for the pipeline. We propose to continue this approach.

D.3.1 The value of the Regulatory Asset Base

In general, to determine the value of the RAB for SDP and the pipeline over the 2017 determination period, we:

- ▼ Take the RAB value we determined at the start of the 2012 determination period (the opening RAB) and incorporate SDP's prudent and efficient actual capital expenditure over the 2012 determination period, and make adjustments to account for other changes to the RAB over the period (eg, any asset disposals). This determines the opening RAB for the 2017 determination period.
- ▼ Roll forward this opening RAB to the end of the 2017 determination period by including prudent and efficient forecast capital expenditure over the 2017 determination period, and making adjustments to account for other forecast changes to the RAB (eg, regulatory depreciation allowance, asset disposals). This gives the forecast RAB for each year of the 2017 period.

D.3.2 Asset lives

In the 2012 Determination, we accepted SDP's proposal to calculate the depreciation allowance using the asset lives it put forward, given our consultant's advice that these lives were appropriate. Table D.1 below shows SDP's proposed economic lives for each asset category.

In line with this decision and the straight-line depreciation method, SDP's assets were depreciated at a rate of approximately 2.2% per annum over the 2012 determination period. This means that, in general terms, we calculated the allowance for regulatory depreciation by multiplying the annual value of the RABs over the determination period by 2.2%.¹¹⁶

	Proposed economic lives
Original SDP assets	
Plant	30
Intake infrastructure	90
Outlet infrastructure	100
Pumping station	25
Pre-operations payment	20
Sydney Water related costs	44
Non-depreciating	n/a
Future SDP capital expenditure	
Civil	90
Electrical	20
Mechanical	15
Electronic	15
Non-depreciating	n/a
Distribution pipeline	
Civil	140
Electrical	30
Mechanical	40
Electronic	15
Non-depreciating	n/a

Table D.1 SDP proposed asset lives in the 2012 Determination

Source: SDP submission to IPART: review of prices for SDP, 8 July 2011, p 27, Table 5.4.

D.4 Tax allowance

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.

Our standard approach is to calculate the tax allowance for each year by applying a 30% statutory corporate tax rate adjusted for gamma to the utility's (nominal) taxable income.¹¹⁷ For this purpose, taxable income is the notional revenue requirement (excluding tax allowance) less operating cost allowances, tax depreciation, and interest expenses.

¹¹⁶ IPART, Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2012 - Final Report, December 2011, p 75.

¹¹⁷ Under a post-tax framework, the value of franking credits (gamma) enters the regulatory decision only through the estimate of the tax liability.

E Calculating shortfall adjustments for electricity and RECs

In this appendix, we discuss some of the data sources and averaging periods we propose to use to calculate the pass-through amounts for SDP's electricity and RECS gains and losses.

E.1 Shortfall adjustments for electricity

In accordance with the Methodology Paper, we propose using electricity halfhourly spot prices to calculate SDP's electricity resale gains and losses.¹¹⁸

In particular, we propose using Australian Energy Market Operator's (AEMO) monthly average spot price.¹¹⁹ SDP's fixed annual contract price would be subtracted from the monthly average spot price to determine the realised gain/loss per MWh. To account for potential misalignment between the EnAM that operates on a financial year basis and SDP's contracts that operate on a calendar year basis, we will use the annual electricity price SDP incurs under its contract in the relevant calendar year (ie, adopt a 'like for like' approach).¹²⁰

SDP's actual monthly volumes of electricity used will be compared to its minimum contract volume to determine the shortfall in electricity (we propose dividing the annual contracted volume by 12 to obtain a monthly contracted volume). If actual volumes are greater than the minimum contracted volume for the month, a zero result is returned (ie, no surplus electricity to sell). If monthly volumes are less than the minimum contracted volume, the difference is multiplied by the realised gain/loss per MWh.

¹¹⁸ IPART, Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms - Methodology Paper, April 2012, p 21.

¹¹⁹ AEMO, Average Price Tables, http://www.aemo.com.au/Electricity/Data/Price-and-Demand/Average-Price-Tables

¹²⁰ For example, the average AEMO half-hourly spot price for December 2013 would be compared to SDP's annual contract price for calendar year 2013; whereas January 2014 would be compared to SDP's annual contract price for calendar year 2014.

