SDP Regulatory proposal to IPART

Review of prices for Sydney Desalination Plant Pty Ltd

From 1 July 2017

Public
24 October 2016

An appropriate citation for this paper is:

SDP Regulatory proposal to IPART

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Abbreviations

Term	Definition
ACCC	Australian Competition and Consumer Commission
ACT	Australian Competition Tribunal
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
AIR	Annual Information Return
ARR	Annual Revenue Requirement
AWE	Average Weekly Earnings
BI	Business Interruption
CAPM	Capital Asset Pricing Model
CGS	Commonwealth Government Securities
CIP	Clean In Place
CPI	Consumer Price Index
DPI Water	Department of Primary Industries Water
DRC	Daily Restart Charge
DWPS	Drinking Water Pumping Station
EBSS	Efficiency Benefit Sharing Schemes
ECM	Efficiency Carryover Mechanism
EfAM	Efficiency Adjustment Mechanism
EnAM	Energy Adjustment Mechanism
ESA	Energy Supply Agreement
ESC	Essential Services Commission
ESCOSA	Essential Services Commission of South Australia
ESCV	Essential Services Commission Victoria
ESS	Energy Saving Scheme
FCAS	Frequency Control Ancillary Services
FNC	Fixed Network Charge
FRC	Full Retail Contestability
HWC	Hunter Water Corporation
INR	Infrastructure and Natural Resources Group
IPART	Independent Pricing and Regulatory Tribunal
ISR	Industrial Special Risks
LGC	Large-Scale Generation Certificate

Term	Definition
LRET	Large-scale Renewable Energy Target
LRMC	Long Run Marginal Cost
MEMP	Marine Estuarine Monitoring Program
MWD	Metropolitan Water Directorate
MWP	Metropolitan Water Plan
NBN	National Broadband Network
NCAS	Network Control Ancillary Services
NEM	National Electricity Market
NER	National Electricity Rules
NGR	National Gas Rules
NPV	Net Present Value
O&M	Operation and Maintenance
OTPP	Ontario Teachers' Pension Plan Board
PPA	Power Purchase Agreements
PPP	Public-Private Partnership
QCA	Queensland Competition Authority
RAB	Regulated Asset Base
RBA	Reserve Bank of Australia
REC	Renewable Energy Certificate
RO	Reverse Osmosis
ROC	Retail Operating Costs
ROM	Retail Operating Margin
RSA	REC Supply Agreement
SBS	Sodium Bisulphite
SDP	Sydney Desalination Plant
SMF	Synthetic Mineral Fibres
SRAS	System Restart Ancillary Services
SRES	Small-scale Renewable Energy Scheme
STC	Small-Scale Technology Certificates
SWC	Sydney Water Corporation
TIF	The Infrastructure Fund
TOR	Terms of Reference
TSA	Transitional Services Agreement
TUOS	Transmission Use of System

Term	Definition
UPS	Uninterruptable Power Supply
UTA	Utilities Trust of Australia
Veolia	Veolia Water Australia
VNC	Variable Network Charge
VSD	Variable Speed Drive
WACC	Weighted Average Cost of Capital
WHS	Work Health and Safety
WIC Act	Water Industry Competition Act 2006
WSA	Water Supply Agreement
WSAA	Water Services Association of Australia
WSC	Water Service Charge
WUC	Water Usage Charge

Overview

The Sydney Desalination Plant (**SDP**) plays a key role in securing Sydney's water supply by providing both a water security service to ensure Sydney has sufficient high quality drinking water during drought or other water scarcity conditions — as well as a long-term water supply service that assists in protecting river health and meeting future demand from population growth.

We have developed a detailed proposal that sets out our proposed services, costs and prices for the period 1 July 2017 to 30 June 2022 (the 2017-22 regulatory period). This proposal includes the revenues required to operate and maintain the SDP and the tariff structures, incentive and risk management framework necessary during the 2017-22 regulatory period to ensure the SDP can effectively fulfil its water supply and water security services under the Metropolitan Water Plan (**MWP**) as well as our obligations to Sydney Water Corporation (**SWC**) under the Water Supply Agreement (**WSA**).

In developing this proposal, we:

- Analysed the material changes that have occurred in the policy, regulatory and commercial operating environments and their implications for us and SWC and its residential and business customers over the 2017-22 regulatory period.
- Engaged with SWC and other stakeholders to discuss their priorities and preferences in relation to our services over the 2017-22 regulatory period.
- Reviewed the evolution of regulatory policy and practice in a range of infrastructure sectors in Australia and overseas and their applicability to the regulation of SDP's maximum prices over the 2017-22 regulatory period.
- Considered the Independent Pricing and Regulatory Tribunal of NSW's (**IPART**) 2012 Determination and the extent to which the regulatory settings in the 2012 Determination remain 'fit for purpose' over the 2017-22 regulatory period.
- Addressed the issues raised by IPART in its Issues Paper.[1]

Lowering water bills

Our proposal includes a 20.9% decrease in the revenue to be recovered from customers in water security for the 2017-22 regulatory period compared to the approved revenue requirement for the 2012-17 regulatory period (excluding the impact of inflation), on a cost per customer basis.

This will deliver average annual savings of around $23 per customer over the 2017-22 regulatory period or:

- 2.7% on a small residential end-customer water and wastewater bill (excluding the impact of inflation)
- 2.0% on a larger residential end-customer water and wastewater bill (excluding the impact of inflation)
- 1.6% on a small business end-customer water and wastewater bill (excluding the impact of inflation).

Figure OV.1 outlines the indicative impacts for a range of typical customers of our proposed charges in water security and full operation mode. These have been calculated relative to the allowed revenues for the 2012-17 regulatory period, on a cost per customer basis.

[1] IPART, Review of prices for Sydney Desalination Plant Pty Ltd: From 1 July 2017 - Issues Paper, August 2016.

Figure OV.1: Indicative customer impacts of our 2017 regulatory proposal (excluding inflation)

Source: SDP Analysis

Note: These have been calculated relative to the allowed revenues for the respective modes; SDP operating mode excludes the costs of restarting the SDP.

Ensuring the SDP can continue to effectively fulfil its water supply and water security role under the MWP

Our proposal ensures the SDP can continue to effectively fulfil its water supply and water security role under the MWP.

It includes targeted investments to maintain our service levels—including in maintaining and testing the SDP following the tornado damage in 2015 to ensure it is able to fulfil its water security role, while continuing to minimise costs to customers. We have followed our strong governance process for asset management to ensure that our program is planned, managed and delivered prudently and efficiently for the long-term benefit of our customers. Maintaining the condition of the SDP's assets is critically important to our customers' long-term interests.

At the same time, the proposal enables us to adapt our services to our changing environment (e.g. by ensuring the SDP is able to provide its water supply and water security services under potential changes to the MWP). Consistent with SWC's assumption in its submission to IPARTs 2016 Review of Prices for SWC, we expect to continue in water security mode for the majority of the 2017-22 regulatory period.

Declining costs and notional revenue requirement

Our proposed notional revenue requirement for the plant and pipeline in water security mode for the 2017-22 regulatory period is $852.73m (Table OV.1) representing a:

- Decrease of 20.9% compared to the approved notional revenue requirement in water security mode for the 2012-17 regulatory period (excluding the impact of inflation), on a cost per customer basis
- Decrease of 15.3% when compared to the approved notional revenue requirement in water security mode for the 2012-17 regulatory period (excluding the impact of inflation).

Table OV.1: Proposed notional revenue requirements for the plant and pipeline in water security mode for the 2017-22 regulatory period ($2016-17, $million)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Notional revenue requirement ($m)	167.22	168.69	167.59	175.85	173.39	852.73
Change in notional revenue requirement (%)	-14.2%	0.9%	-0.7%	4.9%	-1.4%	

Source: SDP calculations

Our proposed notional revenue requirement for the plant and pipeline in full operation mode for the 2017-22 regulatory period is $1,212.07m (exclusive of any restart charges) (Table OV.2) representing a:

- Decrease of 16.7% compared to the approved notional revenue requirement in full operation mode for the 2012-17 regulatory period (excluding the impact of inflation), on a cost per customer basis
- Decrease of 11.0% when compared to the approved notional revenue requirement in full operation mode for the 2012-17 regulatory period (excluding the impact of inflation).

Table OV.2: Proposed notional revenue requirements for the plant and pipeline in full operation mode for the 2017-22 regulatory period, exclusive of restart charges ($2016-17, $million)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Notional revenue requirement ($m)	244.75	243.58	242.31	241.38	240.05	1212.07
Change in notional revenue requirement (%)	-9.5%	-0.5%	-0.5%	-0.4%	-0.6%	

Source: SDP calculations

The principal reason for this decline in our notional revenue requirement for the 2017-22 regulatory period is that our funding costs for the 2017-22 regulatory period are lower than the 2012-17 regulatory period, which reduces our notional revenue requirement, particularly for our pipeline assets. This reduction more than offsets:

- Higher operating expenditure for the 2017-22 regulatory period including necessary one-off and ongoing expenditure requirements to manage operational risks associated with an extended period of water security mode as more realistic ongoing operating expenditure to manage SDP as a stand-alone entity rather than as a subsidiary of SWC.
- Higher necessary capital expenditure for the 2017-22 regulatory period than for the 2012-17 regulatory period (although minor relative to the regulatory asset base) including targeted investments in the drinking water pumping station (**DWPS**) to ensure SDP is able to fulfil its water security role.

Promoting the long-term interests of our customers

Our proposal strikes the right balance between our business and customer outcomes necessary to promote the long-term interests of our customers, including SWC and end-use water customers.

Our proposal ensures we recover the efficient costs necessary to maintain the safety, reliability and responsiveness of our services over the 2017-22 regulatory period and address the challenges in a way that best promotes our customers' long-term interests. This includes the cost of funding our investments from debt and equity markets over this period, which is the biggest single driver of our total costs.

The SDP continues to provide a cost-effective means of delivering water security for Sydney, and our private ownership provides us with financial incentives to continually improve our service performance and cost efficiency and share these improvements with our customers, including SWC and end-use water customers. In our view, IPART's regulatory settings are generally working well, however some elements of the framework may require refinement to ensure they are 'fit for purpose' over the 2017-22 regulatory period. We welcome IPART's acknowledgement that many features of the 2012 Determination are likely to be maintained, and that IPART will seek to ensure that the regulatory framework creates incentives that align with SDP's water security role, as outlined in the NSW Government's MWP.[2]

We have carefully considered the issues raised by IPART in its Issues Paper and we welcome IPART's willingness to engage with us to date and look forward to continued engagement with IPART, our customers and stakeholders to ensure IPART's 2017 Determination facilitates SDP effectively fulfilling its water supply and water security services for the long-term benefit of our customers.

Keith Davies

Chief Executive Officer

[2] IPART, Review of prices for Sydney Desalination Plant Pty Ltd: From 1 July 2017 - Issues Paper, August 2016, p3.

1. About this proposal

IPART sets maximum prices for SDP's declared monopoly services. IPART's 2012 Determination of prices for SDP's water supply services expires on 30 June 2017.

This document is SDP's regulatory proposal to IPART for the 2017-22 regulatory period. The proposal has been submitted in compliance with the Standing Terms of Reference (**TOR**) and IPART's submission requirements[3].

1.1 Approach used to develop this proposal

To develop this proposal, we first:

- Analysed the material changes that have occurred in the policy, regulatory and commercial operating environments and their implications for us and our customers – including SWC and end-use water customers – over the 2017-22 regulatory period.
- Engaged with SWC as well as stakeholders to discuss their priorities and preferences in relation to our service and safety standards, and our tariff structures over the 2017-22 regulatory period.
- Reviewed the evolution in regulatory settings in a range of infrastructure sectors in Australia and overseas and their applicability to the regulation of SDP's maximum prices over the 2017-22 regulatory period.
- Considered the issues raised by IPART in its Issues Paper.[4]

We used this information to inform our analysis and decisions for each of the key components of the proposal, and help ensure that the proposal responds to the policy, regulatory and commercial challenges over the 2017-22 regulatory period in a way that best promotes our customers' long-term interests. These components include:

- The proposed application of the form of regulation, and the proposed incentive and risk management frameworks to apply for the 2017-22 regulatory period
- The proposed revenue requirements for each operating mode to be recovered from SWC through our prices (or charges)
- The forecast capital and operating expenditures and proposed rate of return, which are key inputs to the proposed revenue requirements
- The proposed tariff structures and price levels.

1.2 How to navigate this proposal

The remainder of this proposal is structured in line with the approach outlined in Section 1.1.

- Chapter 2 provides background information on the SDP, and our role in securing SWC's supply.
- Chapter 3 focuses on the challenges and our priorities over the 2017-22 regulatory period, including the engagement we undertook with customers and stakeholders.
- Chapters 4 to 10 detail each of the main components of the proposal—including the proposed regulatory and risk and incentive frameworks, proposed revenue requirements, forecast operating expenditure, forecast capital expenditure, proposed rate of return, tariff structure, and proposed tariffs.

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3 IPART, Guidelines for Water Agency Pricing Submissions, 2015.

4 IPART, Review of prices for Sydney Desalination Plant Pty Ltd: From 1 July 2017 - Issues Paper, August 2016.

- We have also provided an easy-to-read customer overview, which explains our proposal — including the key decisions we made in formulating the proposal — and what it will mean for our customers, including SWC and end-use water customers.

Table 1.1 provides a more detailed overview of the structure and content of the proposal, and lists the key Appendices and supporting information for each chapter.

All amounts in this document are in $2016-17 unless otherwise specified.

Table 1.1: Structure of the proposal

Chapter	Content	Supporting Appendices
1. About this proposal	• A description of this proposal	• 1-1: CEO's declaration of accuracy and consistency of data in the proposal • 1-2: Claims for Confidentiality • 1-3: Responses to IPART's Issues Paper Questions
2. About SDP and our role in securing Sydney's water supply	• Our business, and our role and vision in providing water supply and water security services • Our performance • The regulatory framework	• 2-1: SDP's key operational relationships
3. Challenges and priorities over the 2017-22 regulatory period	• Performance over the 2012-17 regulatory period • Challenges for the 2017-22 regulatory period • Engagement with our customers and stakeholders • Our priorities over the 2017-22 regulatory period	• 3-1: Our customer and stakeholder and engagement • 3-2: Assessment of damage caused by the 2015 Kurnell Tornado
4. Proposed changes to the regulatory framework	• Proposed form of regulation to apply to our services • Proposed incentive schemes to encourage service and cost improvements • Proposed mechanisms to manage risks and uncertainties	• 4-1: Efficiency Adjustment Mechanism (**EfAM**) • 4-2: Analysis of the abatement mechanism • 4-3: Regulatory precedents on mechanisms to manage unforeseen events • 4-4: Formulation of proposed cost pass-through mechanism
5. Revenue requirement for our water supply and security services	• Overview of proposed notional revenue requirement (or unsmoothed building block costs): – proposed return on and of capital (including opening capital base, forecast capital expenditure, rate of return and regulatory depreciation) – operating and tax costs • Proposed target revenue (smoothed revenue requirement) • Implied average price changes	• 5-1: Detailed breakdown of Revenue Requirement under all modes • 5-2: Impact of extending assumed asset lives • 5-3: Large Generation Certificate (**LGC**) and Electricity Trading Review (Seed Advisory)

Chapter	Content	Supporting Appendices
6. Forecast operating expenditure	• Our forecast of operating expenditure including: – Plant and pipeline asset management – Partial plant test – Pipeline maintenance costs – Energy – unit costs and consumption – Corporate costs – Restart costs • The outcomes and our performance in the 2012-17 regulatory period	• 6-1 Forecast operating expenditure by mode • 6-2: Review of Operation and Maintenance (**O&M**) Costs (Advisian) • 6-3: Water Security Program Business Cases (Advisian) • 6-4 Expert Opinion of the Drinking Water Quality Impacts posed by Options Identified to Maintain Shutdown of the Sydney Desalination Plant • 6-5: Pipeline asset management Review (KBR) • 6-6: Insurance Premium Forecasts (Aon) • 6-7: Estimates of Long Run Marginal Cost (**LRMC**) of energy supply (Frontier Economics) • 6-8: Supporting information on market fees and other retail electricity costs
7. Forecast capital expenditure	• Our forecast of capital expenditure • Our governance and asset management strategy • The outcomes and our performance in the 2012-17 regulatory period	• 7-1:Drinking Water Pumping station (DWPS) feasibility (KBR)
8. Rate of return	• Our proposed rate of return including: – return on debt – return on equity – gamma	• 8-1: SDP Allowed rate of return (Frontier Economics)
9. Tariff structure and cost sharing	• How we set our proposed prices, including tariff structures • How we will update our prices over the regulatory period	• 9-1: Allowed return when plant is inoperable (Frontier Economics)
10. Customer and financial impacts of our proposed prices	• Key outcomes of our proposed prices on: – SWC and its residential and business customers – SDP financial performance • How the proposed prices meet the Standing TORand promote the long-term interests of customers	• 10-1: SDP detailed price list • 10.2: Financeability Review (Titanium)

1.3 Claims for confidentiality

In some circumstances the benefit of publishing some confidential information may be outweighed by the potential harm. For example, we may provide an estimate of the cost of procuring a service however if IPART were to publish this information it could impact our ability to undertake a competitive tender, and ultimately increase the costs to consumers. In a very limited number of cases, information has been provided to SDP by a third party on a commercial in confidence basis. To overcome this we have marked some of the information in this proposal as confidential (see Appendix 1.2).

2. About SDP and our role in securing Sydney's water supply

Key Messages

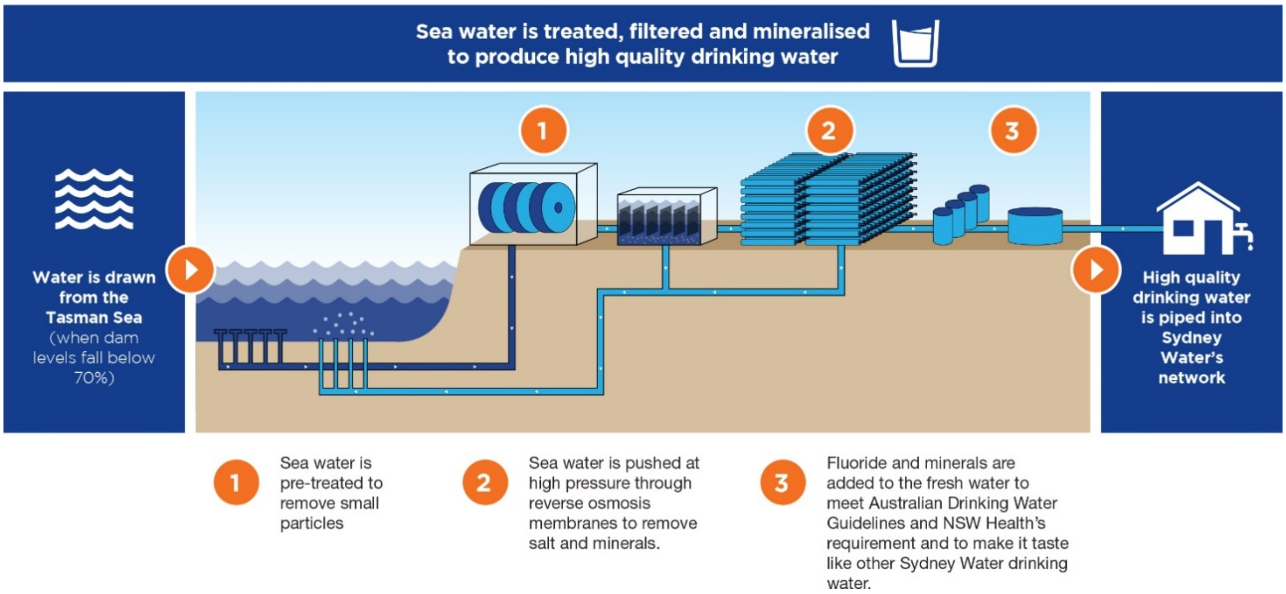
- The SDP has a key ongoing role in securing Sydney's water supply and meeting the objectives of the NSW Government's 2010 MWP and its NSW 2021 Plan. A secure water supply is critical to ensure customers do not have to again suffer severe restrictions during times of water shortage.
- The SDP is capable of providing at least 15% of Sydney's average water needs by producing and transporting 91.3GL/year of high quality drinking water to SWC's network, which is then provided to homes and businesses across the Sydney region.
- SDP is NSW's largest privately owned water provider and our shareholders have significant experience in sourcing, financing and managing infrastructure assets around the world.
- The operations of SDP are governed by the MWP, the WSA with SWC and the Water Industry Competition Act 2006 (**WIC Act**), supporting regulation and SDP's licences.
- SDP is required to operate and maintain its infrastructure with the objective of maximising the production of drinking water when Sydney catchment storage levels fall below 70% until storage levels recover to 80%. There may also be circumstances when the plant is on and supplies water outside of this 70/80 rule.
- Our charges in water security mode make up around 9% of a typical residential end-customer's water and wastewater bill.
- Our services, costs and prices are independently regulated, and this regulation together with our private ownership provides us with strong financial incentives to continually improve our cost efficiency and share these improvements with our customers over time.

2.1 The Sydney Desalination Plant

The SDP is a large scale reverse osmosis (**RO**) desalination plant located in Kurnell, Sydney. It is capable of providing at least 15% of Sydney's average water needs by treating, filtering and remineralising seawater to produce up to 91.3GL/year of high quality drinking water and transporting this via an 18km pipeline to SWC's system at Erskineville. SWC then distributes the water to homes and businesses across the Sydney region.

The SDP uses RO membrane technology to turn seawater into fresh water. There are several steps to this process, which are summarised in Figure 2.1.

Figure 2.1: The SDP produces high quality drinking water from seawater

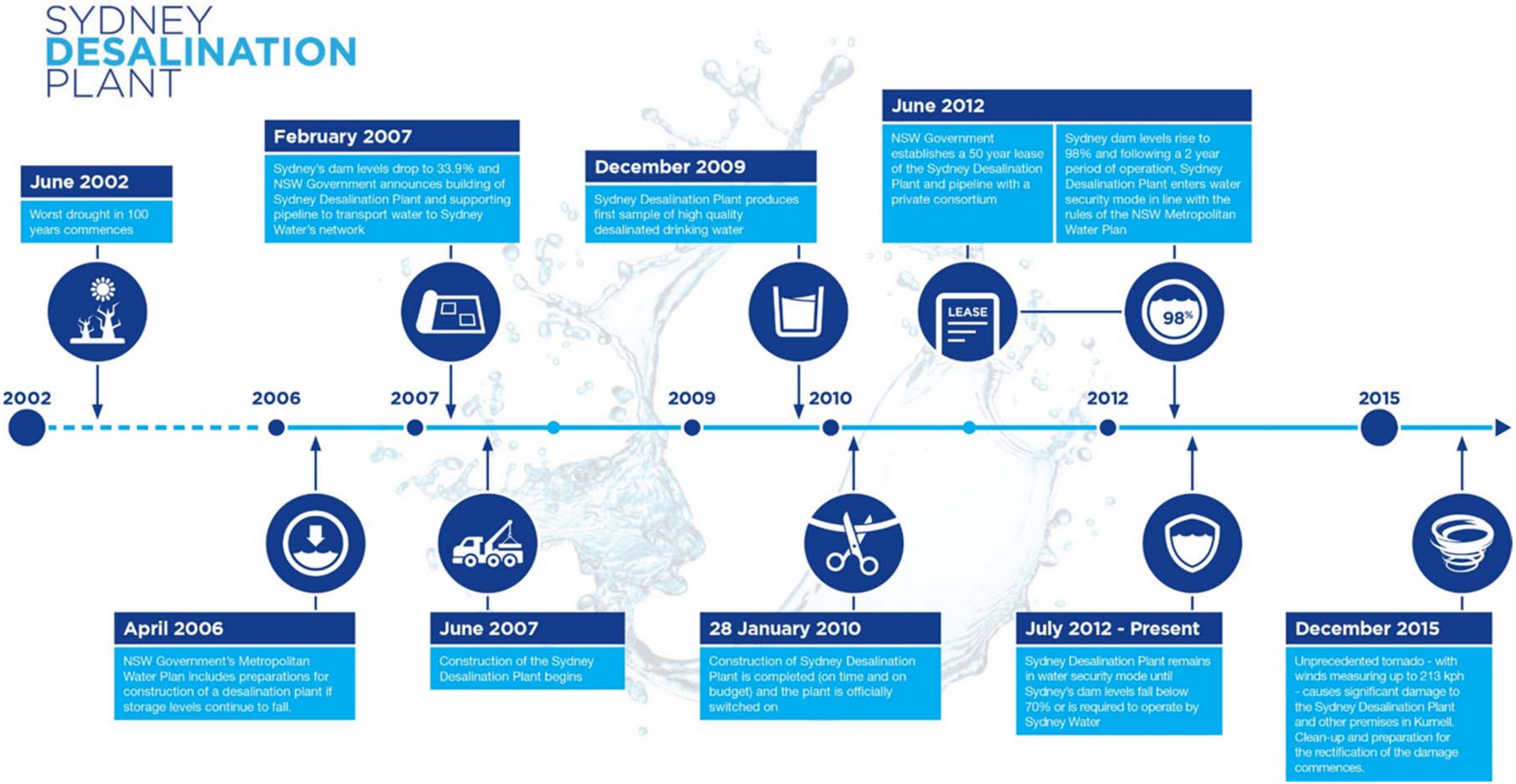


Source: SDP

The NSW Government established the desalination plant at Kurnell (with SWC being the original owner) and the construction of the SDP took 3 years from 2007-2010, with the first desalinated drinking water delivered to Sydney in February 2010 (Figure 2.2). The plant then ran continuously for 2 years providing high quality drinking water to SWC, from 2010 to 2012 to prove plant capacity and reliability.

In June 2012, the NSW Government leased SDP for 50 years to a private consortium for $2.3 billion (Box 1). The lease includes the plant and the pipeline connecting the plant to the water supply network and is supported by a 50-year water supply contract with SWC. The SDP's shareholders have significant experience in sourcing, financing, executing and managing infrastructure assets around the world. Our vision is that all of our stakeholders view the SDP as a reliable and sustainable world-class water asset benefiting the people of Sydney.

Figure 2.2: The SDP and its history



Source: SDP

Our O&M contractor — Veolia Water Australia (**Veolia**) is contracted to operate the plant under a 20 year O&M contract originally agreed with SWC. Our O&M contractor will:

- Operate and maintain the plant in accordance with industry best practice and a detailed Operations Management Plan
- Provide drinking water in quantities directed by SDP, and
- Perform services that meet technical requirements specified by SDP, including drinking water standards.

Consistent with the planning consent conditions for the plant, SDP is powered 100% from renewable energy via a long-term renewable energy contract with Infigen Energy. The regulator of the SDP Project Approval is the Department of Planning. As detailed further in Appendix 2.1, the Department can take a number of different enforcement actions in relation to non-compliance with these conditions.

We believe that the SDP continues to provide a cost-effective means of underpinning water security for Sydney. The SDP's private ownership provides financial incentives to continually improve service performance, cost efficiency, and share these improvements with its customers.

Box 1: Our ownership structure

The NSW Government leased SDP for 50 years to a private consortium, SDP. SDP, is jointly owned by:

- The Ontario Teachers' Pension Plan Board (**OTPP**), in which Ontario Teachers' has a dedicated Infrastructure and Natural Resources Group ("**INR**") with managed assets valued at approximately C$22 billion that includes regulated utilities, high-speed rail, airports, port facilities, power generation, timberland, agriculture, oil & gas, and mining. Ontario Teachers' is Canada's largest single-profession pension plan that provides teachers in Ontario with retirement and pension security. Ontario Teachers' pays pensions and invests plan assets on behalf of 316,000 working and retired teachers.
- The Infrastructure Fund (**TIF**) and Utilities Trust of Australia (**UTA**). Hastings Funds Management Limited is Australian-owned and manages UTA's and TIF's share in SDP. TIF is one of Australia's top performing infrastructure funds with a portfolio of Australian and overseas assets worth more than $1.75 billion.

Source: SDP

2.2 Our role in meeting Sydney's water needs

The SDP plant and pipeline were constructed in response to a severe drought across the Sydney basin, which saw Sydney's dam levels fall below 34% in 2007. The NSW Government's 2010 MWP[5] articulates the benefits of diversifying Sydney's water supply in meeting population growth, protecting river health, and responding to future droughts,[6] SDP plays an integral role in securing Sydney's water supply under the MWP by providing two water supply services (Figure 2.3):

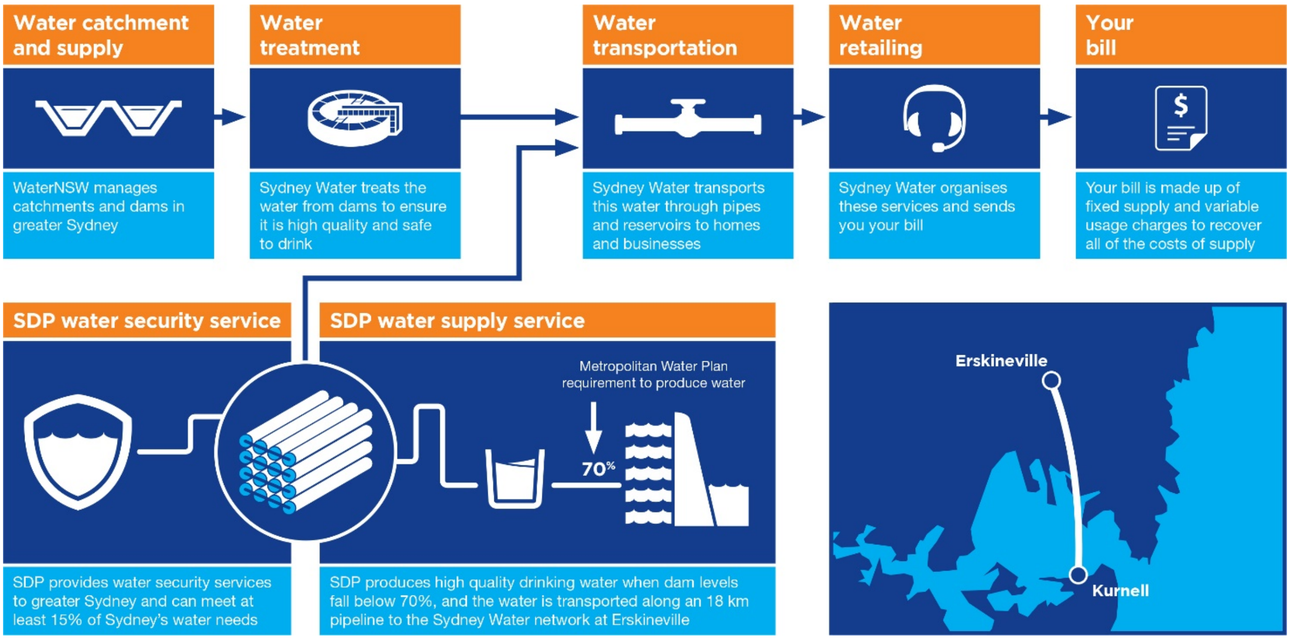
- The supply of non-rainfall-dependent drinking water.
- The making available of the plant to supply non-rainfall-dependent drinking water.