E.2 Shortfall adjustments for Renewable Energy Certificates

Similar to electricity, we propose using a spot price to reflect the market price for RECs. The spot price of RECs is defined in the Methodology Paper as:

...the time weighted average of the "last / mkt" prices specified in A\$/MWh for "all spot T+3" transactions of "LGCs (LRETs)" occurring in the final month of each calendar quarter, as published in the Greenroom report (or equivalent).¹²¹

The Greenroom reports (supplied by Nextgen) are no longer available. We have engaged TFS Green Australia (another green market operator) to provide the required RECs data.¹²²

In accordance with the Methodology Paper, we will use the last market price recorded each Friday to calculate a time-weighted average spot price for each month.¹²³ We only use the time-weighted spot price for the **last month** in each calendar quarter to calculate hypothetical and realised gains or losses.

We propose employing a first-in first-out approach to calculate the overall annual gain or loss on surplus RECs. This method of inventory valuation assumes that RECs are sold in the same chronological order in which they are received. We propose using the first-in first-out approach because it is administratively prohibitive to track individual RECs through the market – ie, from time received to time of sale.

Adopting a first-in first-out approach means that:

 Hypothetical gains or losses will compare SDP's contract price to the spot price at the time surplus RECs are received (where the spot price is the timeweighted price for the last month of the calendar quarter in which the RECs are received).

Realised gains or losses will compare the sale price received by SDP for RECs sold in the market to the spot price of the 'first available' or 'oldest' tranche of surplus RECs banked by SDP (ie, the time-weighted price for the last month of the calendar quarter those RECs were received).

¹²¹ IPART, Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms - Methodology Paper, April 2012, p 24.

¹²² TFS Green Australia provides comprehensive spot trade data on a transaction by transaction basis - ie, we receive the date, volume and price for each REC transaction on the market. The Greenroom reports typically reported only the last market price on a Friday.

¹²³ The time weighted average means that each price typically gets a 7-day weighting. However, if a Friday falls before the 7th of a month, it receives a reduced weighting. For example, Friday the 4th would get four days of weighting in the month being considered, and three days of weighting in the previous month.

F Application of the efficiency adjustment mechanism

We have developed two examples to illustrate the key design features of the EfAM as set out in the current Methodology Paper. The values in the tables represent daily non-energy operating expenditure allowances (note that the values shown are for illustration only).

For simplicity, we have assumed that SDP moves between mode 5 (Water Security Shutdown) in years 1 to 3, then to mode 1 (Plant Operation) in years 4 to 7 and finally back to mode 5 (Water Security Shutdown) in years 8 to 10. That is, the plant is off in years 1 to 3, on in years 4 to 7 and off again in years 8 to 10.

Because SDP is switching between modes through the example, we have greyed out figures that do not apply in that particular year.

F.1 Example 1: mode-specific efficiency (see Table F.1)

The following points step through this example:

- In regulatory period 1, SDP has a regulatory allowance of \$1,000 per day in mode 1 (M1 base allowance) and \$500 per day in mode 5 (M5 base allowance).
- ▼ SDP spends its full allowance (\$500) in years 1 to 3.
- In year 4, the plant switches on and SDP spends \$900 of its \$1,000 allowance. This represents a gain of \$100. Since this efficiency was achieved in year 4, an 'incremental gain' of \$100 is recorded.
- SDP maintains this gain in year 5 recording another within period gain of \$100. The gain in year 5 equals the gain in year 4 so there is no additional or 'incremental' gain in year 5.
- When prices are reviewed at the end of the first regulatory period, four things happen:
 - 1. A decision is made on whether the \$100 efficiency was mode-specific or general. In this case it is determined to be specific to mode 1.
 - 2. The base allowances are reset for regulatory period 2.
 - i) The M1 base allowance falls from \$1,000 per day to \$850 per day. This \$150 reduction is greater than the revealed efficiency of \$100. This demonstrates that IPART has discretion to set allowances to reflect efficient costs.
- ii) The M5 base allowance falls from \$500 per day to \$450 per day. Notice that this base allowance is not adjusted to reflect the \$100 mode-specific efficiency.
- 3. The EfAM calculations are performed. In this case, an incremental efficiency was recorded in year 4. Under the EfAM, gains are to be held in the year they occur plus an additional four years. The gains are held as 'within period gains' in years 4 and 5. Therefore, 'mode-specific EfAM gains' are available in years 6, 7 and 8.
- 4. Net allowances are then calculated for each mode.
 - i) For M1, the net allowance is the base allowance (\$850) plus the mode-specific EfAM gain (\$100) in years 6, 7 and 8. Therefore, the net allowance becomes \$950.
 - ii) For M5, the net allowance equals the base allowance (\$450). It is not adjusted by the EfAM gain because the efficiency is deemed mode-specific.
- While SDP continues to operate in mode 1 (years 6 and 7), it will receive the EfAM gain of \$100.
- In year 8, the plant shuts down and SDP receives the M5 base allowance which excludes the \$100 EfAM gain. Note that if SDP was in M1 in year 8, it would receive the \$100 EfAM gain in this year.
- In years 9 and 10, SDP continues to be in shutdown and receives the M5 base allowance. Note that the mode-specific EfAM gain ceases in year 8. If SDP was to be turned back on in years 9 and 10, the allowance it receives (M1 net allowance) would not include any EfAM gain.

\$/day	Regulatory Period 1				Regulatory Period 2					
	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
Mode	5	5	5	1	1	1	1	5	5	5
M1 base allowance	1,000	1,000	1,000	1,000	1,000	850	850	850	850	850
M5 base allowance	500	500	500	500	500	450	450	450	450	450
Actual expenditure	500	500	500	900	900	850	850	450	450	450
Within period gain	-	-	-	100	100	-	-	-	-	-
Incremental gain	-	-	-	100	-	-	-	-	-	-
EfAM calc yr1		-	-	-	-					
EfAM calc yr2			-	-	-	-				
EfAM calc yr3				-	-	-	-			
EfAM calc yr4					100	100	100	100		
EfAM calc yr5						-	-	-	-	
Mode-specific EfAM gain						100	100	100	-	-
M1 net allowance ^a						950	950	950	850	850
M5 net allowance ^b						450	450	450	450	450
Actual gain						100	100	-	-	-

Table F.1 Mode-specific efficiency adjustment mechanism

a Equals the base allowance of \$850 plus the mode-specific EfAM gain of \$100.

b Same as the base allowance of \$450 because the EfAM gain is specific to mode 1.

Note: the base allowances for regulatory period 2 are not tied directly to actual expenditure in period 1. Efficiency carryover amounts should also be indexed for inflation, however we have kept the example simple and not included the effects of inflation.

F.2 Example 2: general efficiency (see Table F.2)

In this example, the efficiency is determined to be general. That is, it applies to all modes of operation. In this case, the major differences are:

- ▼ The efficiency saving has affected the base allowances for both mode 1 (falling from \$1,000 to \$850) and mode 5 (falling from \$500 to \$350). Notice that both allowances are adjusted to reflect the general efficiency saving of \$100, unlike the example above.
- ▼ The general EfAM gain is added to both the mode 1 and mode 5 base allowances when calculating net allowances. Therefore, the net allowance for mode 1 becomes \$950 in years 6, 7 and 8 and the net allowance for mode 5 becomes \$450 in years 6, 7 and 8.
- The general EfAM gain is received in full regardless of which operating mode occurs during the carryover period. That is, SDP receives the \$100 EfAM gain in years 6, 7 and 8 regardless of which mode actually occurs during these years.

\$/day	Regulatory Period 1				Regulatory Period 2					
	¥1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
Mode	5	5	5	1	1	1	1	5	5	5
M1 base allowance	1,000	1,000	1,000	1,000	1,000	850	850	850	850	850
M5 base allowance	500	500	500	500	500	350	350	350	350	350
Actual expenditure	500	500	500	900	900	850	850	350	350	350
Within period gain	-	-	-	100	100	-	-	-	-	-
Incremental gain	-	-	-	100	-	-	-	-	-	-
EfAM calc yr1		-	-	-	-					
EfAM calc yr2			-	-	-	-				
EfAM calc yr3				-	-	-	-			
EfAM calc yr4					100	100	100	100		
EfAM calc yr5						-	-	-	-	
General EfAM gain						100	100	100	-	-
M1 net allowance ^a						950	950	950	850	850
M5 net allowance ^b						450	450	450	350	350
Actual gain						100	100	100	-	-

Table F.2 General efficiency adjustment mechanism

^a Equals the base allowance of \$850 plus the general EfAM gain of \$100.

 ${\bf b}\,$ Equals the base allowance of \$350 plus the general EfAM gain of \$100.

Note: the base allowances for regulatory period 2 are not tied directly to actual expenditure in period 1. Efficiency carryover amounts should also be indexed for inflation, however we have kept the example simple and not included the effects of inflation.