[5] The MWP was first developed in 2004 and updated in 2006 and 2010. The 2010 MWP is currently being reviewed.

[6] NSW Government, *The MWP*, 2010, p6.

In this way, the SDP plant provides valuable 'insurance' to the community to ensure that in the event of another severe drought (or major SWC supply outage) Sydney does not have to endure the significant economic cost of water use restrictions as occurred during the last decade[7].

Figure 2.3: The SDP plays a key role in ensuring Sydney always has sufficient water to meet its needs



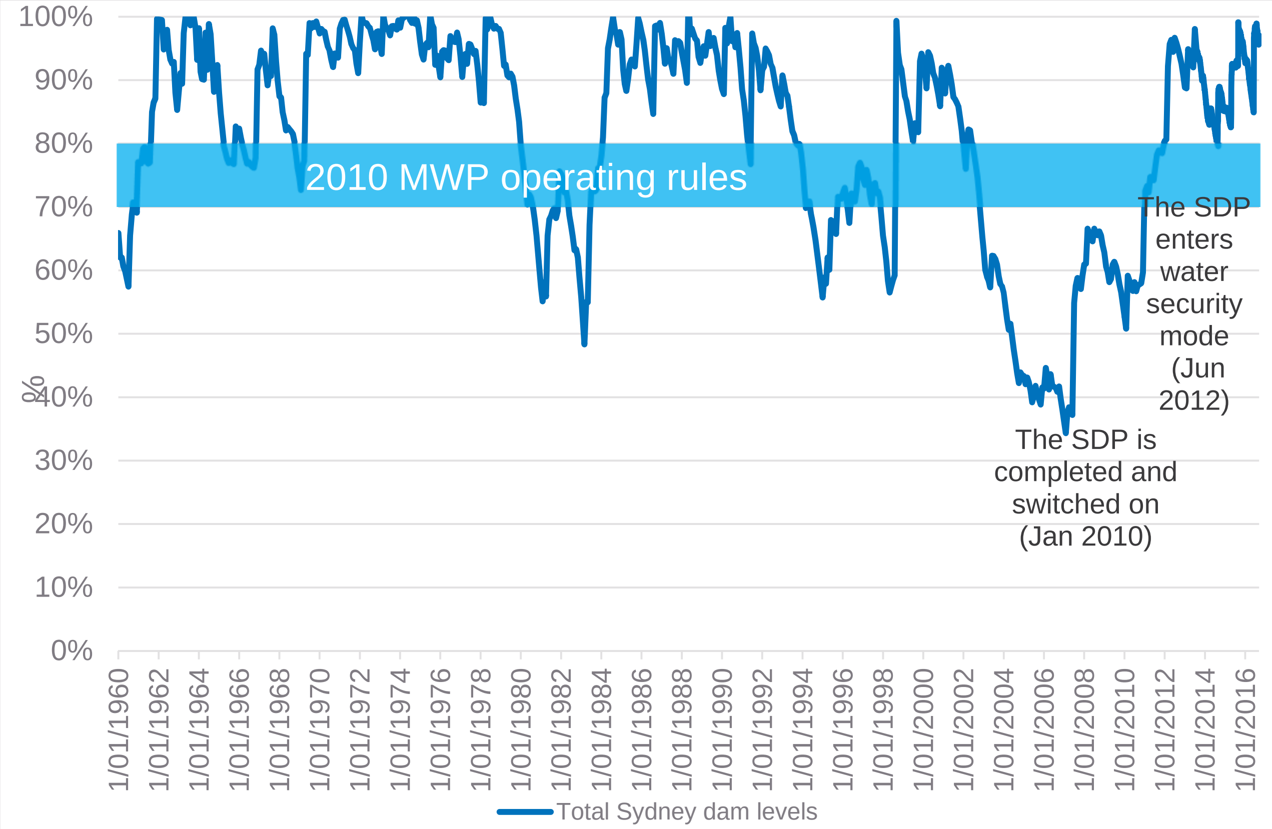
Source: SDP

While recent rainfall has resulted in water storage levels rising above the historical average and the SDP entering water security mode in June 2012, Sydney's dam levels are historically volatile. Although Sydney's catchment areas and water storage capacity are large relative to many other cities in Australia, historical records demonstrate that the catchment is prone to severe droughts with unpredictable water storage recovery rates. In addition, while per household, business and industrial consumption has fallen, population growth means that total demand for water continues to grow.

Figure 2.4 suggests that given the current operating rules, the SDP would have been required to produce drinking water on four separate occasions since 1960.

[7] The Productivity Commission (2011) found that the need to resort to costly mandatory restrictions should be limited to emergency situations, where the benefits of restrictions are most likely to outweigh the cost. Grafton and Ward (2008) found that water restrictions in Sydney in 2004-05 resulted in aggregate welfare losses to consumers of about $275 million (2010 dollars).

Figure 2.4: Sydney's rainfall and dam levels are unpredictable



Source: Data sourced from Verified Storage and analysed by SDP

The operations of the SDP are governed by:

- The MWP which prescribes the operating rules[8] and requires SDP to operate and maintain its infrastructure with the objective of maximising the production of drinking water when Sydney catchment storage levels fall below 70% until storage levels recover to 80%[9];
- A WSA with SWC which obliges the SDP to provide drinking water when requested[10]; and
- The WIC Act, supporting regulation and SDP's licences[11], which empowers IPART as the independent economic regulator to regulate the SDP's pricing and to monitor its licensed operations[12].

At any one time, the plant is either operating (and producing high quality drinking water) or in shutdown mode. Under operating rules established under the MWP, and reflected in SDP's Network Operator's Licence, the plant is required to maximise the production of water when Sydney's overall dam levels fall to

8 These rules are included in the Sydney Desalination Plant's Network Infrastructure Operator's Licence.

9 However the 2010 MWP is currently being reviewed and there remains uncertainty regarding the NSW Government priorities in securing Sydney's water supply and SDP's role and operating framework (see section 2).

10 To supply water to mitigate the effect of a public health incident or to ensure security of supply or network stability during periods of outages, unavailability or maintenance of water industry infrastructure in Sydney Water's area of operations.

11 In addition, the plant operators, Veolia, hold an Environmental Protection Licence for the plant under the Protection of the Environment Operations Act 1997.

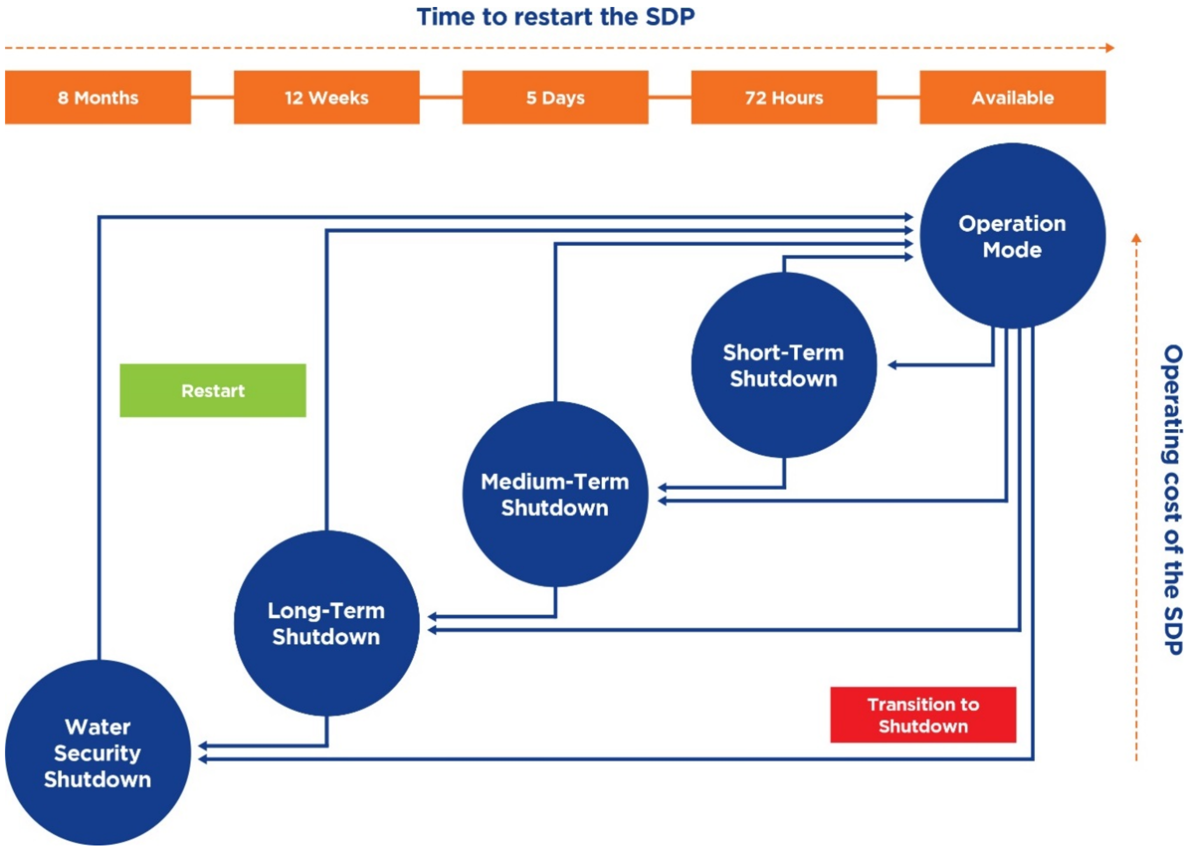
12 The Sydney Desalination Plant holds a Network Operator's Licence under the WIC Act which requires a water quality plan that specifies how the twelve elements of the framework for the management of drinking water, as detailed in the Australian Drinking Water Guidelines, have been addressed and will be implemented. SDP also holds a Retailer Suppliers Licence under the WIC Act which establishes the regulatory framework for SDP for selling the water it produces to customers.

below 70% of capacity, and placed into shutdown mode when the dam levels reach 80% (unless supplying other future customers).

At full capacity the SDP provides around 91.3 GL of water per year equivalent to approximately 15% of Sydney's drinking water and the SDP operated in full production mode between 2010 and 2012. However, as dam levels in Sydney have been above 70% for the past five years, the plant has been shutdown since June 2012. When the plant entered shutdown mode the combined storage levels of Sydney's dams was at 98% and therefore SDP chose to put the plant in a state of readiness that would be regarded as a deep state of preservation, known as 'Water Security Mode', in order to reduce the running costs and therefore maximise the savings passed on to customers[13].

The plant is able to remain in water security mode indefinitely but in the long term there is an increasing risk that the plant will not be able to be restarted within prescribed timeframes and with required reliability. According to the current operating rules determined under the MWP, SDP will be instructed to restart when Sydney's total dam levels fall below 70%. When the plant receives the order to begin operating again it is expected it will take up to eight months to be ready to produce water.[14] However there are a range of different shutdown modes for the plant and the costs incurred in these modes and the time required to move into full production varies (Figure 2.5).

Figure 2.5: The SDP operating modes and the relationship between the time required to move into full production varies



Source: SDP

[13] Under this mode, the SDP does not produce water but is maintained in a state of readiness to be able to supply water when it is next called upon. This includes having a significantly reduced number of staff on site while the plant is in this state relative to when the plant is in full production.

[14] A number of procedures must occur before the SDP can begin producing drinking water. For example, firstly, the ocean intake and outlet caps would need to be removed to get seawater flowing into the plant. The membranes would need to be taken out of preservation. Recruitment of staff would occur and the pipeline would need to be disinfected.

Chapter 3 sets out the engagement we have undertaken with SWC and stakeholders on the trade-off we must make on our customers' behalf between costs (taking into account ongoing costs as well as costs associated with the transition between modes) and the time required for restoring the plant to full production when storage levels drop. Chapter 5 provides further information on mode based pricing including the costs incurred in each mode of operation and the notional revenue required to recover these costs for each operating mode.

In addition, while the focus of the operating rules under the MWP (reflected as a licence condition for SDP) is for the SDP plant to be in full production at times of water shortage, it is technically possible for the plant to produce water outside of these rules, potentially at levels of less than 100% production. It is possible to conceive of a number of situations where this may be desirable, including:

- Where the plant is restarting after having been in standby mode and is able to produce some water but is not yet at full production
- When needed to supply SWC when it has a constraint within its supply network
- When fully testing the plant in standby mode
- When SWC (or any other new customers who emerge in future) wish to be supplied with desalinated water outside of the 70/80 rule.

As recognised by IPART in its Issues Paper, this underlines the need to preserve operating flexibility in the way in which SDP is regulated.

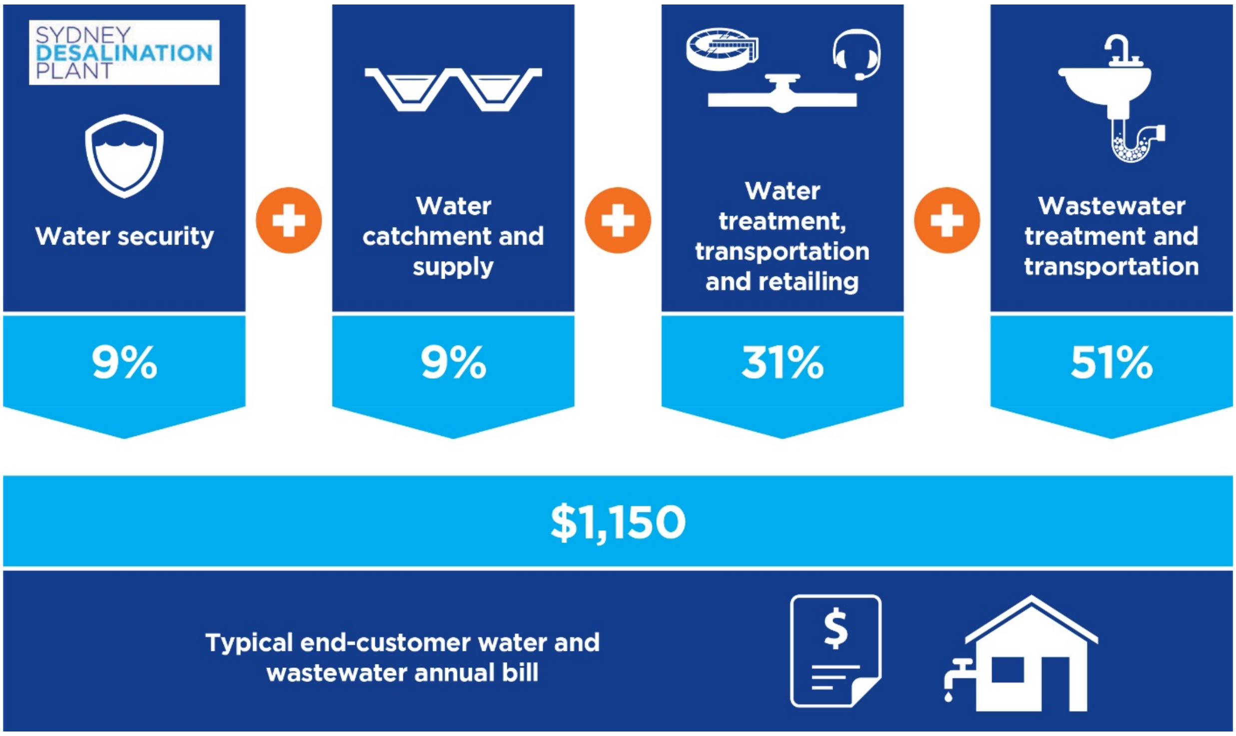
As discussed further in Section 3, the plant is currently out of commission after sustaining significant damage as a result of a tornado event on 16 December 2015.

2.3 Regulation of our prices for providing water supply and water security services

The costs of us providing a water supply service as well as a water security service are recovered through our regulated prices, which are then passed on by SWC to end-customers. Under water security mode, our charges make up around 9% of a typical residential end-customer water and wastewater bill (Figure 2.6).[15]

[15] SWC includes SDP prices—as well as the other costs or providing water and wastewater services, such as water and wastewater transportation costs—in the fixed supply and water usage charges it levies on residential and business end-customer. IPART regulates SWC prices under the Independent Pricing and Regulatory Tribunal Act 1992 (NSW) (the **IPART Act**).

Figure 2.6: The contribution of our water security charges to a typical residential customer's water and wastewater annual bill



Source: SDP

Note: Calculated by dividing the notional revenue requirement by forecast number of water end-customers; assumes a water and wastewater bill of a typical residential end-customer (consuming 232kL per year).

The prices SDP charges for providing water supply service and water security services are determined by IPART under a framework of independent economic regulation (Figure 2.7).

IPART's 2012 Determination[16] of prices for SDP's water supply services expires on 30 June 2017 and IPART is required to set maximum prices for SDP's declared monopoly services to apply from 1 July 2017 to 30 June 2022 (the 2017-22 regulatory period).

This means that we must provide a regulatory proposal to IPART setting out the services we will offer, the costs we expect to incur, and the prices we need to charge to recover our prudent and efficient costs.[17] Our proposal also sets out the incentive and risk management framework necessary during the regulatory period to ensure the SDP can effectively fulfil its water supply and water security services under the MWP as well as our obligations to SWC under the WSA.

16 IPART, Prices for Sydney Desalination Plant Pty Limited's Water Supply Services, Determination, December 2011.

17 IPART, Guidelines for Water Agency Pricing Submissions, December 2015

Figure 2.7: The framework of independent economic regulation of our services and prices

Source: SDP

In making a determination IPART is required under the IPART Act to have regard to a number of matters specified under Section 15 of the IPART Act. Those relevant to SDP's determination include the cost of providing the services required; the protection of customers from abuses of monopoly power; the appropriate rate of return and dividends; the need for greater efficiency in the supply of services; ecologically sustainable development; the impact on borrowing, capital and dividend requirements; considerations of demand management and least cost planning; the social impact; and standards of quality, reliability and safety.

The regulatory framework applied by IPART to SDP also includes various matters specified in a standing TOR issued by the Minister. The TOR refers to two distinct services provided by SDP:

- The supply of non-rainfall dependent drinking water to purchasers.
- The making available of the desalination plant to supply non-rainfall dependent drinking water.

The TOR specify a number of pricing principles with which each price determination is required to be consistent (see Box 2). Reflecting its role in water security, a key principle is that its structure of prices should encourage SDP to be financially indifferent as to whether or not it supplies water.

Box 2: Standing Terms of Reference

Pricing principles specified in the TOR include:

- Maximum prices should be set so that the expected revenue will recover the efficient cost of providing the two types of services over the life of the assets. These costs include operating costs, a return on the assets and return of assets (depreciation).
- In calculating the return on invested assets:
  - the rate of return (or Weighted Average Cost of Capital (**WACC**)) should reflect the commercial risks faced by the asset owner in providing the services.
  - IPART should determine an appropriate opening asset value.
  - Return of assets (depreciation) is to reflect the economic lives of the assets.
- 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 and in particular:
  - The charge for water supply services should reflect all efficient costs that vary with output, including variable energy, labour costs, and maintenance costs.
- The charges for the making available of the desalination plant 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 entitled to charge for this service irrespective of levels of water in dam storages servicing Sydney or availability of water from other sources.

Source: Standing Terms of Reference

As discussed in more detail below, the TOR also mandate the adoption of an EfAM (section 4.3.1) and an energy adjustment mechanism (**EnAM**) (section 4.4.4).

The following sections of this submission outline our proposals for and addressing the challenges over the 2017-22 regulatory period in a way that best promotes our customers' long-term interests and meeting the TOR given to IPART by the Minister.

3. Challenges over the 2017-22 regulatory period

Key messages

- The SDP has been in water security mode since 2012 due to the level of Sydney water storages and it is likely that SDP will remain in water security mode for extended periods over the 2017-22 regulatory period.
- The 2010 MWP is currently being reviewed and there remains uncertainty regarding the NSW Government's priorities in securing Sydney's water supply and SDP's role and operating framework.
- There are a range of challenges over the 2017-22 regulatory period including restoring and testing the SDP plant following the December 2015 Kurnell tornado, ensuring SDP's assets are ready to restart when next required following an extended period of shutdown, and ensuring sufficient flexibility to enable SDP to readily adapt to any new role in water security and supply for Sydney which it may be asked to perform.
- We engaged with our direct customer (SWC), as well as other stakeholders to understand their priorities and preferences for the 2017-22 regulatory period and beyond — including the role they expect SDP to play in meeting their water security needs.
- SDP's priorities for the 2017 regulatory period include ensuring the facility continues to be able to reliably restart and operate after being in water security mode for an extended period, and restoring and testing the plant following the Kurnell tornado.

3.1 Performance over current determination period

Sydney's dam levels rose to 98% in June 2012 at the conclusion of the proving period and, under the rules of the NSW MWP, the SDP plant ceased production and was placed into water security mode. As dam levels have remained above the 70% trigger level, the plant has been in extended water security mode for the current determination period.

While the plant has been in water security mode, the SDP has achieved a high level of compliance with its licence obligations and has undertaken a number of activities over the period, including:

- Establishing SDP as a stand-alone entity:
  - Recruiting a management team and other key resources
  - Establishing a governance framework, including key policies
  - Developing and implementing a risk management framework
  - Developing and implementing a debt financing strategy
- Managing the O&M Contract including liaising with the operator regarding Work Health and Safety (**WHS**), defects, membrane preservation and maintenance activities
- Overseeing the transition of the plant from operating mode to water security mode
- Successfully completing the Marine Estuarine Monitoring Program (**MEMP**)
- Monitoring the Conservation Management Area at site
- Liaising with our customer to understand their evolving needs

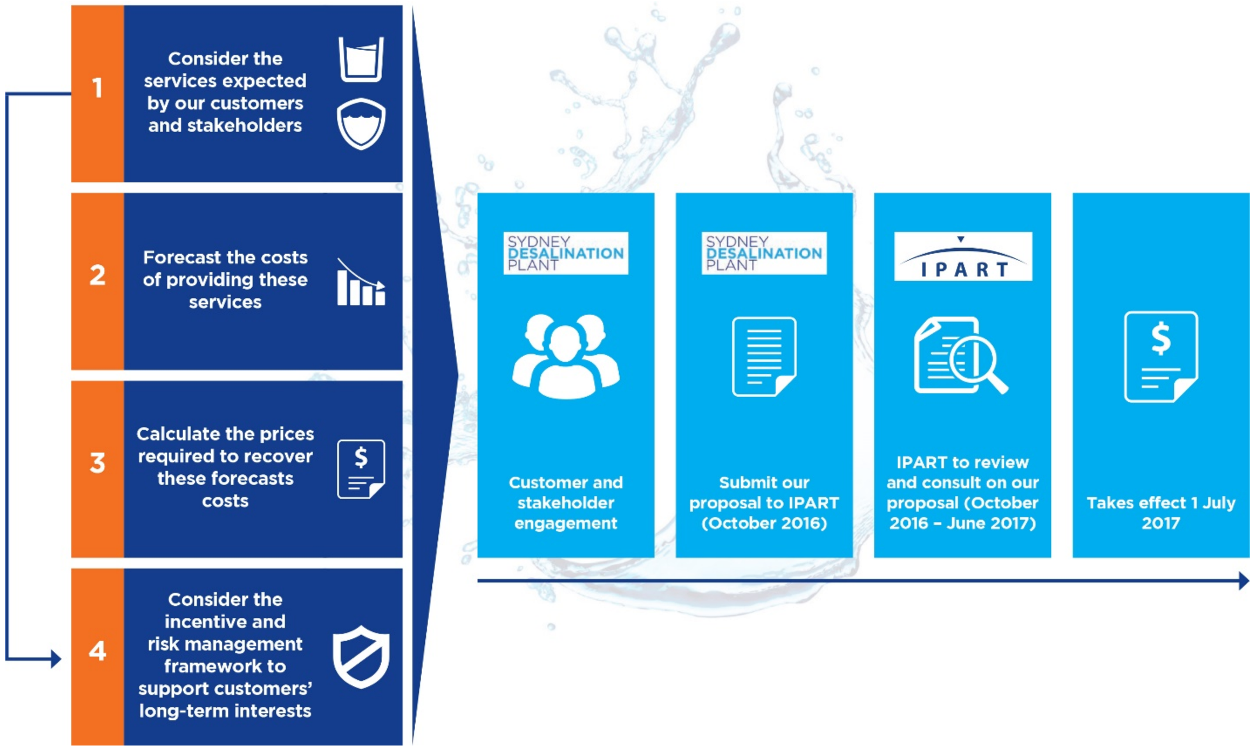
- Adapting to the potential for an extended water security shutdown, including working with our customer to explore options for managing water security risks, resulting in the Water Security Program contained within the submission.
- Managing ongoing compliance with our Network Operator's Licence and Retail Supplier's Licence
- Entered into an ongoing Pipeline Maintenance Agreement
- Developing solutions with property developers to minimise the impact of new developments on our pipeline easements
- Managing the clean-up and make safe of the plant following the December 2015 tornado, worked with insurers to assess the damage and undertaking a procurement process to engage a rebuild contractor to reinstate the plant.

3.2 Challenges and priorities for the 2017-22 regulatory period

To develop our proposal (Figure 3.1), we:

- Considered the service levels expected by our customers and our stakeholders over the 2017-22 period (and future periods) and engaged with SWC and other stakeholders to discuss their priorities and preferences in relation to our services over the 2017-22 regulatory period (Box 3).
- Forecast the efficient level of costs we will incur over this period to meet these service levels, and run our business in a way that promotes customers' long-term interests.
- Calculated the prices we need to charge SWC to recover these costs, and structured these prices so that SWC is provided with appropriate price signals about the cost of our water security and water supply services**.**
- Considered the incentive and risk management framework to support our customers' long-term interests.

Figure 3.1: Development of our proposal and the review process



Source: SDP

In considering these issues, we identified several challenges in ensuring the SDP can effectively fulfil its role in providing water security services over the 2017-22 regulatory period. These challenges result from:

- The likelihood that SDP will remain in water security mode for extended periods over the 2017-22 regulatory period, given current dam levels, which also limits the opportunity to test the operating condition of the SDP plant.
- Uncertainty regarding the future operation of SDP under any revised MWP and the impact of this on our operations, asset planning and cost structures.[18]
- The Kurnell Tornado that caused significant damage to key elements of the SDP plant in December 2015.

Against this background, our key priorities over the 2017-22 regulatory period are to ensure we fulfil our water security function by:

- Ensuring the SDP plant is able to reliably restart and then produce 91.3GL/year of high quality drinking water following an extended period of being in water security mode
- Restoring and testing the SDP plant following the Kurnell tornado that caused significant damage to the plant in December 2015 to ensure it is able to fulfil its water security role.
- Ensuring SDP is equipped to operate in an uncertain environment in a way that optimises the SDP's role in water security.

[18] The last 5 years has highlighted that it can be difficult to accurately foresee how the plant will be operated over any given period. This reflects not only the underlying climate and rainfall conditions, but other factors (e.g. behavioural changes in average water consumption) which might lead to a change in future operating rules under the MWP. It is also possible that the SDP will be required to supply water outside of the operating rules.

Box 3: Balancing trade-offs to promote our customers' long-term interests

Like many businesses, we need to make decisions on behalf of our customers. For example, we need to decide on what service levels we provide to meet our obligations, which has implications for the costs we incur in providing our services, and how we price our services to recover these costs. With a monopoly service like ours, we often need to make these decisions (which can involve trade-offs between our services levels and our costs and prices) on behalf of our customers, within the context of the regulatory framework. In doing so, we must balance a range of competing, and potentially conflicting objectives.

As outlined in Section 2.2 there is a range of different operating modes for the SDP and the costs incurred vary by each mode.[19] There are also one-off activities that are required to switch between any of these modes.[20] While the SDP was put into water security mode in June 2012, there are technically a range of standby modes, most of a shorter duration.

- Short-term shutdown (for 2 to 10 days).
- Medium-term shutdown (for 11 to 90 days).
- Long-term shutdown (for 91 days to 2 years).
- Water security shutdown (for more than 2 years).

Under these shorter modes the plant is able to return to full production more quickly but there are more ongoing activities at the plant (and thus higher ongoing costs) than under water security mode. In principle the choice as to which shutdown mode to enter entails a trade-off between costs (taking into account ongoing costs as well as costs associated with the transition between modes) and the time required for restoring the plant to full production when storage levels drop. The longer the restart time, the lower the costs incurred during water security mode. However longer restart times reduce the flexibility to procure water over shorter timeframes.

However, in practice, it is likely that it will generally make sense to enter water security mode.[21]

One of the key trade-offs we tested with our customer and the Metropolitan Water Directorate (**MWD**) was the balance between the cost associated with the various shutdown modes and the length of time required for SDP to restart and be fully operating should the MWP or SWC require us to produce water. This is particularly the case given SDP currently makes decisions on behalf of its customers, including SWC and end-water customers, on the type of standby mode to enter into once dam levels reach 80%.

We tested our customer and other stakeholder preferences on this issue. Together with SWC, we commissioned GHD to produce a Reduced Flow/Operating Modes Analysis report. The report assesses how alternative modes address the risks resulting from SDP water security mode in relation to SDP's twin roles in providing for water security and for security of supply in response to an adverse event. The outcomes of this report, and the consultation we undertook with SWC and the MWD to inform the optimal

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19 For example, there are higher operating costs — including the costs of purchasing and transporting energy, having more staff on-site to oversee the desalination process — when the SDP is supplying drinking water to SWC.

20 For example, when the SDP ceases treating water, the steps to enter the standby modes begin with capping the ocean intakes and outlets. This means that the plant can become 'dry' which protects and prolongs the stainless steel pipework and equipment and ensures the life of the concrete structures within the plant. The RO membranes are then put under preservation and the pipeline is disinfected and sealed.

21 This reflects both the lower costs in water security mode and recognises that the time it takes for the storages to drop below 70% once they have reached 80% is highly likely to be more than two years, based on historical records.

operating mode, are detailed in Chapter 6.

Appendix 3.1 provides further information on the engagement with SWC and stakeholders, including how the feedback we received through this engagement shaped our regulatory proposal.

3.2.1 Ensuring the SDP continues to be able to reliably restart following an extended period of being in water security mode

While it is expected that SDP’s water supply service may not be required for a number of years, SDP’s water security role remains a critical element in securing Sydney's water supply. However, such an extended period of shutdown of a desalination plant is unprecedented (see Table 3.1). This gives rise to challenges in ensuring that an extended period of water security mode is managed in a way which minimises costs for SDP and customers, but which also provides for an optimal restart when the SDP is required to provide water supply services as envisaged under the MWP.

Table 3.1: Large municipal desalination plants

Maximum Shutdown Period	Current Production			
	Continuous Production (Operating continuously at reduced or full flow for the entire year)	Periodic (Full production for >50% of the year, in security or standby for the remainder)	Standby (Operated to maintain systems, not used as a significant water source)	Deep Preservation (Not in operation or standby)
Never shut down	**Southern Seawater Desalination Plant, Perth** (full production) **Perth Seawater Desalination Plant, Perth** (full production) **Carboneras Ocean Water Treatment Plant, Carboneras** (62% design capacity) **Torrevieja, Spain** (Reduced to 20% production) **Llobregat, Barcelona** (Reduced capacity) **Carlsbad, USA** (Full operation)	**Tuas, Singapore**	**Victorian Desalination Plant, Wonthaggi** (Intermittent testing, currently preparing to deliver its first 50GL water order) **Adelaide Desalination Plant, Adelaide** (low flow) **Gold Coast Desalination Plant, Gold Coast** (operating 3 days per fortnight operation, low flow)	
1-3 Months		**Tampa, USA** (Seasonal Standby, 3 months)		
3 months – 5 Years				
>5 Years				**SDP, Sydney** (Expected to be in water security mode for up to 10 years)

Source: Adapted from Reduced Flow / Operation Mode Analysis report (with relevant updates), attached in Appendix B of Appendix 6.3 (Advisian Water Security Report).

The consequence of SDP remaining in extended water security mode is more uncertainty about the operating condition of key elements of the plant than if it had been operating.

SDP must adapt its operations to ensure that confidence in plant availability is maintained, and that the plant continues to provide water security to customers.

Chapters 6 and 7 set out the targeted investments and expenditure related to plant testing and asset maintenance we consider necessary to ensure the SDP continues to be able to reliably restart following an extended period of shutdown.

3.2.2 Restoring and testing the SDP plant following the Kurnell tornado

In December 2015 an unprecedented tornado caused significant damage to the SDP plant and other premises in Kurnell. The high winds and resulting debris from the Kurnell tornado caused widespread damage across the site. The damage assessed includes:

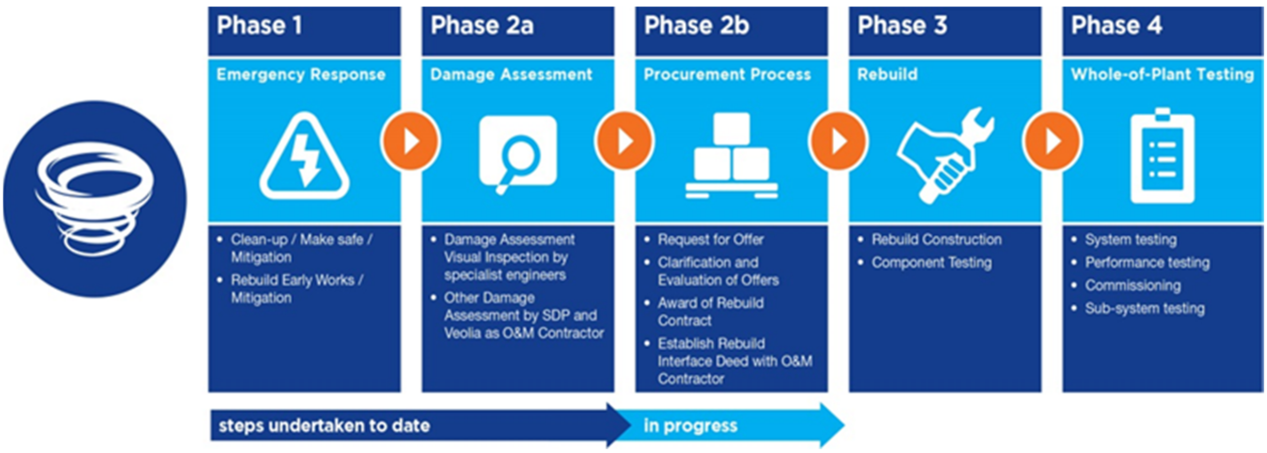
- Damage to the building structures housing plant including the roof structures of some buildings;
- Damage to plant items within those buildings; and
- Loss of preservation fluid to the membranes.

Further detail on the damage caused by the tornado is set out in Appendix 3.2.

To ensure that SDP is able to fulfil its water security role under the MWP, SDP is actively responding to the unprecedented damage, including engaging with insurers.

Our engineers have assessed the nature and extent of the damage as well as preparing for the repair and rebuild. The reinstatement process for the SDP includes five phases with key activities and steps undertaken outlined in Figure 3.2.

Figure 3.2: Responding to damage caused by the December 2015 Sydney Tornado



Source: SDP

3.2.3 Ensuring SDP is equipped to operate in an uncertain environment in a way that optimises the SDP's role in water security

According to the current operating rules determined under the MWP, SDP will instruct our O&M contractor to restart the plant when Sydney's total dam levels fall below 70% and to shut down the plant when dam levels rise above 80%. However, the NSW Government is currently reviewing the MWP and it is possible that SDP's operating rules will change.

Box 4: Potential changes to the SDP operating environment

- The MWP is reviewed periodically to adapt to challenges such as climate variability and a growing population. These reviews allow the mix of supply and demand within the MWP to be adjusted to ensure that growth and drought needs are met whilst minimising costs. SDP's operating rules are an outcome of this process which creates uncertainty around the timing, frequency and duration of SDP's operations.
- SDP has been working with MWD with the aim of ensuring that changes promote customer interests (value for money, water security). However, ultimately the supply and demand mix is a balance of broader government priorities and appropriately decided by government.
- The most recent review of the MWP has not yet been released and therefore the impact on SDP's operating rules is uncertain.
- Uncertainty about when the plant will be required to be switched on and the duration of operations until we are required to turn off drives costs, due to the costs of shutting down and restarting the plant. The behaviour of Sydney's catchments is highly unpredictable and it can take as little as a few days for dams to rise 10%. This occurred as recently as June 2016. The 10% bandwidth in SDP's 70/80 rule means that SDP could be required to enter shutdown having only operated for a short period of time.
- Even when dam levels are high, SDP has an obligation to its customer to be available. Given the limited operating history of SDP, it is unclear how often SWC will require SDP to be turned on for non-drought reasons.

Source: SDP

As noted by IPART in its Issues Paper, several other reviews are being undertaken at the same time as its price review, or are scheduled to be undertaken during the term of the 2017 Determination.

These reviews may lead to changes in SDP's operating rules and licence requirements. For example

- The MWP 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.
- 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.
- The MWD, 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. However, the amendments will not commence until the Directorate finalises its current review of the regulations under the WIC Act.

All of these potential changes highlight the need to ensure SDP has flexibility to adapt its operations to meet emerging demands which may be placed on it. A key lesson from the previous 2012-17 regulatory period is that the way in which the plant operates may be materially different from what was expected at the start of the period.

In the context of this review, SDP is strongly of the view that the regulatory framework, while providing appropriate regulation over its activities, needs to be designed in a way which does not inadvertently restrict operational flexibility which undermines SDP's ability to optimise our role in water security and supply. As discussed in detail in section 4, there are several elements of the current regulatory framework which in SDP's view have the potential to inhibit optimal outcomes. Therefore, a key priority for SDP for the 2017-22 period is to participate, in consultation with SWC, IPART, and other stakeholders, to refine the regulatory framework in a way that provides for greater flexibility to respond to changing circumstances.

4. Refining the regulatory framework

Key messages

- The regulatory settings in IPART's 2017 Determination will significantly influence the risks and incentives SDP faces over the 2017-22 regulatory period, which in turn will influence its ability to respond to current and future challenges in fulfilling SDP's water supply and water security role as envisaged under the MWP.
- While the 2012 Determination was undertaken in challenging circumstances, many of the regulatory settings in the 2012 Determination are likely to remain 'fit for purpose' over the 2017-22 regulatory period, including the maintenance of a 5 year determination period, mode based prices and mechanisms to manage risk and uncertainty such as the EnAM and pass through of electricity network charges.
- However there are opportunities to refine elements of the 2012 Determination to ensure the regulatory settings in IPART's 2017 Determination facilitates SDP effectively fulfilling its evolving water supply and water security role for the long-term benefit of customers. In particular:
  - The 2017 Determination should allow SDP to negotiate an agreed (unregulated) charge for water supplied outside of plant operation mode if SWC, or any other customer, agrees to take the water.
  - There are opportunities to refine the specification of the EfAM over the 2017-22 regulatory period.
  - Refinements to the abatement mechanism would promote value for money outcomes for customers and better support water security outcomes as envisaged under the MWP.
  - A cost pass-through mechanism should be introduced to efficiently manage the risks associated with a number of unforeseen and uncontrollable events.

4.1 Overview of proposed refinements to the regulatory framework

The regulatory framework refers to the collection of rules that regulate the prices for the services we provide, to incentivise cost and service improvements and to share risks and uncertainties in our market.

The regulatory settings in IPART’s 2017 Determination will significantly influence the risks and incentives faced over the 2017-22 regulatory period and beyond, which in turn will influence SDP’s ability to respond to current and future challenges in fulfilling our water security and water supply roles.

IPART’s 2012 Determination established a number of mechanisms to incentivise cost and service improvements and to share risks and uncertainties in our market (Box 5). While the 2012 Determination was undertaken in challenging circumstances — including a compressed timetable and with little or no observable SDP operating performance — many of the regulatory settings in the 2012 Determination are sound and likely to remain ‘fit for purpose’ over the 2017-22 regulatory period.

We consider that the pricing principles specified in the TOR remain appropriate and we have interpreted ‘fit for purpose’ as being those regulatory settings that are likely to be consistent with the standing Terms of

Reference[22] and address the challenges over the 2017-22 regulatory period in a way that best promotes our customers' long-term interests.

Box 5: Key features of 2012 Determination's regulatory framework

The first determination made by IPART covers the period 1 July 2012 to 30 June 2017. In this determination, IPART established:

- A schedule of maximum prices for each of five possible modes of plant operation based on its estimate of SDP's notional revenue requirement for each of these modes (see further detail below).
- Separate prices under several scenarios which were uncertain at the time of the determination, namely whether a carbon pricing scheme was adopted; and whether the transfer of the pipeline connecting the SDP and SWC's system was completed
- Incentive mechanisms including an abatement mechanism and an efficiency carryover mechanism (**ECM**)
- Risk management mechanisms including an EnAM and a limited cost pass-through mechanism for energy network charges as determined by the Australian Energy Regulator (**AER**).

There are, however, a number of elements of the regulatory framework, which in our view could be usefully refined and would ensure the 2017 Determination promotes our customers' long-term interests (Box 6). This chapter sets out the proposed refinements categorised in the following sections:

- Broad form of regulation
- Incentive framework
- Risk management framework
- Reporting requirements

Chapter 9 discusses issues relating to the recovery of costs through the structure of tariffs and cost sharing mechanisms between multiple users.

[22] The Government has issued a standing Terms of Reference to IPART in respect of regulation of SDP.

Box 6: Ensuring the 2017 Determination promotes our customers' long-term interests

In SDP's view, IPART's 2017 Determination is most likely to positively affect the services it provides and prices charged (and thus be 'fit for purpose') if it ensures that:

- There are incentives and funding to invest, operate and maintain a safe, reliable and responsive water supply and water security service that is valued by customers, including SWC and end-use water customers;
- There is a reasonable opportunity to recover efficiently and prudently incurred expenditure on the SDP plant and pipeline consistent with an efficient allocation of risk between SDP and customers, including SWC and end-use water customers, so that it supports continued access to financing;
- The regulatory settings appropriately balance stability and predictability to minimise regulatory risk and promote investment in long-lived assets (and continued access to financing) yet are sufficiently flexible to be capable of efficiently responding to the inevitable uncertainties associated with SDP's operating framework and SDP's costs within this framework;
- SDP's regulatory and financial incentives or interests are aligned with those of our customers, including SWC and end-use water customers as well as the broader community — for example, by providing incentives to optimise SDP's role in water security and to pursue ongoing cost efficiencies.

4.2 Broad form of regulation

The first step in determining prices for SDP's services is to decide on the form of and broad approach to regulation. This includes matters such as the length of the determination period, the approach for calculating the revenue requirement over this period and the price control mechanism that determines how prices move over time.

4.2.1 Length of determination period

Background

The length of the determination period is a key element of the regulatory framework. For the current determination period IPART adopted a five-year term, from 1 July 2012 to 1 July 2017, as this was specified in the TOR.

It is open to IPART to specify the appropriate length of the next determination period. A longer determination period generally provides greater regulatory certainty and stronger incentives to achieve efficiencies, but may also run the risk of becoming misaligned to changing industry conditions.

There has been a noticeable trend in regulation towards longer regulatory periods.[23] In many cases, longer determination periods have also been accompanied by mechanisms which allow greater flexibility to adapt to changing circumstances (e.g. re-opening provisions and/or cost pass-throughs).

In its Issues Paper, IPART stated its preliminary view 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.

[23] For example, the UK electricity regulator Ofgem has instituted eight-year regulatory periods for network energy businesses.

Assessment

We agree with IPART's preliminary view that a five-year determination period provides an appropriate balance between the risk of structural changes in the industry and the need to minimise regulatory instability and the administrative costs of more frequent price reviews.

Our proposal

Our proposed length for the determination period is 5 years from 1 July 2017 to 30 June 2022.

4.2.2 Mode based 'building block revenue' requirements

Background

In common with most economic regulators of water and energy businesses in Australia, IPART typically adopts the CPI-X building block approach to establishing revenue requirements and prices for regulated services (Box 7).

We support building block incentive regulation and Box 6 outlines many of the features of building block incentive regulation that are likely to ensure the 2017 Determination promotes our customers' long-term interests.

Box 7: Incentive regulation and a 'CPI-X building block' approach is commonly used for regulating infrastructure services

The CPI-X building block approach is commonly used across the infrastructure sector in Australia and overseas. At a broad level it involves:

- The regulator determining what it considers to be an efficient revenue requirement based on the 'building block' components (see Chapter 5 for more detail on this components) to deliver the nominated outputs, based on the regulated business's submission, engineering advice, public input via extensive consultation processes, and their own analysis. Typically, this revenue level is allowed to grow at the rate of general inflation, less some 'X' factor.
- Maximum prices for individual services (or baskets of services) are then set in such a way as to yield the allowed revenues, given a forecast of demand for the regulated services. Generally prices or revenues are set for a fixed period and businesses are provided with an incentive to generate efficiencies through the regulatory period by being able to retain any cost savings over and above those assumed by the regulator (while absorbing any over-runs) for the duration of the period.

This approach seeks to ensure that there is a close relationship between the overall level of prices and the efficient costs of the regulated business, and is generally seen as providing strong incentives for long-term investment as once capital expenditure is deemed as prudent and efficient, it is automatically permitted to earn a regulated rate of return.

However, applying the building block model to SDP is complicated by the fact that its costs vary depending on its mode of operation. For example, there are higher operating costs — including the costs of purchasing and transporting energy— when the SDP is supplying drinking water to SWC. There are also costs incurred in transitioning between these modes, for example the costs of restarting the SDP following a period in standby mode. As recognised by IPART in its 2012 Determination:

> *SDP is different to other regulated businesses due to its different operational modes. SDP operating costs (and maintenance expenses) are different for each operational mode. For*

> *example, this will mean that a full production building block model will have greater operating costs than a building block model for a long-term shutdown.*
>
> *While the operating costs for all water utilities vary with how intensively they are using their assets, no other utility that we regulate has such distinct operational modes. The differences in operating costs in different modes are significant. As such, we decided to modify our building block approach for SDP in this review.*

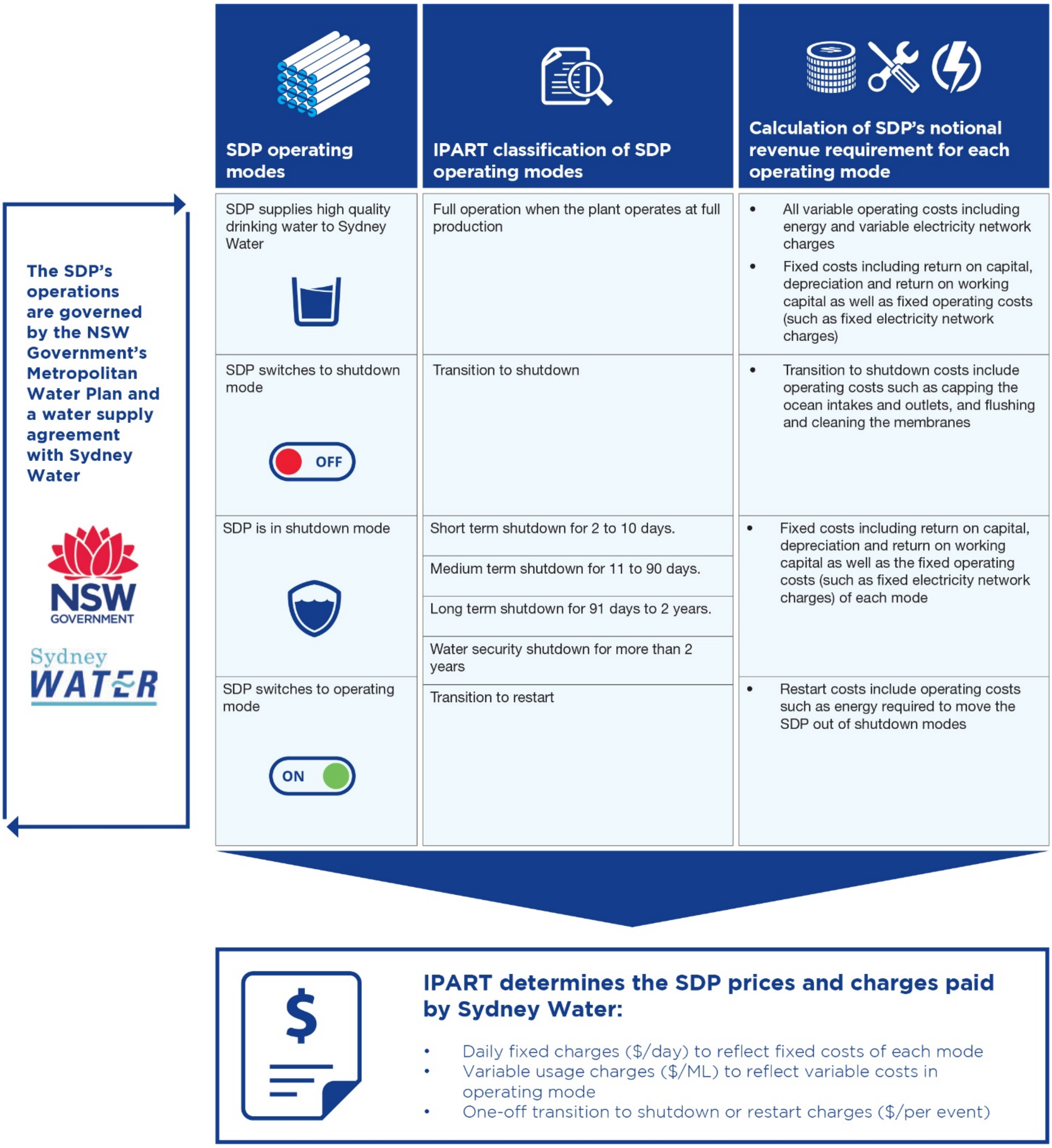
Specifically, to manage the different cost structures associated with different operating 'modes', in the 2012 Determination IPART:

- Established the daily revenue requirements and prices for each of the operating modes.
- Determined a set of prices designed to enable SDP to recover these notional revenue requirements.
  - For plant operation mode, the prices include a fixed daily service charge and a variable usage charge (per ML).
  - For each of the four shutdown modes, the prices include a fixed daily charge.
  - For medium term, long-term and water security shutdowns, IPART set fixed transition to shutdown and restart charges that are payable once per transition.

IPART's mode based pricing is summarised in Figure 4.1. Chapter 9 and 10 provide further discussion of the proposed tariff structures and resulting price levels.

As noted by IPART, the method it adopted to deal with the plant's operational characteristics can be viewed, at a high level, as a series of building block models, covering each operational mode in every year of the determination.

Figure 4.1: Mode based pricing in the 2012 Determination



Source: SDP

The IPART Issues Paper states that, as for the 2012 Determination, IPART proposes to:

- Use a 'building block' method to calculate SDP's revenue requirement
- Maintain mode-dependent pricing but:
  - Suggested that there may be additional modes of operation for the 2017 Determination period which vary from those applied in the 2012 Determination period. In particular, IPART sought views on whether a new pricing mode should be established for when the plant is inoperable, on the basis that the fixed costs incurred by SDP while the plant is inoperable may differ from those incurred while in water security shutdown.

- Raised the question as to whether charges for the pipeline should continue to be differentiated on a mode-dependent basis.

Assessment

In our view, establishing mode based revenue requirements and associated prices appropriately reflects the operating characteristics and costs of operating and maintaining the SDP across different modes, as envisaged under the MWP. For example, it allows the lower costs associated with water security shutdown cost savings to be passed on to customers and ensures neither IPART nor SDP are required to forecast the relevant operating mode. In short, in ensures customers only pay for the efficient costs of operating and maintaining the SDP and provides us with a reasonable opportunity to recover efficiently and prudently incurred expenditure on the SDP plant and pipeline, which in turn facilitates continued access to financing. It also ensures that when water is relatively scarce, customers are encouraged by the higher price to conserve water.

However, as discussed later in this submission, SDP believes that there is a need to adjust the pricing structures within some of the modes (particularly for restarting the plant after it has been in water security shutdown mode for an extended period) and also to address some unintended interactions between the abatement mechanism and the definition of the modes for charging purposes. Chapter 9 provides further detail on this issue.

Further, while the SDP may currently be 'inoperable' given the Kurnell tornado, it is not clear what costs IPART considers may be avoided relative to the SDP being 'operable' and in water security mode, nor the benefits of a separate set of prices. Indeed, many of the maintenance activities at the plant will be more time consuming and costly until the damage is repaired. Examples include:

- Having to hand fill water carts to fill up pump casings ready for hand rotation.
- All circuits must be checked by an electrician prior to being energized for maintenance activities.
- Hiring portable cranes for all jobs requiring a lift, as the onsite cranes were damaged.
- Extra labour for bund emptying due to the need for temporary equipment to be used (e.g. air compressors).
- Increased sampling and laboratory testing due to the significant increase in bund and valve pump outs.
- Increased number of safety inductions and training for additional visitors associated with the tornado rebuild activities.

As discussed in Section 4.4.3, there is likely to be a number of upfront costs to restore the plant to a state of readiness and many regulatory frameworks permit the recovery of the prudent and efficient incremental costs of responding to these force majeure events (see Appendix 4.3), as well as the previously determined fixed revenue requirements. In addition, as discussed in section 9.6, restricting the recovery of revenue requirements following a force majeure event would not afford us with a reasonable opportunity to recover efficiently and prudently incurred expenditure on the SDP and weaken the incentives and ability to invest, operate and maintain a water supply and water security service as envisaged under the MWP. SDP will be providing a further supplementary submission assessing the impact of a change to the current approach to charging when the plant is in 'inoperable' mode.

As discussed further in section 9, we see merit in maintaining a separate revenue requirement (and associated charge) for the pipeline for transparency. However, as pipeline costs do not vary by mode of plant operation there would not appear to be any benefits from establishing mode-dependent charges for this asset.

SDP proposal

SDP proposes a continuation of the current approach to determining ‘building block’ revenue requirements based on different modes of operation of the plant, subject to some adjustments detailed in this submission.

4.2.3 Scope of services subject to regulation

Background

Under section 51 of the WIC Act, the Minister for Finance and Services has declared SDP to be a monopoly supplier in relation to the water supply services it provides under its network operator’s and retail supplier’s licences. Together, these licences authorise SDP (and our O&M contractor) to operate and maintain the desalination plant and pipeline to supply drinking water to any person (other than a small retail customer) within SWC’s area of operations (as defined in the SWC Operating Licence).

The TOR further specify that prices set by IPART should reflect the water supply services provided by SDP, namely:

- the supply of non-rainfall dependent drinking water to purchasers
- the making available of the desalination plant to supply non-rainfall dependent drinking water.

The TOR are clearly focussed on the supply of water under the 70/80 rule which are imposed on SDP as a condition of its network operator licence. This is evident in the background section of the TOR which explains the services provided by SDP arising from this licence condition.

In its Issues Paper[24], IPART explores how greater pricing flexibility might encourage the potential additional use of the SDP. In particular, it raises the issue as to whether unregulated price agreements might be permitted when dam levels are high.

It suggests that unregulated pricing agreements between SDP and its customers outside the 70/80 rule would allow them to negotiate the price of the water usage charge and incremental fixed costs in their own self-interest, where SDP has limited monopoly power. IPART further states its view that SDP has limited monopoly power when it operates outside the 70/80 rule as water is not scarce and there are other sources of readily available water. In addition, it observed that SDP’s customers are likely to be large sophisticated customers with negotiation acumen, such that SDP and SWC (or other customers) would only enter into unregulated pricing agreements when all parties benefit (i.e. a ‘win-win’ agreement).

While IPART stated that “the regulatory framework should not prevent these win-win agreements from occurring”, and has noted its preference to facilitate win-win agreements in its 2016 SWC Determination, IPART’s preliminary view is that unregulated prices could be inconsistent with the financial indifference principle in the TOR as SDP would only enter into such an agreement if they expected to benefit from doing so, and thus would no longer be financially indifferent.

Assessment

There may be a number of situations where SDP might supply water outside the operating rules, initiated by either SDP or SWC and as noted by IPART, the regulatory framework should not prevent parties from entering into ‘win-win’ agreements. These agreements should permit SDP to fully recover the costs of providing the services.

There are a number of regulatory precedents for bilateral agreements of unregulated charges between parties with countervailing power. Indeed, it its recent decisions for SWC and HWC, IPART has allowed

[24] IPART, Issues Paper, p.39

greater price flexibility for these suppliers to enter into unregulated agreements with non-residential customers.

SDP considers that IPART's interpretation of the TOR is too narrow. The financial indifference principle is directed at circumstances under which SDP may and may not operate under the 70/80 operating rule. It is not directed at voluntary transactions that are otherwise efficient outside of that framework particularly where SDP does not have market power.

SDP proposal

The 2017 Determination should allow SDP to negotiate an agreed (unregulated) charge for water supplied outside of plant operation mode if SWC (or any other customer) initiates such a request.

4.3 Incentive framework

In addition to the incentives associated with price caps set under the building block approach (as outlined above), the regulatory framework also includes a number of additional mechanisms designed primarily to align SDP's regulatory and financial incentives or interests with those of SWC and end-customers. These are the EfAM and the abatement mechanism.

4.3.1 Price control mechanism

Background

There is a range of potential forms for price control that have been used by economic regulators including price caps, tariff baskets and revenue caps. Under the current determination, IPART has specified maximum prices to apply to each of the defined regulated services provided by SDP under different modes of operation. This represents a 'price cap' form of regulation.

Assessment

The appropriate form of price control is likely to vary depending upon the particular circumstances applying to the regulated business. While price caps are perhaps the most common form of price control, revenue caps have been adopted particularly where there is significant uncertainty regarding the demand for services and/or where there are significant fixed costs. Tariff baskets are often used to regulate the prices of multi-product monopolies and provide greater flexibility for a business to change prices of individual products within an overall constraint on price increase for the defined basket of services.

Given the nature of SDP's activities, SDP supports continued application of a price cap.

SDP proposal

We propose a continuation of price caps as the form of price control. As discussed in further detail in Chapters 9 and 10, however, we consider that higher caps need to be developed to more accurately reflect the costs associated with restart depending on the length of time the plant has been in shutdown mode.

4.3.2 Efficiency adjustment mechanism (EfAM)

Background

Regulators and regulated businesses have recognised that under the standard incentive-based regulatory approaches (such as price and revenue caps) the incentives for businesses to reduce costs will vary over the regulatory period. Cost reductions achieved in the first year of a multi-year regulatory period that can be maintained throughout the regulatory period will yield a greater return than cost reductions achieved during the last year of the regulatory period that may be retained for only one year as they are rolled into prices in subsequent price reviews. The regulated business may therefore have a greater incentive to achieve efficiency gains in earlier rather than later years of the regulatory period.

Regulators have developed several mechanisms aimed at addressing this problem of diminishing incentives over the course of the regulatory period, which are generally referred to as Efficiency Benefit Sharing Schemes (**EBSS**s) or ECMs.

Under an ECM a business realising a gain towards the end of regulatory period can retain the benefits (or a proportion of the benefits) for a reasonable amount of time before they are passed through to customers. It therefore creates a situation in which the regulated business has a constant incentive to achieve efficiency gains throughout the regulatory period, as any efficiency gains are maintained by the business for a predetermined length of time. Such mechanisms have been developed by a number of regulators such as the Essential Services Commission (**ESC**), Queensland Competition Authority (**QCA**), Australian Competition and Consumer Commission (**ACCC**) and AER.

In its 2012 determination, IPART recommended that its standing TOR be amended to provide for an ECM for SDP (now known as the EfAM). The TOR now provides that SDP should be permitted to retain demonstrated efficiency savings (net of efficiency losses) for a period of 4 years following the year in which the efficiency savings were achieved. The stated objective of the proposed EfAM is "to encourage SDP to make efficiency gains as early as possible for the ultimate benefit of users via lower prices in the longer term" (p15)".

As required by the standing TOR, IPART published a Methodology Paper setting out its approach to implementing the EfAM[25]. The key features of the current EfAM are set out in Appendix 4.1. A key feature of the EfAM applying to SDP, however, is that it is mode-dependent. This means that it only provides for the assumed share of benefits to be retained if the plant operates in the same mode for the next four years, unless SDP can demonstrate that gains/losses are not directly attributable to that mode.

In its Issues Paper IPART states that the price review presents an opportunity for it to concurrently review, consult on, and if necessary update the 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. IPART is not proposing to change the methodology to apply in the current price control period.

SDP notes that IPART has recently established an ECM for other metropolitan water businesses it regulates (SWC and HWC) for the next regulatory period. These schemes share many of the features of the EfAM (e.g. they apply only to operating expenditure and not to capital expenditure). One notable difference is that they also introduce a distinction between temporary and permanent cost savings/over-runs, whereby those which are deemed 'temporary' are captured/borne by the business, while those which are deemed 'permanent' are (subject to IPART review) passed through to customers after a defined period.

IPART poses the following questions:

- Is our proposed implementation of the EfAM for the current price review appropriate?
- What aspects of the EfAM should be updated or amended for implementation at future price reviews?
- Should we extend the ECM that we introduced for SWC, HWC and Water NSW to SDP?

IPART notes several issues in applying an ECM to SDP. In particular, it recognises that although mode-dependent efficiencies might apply in principle, there might also be difficulties in demonstrating this in practice. IPART therefore questions whether this aspect of the EfAM adds unnecessary complexity and whether there are opportunities to improve this design feature.