G Glossary

2012 Determination	IPART, Prices for Sydney Desalination Plant Pty Limited's Water Supply Services - Determination No. 2, December 2011.
2017 Determination	Determination of SDP's price from 1 July 2017, to be made in this review.
2016 Sydney Water 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.
The 70/80 rule	Condition A2(b) of SDP's network operator's licence 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.
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AIR	Annual Information Return

Australian Drinking Water Guidelines	HMRC, NRMMC, Australian Drinking Water Guidelines Paper 6 National Water Quality Management Strategy, National Health and Medical Research Council, National Resource Management Ministerial Council, Commonwealth of Australia, Canberra, 2011, updated February 2016.
Base service charge (water security)	Proposed 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.
DPI Water	Department of Primary Industries Water responsible for the management of NSW's surface water and groundwater resources.
EfAM	Efficiency Adjustment Mechanism
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 Methodology Paper.
ECM	Efficiency carryover mechanism eg, as applied in Sydney Water 2016 Determination.
EnAM	Energy Adjustment Mechanism
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 Methodology Paper.

EPA	NSW Environment Protection Authority
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" (see SDP's Referred Services).
FNC	Fixed Network Charge (under the 2012 Determination)
Force majeure event	Any event or circumstances which reduces the amount of desalinated water the plant is capable of supplying, is outside the reasonable control of SDP and could not have been prevented, avoided or overcome by SDP (under the 2012 Determination).
Full operation mode	Term for the operational mode where the plant is producing water at maximum capacity.
GWh	Gigawatt-hour
Hunter Water	Hunter Water Corporation
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 fixed charges	Proposed mode-dependent daily fixed charges for making the plant available in each shutdown and operating mode, over and above the base service charge (water security).
Infigen	Infigen Energy Limited
Infigen Contracts	Electricity Supply Agreement and RECs Supply Agreement between Infigen and SDP.
kL	Kilolitre
LGCs	Large-scale generation certificates

Long Term Restart mode	Term for the operational mode where the plant is being restarted from a period of not producing water of between 91 days and two years.
Long Term Shutdown mode	Term for the operational mode where the plant is not producing water for between 91 days and two years.
Low flow	SDP's operation at less than full capacity.
LRET	Large-scale Renewable Energy Target
LRMC	Long run marginal cost
Medium Term Restart mode	Term for the operational mode where the plant is being restarted from a period of not producing water of between 11 and 90 days.
Medium Term Shutdown mode	Term for the operational mode where the plant is not producing water for between 11 and 90 days.
Methodology Paper	IPART, Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms, Methodology Paper, April 2012
Metropolitan Water Plan	NSW Government, 2010 Metropolitan Water Plan, August 2010
ML	Megalitre
MRP	Market risk premium
MWh	Megawatt-hour
Nil water usage charge	Under the 2012 Determination, applies when SDP supplies drinking water to Sydney Water outside the 70/80 rule.
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).
Operator's licence	SDP's network operator's licence granted under the WIC Act on 9 August 2010, as varied.
Outside the 70/80 rule	See 'the 70/80 rule' above

G Glossary

Pipeline charge	Under the 2012 Determination, 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 modes	The mode to transition from a corresponding shutdown mode into 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 Restart mode	Term for the operational mode where the plant is being restarted from a period of not producing water of between 2 and 10 days					
Short Term Shutdown mode	Term for the operational mode where the plant is not producing water for between 2 and 10 days					
Shutdown modes	Short Term, Medium Term, Long Term and Water Security shutdowns. No water is supplied to customers (except for water from storage) under the 2012 Determination.					
SIR	Special Information Return					

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, <i>Sydney Water</i> <i>Corporation Operating Licence</i> , 2015-2020.
Terms of reference	Terms of reference for Referral of Sydney Desalination Plant Pty Limited to IPART under section 52 of the <i>Water</i> <i>Industry Competition Act 2006,</i> 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
VNC	Variable network charges that are related to the variable electricity used in water production.
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 Restart mode	Term for the operational mode where the plant is being restarted from a period of not producing water of longer than two years (under the 2012 Determination).
Water Security Shutdown mode	Term for the operational mode where the plant is not producing water for longer than two years (under the 2012 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.

G Glossary

Water Usage Charge	Variable water charge per ML of water supplied to SDP's customers (under the 2012 Determination).						
WIC Act	Water Industry Competition Act 2006 (NSW)						
WIC Regulation	Water (NSW)	Industry	Competition	(General)	Regulation	2008	