IPART also sought views on the impact of any existing incentive mechanisms (e.g. efficiency sharing arrangement) between SDP and our O&M contractor on the application of the EfAM.

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[25] IPART (2012) *Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms*, Water – Methodology Paper, April.

Assessment

SDP supports the principle of incentive regulation and concurs that an EfAM is consistent with emerging best practice regulation to provide ongoing incentives for efficiency.

However, in our view, the incentive properties of the existing EfAM are relatively weak as it provides few opportunities for SDP to retain any efficiency savings it makes. This is primarily because the current ECM only provides for the assumed share of benefits to be retained if the plant operates in the same mode for the next four years.

In developing the EfAM for the 2012 determination, IPART undertook modelling which showed that its 'mode-specific' EfAM provides a constant sharing ratio (of 29% to SDP and 71% to customers assuming a 7% real WACC[26]), so long as that mode recurs at the same stage of each regulatory period for the same duration. However, the 29% sharing ratio (which is generally seen by regulators as an appropriate benchmark) is in fact a special case.

As demonstrated in Appendix 4.1, the actual sharing ratio will depend on which mode the plant is in and this is outside of SDP's control. This uncertainty in itself reduces incentives for SDP making efficiency savings. In principle, it could also incentivise SDP seeking to predict the duration of a mode before investing resources to make savings. SDP may also have incentives to bring forward operating expenditure into the final year of a mode and attribute it specifically to that mode if that mode is not expected to reoccur for some time.

In addition, the current mode-specific approach as established in the 2012 determination would not appear to be consistent with TOR 8 which provides that "SDP should be allowed to carryover demonstrated efficiency savings, net of efficiency losses, in operating expenditure in providing the water supply services for a period of 4 years following the year in which the efficiency saving was achieved". It also appears to be inconsistent with the financial indifference principle, as whether or not SDP actually receives its share of the savings depends on which mode the plant is in during the next regulatory period.

However, SDP also accepts that it is not appropriate for efficiencies which are specific to one particular mode of operation to be reflected in higher prices when these efficiencies are not being manifested because the plant is in a different mode of operation.

In considering the current EfAM it is also important to recognise that there is minimal scope for savings when the plant is in shutdown mode. It is also important to note that our O&M contract provides for sharing of efficiency gains on a 5 yearly cycle (see Appendix 6.2).

SDP's proposed approach

SDP proposes that the EfAM applying to SDP be modified to allow mode-specific savings (overruns) to carryover, in constant real terms, for the next four years of the same mode, regardless of when that occurs.

This would acknowledge that SDP does not ex ante know, and cannot control, the duration of a mode. By helping to narrow the range of sharing ratios which apply in practice, this would strengthen the incentive properties of the mechanism. In SDP's view this approach is also more consistent with the intent of the Standing TOR.

SDP does not support the adoption of the temporary/permanent savings/over-runs distinction as applied in the recent EfAM schemes for SWC and HWC. In our view this adds considerable additional complexity (particularly in the context of SDP's already more complex mode-based scheme), given the practical difficulty in distinguishing between 'temporary' and 'permanent' savings, for little apparent benefit.

[26] With a more realistic 5% real WACC, 29% sharing ratio falls to 21.6%.

4.3.3 Abatement mechanism

Background

In its 2012 Determination IPART established a mechanism to abate charges levied by SDP if it fails to provide desalinated water services when otherwise required to do so under the MWP. The stated rationale for this abatement mechanism is to ensure that "while SDP is financially indifferent as to whether or not it supplies water, it also has no incentive to withhold supply when available dam storages are below 70% or until levels rise again above 80%".

This mechanism reduces the daily water service charge (**WSC**) applicable in that day's full operation mode if the average production of the preceding 365 days of full production is less than IPART's interpretation of the plant's nameplate capacity (i.e. 250ML per day). In calculating the average daily production over 365 days of full production, shutdown event days and force majeure events are excluded.

In its Issues Paper, IPART sought comment on:

- whether there were aspects of the current abatement mechanism that needed modifying
- whether the financial incentive was still relevant or whether there are other performance mechanisms that could better ensure SDP maximises supply when required.

IPART's preliminary view was that the abatement mechanism should continue to apply whenever SDP is required to operate under the 70/80 rule (other than in circumstances when the plant is gearing up to or down from full production or operating for a minimum run time).

This reflected IPART's view that a financial incentive is important to ensure SDP operates as intended and in accordance with its operating rules and conditions of its network operator's licence. IPART did not consider the licence conditions on their own provide a sufficiently strong incentive.

However, IPART suggested that there may be a need to refine the operation of the abatement mechanism to manage short-term fluctuations around the plant's nameplate capacity and to distinguish between the plant operating under the 70/80 rule and outside this rule. In particular, IPART recognises that the current abatement mechanism has significant shortcomings. IPART suggests that while the abatement mechanism 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:

> *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[27].*

IPART identifies a 'soft' restart, which would allow SDP to supply volumes of less than 250 ML per day to SWC (or another customer), without financial penalty, as it ramps up to full production under the 70/80 rule, as one option for addressing this issue.

IPART also notes its preliminary view that the abatement mechanism should be more flexible and allow SDP to manage short-term fluctuations, while maintaining its drought supply obligations (e.g. by calculating the abatement on a periodic basis – rather than daily - to allow SDP to achieve the 250 ML per day target on average)[28].

[27] IPART, Issues Paper, p.42

[28] IPART, Issues Paper, p.49

Assessment

SDP understands the importance of ensuring that the plant is able to run at full capacity at times when it is needed, and it takes its responsibilities to provide a non-rainfall-dependent supply of water at times of shortage very seriously. Indeed, many of the actions outlined in this submission are directed towards ensuring that the plant can operate at full capacity when it is called upon to do so.

SDP firmly believes that it should be held accountable for its performance in fulfilling its water security role and that linking this to financial incentives is consistent with sound commercial practice. SDP supports the retention of an abatement mechanism which appropriately incentivises SDP to maintain and operate the plant and pipeline and ensure that it can supply water at full production levels when required to do so.

In order for the abatement mechanism to best achieve its objective, SDP considers that it needs to be designed in such a way that the financial incentives:

- Relate directly to SDP's performance in ensuring the plant is able to maximise production when required to do so through actions within its control. SDP should not be penalised where production is not maximised because of factors outside of its control. This includes force majeure events and directions given to SDP by SWC to supply at lower levels of output.
- Do not contain any perverse incentives for SDP to act in any way contrary to optimising its role in water security.

SDP shares IPART's concerns about the current specification of the abatement mechanism. In particular:

- The abatement mechanism creates a perverse incentive for SDP to discharge high quality drinking water to the ocean in a period of low water availability when restarting the plant.
  - When dam levels fall below 70%, SDP will issue instructions to our O&M contractor to restart the plant. The restart period will take up to eight months whilst the plant becomes fully operational, although after about four months, SDP will progressively commence producing potable water that meets the standard required by SWC. Under the definition of the Restart Period in the Determination, the period ends as soon as SDP supplies water to a customer. As SDP would not yet be producing 250ML perday, supplying water to SWC as the plant is restarting would result in SDP's WSC immediately being abated. This provides SDP with an incentive to dispose of any water that is produced during the ramp-up period (i.e. return it to the sea), rather than supplying it to SWC, in order to avoid being penalised.
  - Although SDP is not obligated to supply water during restart, it is in the interests of SWC's customers and water security for SDP to supply water as soon as possible once the restart has been triggered. In addition, SDP believes that it is in the interests of SWC's network stability for the desalinated water to be gradually introduced to SWC's system rather than commencing supply at full production.
- Under some circumstances it could impose financial penalties on SDP when production is curtailed due to factors outside its control.
  - The current mechanism excludes shutdown event days and force majeure events from the calculations consistent with the principle that SDP should not be penalised for events outside its control. This feature should be retained in the abatement mechanism.
  - However, other circumstances where production of the plant may be curtailed other than through factors within SDP's control (e.g. where SWC are unable to receive full supply) are not adequately addressed in the current mechanism. In these circumstances, SDP is prevented from maximising production which results in a lost opportunity to build a production "bank" which is necessary to accommodate essential future maintenance. The potential consequences for abatement of this lost opportunity have been recognised by SWC and are addressed in the WSA.

Further analysis of the deficiencies with the current specification of the abatement mechanism is provided in Appendix 4.1.

SDP's proposal

SDP supports the retention of an abatement mechanism which provides strong financial incentives for SDP to ensure it operates at full capacity when it is called upon to do so.

SDP proposes a number of adjustments to enhance the abatement mechanism to ensure it is best able to achieve its objectives and avoids any perverse incentives, and that any financial incentives are proportionate and symmetric in regard to SDP's role in water security. These changes are also aimed at aligning the abatement mechanism with the design parameters of the plant, namely 266ML/day with an availability of 94%, or 91.3GL/year.

SDP proposes the following changes to the abatement mechanism:

- Introduction of a 'grace period' so that SDP is not subject to abatement during the period between being instructed to switch on and producing water at 100% of capacity. This will remove the incentive for SDP to dispose of water to the sea rather than supply it to SWC. SDP proposes a grace period of 8 months from being instructed to switch on, on the basis that this represents a reasonable period for restart, after which SDP would be considered to be in a plant operating period for the purposes of charging. Any delays beyond this period would be subject to the abatement mechanism.

  The water usage charge payable during the restart period should be lower than the water usage charge during a plant operating mode. This is because SDP will only need to recover the energy costs associated with supplying the water, as other variable costs incurred during restart (eg chemicals) are already included in the transition from water security (restart) charge.

- Changes to the calculation methodology to better align the financial incentives of the mechanism with the impact of SDP's production performance on water security outcomes by adjusting the recorded volumes of production on days where production is curtailed due to actions of others (e.g. SWC being unable to receive full supply) by deeming production for those days to be the higher of:
  - 250ML; or
  - the average of the preceding five Availability Days of unconstrained production.

  In accordance with the WSA with SWC, this adjustment would not apply with respect to up to five days in any financial year.

4.4 Risk management framework

As highlighted in section 4.1, ensuring the 2017 Determination promotes our customers' long-term interests requires the regulatory settings to appropriately balance:

- stability and predictability to minimise regulatory risk and promote investment in long-lived assets (and continued access to financing)
- flexibility and be capable of efficiently responding to the inevitable uncertainties associated with SDP's operating framework and SDP's costs within this framework;

Most regulators seek to establish a risk management framework that allocates risk to those parties best able to manage those risks. This efficient allocation of risk can lower the risk profile of a regulated business and thus its cost (and prices) of providing regulated services.

This section sets out the key elements of our proposed risk management framework, including those elements of the 2012 Determination that remain fit for purpose, as well as a number of new elements that we consider necessary for the 2017-22 regulatory period if the SDP is to have the ability to fund, invest, operate and maintain a water supply and water security service as envisaged under the MWP.

4.4.1 Cost pass-through of energy network costs

Background

As outlined in Chapter 2, desalination can be an energy intensive process. While the cost of energy is a significant proportion of SDP's operating expenditure when in operation mode[29], when in shutdown modes (such as water security) the SDP's energy requirements are modest, meaning the cost of energy is a small proportion of SDP's operating expenditure. This means there is significant volatility and uncertainty in the volume of energy that needs to be transported to the SDP.

In addition to this volume risk, the cost of transporting this energy (on a cost per unit basis) is highly uncertain. Network charges, as levied by Ausgrid, are subject to independent regulation by the AER and there is significant uncertainty regarding these network charges for the 2017-22 regulatory period (see Box 8).

Together, these volume and price uncertainties create risks for SDP in forecasting energy network costs.

At the time of the 2012 determination, there was also considerable uncertainty as to the network charges that SDP would face over the 2012-17 determination period, as at the time the Australian Energy Market Commission (**AEMC**) was undertaking a review of provisions in the National Electricity Rules (**NER**) relating to economic regulation and AER's then current determination was expiring in 2013-14.

IPART considered the options to manage this uncertainty and established an explicit cost pass-through mechanism as part of the 2012 determination to enable SDP to pass through annual changes in network charges (consistent with its current approach to regulating retail gas prices). In its determination, IPART stated that:

> *"IPART considers it important that SDP is able to pass through electricity network costs through its water prices given that SDP will have little ability to control these costs. In addition, there is significant uncertainty about average changes in network prices into the future. Given these uncertainties, we have established a mechanistic cost pass through provision for network charges to ensure that SDP does not have to bear the risk associated with changes in network costs. This in turn ensures that the charges paid by water customers ultimately reflect the actual network costs." (p. 64 Determination, Schedule 6).*

There is again significant uncertainty relating to network charges for SDP's 2017-22 regulatory period (Box 8) such that making an ex-ante forecast of network costs is highly challenging and could result in operating expenditure allowances that are above or below the actual costs of transporting electricity. In this context, IPART's Issues Paper proposes to continue with a cost pass-through mechanism for network energy costs in the 2017 Determination as the reasons for this approach continue to apply.

[29] In addition, the original planning conditions for the plant required SDP to develop a Greenhouse Gas Reduction Plan which mandates the development of a plan for managing greenhouse gas generation associated with electricity supply to the plant, including powering the plant with 100% renewable energy.

Box 8: Uncertainty regarding regulated network electricity prices for the 2017-22 regulatory period

There is significant uncertainty relating to network charges for SDP's 2017-22 regulatory period resulting from:

- The AER made Final Determinations on distribution network charges for three NSW electricity distributors, including Ausgrid, covering the period 2014/15 – 2018/19 in April 2015. The three NSW electricity distributors (known collectively as Networks NSW) sought from the Australian Competition Tribunal (the **ACT**) merits reviews of the Determinations.
- In February 2016, the ACT delivered its decision, setting aside the AER's 2015 Determination on a number of grounds, and sent those matters back to the AER with orders to remake the Determinations in relation to those matters. The ACT upheld the three NSW electricity distributors' applications for review in a number of areas that would have a material impact on allowed revenues, the most significant of which were: the value of imputation credits, the cost of debt and the use of benchmarking in setting operating expenditure allowances.
- On 24 March 2016, the AER lodged applications with the Full Federal Court seeking judicial review of the ACT's judgment, covering the three items above, and it is unclear when the judicial review process will be completed.
- If the AER's judicial review applications are unsuccessful, it would need to remake its Determinations in line with the ACT's orders, which would add further delays in settling the outcome of regulated distribution network charges for the period 2014/15 – 2018/19.

Assessment

In SDP's view the 2012 Determination's pass-through mechanism for electricity network charges remains appropriate given the significant uncertainty with electricity network prices over the medium term (i.e. AER merits reviews and judicial review processes). Retention of this pass-through mechanism would also maintain regulatory consistency in addressing the same issue across determinations and consistency with IPART's treatment of energy network cost risk in its 2010 and 2013 retail electricity decisions.[30]

SDP proposal

IPART should retain a specific pass-through mechanism for network energy costs for the 2017-2022 determination period.

4.4.2 General cost pass-through mechanism

Background

To manage the risks that a regulated business incurs (uncontrollable and material changes in its costs that were unforeseen at the time of the regulation determination), many regulatory frameworks include risk sharing mechanisms such as a 'pass-through mechanism' to adjust prices up or down in response to the efficient incremental costs of these unforeseen changes.

[30] IPART, Review of regulated retail prices and charges for electricity: From 1 July 2013 to 30 June 2016 – Final Report, June 2013.

In general, mechanisms exist across a variety of industries to pass-through costs that are outside a business' control and not built into the original price determination. For instance, the NER and National Gas Rules (**NGR**) recognise that a service provider can be exposed to risks beyond their control, which may have a material impact on the costs of service provision. For this reason the NER and NGR provide for a number of cost pass-through events which enable service providers to seek approval to recover (or pass through) the efficient costs of defined, material events whose costs are not built into the regulatory determinations. These events include regulatory and tax change events, retailer insolvency, 'insurance gap' and other events either specified in the NER and NGR or in the relevant determination as a pass through event. IPART, in its previous role in regulating electricity network prices prior to the AER taking over this function, and in its role in regulating electricity retail prices, also established a general cost pass through mechanism for similar reasons.

Appendix 4.2 provides further detail on the considerable regulatory precedent in managing the risks associated with material unforeseen and uncontrollable events.

Unlike other regulatory frameworks governing infrastructure providers, IPART in its 2012 Determination for SDP did not include a generic mechanism to manage costs associated with unforeseen and uncontrollable events. Rather it chose to establish a number of targeted mechanisms to manage specific risks, including the uncertainty surrounding:

- The Carbon Pricing Scheme and the potential to impact the costs of procuring electricity
- The level of electricity network charges.

While we support the continuation of the pass through of electricity network charges (as discussed in section 4.4.1), the absence of a mechanism to manage the risk and resulting costs associated with regulatory, legal and taxation change events as well as other extraordinary (or broader force majeure) events results in SDP bearing significant risk, with resulting impacts on SDP's risk profile. It also creates the potential for inefficient price signals to be sent to customers regarding the costs of water security or water supply services. It is also inconsistent with most other regulatory frameworks across Australia.

As IPART has recognised in its recent Issues Paper:

> *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 pass-through 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.*

IPART has considered the circumstances to which pass through mechanisms may be appropriate and its Issues Paper sets out that cost pass-through mechanisms should only be applied in exceptional circumstances (see Box 9).

Box 9: IPART's proposed 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.
- 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.

Source: IPART, Issues Paper, p62

Assessment

We agree with many of these criteria outlined by IPART, for example, that any pass through mechanism needs to have a clearly defined and identified trigger event in the price determination and should only allow the incremental and efficient costs (or savings) associated with the event to be passed through to customers. We also agree that the cost pass-through should result in prices that better reflect the efficient cost of service provision.

However, in our view, some of the criteria outlined by IPART are too narrow and risk excluding the establishment of a mechanism that may result in an efficient allocation of risk and least cost outcomes for customers.

For example, a regulated business may not be able to influence the likelihood of the trigger event (say a natural disaster) but it may be able to influence the resulting cost. This is because prior to an event occurring (in this case a natural disaster) the regulated business may be able to make investments (physical or financial) that could minimise the resulting costs from the event. However, the nature and size of these investments (and resulting reduction in risk and costs) may not be an efficient response to this risk, and could result in higher costs (and prices) for customers. The appropriate question therefore relates to whether a cost pass through mechanism can provide the right incentives to ensure an efficient allocation of risk and least cost outcomes for customers. Appendix 4.3 highlights that other regulators of infrastructure services have been able to structure pass through mechanisms that provide these outcomes.

Provision for a pass-through mechanism ensures that in forecasting their operating and capital expenditures (for the purpose of determining prices), regulated businesses do not include any speculative and significant allowances for events that may not occur. These mechanisms ensure that risks associated with uncontrollable and material events in the policy, regulatory and commercial operating environments are managed efficiently, which can lower the risk profile of the regulated business, its costs and its prices.

In our view, a targeted cost pass through mechanism to manage the risks associated with a number of unforeseen and controllable events:

- Is likely to be an efficient regulatory response to these risks, and result in lower costs (and prices) for customers.
- Is consistent with the TOR which provide for SDP to recover the costs of supplying water
- Is consistent with regulatory precedent across Australia over many years
- Can be designed to be consistent with IPART's criteria (and IPART Act) for a cost pass-through mechanism.

SDP proposal

We have carefully considered the regulatory precedents (including IPART precedents), our unique operating environment and our ability to manage the risk of unforeseen, uncontrollable and material costs in a cost-effective way over the 2017-22 regulatory period. We consider a targeted risk management framework necessary during the 2017-22 regulatory period to ensure the SDP can continue to effectively fulfil its water supply and water security services under the MWP.

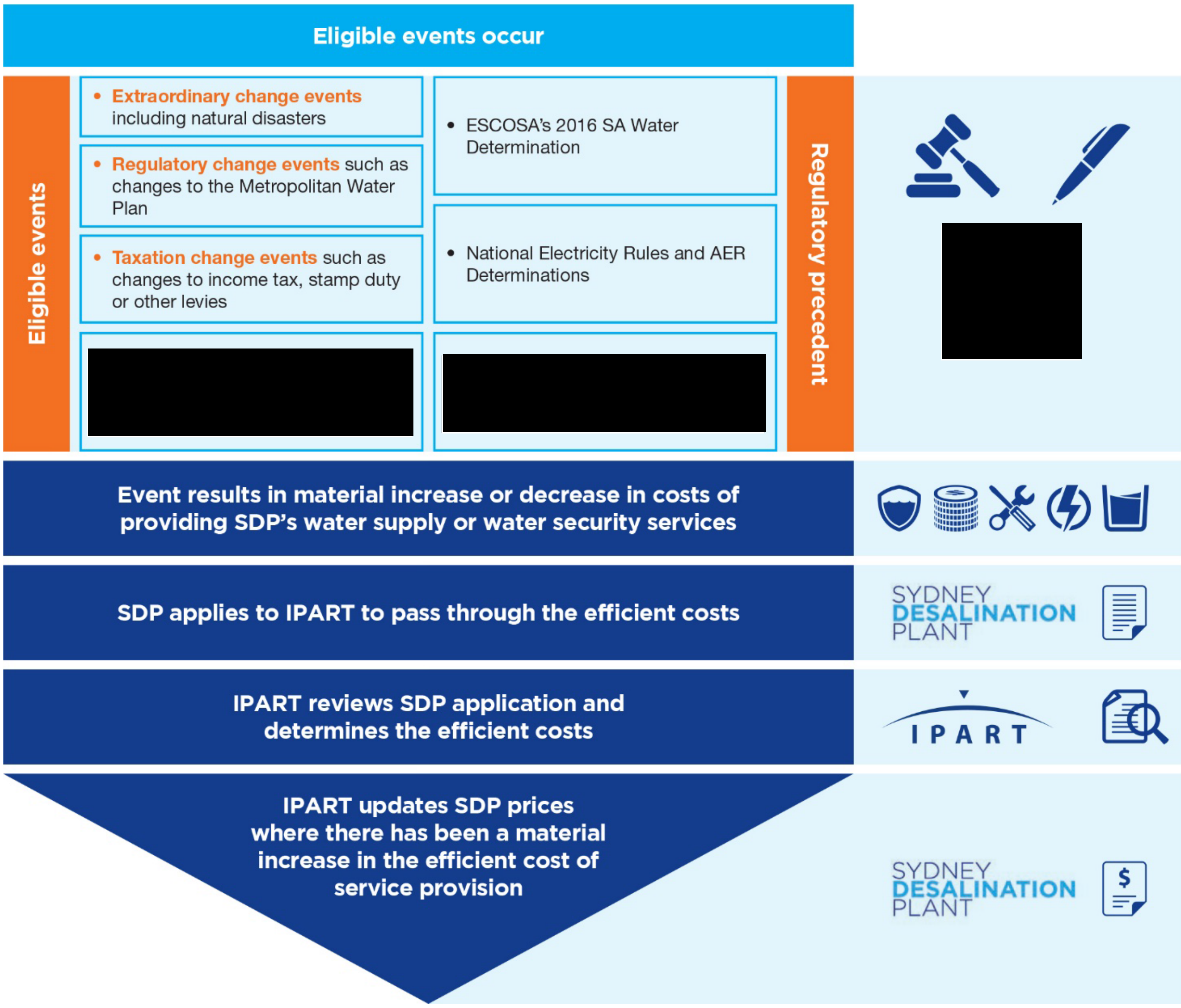
We propose that risks associated with:

- Unforeseen and uncontrollable regulatory, taxation and extraordinary events be managed through a general cost pass-through mechanism.

The pass through mechanism would allow SDP to apply to IPART to pass through the efficient and incremental costs associated with eligible events. The aim of this mechanism is to enable the recovery of efficient costs (or pass through savings) in the advent of these events – to allow the SDP to continue to invest, operate and maintain a water supply and water security service as envisaged under the MWP – while ensuring that SDP's prices are no more than necessary to provide its services.

A summary of how these proposed cost pass-through mechanisms would apply are provided in Figure 4.2 and outlined below. Appendix 4.4 provides further detail including event definitions that we propose be included in the 2017 Determination. Where possible, these events have been defined consistent with other regulatory determinations that apply to infrastructure services in Australia.

Figure 4.2: Proposed cost pass-through mechanism to apply for the 2017-22 regulatory period



Source: SDP

This process would involve:

1. An eligible event occurring that results in a material increase (**Positive Change Event)** or decrease in costs (**Negative Change Event**) of providing SDP's water supply or water security services (**Pass Through Water Services**)
2. SDP applying to IPART (or IPART initiating) and substantiating the increase (or decrease) in costs of providing SDP's water supply or water security services (**Eligible Pass Through Amount)**
3. IPART reviewing the SDP application to determine the efficient increase or decrease in costs to be passed through to customers (**Approved Pass Through Amount)**
4. IPART notifying SDP (and stakeholders) of the decision and the prices to apply in each remaining year of the 2017-22 regulatory period.

4.4.3 Commercial in Confidence

4.4.4 Energy Adjustment Mechanism (EnAM)

Background

Desalination is an energy intensive process. Although the SDP uses world-class technology to reduce its energy requirements, the cost of energy is a significant proportion of SDP's operating expenditure when in production mode. Further, the original planning conditions for the plant required SDP to develop a Greenhouse Gas Reduction Plan which mandates the development of a plan for managing greenhouse gas generation associated with electricity supply to the plant, including powering the plant with 100% renewable energy. At the time of construction, it was considered appropriate that long-term contracts be entered into to procure electricity from a renewable source to meet the plant's operation needs at full capacity.

However, when in shutdown modes (such as water security) the SDP's energy requirements are modest, meaning the cost of energy is a small proportion of SDP's operating expenditure.

This volatility in energy requirements and costs creates risks for SDP in purchasing energy, particularly in the National Electricity Market (**NEM**) which is characterised by significant price volatility.

Recognising these risks and the potential resulting impact on SDP's risk profile, the current regulatory framework (through the Standing TOR) includes a mechanism to share this risk between SDP and its customers, including SWC and end-use water customers. The mechanism is required to:

- Allocate the costs or benefits to SDP customers of actual gains or losses beyond a core band that results 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 (now called 'Large-scale Generation Certificates or **LGC**s).
- Operate at times when SDP is in Shutdown or in a Restart Period and SDP complies with its requirements to maintain and operate the plant under clause A2 of it network operator licence.

IPART's current specification of the mechanism (the EnAM):

- Passes through 90% of gains or losses above a threshold of 5% of minimum contract cost, applied on an annual basis.
- Requires SDP to act prudently to minimise its exposure to losses on the resale of surplus electricity and Renewable Energy Certificate (**REC**s).
- Does not apply if the Infigen contracts are assigned to a third party or terminated.

In its 2012 Proposed Methodology Paper, IPART stated that the 5% threshold provides considerable protection to SDP against uncontrollable costs, while the 90% pass-through rate provides a "modest degree of risk sharing and an incentive to efficiently manage risks".[31]

In its Issues Paper IPART sought views on whether its proposed implementation of the EnAM for 2017-22 regulatory period is appropriate, including the:

- calculation method for resale gains or losses
- threshold level and pass-through formula (i.e. 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)

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[31] IPART, *Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms IPART's Proposed Methodology* March 2012, p16

- interest rate used to account for financing costs.

IPART also noted that there may 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 MWP or new operating modes proposed by SDP and/or other stakeholders. In particular, the EnAM applies only in shutdown and restart modes. As noted by IPART, if the EnAM does not apply when the plant is producing water outside the 70/80 rule, SDP may at times have an incentive to remain in shutdown mode.

Assessment

Ongoing role of the EnAM

In our view, the current specification of the EnAM as it applies during shutdown and restart modes remains broadly appropriate given it:

- Incentivises SDP to manage its energy costs, and at the same time, recognises that SDP has entered into a long-term least-cost energy procurement arrangement which shares the benefits of these least-cost options with customers
- Results in a reasonable allocation of energy price and volume risk between SDP (who has little control of when it operates) and its customers, including SWC and end-use water customers, without materially affecting SDP cash flows.

Table 4.1 highlights that SDP has borne a total of $9.52m of the 'losses' that result from the difference between SDP's energy costs (including electricity and LGCs) and revenues from the sale of surplus energy over the four years of the 2012-17 regulatory period.

Table 4.1: EnAM and the sharing of risk between SDP and its customers, including losses borne by SDP ($nominal, $million)

	2012-13	2013-14	2014-15	2015-16	Total
Total losses (difference between SDP's total energy costs and revenues from the sale of surplus energy)	7.96	10.19	13.48	2.51	34.14
Losses passed through to customers under the current EnAM	5.56	7.70	10.63	0.73	24.62
Losses borne by SDP under the current EnAM	**2.40**	**2.49**	**2.85**	**1.78**	**9.52**

A change in the allocation of risk between SDP and its customers (for example, a lower pass through rate) could involve SDP retaining more of the gains (or bearing more of the losses) from the difference between SDP's energy costs (including electricity and LGCs) and revenues from the sale of surplus energy. This could impact SDP's cash flows and financeability which ultimately increase SDP's risk profile (see Section 10.2).

For this reason, we consider the current specification of the EnAM, as it applies during shutdown and restart modes, remains broadly appropriate.

Methodological issues

While we do not propose any changes to IPART's approach to calculating the pass-through amounts under the EnAM as set out in its Methodology Paper, as noted by IPART, one aspect of the methodology which will need to be updated is the rate used for accounting for financing costs.

IPART has previously used a rate published by the Reserve Bank of Australia (**RBA**) that is based on Australian corporate bonds with 1-5 years to maturity. This was deemed to be appropriate given that the costs in question would be incurred at various points during the regulatory period and therefore could have anywhere between 1 and 5 years to the end of the regulatory period.

IPART notes that the RBA no longer publishes that series, and proposes consideration of two alternatives:

- A series based on 3-year Australian corporate bonds
- A series based on 5-year Australian corporate bonds.

Conceptually, what is required is an interest rate that matches the time between the incurrence of the cost and the end of the regulatory period. Thus, a different rate would be applied, depending on when the cost was incurred. However, given the relatively small time periods (all less than 5 years) IPART has stated that it will use a single rate for all costs. This implies that a rate that matches the average time period would be appropriate. Of the two alternatives, it seems that the 3-year rate would best match the average time period – assuming that the relevant costs are incurred uniformly throughout the regulatory period.

In the Issues Paper, IPART also compares the potential 3-year and 5-year series against the series that it had previously used and showed that the 3-year series provides a closer match to the previous series (which included all bonds with 1-5 years to maturity).

The Issues Paper suggests that one reason to consider the 5-year series is that this would match the length of the regulatory period. However, conceptually, the length of the regulatory period is irrelevant. The relevant time period is the time between the cost being incurred and the end of the regulatory period – as set out above.

SDP therefore supports IPART's proposal that the 3-year series should be adopted as the financing rate for calculating cost pass-through amounts under the EnAM.

Non-application to partial production mode

The most significant issue with the EnAM relates to its application being restricted to when the plant is in shutdown and restart modes only. SDP shares IPART's concern that the restricted application of the EnAM may act as a major constraint on future operating flexibility of the plant and in particular provides a strong disincentive for SDP to operate at less than full production levels. This is due to the fact that the plant is designed to operate most efficiently when it is operating at full production, and SDP's contractual arrangements reflect this. For example, if the SDP were to operate in a low flow mode, it would require much less energy than the full contract volumes. It may then be liable for significant gains or losses payments under its energy contracts with Infigen[32]

This would create incentives that are unlikely to be aligned with those of our customers, including SWC and end-use water customers. For example, there would be incentives for the SDP to remain in shutdown mode rather than to operate at less than full operation, even when doing so may provide significant benefits to customers. SDP also believes this is inconsistent with the financial indifference principle in the Standing TOR.

In addition, it is arguable that the specification of the Standing TOR, which limits the application of the EnAM to shutdown and restart modes, does not give full effect to the original intentions of the Minister administering the WIC Act as set out in his Letter to IPART[33]. This Letter advised that the intention of the EnAM 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*…"

[32] It would also involve higher per unit costs of production as the plant is less efficient when running at less than full capacity.

[33] Letter to IPART 16 February 2012

The drafting of the TOR on the EnAM appears to be predicated on the assumption that if the plant is not in 'full operation mode' then it must be in either shutdown or restart mode (i.e. it does not contemplate a 'partial production' mode). There would not appear to be any logical reason as to why it would be seen as appropriate to share the gains and losses with customers under restart or shutdown modes but not under a partial operation mode.

We are not proposing a change to the Standing TOR to address this issue. Rather, SDP considers that there are several options for adjusting the current regulatory settings to ensure the limited application of the EnAM does not inadvertently constrain future operating flexibility. These regulatory options include:

- introducing a new mechanism analogous to the EnAM but applying specifically to partial production modes, including when SDP is operating under the 70/80 rule but SWC has requested SDP to reduce production (due to network constraints, for example); and
- providing for SDP to enter into unregulated agreements when operating outside of the 70/80 rules as discussed further in section 9.4, which would include costs associated with the energy contracts.

We would welcome further engagement with SWC, IPART and other stakeholders to develop an approach that:

- aligns SDP's regulatory and financial incentives or interests with those of our customers, including SWC and end-use water customers.
- avoids the 2017 Determination unnecessarily constraining the flexible operation of the SDP (and the benefits this could provide), particularly given the uncertainty over the 2017-22 regulatory period.
- ensures the 2017 Determination is consistent with the financial indifference principle in the Standing TOR.

SDP proposal

The EnAM should be retained in its current form as it applies during shutdown and restart modes.

The adverse effects of the non-application of the EnAM to partial production modes should be addressed via changes to the regulatory framework rather than via changes to the Standing TOR and we would welcome further engagement with SWC, IPART and other stakeholders in developing an appropriate approach.

SDP also supports IPART's proposal that the 3-year series should be adopted as the financing rate for calculating cost pass-through amounts under the EnAM.

SDP's proposal to be allowed to enter into unregulated agreements and recover its energy costs when operating outside the 70/80 rule is discussed in Chapter 9.

4.5 Reporting requirements

Background

In order for IPART to fulfil its regulatory functions and in particular its price monitoring role, IPART requires certain information from SDP.

In the 2012 determination IPART developed a reporting framework which included SDP submitting an Annual Information Return (**AIR**) and information on daily plant availability and production levels.

In its issues paper IPART is proposing to maintain similar reporting requirements over the 2017 determination period.

Assessment

In SDP’s view the current reporting requirements are reasonable and not excessively onerous.

SDP proposal

SDP supports continuation of the current reporting requirements.

5. Revenue requirements for our water supply and security services

Key messages

- In developing our proposed revenues, we have addressed all relevant TOR requirements. We also took account of the changes occurring in our market and the priorities and preferences of SWC and end-use water customers.
- Our proposed notional revenue requirement (or ‘building block’ costs) for the plant and pipeline for the 2017-22 regulatory period in water security mode is $852.73m and in full operation mode is $1,212.07m (exclusive of any restart and electricity network charges). These amounts reflect the efficient costs of providing our services and meeting the safety and service levels our customers expect and value, while prudently balancing cost and price pressures in future regulatory periods.
- These proposed notional revenue requirements for the 2017-22 regulatory period represent decreases of 20.9% and 16.7% when compared to the approved notional revenue requirements in water security mode and full operation modes respectively for the 2012-17 regulatory period, on a cost per customer basis (excluding the impact of inflation)
- The principal reason for this reduction in our proposed notional revenue requirement for the 2017-22 regulatory period is that our funding costs for the 2017-22 regulatory period are lower than the 2012-17 regulatory period, which reduces our notional revenue requirement. This more than offsets:
  - Higher operating expenditure for the 2017-22 regulatory period including necessary expenditure requirements to manage operational risks associated with an extended period of water security mode as well as more realistic operating expenditure required to manage SDP as a stand-alone entity.
  - Higher capital expenditure for the 2017-22 regulatory period than for the 2012-17 regulatory period (although minor relative to the Regulated Asset Base (**RAB**)) including targeted investments in the DWPS to ensure SDP is able to fulfil its water security role.

5.1 Overview of proposed notional revenue requirements

The notional revenue requirements represent the amount of revenue we need to generate over the 2017-22 regulatory period to allow us to invest in, operate and maintain our assets efficiently and earn a reasonable return on our investment in providing the water supply and water security services under the MWP as well as our obligations to SWC under the WSA. The notional revenue requirements are established under a ‘building block’ methodology – whose key components include a return on capital, depreciation, operating and maintenance costs and tax costs – and is used to derive the prices we charge for our water supply and water security services. Section 5.4 explains how the notional requirements are converted to annual revenue requirements.

As set out in Chapter 4, we support the maintenance of mode based pricing whereby the notional revenue requirements are calculated for each operating mode, given the activities we undertake and the associated costs vary between these modes. This mode based pricing ensures customers, including SWC and end-use water customers, only pay for the services we provide.

In our view, the most likely scenario is that the SDP will remain in water security mode for the majority of 2017-22 regulatory period. However, should the SDP be called into operation during the entire 2017-22 regulatory period, the notional revenue requirement would need to reflect the higher ongoing costs of producing desalinated water and the one-off costs for transitioning into full operation mode ('restart'). This chapter presents the notional revenue requirements for water security and full operation mode—including our approach to establishing the notional revenue requirements—as well as the notional revenue requirement associated with a restart from water security mode.

Appendix 5.1 sets out our proposed notional revenue requirements for the other shutdown modes—short, medium and long-term shutdown modes. However, as outlined in Chapter 2, the financial incentives—including the trade-off between the costs SDP incurs and the time required for restoring the plant to full operation when storage levels drop—mean that in practice, it is likely that it will generally make sense to only enter water security mode.[34]

5.1.1 Notional revenue requirements – water security mode

Table 5.1 shows that our proposed notional revenue requirement for the plant and pipeline in water security mode for the 2017-22 regulatory period is $852.73m (exclusive of network charges). This represents a:

- Decrease of 20.9% compared to the approved notional revenue requirement in water security mode for the 2012-17 regulatory period (excluding the impact of inflation), on a cost per customer basis (Figure 5.1)
- Decrease of 15.3% when compared to the approved notional revenue requirement in water security mode for the 2012-17 regulatory period (excluding the impact of inflation).

Table 5.1: Proposed notional revenue requirements for the plant and pipeline in water security mode for the 2017-22 regulatory period ($2016-17, $million)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Notional revenue requirement ($m)	167.22	168.69	167.59	175.85	173.39	852.73
Annual change in notional revenue requirement (%)	-14.2%	0.9%	-0.7%	4.9%	-1.4%	

Source: SDP calculations.

Note: totals may not add due to rounding.

This decrease in our notional revenue requirement for the plant and pipeline in water security mode for the 2017-22 regulatory period reflects:

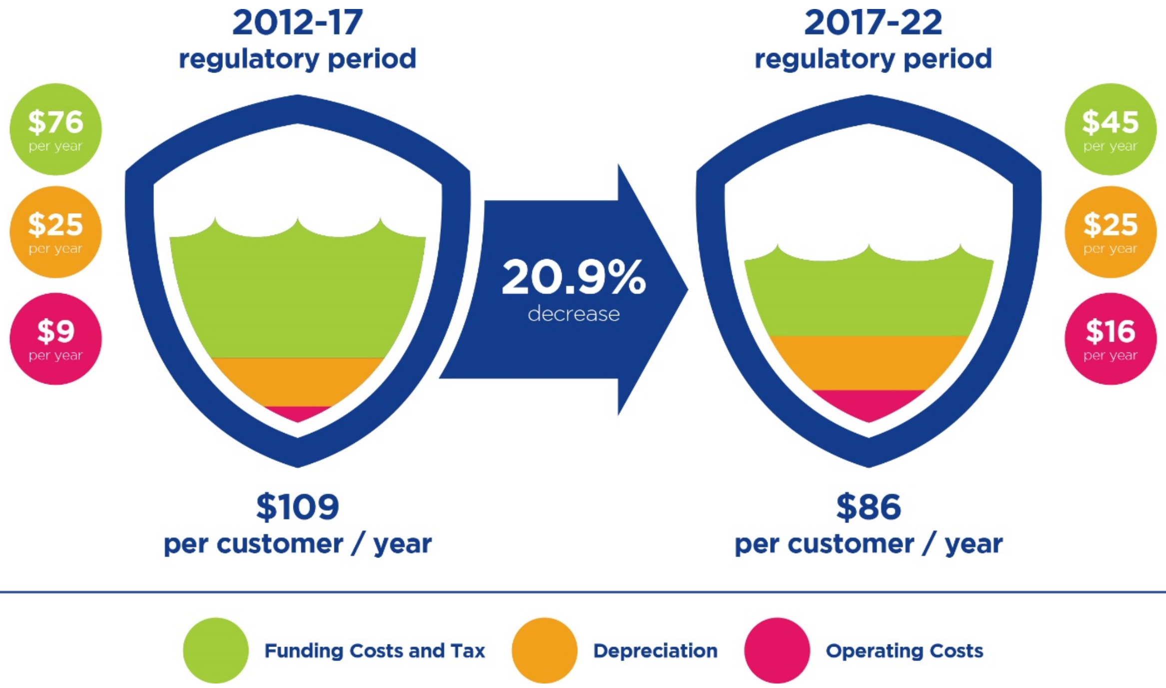
- Our funding costs for the 2017-22 regulatory period are lower than the 2012-17 regulatory period (see chapter 8).
- Our operating expenditure in water security mode for the 2017-22 regulatory period is higher than the 2012-17 regulatory period including necessary one-off expenditure requirements – such as the Partial Plant Test as well as additional maintenance programs required to manage operational risks associated with an extended period of water security mode – and more realistic operating expenditure to manage SDP as a stand-alone entity rather than as a subsidiary of SWC (see chapter 6).

[34] As the time it takes for the storages to drop below 70% once they have reached 80% will typically be greater than the 8 month period required to return from water security shutdown to full operation.

- Our capital expenditure for the 2017-22 regulatory period is higher than the 2012-17 regulatory period including targeted investments in the DWPS to ensure the SDP is able to fulfil its water security role (see chapter 7).

Figure 5.1 compares the proposed notional revenue requirements for the plant and pipeline in water security mode for the 2017-22 regulatory period with those approved by IPART for the 2012-17 regulatory period on a cost per customer basis.[35] It shows that the reduction in our funding costs more than offsets the proposed increases in operating expenditure required to ensure ongoing reliability of the assets, resulting in an overall decrease of 20.9% in the notional revenue requirement in water security mode (excluding the impact of inflation), on a cost per customer basis.

Figure 5.1: Notional revenue requirement per customer in water security mode— proposed for 2017-22 regulatory period compared with approved for 2012-17 regulatory period ($2016-17)



Source: SDP

Note: Total dollars per customer per year (and percentage change) may not add due to rounding. Funding costs includes return on assets, working capital and taxation costs (noting that IPART intends to use a real post-tax WACC for the 2017-22 regulatory period and provide for an explicit tax allowance as a separate cost building block); operating costs includes EnAM allowances.

5.1.2 Notional revenue requirements – full operation mode

Our proposed notional revenue requirement for the plant and pipeline in full operation mode for the 2017-22 regulatory period is $1,212.07m (exclusive of any restart charges or network charges) representing a:

- Decrease of 16.7% compared to the approved notional revenue requirement in full operation mode for the 2012-17 regulatory period (excluding the impact of inflation), on a cost per customer basis (Figure 5.2).
- Decrease of 11.0% when compared to the approved notional revenue requirement in full operation mode for the 2012-17 regulatory period (excluding the impact of inflation).

35 These per customer costs were derived by dividing the building block costs by actual and forecast customer numbers.

Table 5.2: Proposed notional revenue requirements for the plant and pipeline in full operation mode for the 2017-22 regulatory period, exclusive of restart charges ($2016-17, $million)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Notional revenue requirement ($m)	244.75	243.58	242.31	241.38	240.05	1212.07
Annual change in notional revenue requirement (%)	-9.5%	-0.5%	-0.5%	-0.4%	-0.6%	

Source: SDP calculations

Note: This does not include the costs of restarting the plant to return to operating mode.

This decrease in our notional revenue requirement for the plant and pipeline in full operation mode for the 2017-22 regulatory period reflects:

- Our funding costs for the 2017-22 regulatory period are lower than the 2012-17 regulatory period (see chapter 8).
- Our operating expenditure in full operation mode for the 2017-22 regulatory period is higher than the 2012-17 regulatory period including necessary one-off expenditure requirements–such as additional scheduled as well as preventative maintenance associated with the age of our assets– and more realistic operating expenditure to manage SDP as a stand-alone entity) and unavoidable upward pressure on prices of some key inputs over the 2017-22 regulatory period (see chapter 6).
- Our capital expenditure for the 2017-22 regulatory period is higher than the 2012-17 regulatory period including targeted investments in the DWPS to ensure the SDP is able to fulfil its water security role (see chapter 7).

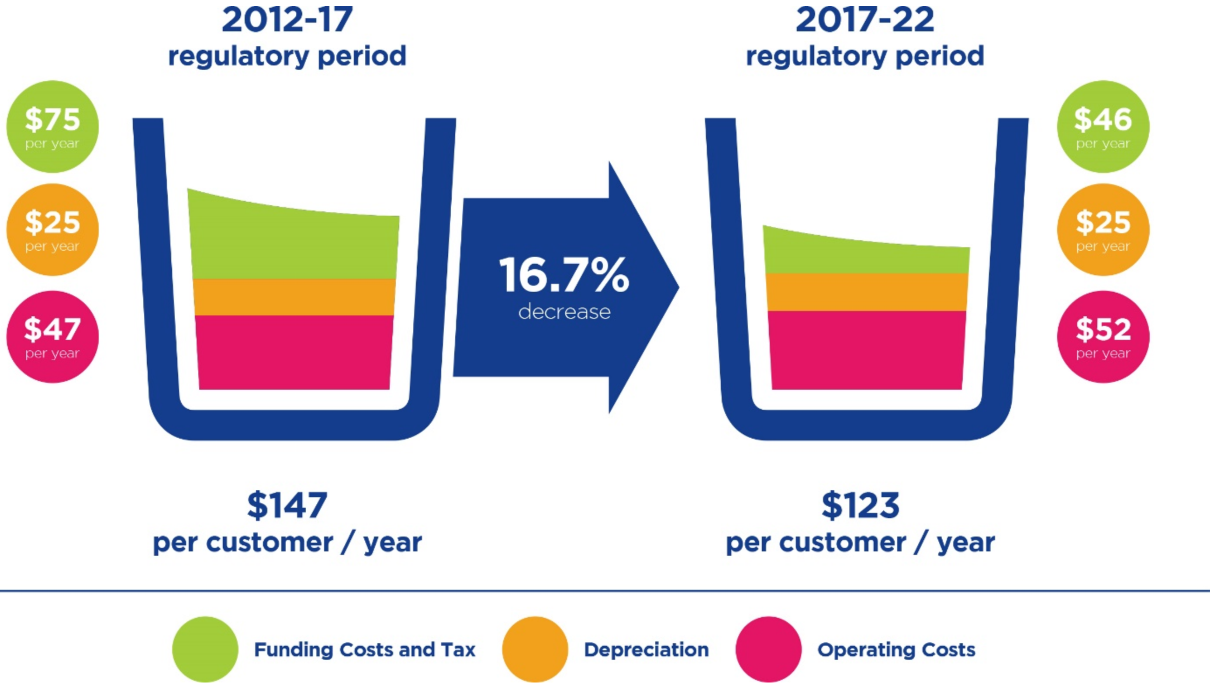
This decrease in our notional revenue requirement for the plant and pipeline in full operation mode for the 2017-22 regulatory period again reflects a reduction in our funding costs.

If the plant were to return to full operation mode there would also be costs incurred in restarting the plant. Table 10.6 sets out the proposed prices for transitioning from water security to full operation mode for the 2017-22 regulatory period.

Figure 5.2 compares the proposed notional revenue requirements for the plant and pipeline in full operation mode for the 2017-22 regulatory period with those approved by IPART for the 2012-17 regulatory period on a cost per customer basis.[36] It shows that the reduction in our funding costs more than offsets the proposed increases in operating expenditure, resulting in an overall decrease of 16.7% in the notional revenue requirement in full operation mode (excluding the impact of inflation), on a cost per customer basis.

[36] These per customer costs were derived by dividing the building block costs by actual and forecast customer numbers.

Figure 5.2: Notional revenue requirement per customer in full operation mode— proposed for 2017-22 regulatory period compared with approved for 2012-17 regulatory period ($2016-17)



Source: SDP

Note: Total dollars per customer per year (and percentage change) may not add due to rounding. Funding costs includes return on assets, working capital and taxation costs (noting that IPART intends to use a real post-tax WACC for the 2017-22 regulatory period and provide for an explicit tax allowance as a separate cost building block); operating costs includes EnAM allowances.

5.2 Disaggregation of notional revenue requirements

This section sets out our proposed notional revenue requirements at a more disaggregated level (i.e. by building block component) for the 2017-22 regulatory period:

- for each of water security mode and full operation mode
- for each of the two key SDP assets (i.e. the plant and the pipeline).

5.2.1 Proposed notional revenue requirement components by mode

Table 5.3 sets out our total proposed notional revenue requirements in water security mode by building block component for the 2017-22 regulatory period.

Table 5.3: Proposed notional revenue requirements by building block component for the plant and pipeline in water security mode for the 2017-22 regulatory period ($2016-17, $million)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Return on capital (funding costs)	87.26	85.07	82.91	80.75	78.55	414.54
Return of capital (depreciation)	48.72	48.76	48.80	48.79	48.74	243.80
Forecast operating expenditure	18.80	21.43	21.62	31.24	30.41	123.50
Tax costs (net of imputation)	4.83	5.83	6.68	7.47	8.15	32.96
Working capital	0.77	0.77	0.75	0.76	0.75	3.80
Other revenue adjustments[37]	6.83	6.83	6.83	6.83	6.78	34.12
Total notional revenue requirement	167.22	168.69	167.59	175.85	173.39	852.73

Note: totals may not add due to rounding.

Table 5.4 sets out our total proposed notional revenue requirements in full operation mode by building block component for the 2017-22 regulatory period.

Table 5.4: Proposed notional revenue requirements by building block component for the plant and pipeline in full operation mode, exclusive of restart charges, for the 2017-22 regulatory period ($2016-17, $million)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Return on capital (funding costs)	87.26	85.07	82.91	80.75	78.55	414.54
Return of capital (depreciation)	48.72	48.76	48.80	48.79	48.74	243.80
Forecast operating expenditure	96.23	96.22	96.25	96.70	96.95	482.36
Tax costs (net of imputation)	4.84	5.84	6.69	7.47	8.16	33.00
Working capital	0.91	0.90	0.88	0.88	0.87	4.45
Other revenue adjustments[38]	6.78	6.78	6.78	6.78	6.78	33.92
Total notional revenue requirement	**244.75**	**243.58**	**242.31**	**241.38**	**240.05**	**1212.07**

Note: totals may not add due to rounding.

These tables highlight that:

[37] Includes other items including energy adjustment mechanism allowances

[38] Includes other items including energy adjustment mechanism allowances

- The key difference in the notional revenue requirements between water security and full operation modes is operating expenditure (primarily energy and chemical costs) required to produce desalinated water.
- The return on capital (funding costs) and return on assets (depreciation) for SDP are identical under both water security mode and full operation mode. This reflects the capital-intensive nature of our business.

Proposed notional revenue requirements for transitioning between modes

There are also one-off costs associated with transitioning from shutdown to restart, and from full operation to one of the shutdown modes. As each of these vary depending on the type of transition involved, a separate revenue requirement is associated with each of these various transitions. For the purposes of the scenarios presented here, we present below the revenue requirement associated with a restart from water security shutdown as this is the most likely type of transition for the 2017-22 period. The revenue requirements for other types of transition between modes are presented in Appendix 5.1.

Table 5.5 sets out our total proposed notional revenue requirements for transitioning from water security to full operation mode (restart) for the 2017-22 regulatory period.

Table 5.5: Proposed notional revenue requirements transitioning from water security to full operation mode (restart) for the 2017-22 regulatory period ($2016-17, $million)

	2017-18	2018-19	2019-20	2020-21	2021-22
Forecasting operating expenditure	37.27	38.40	39.37	40.23	40.98
Total	**37.27**	**38.40**	**39.37**	**40.23**	**40.98**

Note: these costs are one-off costs incurred only when the plant is returning to full operation mode following a water security shutdown. These costs are not incurred annually.

Note: totals may not add due to rounding.

5.2.2 Proposed notional revenue requirement components by major asset

SDP owns and operates two major assets: the plant and the pipeline. Each have different revenue requirements.

Revenue requirement - plant

Table 5.6 and Table 5.7 set out these proposed notional revenue requirements for the plant for the 2017-22 regulatory period in water security mode and in full operation mode.

Table 5.6: Proposed notional revenue requirements by building block component for the plant in water security mode for the 2017-22 regulatory period ($2016-17, $million)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Return on capital (funding costs)	56.18	54.31	52.48	50.65	48.77	262.39
Return of capital (depreciation)	41.48	41.52	41.56	41.55	41.50	207.61
Forecast operating expenditure	18.49	21.11	21.30	30.92	30.09	121.91
Tax costs (net of imputation)	7.06	7.77	8.34	8.87	9.31	41.35
Working capital	0.56	0.56	0.54	0.56	0.55	2.77
Other revenue adjustments[39]	6.83	6.83	6.83	6.83	6.78	34.12
Total notional revenue requirement	**130.60**	**132.10**	**131.06**	**139.38**	**137.01**	**670.15**

Note: totals may not add due to rounding.

Table 5.7: Proposed notional revenue requirements by building block component for the plant in full operation mode, exclusive of restart charges, for the 2017-22 regulatory period ($2016-17, $million)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Return on capital (funding costs)	56.18	54.31	52.48	50.65	48.77	262.39
Return of capital (depreciation)	41.48	41.52	41.56	41.55	41.50	207.61
Forecast operating expenditure	95.92	95.90	95.94	96.38	96.63	480.76
Tax costs (net of imputation)	7.06	7.77	8.35	8.88	9.32	41.39
Working capital	0.71	0.70	0.68	0.68	0.67	3.42
Other revenue adjustments[40]	6.78	6.78	6.78	6.78	6.78	33.92
Total notional revenue requirement	208.13	206.99	205.78	204.92	203.68	1029.50

Note: totals may not add due to rounding.

Again, these tables highlight the fact that the return on capital (funding costs) and return on assets (depreciation) for the plant are identical under both water security mode and full operation mode. The differences in revenue requirements between mode are largely attributable to the difference in operating costs when the plant is on.

39 Includes other items including energy adjustment mechanism allowances

40 Includes other items including energy adjustment mechanism allowances

Revenue requirement - pipeline

Table 5.8 and Table 5.9 set out these proposed notional revenue requirements for the pipeline for the 2017-22 regulatory period in water security mode and full operation mode respectively.

Table 5.8: Proposed notional revenue requirements by building block component for the pipeline in water security mode for the 2017-22 regulatory period ($2016-17, $million)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Return on capital (funding costs)	31.08	30.76	30.43	30.10	29.78	152.15
Return of capital (depreciation)	7.24	7.24	7.24	7.24	7.24	36.20
Forecast operating expenditure	0.31	0.32	0.32	0.32	0.32	1.59
Tax costs (net of imputation)	-2.23	-1.94	-1.66	-1.40	-1.16	-8.39
Working capital	0.21	0.21	0.21	0.20	0.20	1.03
Other revenue adjustments[41]	-	-	-	-	-	-
Total notional revenue requirement	**36.62**	**36.59**	**36.53**	**36.46**	**36.38**	**182.58**

Table 5.9: Proposed notional revenue requirements by building block component for the pipeline in full operation mode, exclusive of restart charges, for the 2017-22 regulatory period ($2016-17, $million)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Return on capital (funding costs)	31.08	30.76	30.43	30.10	29.78	152.15
Return of capital (depreciation)	7.24	7.24	7.24	7.24	7.24	36.20
Forecast operating expenditure	0.31	0.32	0.32	0.32	0.32	1.59
Tax costs (net of imputation)	-2.23	-1.94	-1.66	-1.40	-1.16	-8.39
Working capital	0.21	0.21	0.21	0.20	0.20	1.03
Other revenue adjustments[42]	-	-	-	-	-	-
Total notional revenue requirement	**36.62**	**36.59**	**36.53**	**36.46**	**36.38**	**182.58**

Table 5.8 and Table 5.9 highlight that the costs of the pipeline do not vary depending on whether the plant is in shutdown or full operation mode.

41 Includes other items including energy adjustment mechanism allowances

42 Includes other items including energy adjustment mechanism allowances

Relative revenue requirements for the plant and the pipeline

The tables above indicate that in water security mode, the plant accounts for around 79% of the notional revenue requirement and the pipeline for around 21% of the revenue requirement.

In full operation mode, the proportion of the notional revenue requirement accounted for by the plant increases to around 85% and for the pipelines decreases to around 15%.

5.3 Derivation of proposed notional revenue requirements

To calculate the proposed notional revenue requirements for each operating mode, we used a building block approach. This involved calculating and summing the following building block costs: return on capital (or funding costs); return of capital (depreciation); forecast operating expenditure and; forecast tax costs (see Box 10).

This section sets out how we calculated the proposed notional revenue requirements for each operating mode. Chapter 9 discusses how we propose to recover these costs from SWC and future customers including the structure of our charges.

Box 10: Calculating the notional revenue requirement using a 'building block' method

We calculated our proposed notional revenue requirement using a building block method. This involved calculating and adding together the following allowances:

- **Return on capital -** This allowance represents the efficient costs of funding our investment in the assets used to provide our services—including our past and forecast capital expenditure—over the regulatory period. To calculate this allowance we used three key inputs: the opening value of our asset base (see Appendix 5.2); our forecast capital expenditure over the period (see chapter 7); and our proposed rate of return (see chapter 8).
- **Return of capital -** This allowance represents the depreciation of our assets over the regulatory period (the decrease in their value due to usage and aging). To derive this allowance, we used three key inputs: the opening value of our asset base (see Appendix 5.2); the remaining lives of our assets; and our forecast capital expenditure over the period (see chapter 7).
- **Forecast operating expenditure** - This allowance represents our forecast operating expenditure over the regulatory period including the costs of operating and maintaining our physical assets (such as the energy required to power the SDP), responding to emergencies and overseeing our businesses (see chapter 6).
- **Tax costs -** This allowance represents our forecast income tax liabilities over the regulatory period. To calculate this allowance we used two key inputs: the corporate tax rate; and the value of imputation credits to reflect the value of 'franking credits' to investors (see Section 5.3.4).
- **Other revenue adjustments -** This allowance includes adjustments made to our allowed revenues to reflect a pass through of specified gains and losses under the EfAM.

Source: SDP

5.3.1 Forecast operating expenditure

Our operating expenditure includes the costs of operating and maintaining our physical assets (such as the energy required to power the SDP), responding to emergencies and managing our business.

Our proposed forecast operating expenditure represents 14.5% of our total building block costs in water security mode (Table 5.3) and 40% of our total building block costs in full operation mode (Table 5.4). Chapter 6 provides more details of this expenditure, including how it represents the efficient level of expenditure required to operate and maintain the SDP.

5.3.2 Return on capital

The return on capital allowance reflects the benchmark efficient costs of funding our investments in the assets we use to provide our water security services over the regulatory period. We finance these investments through borrowings from the debt market and funds from equity holders, which we pay back over the long term. This approach spreads the costs of assets over their lives (and therefore our prices), and ensures both the current and future customers who benefit from these investments contribute to their costs.

Our proposed return on capital allowance is the largest of the building block costs, representing 49% of our total building block costs in water security mode, and 34% of our total building block costs in full operation mode. We calculated this allowance using three key inputs:

- Opening value of the asset base;
- Forecast capital expenditure (see Table 5.11)
- Proposed rate of return (see Table 5.12)

Each of these inputs is outlined below.

Proposed opening value of the asset base

The value of the assets we use in providing water supply and water security services is known as the RAB. This value represents the (as yet) unrecovered past capital investments we have made to provide services to our customers.

The value of the RAB changes over time. As we invest in new assets, this expenditure is added to the RAB. As our assets depreciate, this value is subtracted from the RAB. If we dispose of assets, these proceeds are subtracted from the RAB.

To calculate the opening value of the RAB for the 2017-22 regulatory period, we used an approach consistent with the IPART's RAB roll-forward methodology. This involved taking the opening RAB for the 2012-17 regulatory period as previously determined by IPART, and adjusting this value to take account of our efficient actual and expected capital expenditure over that period, as well as the depreciation of our assets over that period and several other factors (see Box 11).

Table 5.10: Proposed opening value of the asset base ($2016-17, $million)

Asset	Proposed opening value of the asset base
Plant	1,270.51
Pipeline	703.08
Total	**1,973.59**

Source: SDP

Box 11: Calculating the opening RAB for the 2017-22 regulatory period

To calculate the opening RAB for the 2017-22 regulatory period, we

- Take the opening RAB for the 2012-17 regulatory period
- Indexed this RAB to account for inflation over that period
- Added the value of our actual and expected capital expenditure over that period
- Deducted the value of depreciation over that period (calculated using IPART's approved standard asset lives)

Forecast capital expenditure

Our capital expenditure includes the investments we make to buy and build the physical assets required to meet our service levels now and in the future.

Our forecast capital expenditure over the 2017-22 regulatory period is set out in Table 5.11. More information on this expenditure — including how the proposed capital program represents the efficient level of expenditure required to provide our water supply and water security services as envisaged under the MWP — is provided in chapter 7.

Table 5.11: Proposed capital expenditure for the 2017-22 regulatory period ($2016-17, $million)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Gross capital expenditure	0.315	0.015	2.115	0.015	0.015	2.475

Proposed rate of return

The rate of return reflects the weighted average of the interest we pay on our loans and the return our shareholders expect for committing their money to our operations (or the WACC)[43].

Our proposed rate of return for the 2017-22 regulatory period is set out in

43 Non-interest costs associated with borrowing are included in our forecast operating costs.

Table 5.12. We calculated this rate of return using an approach consistent with the IPART's preferred methodology. We have expressed the rate of return as 'post-tax real WACC' (see chapter 8).

Table 5.12: Proposed rate of return ('post-tax real WACC') (%)

Return on equity	8.36
Return on debt	6.23
Inflation	2.45
Leverage	60.00
Gamma	25.00
Corporate tax rate	30.00
Post-tax real WACC (%)	4.52

Source: SDP

5.3.3 Return of capital (Depreciation)

The return of capital allowance reflects the depreciation of our assets over the regulatory period—that is, the decrease in their value due to usage and aging.

Our proposed return of capital allowance for our services (shown in Table 5.3 and Table 5.4) represents 29% of our total building block costs in water security mode, and 20% of our total building block costs in full operation mode.

We calculated this allowance using an approach consistent with IPART's preferred methodology (see Box 12).

Box 12: Calculating the return of capital (or regulatory depreciation) allowance for the 2017-22 regulatory period

To calculate our proposed return of capital allowance, we applied the real straight line depreciation method, which involves:

- For existing assets, dividing the amount of the opening RAB as at 1 July 2017 for each asset class, by the relevant weighted remaining asset lives
- For new assets, dividing the real net capital expenditure over the 2017-22 regulatory period, by our proposed standard asset lives.

Source: SDP

Asset lives

As outlined in Box 12, a key input into the calculation of regulatory depreciation is the nominated asset lives of the various assets in the RAB. IPART's Issues Paper notes that it will need to determine the appropriate asset lives for the assets in SDP's RAB and the appropriate depreciation method to use.

SDP considers that the asset classes and asset lives for the 2012 Determination should remain for the next Determination period. However, the one exception is that we consider there to be a strong case for a reduction to the pipeline asset life to more closely match design lives of assets to correct an oversight in the 2012 Determination. The design documentation for the plant articulates the correct design lives. We propose to adjust the asset lives for pipeline assets to reflect the original design lives for the assets, including adjusting the pipeline depreciation from a 140 year life, to 100 years.

IPART's Issues Paper also suggests that it may need to reconsider the impact on plant asset lives of the replacement of assets through insurance remedial work undertaken because of the damage caused by the Kurnell Tornado, as well as the impact of long periods of shutdown.[44]

We have considered this issue carefully and in our view, there is no case for varying the plant asset lives for either of these eventualities.

First, the reinstatement of the plant is ongoing and over 70% of the assets considered within the current Damage Assessment are subject to inspection to confirm whether there is no damage. Therefore, neither the full scope of damage nor the extent of asset replacement is known at this stage.

Second, a clear distinction needs to be made between engineering depreciation and economic regulatory depreciation. This is because while both of these events may have a (relatively minor) impact on the technical engineering lives of these assets, neither should lead to a change in their economic asset lives or the period over which the original capital investment made by SDP should be recovered.

In establishing asset lives for regulatory depreciation purposes, the key question is over what period the upfront capital cost of the investment in the asset is recovered over time, rather than the physical deterioration of the asset[45]. In the case of an asset which is replaced through insurance remedial work, there is no basis for adjusting the asset life or the existing RAB. SDP would not add the capital expenditure on this asset into its RAB, as to do so would be to recover the cost of the asset from both the insurer and from customers. Equally, however, it would still seek to recover its original investment over the economic life of that investment.

We have analysed the implications of changing the assumed asset lives of assets replaced as a result of reinstatement after the tornado (see Appendix 5-2). In summary, if the assumed economic life of the replaced asset were to be extended, the time period of recovery of the initial investment would also be extended. This would mean that regulatory depreciation would be lower, but SDP would also receive a return on the asset for longer. Overall, in Net Present Value (**NPV**) terms, there would be no windfall gain or loss to SDP or to customers.

However, as shown in Appendix 5-2, the recovery of the investment would be slowed down, impacting on SDP's cash flows and potentially affecting financeability. In addition, extending the assumed asset life increases the risk of asset stranding, which is a greater risk for SDP than for other water businesses given the rapid technological changes occurring in desalination production and SDP's reliance on the supply contract with SWC. The effect of these factors would be to make SDP worse off than it was prior to the tornado.

Similar arguments apply to the impact on asset lives following extended periods of shutdown. As highlighted by Advisian, the unprecedented period of shutdown also creates significant uncertainty about the operating condition of key elements of the plant (see Appendix 6.3). This means it is highly unlikely that the technical engineering lives of these assets can be extended in line with the period of shutdown.

[44] IPART, Issues Paper, p. 63

[45] IPART notes that the "allowance for regulatory depreciation is included in the revenue requirement (and used in calculating the value of the RAB, as discussed above). This is intended to ensure that the capital invested in the regulatory assets is returned over the useful life of each asset". IPART, Sydney Water final decision, p.127.

5.3.4 Tax costs

Our proposed tax cost allowance over the 2017-22 regulatory period (shown in Table 5.3 and Table 5.4) represents around 4% of our building block costs in water security mode, and 3% of our total building block costs in full operation mode.

In the 2012 Determination, IPART used a pre-tax rate of return to calculate the return on capital allowance (refer Chapter 8). As such, the allowance for the cost of corporate income tax was included in the allowed rate of return. For the 2017 Determination, IPART has indicated its preference for moving to a real post-tax WACC[46] and accounting for the cost of tax liabilities through a separate allowance in the building block calculations. This therefore requires the determination of a separate building block for allowed tax costs.

We calculated this allowance using an approach consistent with IPART's preferred methodology. Key inputs for this approach include the corporate tax rate and the value of imputation credits to reflect the value of 'franking credits' to investors (Box 13).

As part of calculating the tax costs for the 2017-22 regulatory period, we forecast tax depreciation using a tax asset base. This is because the tax obligations faced by SDP will reflect the tax asset base (which will reflect standard ATO asset life assumptions and tax depreciation rules). This is consistent with the approach adopted by IPART for SWC.[47]

Box 13: Calculating the cost of corporate income tax for 2017-22 regulatory period

To calculate our proposed tax cost allowance, we:

- Determined the opening tax asset base for the 2017-22 regulatory period
- 'Rolled forward' the tax base over this period
- Used the legislated income tax rate of 30%, and
- Assumed the value of imputation credits is 0.25 (see chapter 8).

We modelled this for the plant and pipeline assets separately and then considered the net tax payable on income from the combined asset base.[48] That is, the tax costs for the 2017-22 regulatory period are the total plant and pipeline tax costs.

Source: SDP

5.3.5 Other revenue adjustments including EnAM allowances

IPART's 2012 Methodology Paper[49] sets out the methodology for calculating the EnAM (see chapter 4).

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46 IPART, Review of prices for Sydney Desalination Plant Pty Ltd: From 1 July 2017 - Issues Paper, August 2016, p62.

47 In its recent Determination for Sydney Water, IPART calculated the tax allowance for each year by applying a 30% statutory corporate tax rate adjusted for franking credits to the business's (nominal) taxable income. For this purpose, taxable income was calculated as the notional revenue requirement (excluding tax allowance) less operating cost allowances, tax depreciation, and interest expenses.

48 The tax calculation for pipeline assets results in tax losses over the 2017-22 regulatory period due to the variation between the tax depreciation and regulatory depreciation for these assets. In our view, these tax losses should be offset against tax payable on the plant assets. That is, the pipeline and plant assets should be considered jointly with net tax payable on the income from the combined asset base. If the two assets are considered separately, the tax losses on the pipeline assets would be carried forward rather than realising an immediate tax benefit from the offset against income from the plant assets. Since the pipeline and plant are two components of the integrated business (i.e., neither component is of any real value without the other), we consider modelling the combined asset base and the resulting net tax payable to the appropriate approach.

We have calculated these other revenue adjustments consistent with IPART's 2012 Methodology Paper (see Table 4.1). The EAM amount from the 2012-17 regulatory period included in other revenue adjustments is $33.72 million.

SDP commissioned Seed Advisory to undertake an independent expert review of SDP's LGC and electricity trading. Seed Advisory found that SDP's trading activities were prudent and achieved value for money. Further detail on the Seed Advisory report is provided in Appendix 5.5.

Our other revenues adjustments also includes a $0.1 million pa efficiency saving which we propose to include via the EfAM. This efficiency resulted from a decision we made in consultation with our O&M Contractor to combine the Operator's insurance premium for the DWPS with the insurance premium for the whole plant. This resulted in an overall reduction to the O&M Contractor's insurance premiums from 2016-17 of $0.1 million, compared to the costs incurred in 2015/16.

5.4 Proposed target revenue

Many regulated businesses, including SDP, recover their notional revenue requirements or building block costs on a 'smoothed' basis. This means the annual notional revenue requirements may not match the annual target revenue. For example, target revenue may be higher than the notional revenue requirement in some years and lower in other years. However, the regulated businesses and customers should be no better or worse off over the whole determination period, such that the notional revenue requirements are equal to target revenues in present value terms over the regulatory period.

Unlike other regulated businesses, there is significant uncertainty as to services the SDP's may provide over the period and the revenue it requires to provide these services. For this reason, IPART's 2012 Determination set mode based revenue requirements.

While we support the maintenance of mode based pricing, this approach makes it more challenging to smooth the notional revenue requirements given there is uncertainty as to whether the SDP would be able to recover any difference between the notional revenue requirements and target revenues (in present value terms) if the SDP was to switch modes.

As set out in Table 5.1, there is some variability in SDP's annual notional revenue requirements in water security mode over the 2017-22 regulatory period. This largely results from the operating expenditure associated with the partial plant test proposed over 2020-21 and 2021-22. While the impact of this volatility is not large on an end-customer's water and wastewater bill, it may impact SWC, including its cash flow requirements.

We would welcome further engagement with SWC and IPART to consider options to minimise the fluctuations in SDP's target revenues and prices but ensure that the SDP is provided with the opportunity to recover the notional revenue requirements over the period, including if the SDP was to switch modes.

[49] IPART, Methodology Paper, 2012

6. Forecast operating expenditure

Key messages

- We developed our forecast operating expenditure for each possible mode of operation over the 2017-22 regulatory period:
  - Using levels of efficient and prudently incurred recurrent operating expenditure (or projected expenditure under our competitive tendered contracts for full operation mode) over the 2012-17 regulatory period ('base year costs'); and
  - Adjusting this to account for necessary one-off expenditure requirements to respond to future changes in our circumstances and operating environment and upward pressure in other cost inputs over the 2017-22 regulatory period.
- Our forecast operating expenditure over the 2017-22 regulatory period reflects the efficient expenditure necessary to ensure the safety, reliability and responsiveness of our services as envisaged under the MWP over the 2017-22 regulatory period, depending on the operating mode :
  - Our forecast operating expenditure for water security mode is $123.50m for the 2017-22 regulatory period. This includes necessary one-off expenditure requirements–such as [redacted] and ongoing expenditure required to manage operational risks associated with an extended period of water security mode – as well as a more realistic level of operating expenditure required to manage SDP as a stand-alone entity rather than as a subsidiary of SWC.
  - Our forecast operating expenditure for full operation mode is $482.36m for the 2017-22 regulatory period. This includes necessary expenditure requirements–such as additional scheduled and preventative maintenance associated with the age of our assets – as well as operating expenditure needed to manage our business as a stand-alone entity, and unavoidable upward pressure on the prices of some of our key inputs, particularly the cost of chemicals, over the 2017-22 regulatory period.
  - Our forecast operating expenditure for a one-off restart over the 2017-22 regulatory period is between $37.27m - $40.98m should we be required to restart the plant (depending on the year in which restart occurs). This includes O&M costs and energy costs not provided for over the 2012-17 period.
- To minimise our forecast operating expenditure we have:
  - Procured key contracts for services (such as our O&M and energy contracts) through a competitive process (and drive incentives for ongoing efficiency in these contracts), and where relevant, we have benchmarked our key contracts (such as for energy) against publicly available information (including benchmarks used by IPART).
  - Included cost reductions in energy and other costs.

Forecast operating expenditure is one of the building block costs used to calculate the notional revenue requirement (chapter 5).

We must propose the total prudent and efficient operating expenditure required to provide our water security and water supply services in each year over the 2017-22 regulatory period. As our operating expenditure varies depending on our mode of operation, we must also propose the operating expenditure required in each operating mode and the operating expenditure required to transition between the modes in each year for the 2017-22 regulatory period.

We have proposed the total operating expenditure necessary to comply with all relevant regulatory obligations and requirements and to ensure the safety, reliability and responsiveness of our water supply and water security services as envisaged under the MWP over the 2017-22 regulatory period.

Section 6.1 provides an overview of our forecast operating expenditure over the 2017-22 regulatory period for water security and full operation modes, and for transitioning from water security to full operation mode (restart). Subsequent sections then explain for each of our key categories of operating expenditure (including O&M costs, energy costs and other operating costs):

- Our proposed costs over the 2017-22 regulatory period for water security, full operation and restart modes.
- The approach we used to forecast these costs for water security, full operation and restart modes to ensure it is consistent with the costs that would be incurred by a prudent service provider acting efficiently.
- The difference between our forecast costs for the 2017-22 regulatory period and allowed costs for the 2012-17 regulatory periods, and the key drivers of any difference.

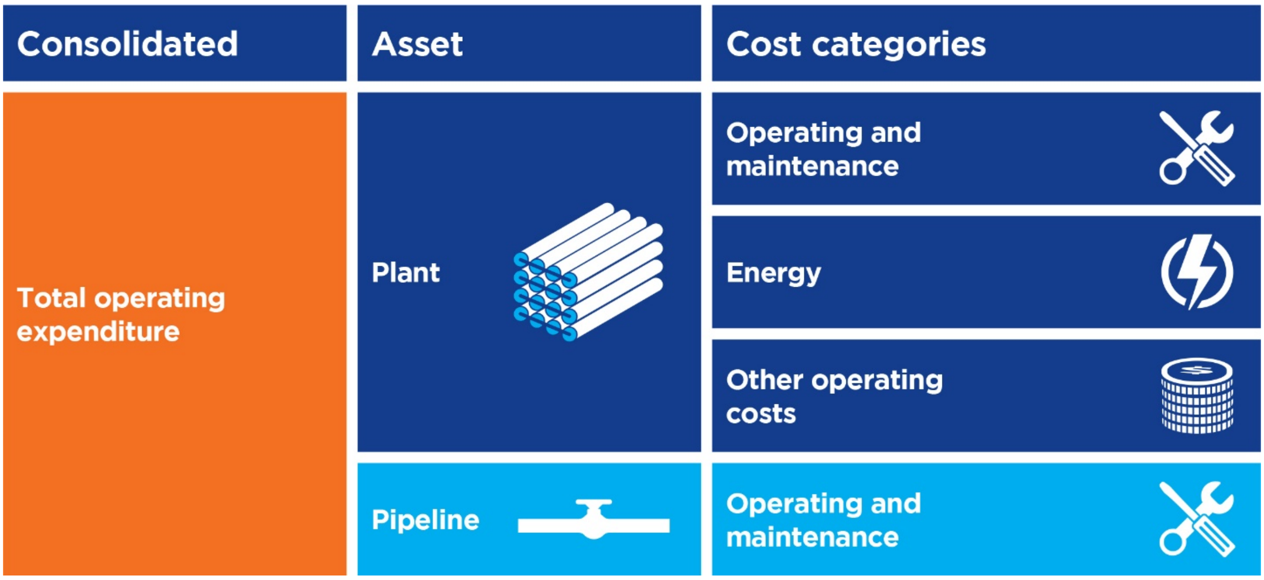
6.1 Overview of forecast operating expenditure

There are three key categories of operating expenditure in providing water supply and water security service as envisaged under the MWP:

- **O&M costs**, which include the costs of operating and maintaining our physical assets (e.g. pre-treatment, RO and mineralisation stages, cleaning and replacing membranes) to ensure they are able to provide services envisaged under the MWP over the 2017-22 regulatory period. These costs relate to payments made to our O&M contractor for the operation and maintenance of the plant and related infrastructure. O&M costs are incurred across both the plant and pipeline assets.
- **Energy costs**, which include the cost of procuring energy and LGCs to power the plant. These costs relate to payments made to Infigen under a long-term contract. Energy costs are incurred for the plant only.
- **Other operating costs**, which include corporate costs incurred in managing our business (e.g. risk management, financial management, contract administration, customer and stakeholder interaction) and meeting our relevant regulatory obligations and requirements.

These costs vary considerably depending on the operating mode of the plant. In contrast, the operating costs for the pipeline do not vary by operating mode (with the exception of the costs incurred in flushing and disinfecting the pipeline when the plant is restarting) and represent a very small component of overall O&M costs).

Figure 6.1: Our operating expenditure categories



The following sections summarise our forecast expenditure for each operating expenditure category over the 2017-22 regulatory period for water security, full operation and restart modes[50].

Sections 6.2 to 6.4 detail:

- Our approach to forecasting operating expenditure for water security, full operation and restart modes across each operating expenditure category to ensure they are consistent with the costs that would be incurred by a prudent service provider acting efficiently; and
- The difference between our forecast costs for the 2017-22 regulatory period and allowed costs for the 2012-17 regulatory periods, and the key drivers of these differences.

6.1.1 Forecast operating expenditure – water security mode

Table 6.1 sets out the forecast operating expenditure for water security mode for the 2017-22 regulatory period.

Table 6.1: Forecast operating expenditure for water security mode for the 2017-22 regulatory period by operating expenditure category ($2016-17, $million)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Operating and maintenance (total)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
O&M - plant	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
O&M - pipeline	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Energy costs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Other operating costs	8.23	8.11	8.36	8.64	8.63	41.98
Total	**18.80**	**21.43**	**21.62**	**31.24**	**30.41**	**123.50**

Note: totals may not add due to rounding.

50 Appendix 6.1 sets out our forecasts of operating expenditure for all modes (including all shutdown and transition modes) over the 2017-22 regulatory period.

Our forecast operating expenditure for water security mode is $123.50m for the 2017-22 regulatory period. The key drivers of the proposed expenditure include:

- Necessary one-off expenditure requirements – such as [redacted] and additional maintenance programs – to maintain our ageing assets and manage operational risks associated with an extended period of water security mode to ensure the SDP is able to provide water supply and water security services as envisaged under the MWP.
- More realistic operating expenditure including the corporate costs associated with managing SDP as a stand-alone entity, and the administrative compliance costs associated with meeting our relevant regulatory obligations and requirements.

6.1.2 Forecast operating expenditure – full operation mode

Table 6.2 sets out the forecast operating expenditure for full operation mode for the 2017-22 regulatory period.

Table 6.2: Forecast operating expenditure for full operation mode for the 2017-22 regulatory period by operating expenditure category ($2016-17, $million)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Operating and maintenance (total)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
O&M - plant	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
O&M - pipeline	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Energy costs*	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Other operating costs	9.06	8.95	9.21	9.49	9.48	46.19
Total	**96.23**	**96.22**	**96.25**	**96.70**	**96.95**	**482.36**

*Assumes annual production of 91.3GL in line with plant design.

Note: totals may not add due to rounding.

Our forecast operating expenditure for full operation mode is $482.36m for the 2017-22 regulatory period. The key drivers of the proposed expenditure include:

- Necessary expenditure requirements such as additional scheduled and preventative maintenance associated with the age of our assets in accordance with best practice asset management.
- More realistic operating expenditure, including the corporate costs associated with managing SDP as a stand-alone entity, and the administrative compliance costs associated with meeting our relevant regulatory obligations and requirements.
- Unavoidable upward pressure on prices of some of our key inputs, including chemicals used in the process of converting seawater to high quality drinking water.

6.1.3 Forecast operating expenditure – restart

Table 6.3 sets out forecast operating expenditure that would be incurred if the plant were restarted. These are one-off costs associated with the transition from an extended water security shutdown (the current mode of the plant) to full operation mode. It is important to note that the restart would occur in only one of these years, and so these costs are not cumulative across years.

Table 6.3: Forecast operating expenditure for transitioning from water security to full operation mode (restart) for the 2017-22 regulatory period ($2016-17, $million)

	2017-18	2018-19	2019-20	2020-21	2021-22
Operating and maintenance (total)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Energy costs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Other operating costs	-	-	-	-	-
Total	**37.27**	**38.40**	**39.37**	**40.23**	**40.98**

Note: these costs are one-off costs incurred only when the plant is returning to full operation mode following a water security shutdown. These costs are not incurred annually.

Note: totals may not add due to rounding.

Our forecast operating expenditure for restart varies depending on the year in which the restart of the plant occurs. By 2021-22, the one-off cost of restarting the plant is $40.98m, which is higher than our allowed expenditure for restart for the 2012-17 period. This increase in operating expenditure for restart is due to:

- O&M costs not accounted for over the 2012-17 period
- Energy costs required to restart the plant not accounted for over the 2012-17 period.

6.2 Operating and maintenance cost component of forecast operating expenditure

Our O&M costs include the costs of operating and maintaining our physical assets (e.g. maintaining various components of the plant such as membranes, pumps and the pipeline) as well as inputs such as chemicals, energy, and labour to ensure the SDP is able to provide water supply and water security services over the 2017-22 regulatory period.

Table 6.4 compares the allowed and forecast O&M costs over the 2012-17 and 2017-22 regulatory periods respectively.

Table 6.4: Comparison of allowed and forecast O&M costs over the 2012-17 and 2017-22 regulatory periods ($2016-17, $million)

	2012-17 (IPART allowed)	2017-22 (SDP proposed)	Difference ($)
Water security mode	[redacted]	[redacted]	[redacted]
Full operation mode	[redacted]	[redacted]	[redacted]
Transition to full operation mode (restart)*	[redacted]	[redacted]	[redacted]

Note: This assumes a transition to full operation mode occurs in Year 5 of the regulatory period.

Note: totals may not add due to rounding.

The following sections explain:

- Our approach to forecasting O&M costs for water security, full operation and restart modes to ensure they are consistent with the costs that would be incurred by a prudent service provider acting efficiently; and
- The difference between our forecast O&M costs for the 2017-22 regulatory period and allowed costs for the 2012-17 regulatory periods, and the key drivers of these differences.

6.2.1 Water security mode

We developed our forecast O&M costs for water security mode over the 2017-22 regulatory period by using efficient and prudently incurred recurrent O&M costs over the 2012-17 regulatory period ('base year costs'), and adjusting these to account for future changes in our circumstances and operating environment and the cost of inputs over the 2017-22 regulatory period.

Box 14 sets out our approach to developing our forecast O&M costs for water security mode over the 2017-22 regulatory period.

Box 14: Our approach to developing our forecast O&M costs over the 2017-22 regulatory period

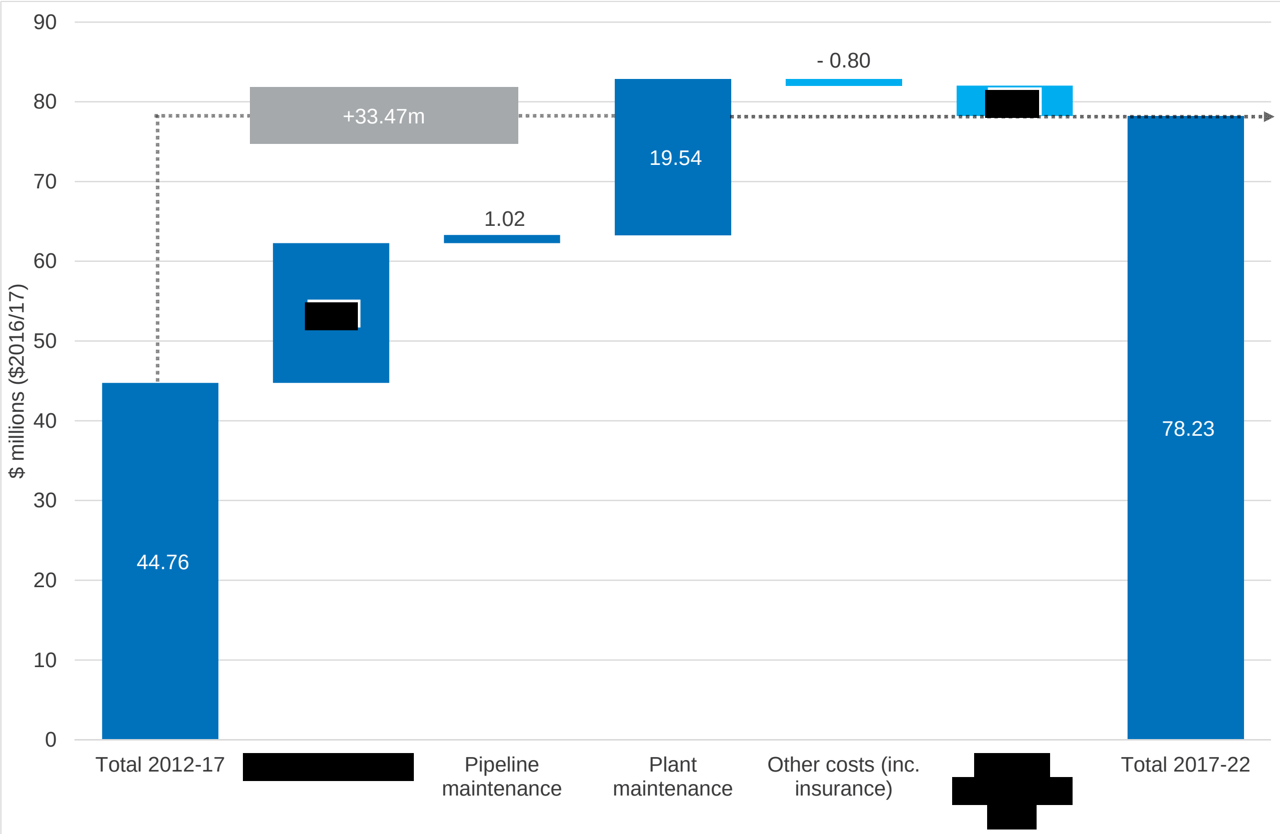
We developed our forecast O&M costs over the 2017-22 regulatory period by using levels of efficient and prudently incurred recurrent operating expenditure over the 2012-17 regulatory period ('base year costs'), and adjusting this to account for future changes in our circumstances and operating environment and the cost of other cost over the 2017-22 regulatory period. The key steps involve:

1. Using levels of actual recurrent O&M costs over the 2012-17 regulatory period (or O&M contractual costs for full production mode) reflecting our competitively tendered costs and other actual expenditure required to provide water security services ('base year costs').
2. Adding or subtracting step changes in O&M costs not captured by the base year expenditure, to reflect new one-off expenditure requirements, such as [redacted] and additional maintenance programs that will be required to manage a further extension of water security mode.
3. Adjusting these to reflect, where relevant, unavoidable upward pressure on O&M costs resulting from indexation of key cost items over the 2017-22 regulatory period.

Our forecast O&M costs for water security mode over the 2017-22 regulatory period are $33.47 higher than our allowed costs for the 2012-17 regulatory period. As shown in Figure 6.2, this increase is driven by the following factors:

- Necessary one-off expenditure requirements – [redacted] – and additional maintenance programs – required to manage operational risks associated with an extended period of water security mode and ensure the SDP can reliably supply water when called upon as envisaged under the MWP.
- Offset by reductions in some components of O&M costs (such as insurance required to be held by the O&M Contractor and which is subject to periodic market testing).

Figure 6.2: Comparison of 2012-17 regulatory period allowed O&M expenditure and 2017-22 regulatory period forecast O&M expenditure, with key drivers of change, in water security mode ($2016-17, $million)



Source: SDP analysis

We are confident that our base year and proposed ‘step changes’ in O&M in water security mode are prudent and efficient for three reasons:

- They are representative of our actual recurrent operating expenditure over the 2012-2017 regulatory period, once adjusted for necessary one-off and ongoing costs.
- They are consistent with the costs incurred by a prudent service provider acting efficiently (see Box 16 Box 19 and Appendix 6.2 for further information and expert analysis).
- There is considerable regulatory precedent for long-term contracts established through competitive tendering processes being accepted as prima facie evidence of efficient costs (see Box 17).

The sections below explain each of the key drivers of the increase in our forecast O&M costs in water security mode. The underlying prudency and efficiency of the costs associated with our long-term O&M contract are discussed in section 6.2.4.

[redacted]

51 [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

- [redacted]

- [redacted]

[redacted]

Additional maintenance to address key operational risks after extended period of water security shutdown

SDP is a large plant with a complex array of components. Maintenance costs increase quite markedly after about five years like any other large industrial plant. Some assets such as valves, rotating equipment (pumps, motors) and instruments wear less when the plant is not operating and therefore require less maintenance. However, for other assets, more maintenance is required than in the initial 5 years of a water security shutdown because many of the assets:

- are continuing in active service and wearing out, even whilst the main plant drinking water process systems are in shutdown (e.g. vessels, tanks, buildings, air conditioners, filters and fire systems); or

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[redacted]

52 [redacted]

- were designed to be kept in a shutdown state for up to five years with routine maintenance, but require additional maintenance beyond five years of shutdown (e.g. electrical infrastructure, RO vessels and piping).

The extended period of water security shutdown was not envisaged in SDP's O&M contract – which forms the basis of our base year O&M costs – nor reflected in the 2012-17 operating expenditure allowances. Addressing the key operational risks (i.e. being unable to restart the plant and reliably return to full production) resulting from this extended period of water security shutdown requires additional maintenance expenditure over the 2017-22 regulatory period (i.e. above base year O&M costs). Preventative and corrective maintenance is required to overhaul and where necessary, replace some of the originally installed assets.

We considered alternative ways of addressing this operational risk, including restarting the plant (and thereby increasing maintenance cost allowances and other costs up to their normal operating levels but only for as long as the plant continues to operate). However, we consider that it is not prudent to direct a permanent restart of the plant in the absence of the need to do so for water supply purposes under the WSA with SWC.

We consider that additional O&M costs to manage these operational risks are consistent with that of a prudent service provider acting efficiently, and in our view, are critical in ensuring the SDP is able to provide water supply and water security services as envisaged under the MWP.

The O&M Contract specifies that revised commercial arrangements will be entered into upon expiration of 5 years in water security. Consequently, we developed forecasts with our O&M contractor of the additional O&M costs necessary to prudently and efficiently address these operational risks.

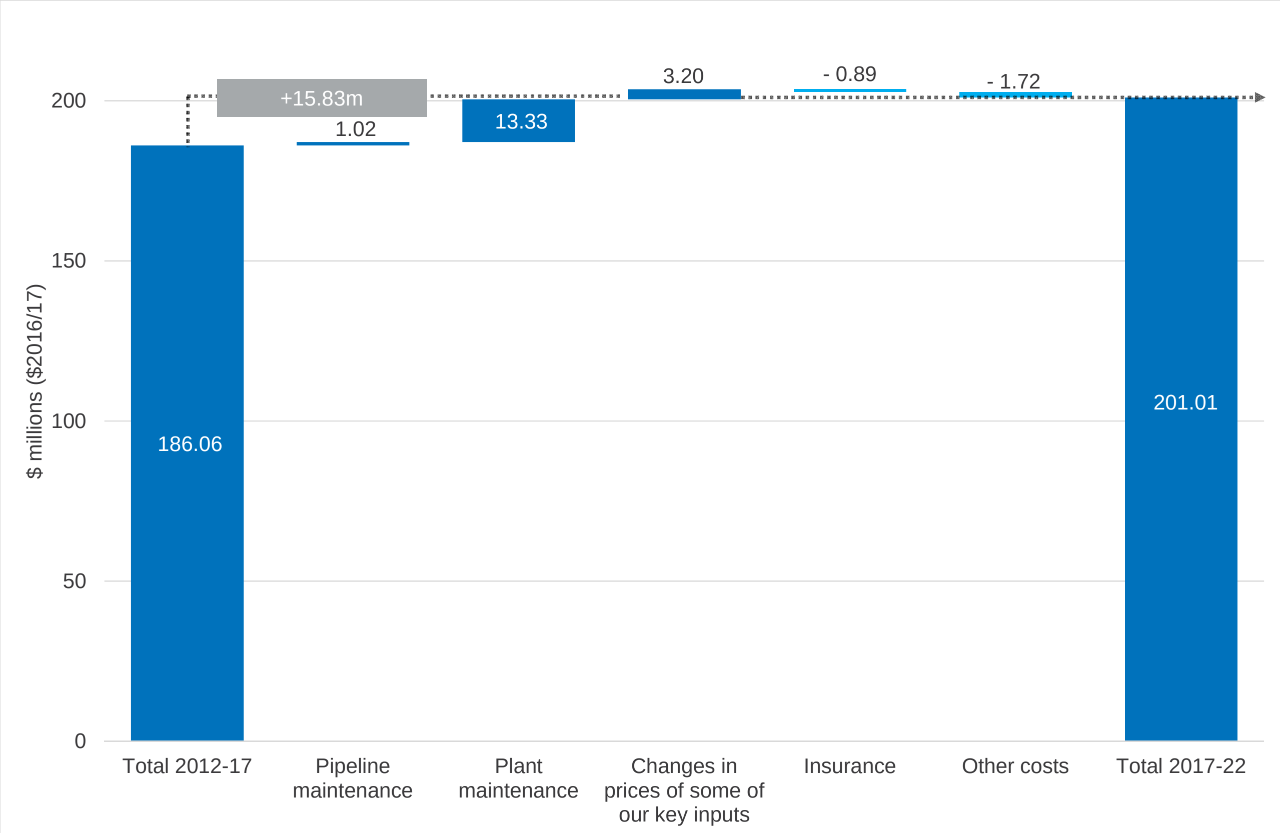
6.2.2 Full operation mode

We developed our forecast O&M costs for full operation mode over the 2017-22 regulatory period by using payments made to contractors under our competitively tendered costs ('base year costs') and adjusting these to account for future changes in our circumstances and operating environment and other cost inputs over the 2017-22 regulatory period. This is the same approach as outlined in Box 14. sets out our approach to developing our forecast O&M over the 2017-22 regulatory period.

Our forecast O&M costs for full operation mode are $15.83m higher than our allowed costs for the 2012-17 regulatory period. As shown in Figure 6.3, this increase is driven by the following factors:

- Necessary expenditure requirements such as additional scheduled and preventative maintenance associated with the age of our assets in accordance with best practice asset management.
- Unavoidable upward pressure on our key input costs, including the cost of chemicals used in the process of converting seawater to high quality drinking water.

Figure 6.3: Comparison of 2012-17 regulatory period allowed O&M expenditure and 2017-22 regulatory period forecast O&M expenditure, including key drivers of change, during full operation mode ($2016-17, $million)



Source: SDP Analysis

We are confident that our base year and proposed 'step changes' in O&M in full operation mode are prudent and efficient for several reasons:

- These costs are consistent with the costs incurred by a prudent service provider acting efficiently (see and for further information and expert analysis on the efficiency of these costs).
- There is considerable regulatory precedent for long-term contracts established through competitive tendering processes being accepted as prima facie evidence of efficient costs (see Box 17).

The sections below explain each of the key drivers of the increase in our forecast O&M costs in full operation mode. The underlying prudency and efficiency of the costs associated with our long-term O&M contract are discussed in section 6.2.4.

Additional scheduled and preventative maintenance in accordance with best practice asset management

All forecast maintenance costs in full operation mode are in line with the amounts contractually agreed with the O&M operator, as part of the competitively tendered process; consequently, we are confident that they represent prudent and efficient amounts. As detailed in Box 18 and Box 19, Advisian reviewed our proposed O&M costs and asset management process and found that our O&M contractor's systems and processes were consistent with best practice asset management and likely to lead to the incurrence of prudent and efficient expenditure.

During the 2012-17 regulatory period, the majority of maintenance undertaken on the assets was routine maintenance, as the plant had only just concluded the proving period and the assets were relatively new.

By the end of the 2017-22 regulatory period, the plant will be 12 years old and many assets will become due to be overhauled or replaced during the period, in accordance with best practice asset management. Consequently, maintenance expenditure in the 2017- 22 regulatory period will be higher than it was in the 2012-17 regulatory period and this increase was included with the O&M Contract at the time it was agreed.

Examples of assets due for refurbishment or replacement in the 2017-22 regulatory period are the valves, the VSD pumps, IT systems and air-conditioners in the switch rooms.

Unavoidable upward pressure on prices of some our key inputs over the 2017-22 regulatory period

The weighted average change of the cost input escalators over the period 2012-2017 (see Box 15) results in an increase in our O&M costs in full operation mode of $5.85m over the 2017-22 period. We have proposed indexing the prices associated with these O&M costs by forecast movements in CPI over the 2017-22 period as the escalation factor rather than forecasts of key cost inputs using bespoke indices.

Box 15: Prices of key input costs relevant to forecasting O&M costs

Under the O&M contract– which forms the basis of our base year O&M costs – the payable charges are specified in real terms and all components of the O&M costs reflected in these charges are subject to regular (typically quarterly) escalation factors. This is consistent with the structure of many other long-term contracts.

The O&M contract recognises that there are a number of escalators that are relevant to capturing changes in key O&M cost inputs including:

- Publically Available Indices
  - Consumer Price Index (**CPI**)
  - Average Weekly Earnings (**AWE**)
  - US Producer Price Index
- Bespoke Indices
  - Chemical Price Index
  - Membrane Price Index
- Some of these indices have increased at a faster rate than the CPI since the O&M contract was established and we have borne this risk over the 2012-17 regulatory period. We have updated these O&M charges by actual movements in these indices to reflect our current charges to establish the base allowance. Given the difficulty in establishing robust forecasts of these indices, we have then used forecast movements in CPI to forecast these O&M costs over the 2017-22 regulatory period.
- This is consistent with the approach adopted by IPART in the 2012 Determination and results in us continuing to bear the risk of differences between the CPI and these key O&M cost inputs specified in the O&M contract. Advisian notes that, based on its examination of long-term trends in these indices, the use of CPI is more likely to under-state (rather than over-state) O&M costs over the 2017-22 regulatory period.

6.2.3 Restart operating and maintenance costs

Our forecast O&M costs for transitioning to restart from water security mode (assuming this occurs in 2021-22) are $24.42m higher than our allowed costs for the final year of the 2012-17 regulatory period.

The forecast costs of restart include the cost of pipeline flushing which was not provided for in restart allowance set for the 2012 Determination.

6.2.4 Prudency and efficiency of overall O&M costs

We are confident that our base year and proposed ‘step changes’ in O&M under all modes are prudent and efficient for several reasons:

- They are representative of our actual recurrent operating expenditure over the 2012-2017 regulatory period, once adjusted for necessary one-off and ongoing costs.
- They are consistent with the costs incurred by a prudent service provider acting efficiently (see Box 16 Box 19 and Appendix 6.2 for further information and expert analysis).

- There is considerable regulatory precedent for long-term contracts established through competitive tendering processes being accepted as prima facie evidence of efficient costs (see Box 17).

Box 16: Our base year and proposed 'step changes' in O&M are prudent and efficient

Our base year O&M costs and proposed 'step changes' in O&M costs for water security mode are consistent with the costs incurred by a prudent service provider acting efficiently for three reasons:

1. We have a strong governance framework and set of internal policies that ensure we incur O&M (and other operating expenditure) only where it is necessary. For example:
   - Payments to our O&M contractor include mechanisms to ensure that the costs are efficient, including incentives for out-performance.
   - Our O&M contractor has world-class asset accreditation, and we have sound processes in place to ensure best practice asset management (see Box 19)
   - Step changes — we systematically assessed our ability to meet our water security obligations and identified additional actions required (after considering all feasible alternatives) to ensure we can meet our obligations and customer expectations, taking into account the extended period of shutdown and the ageing of the assets.
   - Sound budgeting and forecasting processes — these processes facilitate proper cost control and management as well as timely management and statutory reporting consistent with relevant accounting standards, and ensure effective controls are in place to ensure only personnel with appropriate delegated financial authority approve expenditure
   - We use outsourcing and competitive tendering with appropriate evaluation criteria to ensure high-quality services and market-tested prices, including using long-term contracting where it results in optimal outcomes from a cost and risk perspective.
2. Our analysis and expert advice indicates that we are efficient:
   - Expert advice from Advisian indicates that the O&M costs incurred by us through our O&M contract are consistent with the costs incurred by a prudent service provider acting efficiently on the following basis:
     - Prudency — The Operator's asset management system, including documented plans and procedures, ensures the Operator undertakes the operation and maintenance activities which any prudent operator would undertake.
     - Efficiency — The values in the operation and maintenance charges from the O&M contract represent efficient costs.

SDP has in place three O&M service delivery contracts covering the plant, the DWPS and the pipeline.

Box 17: Regulatory precedent for acceptance of long-term contracts established through competitive tendering processes as evidence of efficient costs

Many service providers with significant upfront investments in assets enter into long-term contracts for the procurement of services (such as O&M, energy, etc.) to provide stability and predictability in costs and to make use of high-quality services with market-tested prices. For this reason, there is considerable regulatory precedent for long-term contracts established through competitive tendering processes being accepted as prima facie evidence of efficient costs. For example:

- The ESCV in its draft decision for the 2013-18 Victorian metropolitan water price determination stated that:

> *The Commission has not undertaken an efficiency review of Melbourne Water's forecast desalination security payments nor does it intend to do so. The Partnerships Victoria process that led to the desalination public-private partnership (**PPP**) seeks to ensure issues such as value for money are achieved through a competitive tendering process. The Commission therefore accepts that Melbourne Water's overall desalination security payments will reflect the outcome of an efficient procurement process. In this sense, the Commission accepts that Melbourne Water's desalination security payments reflect an efficient level of expenditure.*[53]

- The ACCC, in its decision on the National Broadband Network (**NBN**) Co Special Access Undertaking[54] provides for a 'prudent cost condition' to be applied in assessing whether expenditure is deemed to be efficient and thus able to be incorporated in prices. Amongst other things, capital expenditure meets the prudent cost condition if it was incurred under a conforming contract, in an open and competitive market or through another value for money process.

While the fact that our long-term O&M contracts were established through competitive tendering processes is prima facie evidence of efficient costs, we also engaged Advisian to comprehensively review our forecast O&M costs to ensure that:

- The asset management processes used to identify the necessary maintenance program is prudent, including reviewing the asset management processes applied to identify the necessary periodic maintenance tasks and the appropriateness of including each maintenance item (including sampling a selection of maintenance item costs).
- The forecasts of the additional O&M costs are calculated according to good process, by experienced personnel and are within reasonable expectations of efficient values.

Box 18 and Box 19 provides a summary of Advisian's review, with further detail contained in Appendix 6.2.

53 ESC, Price Review 2013: Greater Metropolitan Water Businesses – Draft decision, April 2013, p49.

54 ACCC, NBN Co Special Access Undertaking - Final Decision, 13 December 2013

Box 18: Advisian review of O&M charges under the O&M contract

SDP engaged Advisian to review the O&M Charges under contract for prudency and efficiency. Advisian found the processes and systems that support the asset management framework for managing the Plant assets are appropriate and adequate to provide confidence that when the processes are implemented the resulting costs would be prudent. This conclusion was based on a sample of processes, onsite findings and a review of findings of previous audit reports.

Advisian reviewed the details of the O&M charges contained within the forecast O&M costs and found that:

- the forecast O&M costs have been calculated via applying the correct interpretation of the Service Fee under the O&M Contract;
- the forecast O&M costs draws upon the O&M Charges where appropriate; and
- each assumption made in the preparation of the forecast O&M costs is appropriate and likely to lead to the incurrence of efficient costs.
- efficiencies in the delivery of the O&M Services are incentivised via several gain/pain share mechanisms under the Service fee arrangements and that various positive impacts arise to customers of SDP via the incurrence of the O&M expenditure.

Further detail on Advisian's review is provided in Appendix 6.2.

Box 19: Advisian review of SDP's asset management processes

Advisian's review of SDP's asset management framework, plans and supporting processes and systems found that:

- The asset management plan appropriately describes the management of the Plant;
- The supporting processes reflect an efficient and effective approach to managing plant assets, taking into account the operational environment of the Plant, that is, there was no evidence of excessive expenditure and any maintenance activities that were re-scheduled were done so in order to achieve efficient use of resources without any loss of plant integrity;
- The supporting asset management systems are well established within plant operations and do record appropriate historical information to support the efficient ongoing operation of the Plant; and
- Overall, the asset management framework, management plans, processes and systems reflect contemporary asset management practices and are considered to support efficient management decisions.

On this basis, Advisian concludes that SDP's asset management framework, management plans, processes and systems are effective (i.e. fit for purpose). The framework, plans and resulting actions are consistent with good industry practice, and as such represent what a prudent operator in the industry would be expected to deliver. Accordingly, the framework and systems are an appropriate basis for the purpose of substantiating that SDP's O&M costs are consistent with the costs incurred by a prudent service provider acting efficiently.

Further detail on Advisian's review is provided in Appendix 6.2.

While benchmarking is another potentially valuable technique for regulated businesses and regulators when assessing the efficiency of service provision and forecast expenditure, there are a number of challenges in using economic benchmarking to establish the efficient level of O&M costs (see Box 20).

Box 20: Challenges in using economic benchmarking to establish the efficient level of O&M costs over the 2017-22 regulatory period

Benchmarking is a potentially valuable technique for regulated businesses and regulators when assessing the efficiency of service provision and forecast expenditure, and while there are a broad range of techniques that can be used for this propose, the unavailability of reliable, consistent and standardised data creates a significant challenge in applying these techniques in specific contexts. This includes data on the service or asset of interest, as well as on comparator companies through which to benchmark performance.

In the absence of appropriate data, it may not be possible to determine a reliable measurement of relative efficiency and separate genuine inefficiency from measurement error.[55]

The ACT recently found that the AER had erred in its application of benchmarking of a number of NSW electricity distributors, and noted that the AER had not done enough to ensure the quality of the data it had used in its benchmarking analysis and had failed to account properly for large differences between the operating environments faced by the networks.[56] This was despite a lengthy process undertaken by the AER to collate and analyse the data. IPART has not yet commenced such a process.

We asked Advisian to examine the feasibility of conducting reliable benchmarking of SDP's O&M costs using publicly available information and they noted that:

- There is insufficient publicly available data on the operating expenditure and drivers of operating expenditure of desalination plants comparable to SDP.
- The data available on desalination plants in Australia (and elsewhere) are not reported on a consistent basis (i.e., using standard definitions), making reliable comparisons across companies difficult (particularly as many of the plants (including most in Australia) are not standalone operations).
- There are material differences in operating circumstances between SDP and other desalination plants in Australia (and elsewhere) including different environments (e.g. climate and topography), face different input costs (e.g., labour) and legislative and regulatory requirements (including requirements on modal operations) – all of which drive operating expenditure.

We therefore caution against an inappropriate application of benchmarking in setting the 2017-22 O&M cost allowances. We welcome further engagement with SWC, IPART and other stakeholders on an ongoing basis to develop the data as well as technical knowledge of our operating environment and other skills necessary to make further use of benchmarking.

6.3 Energy cost component of forecast operating expenditure

Providing water supply (and to a lesser extent water security) services requires energy to power the plant. There are higher operating costs — including the costs of purchasing and transporting energy to power the SDP — when the SDP is operating at full operation to produce high quality drinking water.

55 For example, due to data errors or inconsistent recording of information on benchmark companies or intrinsic differences in the operating circumstances of companies within the benchmarking sample.

56 Applications by Public Interest Advocacy Centre Ltd and Ausgrid [2016] ACompT 1

Table 6.5 compares the allowed and forecast energy costs over the 2012-17 and 2017-22 regulatory periods.

Table 6.5: Comparison of allowed and forecast energy costs over the 2012-17 and 2017-22 regulatory periods ($2016-17, $million)

	2012-17 (IPART allowed)	2017-22 (SDP proposed)	Difference ($)
Water security mode	[redacted]	[redacted]	[redacted]
Full operation mode	[redacted]	[redacted]	[redacted]
Transition to full operation mode from water security (restart)*	[redacted]	[redacted]	[redacted]

Note: This assumes a transition to full operation mode occurs in Year 5 of the regulatory period

Note: totals may not add due to rounding.

The principal driver of the decrease in energy costs in water security mode is that the forecast energy consumption is based on actual consumption during the 2012-17 regulatory period, which was lower than expected.

The principal driver of the increase in energy costs in full operation mode is SDP's proposal for the prudent and efficient energy costs to be based on the prices in SDP's contract with Infigen, rather than the modelled costs used by IPART in the 2012 Determination. However, both the unit costs and amount of energy proposed for the 2017-22 regulatory period are lower than the allowed amounts in the final year of the 2012 Determination.

The principal driver of the increase in energy costs when restarting from water security mode is the fact that the 2012 Determination did not include an allowance for energy consumed when the plant transitions to operating mode from a water security mode.

Our forecast energy costs over the 2017-22 regulatory period represents the costs of energy incurred by an efficient and prudent operator of the SDP and reflects the risks and uncertainties regarding the operation of the SDP. As required under the planning consent conditions for the plant[57], SDP is powered 100% from renewable energy. Consequently, our forecast energy costs include the costs of operating within this framework.

Our forecast of energy costs consists of:

- The efficient cost or price per unit of energy
- The quantum of energy required in each operating mode

The following sections set out the basis for our estimates of the efficient cost per unit of energy as well as the quantum of energy required in full operation mode and in water security mode.

6.3.1 Cost per unit of electricity

Table 6.6 sets out the forecast cost per unit of energy for the 2017-22 regulatory period.

[57] Project Approval issued pursuant to Section 75J of the *Environmental Planning and Assessment Act 1979*. The planning conditions also require SDP to have a framework for considering and managing a range of factors including additionality, certainty, flexibility and adaptability in the renewable energy supply. C

Table 6.6: Cost price per unit of energy (excluding network charges) ($/MWh, $2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22
Total SDP contract price	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Market fees	*Included in forecast operating expenditure*	*Included in forecast operating expenditure*	*Included in forecast operating expenditure*	*Included in forecast operating expenditure*	*Included in forecast operating expenditure*
Ancillary services	*Included in forecast operating expenditure*	*Included in forecast operating expenditure*	*Included in forecast operating expenditure*	*Included in forecast operating expenditure*	*Included in forecast operating expenditure*
Operating costs and retail margin	*Included in prices above*	*Included in prices above*	*Included in prices above*	*Included in prices above*	*Included in prices above*
NSW Energy Saving Scheme (**ESS**)	*Included in prices above*	*Included in prices above*	*Included in prices above*	*Included in prices above*	*Included in prices above*
Energy losses	*Included in prices above*	*Included in prices above*	*Included in prices above*	*Included in prices above*	*Included in prices above*
Energy network Transmission use of System (**TUOS**) charges	*Passed-through to customers*	*Passed-through to customers*	*Passed-through to customers*	*Passed-through to customers*	*Passed-through to customers*
Total proposed energy price	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Note: totals may not add due to rounding.

This section presents SDP's proposed allowance for recovering these energy costs, the basis of the proposed allowance and a comparison against other benchmark energy costs over the 2017-22 regulatory period.

Overview of energy costs

SDP's energy costs consist of a number of components, reflecting the different products and services that are bundled together to make up the supply of electricity to it. These cost components can be categorised as follows:

- The costs of making use of the electricity network (i.e. paying TUOS charges)
- The cost of procuring wholesale electricity
- The costs of complying with relevant renewable energy schemes
- The costs of complying with relevant energy savings schemes
- The costs associated with arranging electricity supply and managing the risks associated with electricity supply (which include retail operating costs and a retail margin)
- The costs of market fees and ancillary services.

Major energy users, like the SDP, typically enter into long-term contracts for the procurement of energy. This provides a long-term hedge against wholesale energy price volatility and provides a stable and predictable set of energy costs that are necessary to underpin investment in the plant. This is particularly the case in a market where government policy determines when SDP needs to consume energy.

In this sense, these long-term energy supply agreement (**ESA**s) are more like retail supply agreements – similar, albeit longer-term, than agreements that end-customers enter into with energy retailers – than traditional wholesale Power Purchase Agreements (**PPA**s). [58] A provider of electricity services (such as a retailer) would ensure that the prices and charges it offers to end-customers recover all of these costs. For this reason, IPART ensures that it includes forecasts or pass through of these costs in its build-up of regulated retail electricity prices.[59]

In the same way, an efficient and prudent operator of the SDP that requires these bundled products and services (equivalent to the provision of retail energy services), will face each of these costs in procuring the electricity that it requires for its operations. When comparing our forecast energy costs and the SDP's supply arrangements (Box 21) with other benchmarks for energy supply (such as bundled prices for energy and LGC supply) it is necessary to ensure all of these costs are taken into account.

Our approach to forecasting energy costs over the 2017-22 regulatory period

Our forecast cost per unit of energy for the 2017-22 regulatory period (Table 6.6) is based on SDP's contract prices. The forecast costs include all of the costs of the different products and services that are bundled together to make up the supply of energy to an efficient and prudent operator of the SDP, including:

- Sourcing energy requirements from renewable energy under the planning conditions for the plant;
- Complying with relevant energy savings schemes; and
- The costs associated with arranging electricity supply and managing the risks associated with electricity supply (which include retail operating costs and a retail margin).

In our view, SDP's contract price is both an efficient and prudent instrument through which to procure energy to provide the water supply and water security services as envisaged under the MWP, whilst complying with its planning conditions for 100% renewable energy. Major energy users typically enter into long-term contracts for the procurement of energy and there is considerable regulatory precedent for long-term contracts established through competitive tendering processes being accepted as prima facie evidence of efficient costs (Box 17). The contract prices (and other terms and conditions in the contract) are the outcome of a competitive tender process (Box 22) and in our view provide a relevant measure of the efficient costs of procuring energy services. For this reason, we consider that long-term contracts procured through competitive tendering processes such as the Electricity Supply Agreement (**ESA**) and REC Supply Agreement (**RSA**) should form the basis for SDP's energy cost allowance, consistent with other regulatory precedents. Long-term contracts also ensure that SWC and customers are not required to manage year-on-year volatility in our energy costs.

In addition, approximately 85% of large-scale renewable generator capacity participating in the Large-scale Renewable Energy Target (**LRET**) is underpinned by a 20 year PPA. Therefore, it is highly unlikely that the planning requirements for additionality could have been satisfied without a long-term contract.[60]

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[58] For example, PPA's typically do not include the costs associated with meeting obligations under the NSW Energy Saving Scheme (ESS) or other market fees and ancillary charges.

[59] IPART, Review of regulated retail prices and charges for electricity: From 1 July 2013 to 30 June 2016 – Final Report, June 2013.

[60] Securing energy through a long-term contract also ensures that renewable energy can be supplied to SDP even in the event of a change or repeal of the renewable energy target legislation. Although there is currently bipartisan support for renewables, the Wharburton Inquiry in 2014 considered the abolition of the Large-scale Renewable Energy Target (LRET). If this was to occur, there may be no market for LGCs and, without the benefit of a long-term contract, SDP would be unable to demonstrate that it had met the renewable energy requirement of its planning conditions.

Box 21: SDP's energy supply arrangements

SDP procures electricity through two ESAs with Infigen Energy:

- The ESA, which is for the supply of electricity
- The RSA, which is for the supply of LGCs and Small-scale Technology Certificates (**STC**s).
- These ESAs are for the supply of electricity to SDP at the Sydney West 132 kV transmission node. The ESAs require Infigen Energy to:
- Supply electricity to SDP at the Sydney West 132 kV transmission node
- Supply LGCs and STCs
- Supply Energy Savings Certificates (**ESC**s) required under the ESS
- Pay for all network connection costs and TUOS charges
- Pay for all market fees and ancillary services costs (and these fees are passed through to SDP)

Therefore, SDP's contract price explicitly or implicitly includes:

- Supplying electricity to SDP
- Supplying LGCs and STCs
- Losses associated with supplying electricity at the Sydney West 132 kV transmission node rather than the regional reference node
- Supplying Energy Savings Certificates (ESCs) required under the NSW ESS
- Retail operating costs
- Retail margin.

Prices under both the ESA and RSA are constant in real terms being adjusted annually only by CPI.

SDP recognises that there are also other approaches to establishing the efficient energy costs associated with providing water supply and water security services, including modelling forecast spot or contract prices in the NEM and or considering the prices offered by a retailer for a tailored contract to suit SDP's operating circumstances and resulting energy requirements. These approaches may provide higher or lower forecasts of energy costs depending on the allocation of risk and the desired impacts on customers. For example, the costs of procuring a tailored contract to suit SDP's operating circumstances and resulting energy requirements are likely to be significantly higher than the SDP contract price with Infigen. This is because a prudent retailer operating in a competitive market would ensure that the price of any tailored contract reflects the material volume and price risks that it is bearing on SDP's behalf (i.e. include a pricing premium to reflect the allocation of risk).[61]

[61] A tailored contract may involve a retailer purchasing short-term energy supply contracts on SDP's behalf for electricity and renewable certificates. Under this arrangement SDP would only pay for energy it consumed, and there would be no additional credits or debits associated with contracted electricity being in excess or surplus to SDP's actual energy requirements. As a result, a tailored contract would represent a significant allocation of risk from SDP to the retailer. That is, a tailored contract shifts risk associated with SDP's intermittent demand profile to the retailer. However, a prudent retailer would need to capture this

In theory, SDP could also procure its energy needs on the spot market.[62] This could be considered efficient, as SDP would only be charged for energy at the time it was consumed. However, this approach is not prudent as it introduces significant price risk, as demonstrated by the recent volatility in the spot market for both energy and LGCs, particularly in states such as Tasmania and South Australia (Figure 6.4). For this reason, very few commercial customers with significant energy requirements take direct exposure to the electricity and LGC spot markets in Australia for their ongoing energy requirements.[63]

While we consider that SDP's contract price should form the basis for SDP's energy cost allowance, we recognise that IPART has previously adopted a number of alternative benchmarks or approaches to estimating energy costs. For example, IPART used LRMC in the 2012 Determination and LRMC and market based approaches in its 2010 and 2013 regulated retail electricity price determinations[64]. The different operating contexts and regulatory objectives in the regulated retail electricity price determinations – for example where competition tends to result in electricity prices that reflect the prices of short-term forward contracts – suggest that these approaches are not well suited to setting the energy cost allowance for SDP.[65] Furthermore, the LRMC approach represents the long-term view of energy prices at a point in time[66], and not necessarily the price that an efficient retailer would incur in supplying SDP with energy over the 2017-22 regulatory period. It does not produce prices that are associated with contract products that are readily available, observable and regularly traded in the market.

allocation of risk -- namely the volume and price risk associated with SDP's operating circumstances and resulting energy requirements -- into the contract price it offered to SDP.

62 Under this approach, SDP is exposed to spot market volatility when the plant is operating, and during these times of relative water scarcity spot market prices are likely to be higher than average. This is because of restrictions placed on use of water by coal generators (which require water for cooling) and constraints on hydro generation at times of water scarcity.

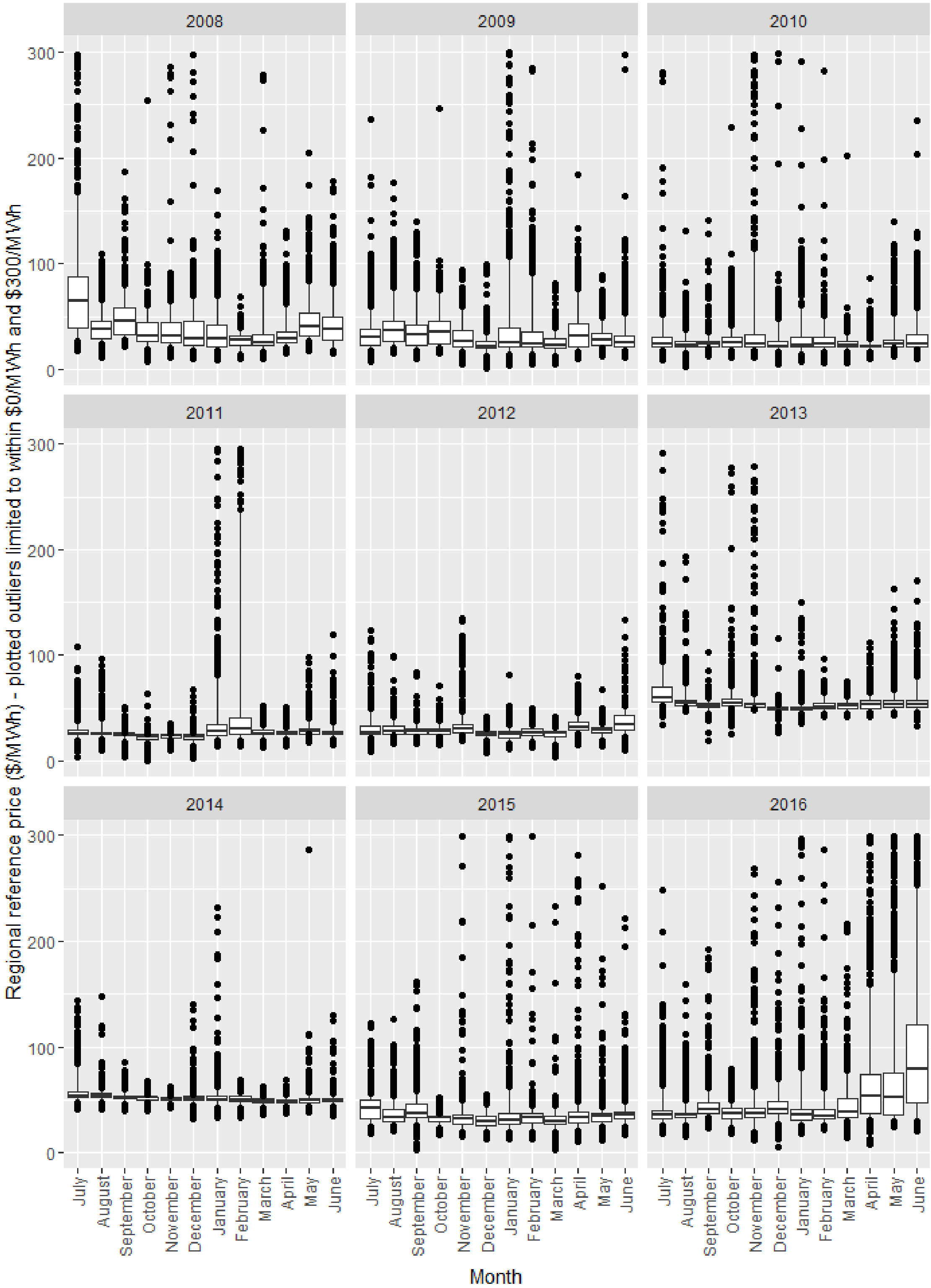
63 Furthermore, the spot market for LCGs is thinly traded and there is a real risk of the LGC price spiking if SDP's retailer were to procure the large number of LGCs that would be required at the time of SDP's operations.

64 IPART, Review of regulated retail prices and charges for electricity: From 1 July 2013 to 30 June 2016 – Final Report, June 2013.

65 For example, IPART's regulation of electricity prices occurred in the context of a competitive market in which retailers regularly enter and exit the market as barriers to entry and exit are low, and there are few sunk fixed costs associated with entry. As such a new entrant retailer can enter the market, enter a set of short-term forward contracts, and offer to supply retail customers at a price that reflects these short-term contract prices. If the prices of these short-term contracts are lower than longer-term PPAs that incumbent retailers might have in place, the new entrant retailer can undercut the incumbent retailers and the incumbent retailers will likely respond by pricing on an equivalent basis. As such in competitive retail electricity markets, competition is likely to result in retailer electricity prices that reflect the prices of short-term forward contracts. For example, SDP does not operate in a competitive market for the supply of desalinated water to SWC, and even if it did, prices in this hypothetical competitive market are likely to reflect the cost of securing electricity and LGCs under a long-term PPA, rather than under short-term forward contracts. This is because there are substantial sunk fixed costs associated with investments in a desalination plant. If the new entrant chose to enter into short-term forward contracts, then the new entrant would be exposed to the financial consequences of increases in the prices of these short-term forward contracts. This can have material consequences for the residual value of the investment in the desalination plant. To manage this risk, a new entrant desalination plant is likely to enter into a long-term PPA, so that it has certainty about its energy costs. Indeed, providers of debt and equity are likely to insist on a long-term PPA before committing funds to the project. What this means is that even in a hypothetical competition market, competition would be unlikely to result in water prices that reflect the prices of short-term forward contracts.

66 And for this reason is often used by potential investors in new generation capacity to forecast long-term revenue based on forecast supply and demand.

Figure 6.4: Volatility in NSW wholesale electricity spot prices[67]



Source: SDP analysis

[67] Boxes represent half-hourly NSW regional reference prices (RRP) between the 25th and 75th percentiles, while the vertical lines represent the 5th and 95th percentiles. Dots represent individual RRP falling outside the 5th and 95th percentiles.

Both the proposed energy costs and benchmarks have been presented on the same basis – namely inclusive of the costs of market fees[68] and other retail electricity costs incurred in supply electricity to end-customers. These costs are around $12/MWh over the 2017-22 regulatory period.[69]

Figure 6.5 shows that:

- The proposed (contract) energy costs fall within the LRMC and market based benchmark range demonstrating that prices under the ESA and RSA is a relevant measure of the efficient costs of energy over the 2017-22 regulatory period and is an appropriate basis for setting the allowance for energy costs.
- The price that SDP faces under the ESA and RSA is constant in real terms, while other estimates of energy costs can vary significantly over time. Basing the energy cost allowance on the SDP contract price minimises unnecessary price volatility to SWC and end-customers.

The sections below provide a summary of how we estimated the LRMC and market based benchmark energy costs consistent with IPART's Determinations. Appendix 6.6 provides Frontier Economics' report on the updated estimates of LRMC (consistent with the approach used by IPART in its 2012 Determination) and Appendix 6.7 provides further information on market fees and other retail electricity costs incurred to supply electricity to end-customers.

Figure 6.5: Comparison of SDP contract prices with equivalent IPART benchmarks ($ per MWh, $2016-17)

Redacted: Commercial in Confidence

[68] An allowance for market fees and ancillary services costs should also be included in the energy cost allowance. Because TUOS charges are passed through to SDP under the ESA and RSA and are subsequently passed through to SWC, TUOS charges do not form part of the proposed wholesale energy price.

[69] Appendix 6.6 provides further information on market fees and other retail electricity costs incurred in supply electricity to end-customers.

Box 22: Competitive tender process for the ESA and RSA with Infigen

The ESA and RSA with Infigen are the result of a competitive tender process held by SWC which followed a three-stage process. The stages were Request for Proposal; Request for Tender; and Evaluation, finalisation and contract execution.

Requests for Proposals were called for in October 2007 and 13 responses were received (including from energy retailers and renewable energy project developers). These proposals were evaluated against:

- Three mandatory criteria, including:
  - Adequate financial strength and capacity;
  - The ability to supply renewable energy from September 2009; and
  - The potential to obtain the licences required for the supply of the renewable energy.
- Three 'desirable' criteria including:
  - Assessed costs, based on the proponents' indicative prices for electricity and RECs but with adjustments for risks (70% weighting)
  - The extent to which the proponents' renewable energy would be generated by a clearly identifiable and sustainable source (20% weighting)
  - The extent to which the renewable energy source would be available by the end of 2009 (10% weighting).

Six of the proponents were shortlisted to tender and were evaluated against:

- Three mandatory criteria, including:
  - Adequate financial strength and capacity
  - Potential to obtain the licences required for the supply of the renewable energy
  - Generation of the renewable energy by a clearly identifiable renewable generating source.
- Three 'desirable' criteria including:
  - Assessed costs, based on the tenderers' prices for electricity and RECs but with adjustments for risks (80 per cent weighting);
  - The extent to which the proponents' renewable generating source would be available in a reasonable timeframe (10 per cent weighting); and
  - The acceptability of the tenderers' proposed commercial conditions (10 % weighting).

Our approach to estimating other benchmark energy costs over the 2017-22 regulatory period

LRMC estimates from 2012 Determination

In determining efficient energy costs in the 2012 Determination, IPART had regard to:

- LRMC of generation as a long term proxy for wholesale market spot and contract prices
- LRMC of meeting the LRET as a proxy for LGC market prices.

Table 6.7 and Table 6.8 present the equivalent LRMC results from IPART's 2012 Determination in $2016-17 dollars. As discussed, the total equivalent LRMC include our estimates of efficient operating costs, retail margin, ESS costs and losses so that the total LRMC can be compared to the total SDP contract price (which is constant in real $2016-17, as set out in Box 21) shows the SDP contract price for comparative purposes.

Table 6.7 and Table 6.8 show that estimates of LRMC vary over time (in this case, the LRMC increases in real terms over the 2012-17 regulatory period), while SDP's contract price is constant in real terms.

Table 6.7: IPART's LRMC from 2012 Determination – with a carbon price on energy ($/MWh, $2016-17)

	2012-13	2013-14	2014-15	2015-16	2016-17
Estimates of LRMC of energy	$66.82	$70.71	$71.26	$73.23	$78.39
Estimates of LRMC of renewable energy	$48.94	$50.90	$52.93	$55.05	$57.27
Operating costs and retail margin	$7.06	$7.43	$7.56	$7.82	$8.27
ESS	$1.71	$1.98	$2.03	$2.38	$2.80
Losses	$0.60	$0.68	$0.32	$0.23	$0.46
Total equivalent LRMC - with carbon	**$125.13**	**$131.70**	**$134.10**	**$138.72**	**$147.19**

Note: totals may not add due to rounding.

Table 6.8: IPART's LRMC from 2012 Determination – without a carbon price on energy ($/MWh, $2016-17)

	2012-13	2013-14	2014-15	2015-16	2016-17
Estimates of LRMC of energy	$46.57	$48.84	$49.98	$48.84	$47.71
Estimates of LRMC of renewable energy	$65.88	$68.16	$70.43	$72.70	$74.97
Operating costs and retail margin	$6.86	$7.15	$7.33	$7.42	$7.49
ESS	$1.71	$1.98	$2.03	$2.38	$2.80
Losses	$0.58	$0.65	$0.31	$0.21	$0.41
Total equivalent LRMC - without carbon	**$121.61**	**$126.79**	**$130.08**	**$131.55**	**$133.38**

Note: totals may not add due to rounding.

Table 6.9: SDP contract price ($/MWh, $2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22
Wholesale energy costs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Renewable energy	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Operating costs and retail margin	Included in prices above	Included in prices above	Included in prices above	Included in prices above	Included in prices above
ESS	Included in prices above	Included in prices above	Included in prices above	Included in prices above	Included in prices above
Losses	Included in prices above	Included in prices above	Included in prices above	Included in prices above	Included in prices above
Total SDP contract price	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Updated estimates of LRMC over the 2017-22 regulatory period

While we consider that SDP's contract price should form the basis for SDP's energy cost allowance, we engaged Frontier Economics to update the estimates of LRMC using the same methodology used in their advice to IPART for the 2012 Determination.

Frontier Economics' estimates of LRMC are set out in Table 6.10 on an equivalent basis (i.e. include our estimates of efficient operating costs, retail margin, ESS costs and losses). Table 6.10 shows that there is a significant decrease in the LRMC estimates from the final year of the 2012-17 regulatory period to the first year of the 2017-22 regulatory period[70], with the LRMC estimates rising over the 2017-22 regulatory period.

While the estimated LRMC for the 2017-22 regulatory period is, on average, broadly consistent with the SDP contract price setting the energy cost allowance on this basis would result in unnecessary price volatility to SWC and end-customers.[71] In our view, customers are not well placed to manage this price volatility and SDP's ESAs shield customers from this risk at no additional cost (i.e. the contract price is within the LRMC and market based benchmarks).

Table 6.10: Total energy costs using Frontier Economics estimates of LRMC ($/MWh, $2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22
Frontier estimates of LRMC of energy	$45.66	$44.50	$45.07	$45.67	$48.87
Frontier estimates of LRMC of renewable energy	$70.14	$72.95	$75.86	$78.92	$82.07
Operating costs and retail margin	$8.05	$8.05	$8.05	$8.05	$8.05
ESS	$3.00	$3.19	$3.29	$3.29	$3.29
Losses	$0.45	$0.45	$0.45	$0.45	$0.45
Total equivalent LRMC - without carbon	**$127.30**	**$129.13**	**$132.72**	**$136.37**	**$142.73**

Note: totals may not add due to rounding.

70 This reflects changes in forecast supply and demand conditions in the electricity market since 2012 including capital and fuel costs for generation, forecast electricity demand, and changes in climate change and renewable energy policy.

71 Over the period of the 2012 Determination, IPART's estimates of LRMC increased by 16% in real terms from 2012-13 to 2016-17. Adopting Frontier Economics estimates would imply that LRMC would return to 2012-13 levels, in real terms, in 2017-18. Over the period from 2017-18 to 2021-22, LRMC would increase again by 12% in real terms.

Market prices for electricity and LGCs over the 2017-22 regulatory period

In its determinations of regulated retail electricity prices for small customers, IPART used a market-based approach to considering the efficient costs of procuring energy for supply to customers. This market based approach utilised information on prices of forward contracts for electricity to inform its determination. Forward contracts for electricity are traded on various platforms (e.g. ASX Energy), with prices for a range of products published daily.

While we consider that SDP's contract price should form the basis for SDP's energy cost allowance, we calculated the equivalent energy cost using IPART's preferred 'point-in-time' approach it has adopted in other regulated retail electricity price reviews to assessing market prices for electricity and LGCs[72]. Forward contracts are only available out to 2019-20.

Consistent with IPART's approach we have averaged these prices over the 20 days up to 13 September 2016. Our estimates of equivalent market prices (which include our estimates of efficient operating costs, retail margin, ESS costs and losses, as specified in Table 6.10 and discussed in detail in Appendix 6.8) are set out in Table 6.11.

Table 6.11 shows that the market based estimates are higher than SDP's contract price for the first three years of the 2017-22 regulatory period[73].

Table 6.11: Total energy costs using market prices for energy and LGCs ($/MWh, $2016-17)

	2017-18	2018-19	2019-20
Wholesale energy costs	$55.50	$55.68	$48.43
Renewable energy	$82.63	$82.63	$82.63
Operating costs and retail margin	$8.05	$8.05	$8.05
ESS	$3.00	$3.19	$3.29
Losses	$0.45	$0.45	$0.45
Total equivalent market prices	**$149.62**	**$150.00**	**$142.84**

Note: totals may not add due to rounding.

Given the significant volatility in market based energy prices, there will almost certainly be times when market based energy prices are lower than SDP's contract price. However, setting the energy cost allowance on this basis (i.e. consistent with IPART's regulated retail price determinations) involves a significant change in risk allocation and could result in significant price volatility to SWC and end-customers. In our view, water customers are not well placed to manage this price volatility and SDP's ESAs shield customers from this risk at no additional cost (i.e. the contract price is within the LRMC and market based benchmarks).

6.3.2 Quantum of energy

Energy Consumption in full operation mode

There a number of drivers of the quantum of energy used by the plant when it is operating. These include factors that the operator cannot control, such as seawater temperature and salinity, as well as those they

72 We have used the price of financial year strip of flat swaps, published by ASX Energy (average of 20 days to13 September 2016), to determine the electricity price. We have used the spot price for LGCs.

73 Only three years are shown because ASX Energy's quarterly derivatives contracts are listed only for the next 3 to 4 years (for instance, quarterly contracts for 2020 have just commenced trading). However, trade in these contracts beyond the next two years tends to be very limited.

can, including membranes and chemical usage. The operator manages the trade-off between membrane replacement, and energy and membrane cleaning costs to ensure efficient production costs, under appropriate incentives in the O&M Contract.

Energy consumption is most efficient when the plant is operating at 100% production capacity and with optimal membrane replacement.

The projected energy usage during the 2017-22 regulatory period for the DWPS is based on the nameplate rating of the delivery pumps. The projected energy usage at the plant is based on the allowed variable energy volume in the O&M Contract, assuming the plant is operating at 100%. This level of energy consumption is consistent with the minimum take energy requirements in the Infigen ESA.

If the plant performed more efficiently than this projection, SDP may be required to make difference payments to Infigen and incentive payments to the O&M contractor. If the plant performed less efficiently than this projection, the operator may be required to meet part of the additional energy cost, depending on the measured temperature and salinity of the seawater.

Importantly for customers, the projected energy consumption is lower than the allowed energy consumption by the final year of the 2012 Determination, resulting in a cost saving passed on to customers of $6.1m over five years (based on SDP's contract price).

SDP notes that although membrane technology may continue to improve over time, the ability to utilise this technology to drive lower per unit costs (either through less energy or higher production) is not possible for SDP without significant capital investment due to the design of the plant. This investment would involve either replacing the fixed speed high pressure pumps with VSD pumps (to reduce energy costs) or increasing the capacity of the Energy Recovery Devices to increase production. Whilst not having undertaken detailed analysis, SDP does not consider such investment would be warranted during the 2017-22 regulatory period.

Energy Consumption in Water Security Mode

SDP's projected energy consumption during water security shutdown is based on actual usage during the 2012 Determination period. As actual usage was lower than the amounts allowed by IPART, this results in a cost saving of $2.85m passed on to customers over the 2017-22 regulatory period (based on SDP's contract price).

6.3.3 Restart Energy Costs

As the plant is taken out of water security mode, energy is used to restart and test those parts of the plant which have been in shutdown, in readiness for the production of drinking water. The majority of the energy is consumed by the high pressure pumps which are used to push the seawater through the membranes to create permeate. During restart, it takes approximately four months to commence drinking water production that meets the required standard. It takes a further four months for the plant to reach full production levels. Our forecast of operating costs for restart therefore includes the cost of the energy used by the plant in restart until the commencement of the supply of drinking water. These costs were not accounted for in the 2012 Determination.

6.4 Other operating cost component of forecast operating expenditure

Our other operating costs incurred in providing water security and water supply services include all expenses other than energy and payments under the O&M contracts. They primarily relate to corporate costs required to oversee our business, insurance, rates and taxes, and other miscellaneous costs. Corporate costs and insurance do vary depending on whether the plant is operating or not, but not by the same extent as other energy, chemicals and maintenance. Rates, taxes and other miscellaneous costs are generally fixed.

Table 6.12 compares the allowed and forecast other operating costs over the 2012-17 and 2017-22 regulatory periods.

Table 6.12: Comparison of allowed and forecast other operating costs over the 2012-17 and 2017-22 regulatory periods ($2016-17, $million)

	2012-17 (IPART allowed)	2017-22 (SDP proposed)	Difference
Water security mode	27.98	41.98	14.00
Full operation mode	29.41	46.19	16.78
Transition to full operation mode (restart)*	-	-	-

Note: This assumes a transition to full operation mode occurs in Year 5 of the regulatory period

The following sections explain:

- Our approach to forecasting other operating costs for water security and full operation modes to ensure they are consistent with the costs that would be incurred by a prudent service provider acting efficiently; and
- The difference between our forecast other operating costs for the 2017-22 regulatory period and allowed costs for the 2012-17 regulatory periods, and the key drivers of these differences.

6.4.1 Water security mode

We developed our forecast of other operating costs for water security mode over the 2017-22 regulatory period by using levels of efficient and prudently incurred recurrent other operating costs over the 2012-17 regulatory period ('base year costs'), and adjusting these to account for future changes in our circumstances and operating environment and other cost inputs over the 2017-22 regulatory period.

Box 23 sets out our approach to developing our forecast of other operating costs over the 2017-22 regulatory period.

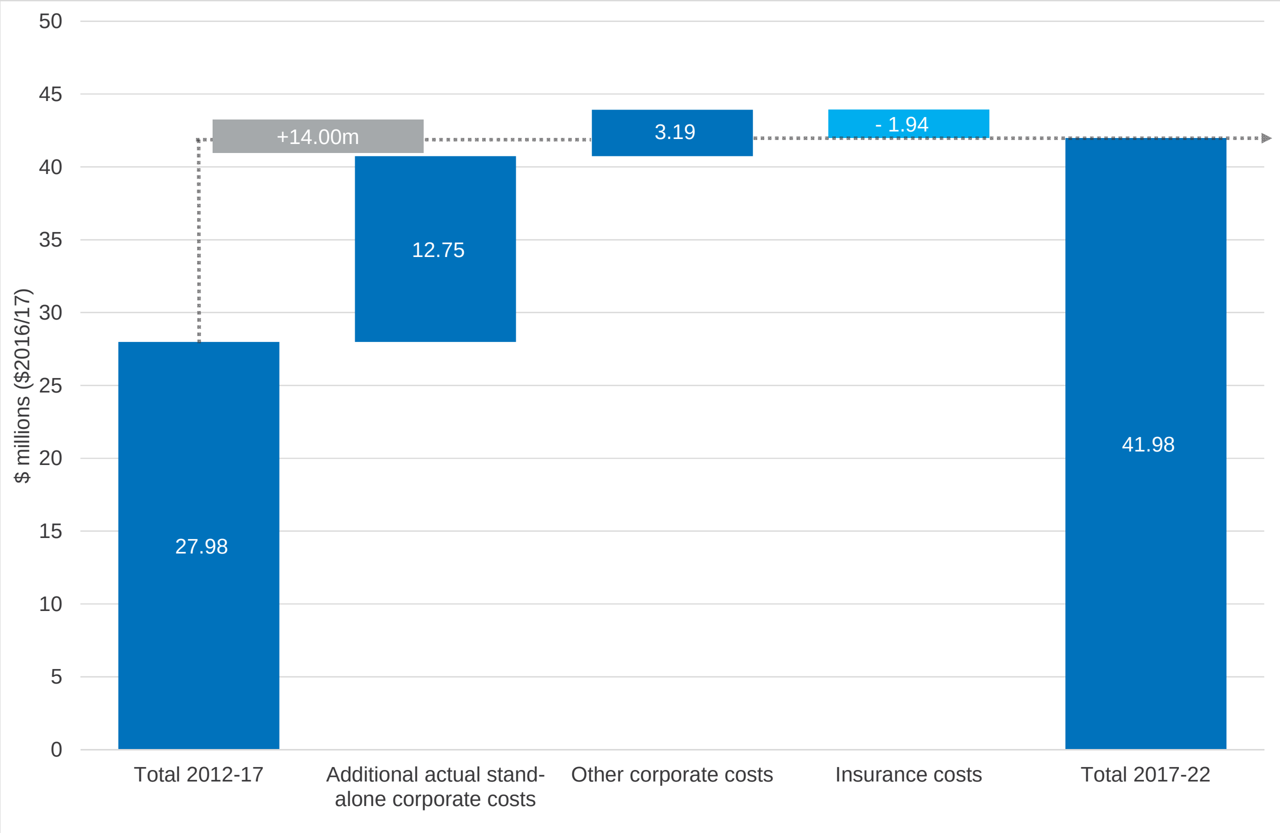
Box 23: Our approach to developing our forecast of other operating costs over the 2017-22 regulatory period

We developed our forecast of other operating costs over the 2017-22 regulatory period by using levels of efficient and prudently incurred recurrent operating expenditure over the 2012-17 regulatory period ('base year costs'), and adjusting these to account for future changes in our circumstances and operating environment and other cost inputs over the 2017-22 regulatory period. The key steps involve:

1. Using levels of efficient and prudently incurred actual recurrent other operating costs over the 2012-17 regulatory period ('base year costs').
2. Adding or subtracting step changes in other operating costs not captured by the base year expenditure such as increased insurance premiums resulting from the current insurance claim for the December 2015 Kurnell Tornado.

Our forecast of other operating costs for water security shutdown mode over the 2017-22 regulatory period is $14.0m higher than our allowed costs for the 2012-17 regulatory period. As shown in Figure 6.6, this increase is largely driven by the more realistic level of operating expenditure required to manage SDP as a stand-alone entity rather than as a subsidiary of SWC, based on the actual and necessary level of expenditure incurred during the 2012-17 regulatory period.

Figure 6.6: Comparison of 2012-17 regulatory period allowed corporate expenditure and 2017-22 regulatory period forecast corporate expenditure, with key drivers of change, during water security mode ($2016-17, $ million)



The section below explains this increase in our forecast other operating costs in further detail.

Corporate costs required to manage SDP as a stand-alone business

SDP has an outsourced model for corporate services, with a small management overlay and dedicated resources for ongoing finance, office administration and operational support.

The following activities undertaken by SDP as a stand-alone business include:

- Corporate governance including a dedicated Board and the development and implementation of key governance policies.
- Contract management and interface with the O&M Contractor.
- Corporate and operational risk management.
- Financial management including debt management, financial reporting and analysis, budgeting and cost control, preparation of statutory accounts, external audit, tax planning and compliance, cashflow management, accounts payable and receivable.
- Banking syndicate management and reporting.
- Transactional banking.
- Compliance with SDP's regulatory and commercial obligations to NSW Government.

- Regulatory pricing management.
- Renewable energy trading.
- Customer liaison.
- Oversight of pipeline easements.
- Insurance strategy and claims management.
- Internal audit.

SDP obtains additional expertise using an out-sourced model. This allows SDP to minimise fixed ongoing costs and obtain the necessary expertise without the ongoing committed costs of permanent resources. It allows for flexibility in project-based expertise, which can vary year on year in line with business needs. Professional fees are incurred in a range of areas, inlcuding:

- Audit services including WHS, internal and external financial audit.
- Independent asset management review.
- Expert financial management advice including debt management, accounting, financial modelling and tax advice.
- Specialist engineering, economic and regulatory support.
- Legal advice including contractual and commercial matters, WHS, insurance, regulatory, financing.
- Other services including stakeholder engagement and communications strategy, website support, IT, recruitment and company secretarial services.

The corporate costs allowed by IPART in its 2012 Determination were based on SDP being allocated a share of corporate costs from SWC rather than the corporate costs for a standalone business. Specifically, SDP's corporate cost allowances for the 2012 determination period were based on its Transitional Services Agreement (**TSA**) and Interim Pipeline Agreement with SWC[74].

Since the 2012 Determination in 2012 SDP has become a standalone business and is no longer part of SWC. As IPART notes in its Issues Paper, some of the allowances IPART 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[75].

This has resulted in SDP incurring other operating costs in excess of the allowed amounts throughout the 2012-17 regulatory period, despite the fact that these costs were prudently and efficiently incurred. For example, SDP's actual corporate costs in 2015-16 were $8.0m, compared with an allowance of $5.42m.

There are two reasons for SDP's proposed increase in the allowance for corporate in the 2017-22 regulatory period.

- First, the range of services included in the TSA excludes the full range of costs that are incurred by SDP as a standalone business. For example, the TSA excludes SDP's costs of:
  - A Board – six Directors with an independent Chairman.
  - A management team comprising a CEO, Chief Financial Officer, Chief Operating Officer and Executive Manager Regulatory and Commercial.

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74 The range of services covered by the TSA with Sydney Water include the following: Opex corporate overheads, In-house finance and management accounting, Property issues, Taxation, Electricity & Green Energy Contract Management, IICATS Monitoring and Scheduling, Laboratory, Assistance with Contracts, Regulatory and Compliance Issues, Design/Technical Issues, Capex corporate overheads, New phone system and Computer replacement.

75 IPART (2016), 'Review of prices for Sydney Desalination Plant Pty Ltd From 1 July 2017', August, Pp 55.

  - Recruitment.
  - Miscellaneous expenses include: office supplies, travel, training, stationary, electricity, conferences, entertainment.
- Secondly, there are economies of scope and scale in the provision of the corporate services included in the TSA. For this reason, SWC's allocation of corporate costs for the services included in the TSA will tend to underestimate the costs that would be faced by an efficient standalone single-asset utility for providing the same range of services. As SDP cannot benefit from economies of scale and scope to the same extent as SWC, its efficient costs as a standalone business to provide the range of services included in the TSA will be significantly higher.

Despite this, and recognising the inherent limitations of such benchmarking, indicative comparisons of SDP's corporate costs with other regulated water businesses in NSW suggest that SDP's corporate costs relative to measures such as RAB and annual revenue requirement are low (see Box 26).

Box 24: Indicative benchmarking of corporate costs with other NSW water utilities

Sydney Water

- Atkins Cardno's recommended corporate cost allowance for SWC for 2015/16 is $180.4m[76], based on its 'Detailed review of Sydney Water's Operating and Capital Expenditure'.
- Partial benchmarking of corporate costs when compared to the relative size of RABs: SWC's RAB is $14.5b[77] compared to SDP's RAB of $1.9b. Therefore, even if we assume that all corporate costs are variable (which would be conservative, as in reality some costs are fixed), SDP's corporate costs would be $24.5m, if SWC's recommended benchmark allowance of $180.4m is scaled down by the proportion of SDP's RAB relative to SWC's RAB.
- Partial benchmarking of corporate costs when compared to the relative size of Annual Revenue Requirements (**ARR**): SWC's ARR is $2.3b[78] compared to SDP's ARR of $0.19b. Even if we assume that all corporate costs are variable (which would be conservative, as in reality some costs are fixed), SDP's corporate costs would be $14.8m, if SWC's recommended benchmark allowance of $180.4m is scaled down by the proportion of SDP's ARR relative to SWC's ARR.
- Both these partial corporate cost benchmarks of $24.5m (when scaled by RAB) and $14.8m (when scaled by ARR) are significantly higher when compared with SDP's current 2016/17 corporate cost budget of $8.5m.

Hunter Water

- IPART's corporate cost allowance for Hunter Water Corporation (**HWC**) for 2015/16 is $39.9m[79].
- Partial benchmarking of corporate costs when compared to the relative size of RABs: HWC's RAB is $2.4b[80] compared to SDP's RAB of $1.9b. Therefore, even if we assume that all corporate costs are variable (which would be conservative, as in reality some costs are fixed), SDP's corporate costs would be $32.5m, if HWC's recommended benchmark allowance of $39.9m is scaled down by the proportion of SDP's RAB relative to HWC's RAB.
- Partial benchmarking of corporate costs when compared to the relative size of ARRs: HWC's ARR is $285m[81] compared to SDP's ARR of $194m. Therefore, even if we assume that all corporate costs are variable (which would be conservative, as in reality some costs are fixed), SDP's corporate costs would be $27.1m, if HWC's recommended benchmark allowance of $39.9m is scaled down by the proportion of SDP's ARR relative to HWC's ARR.
- Both these partial corporate cost benchmarks of $32.5m (when scaled by RAB) and $27.1m (when scaled by ARR) are significantly higher when compared with SDP's current 2016/17 corporate cost budget of $8.5m.

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76 IPART (2012), 'IPART Review of prices for Sydney Water Corporation's water, sewerage, stormwater drainage and other services' June PP 64 Table 5.7.

77 IPART (2012), 'IPART Review of prices for Sydney Water Corporation's water, sewerage, stormwater drainage and other services' June PP 85 Table 6.9.

78 IPART (2012), 'IPART Review of prices for Sydney Water Corporation's water, sewerage, stormwater drainage and other services' June PP 44 Table 4.1.

79 IPART (2016), Review of prices for Hunter Water Corporation, June, Table 4.1, pp 46.

80 IPART (2016), Review of prices for Hunter Water Corporation, June, Table 6.1, pp 69.

81 IPART (2016), Review of prices for Hunter Water Corporation, June, Table 3.1, pp 38.

Unavoidable upward pressure in other operating costs

Our estimated insurance costs are based on same insurance coverage as we currently hold. SDP obtained an expert opinion on projected insurance costs from Aon (Appendix 6.4) which shows that insurance costs will be higher in all modes due to the Kurnell Tornado, compared to the actual expenditure during the 2012-17 regulatory period, but lower that the amounts allowed in the 2012 Determination. In addition, if IPART were to prevent SDP from recovering its efficient costs when it is inoperable, and expect SDP to instead to procure additional Business Interruption (**BI**) insurance for such a loss of revenue, SDP's insurance premiums would be expected to increase (see section 9.6).

6.4.2 Full operation Mode

We expect to incur a small increase in other operating costs when we are in operating mode associated with higher insurance premiums, additional communication and customer liaison and oversight of our compliance with the network operators and retail supplier's licences.

6.4.3 Restart

There are no costs in the 'other operating cost' category specifically attributable to restart.

6.5 Comparison of Actual and Allowed Operating Expenditure for the 2012-17 Regulatory Period

Table 6.14 shows actual expenditure during the 2012-17 regulatory period compared to the amounts allowed by IPART in the 2012 Determination. As detailed in section 6.4.1 the main drivers of variations are the actual corporate costs incurred by SDP as a stand-alone business.

Table 6.13: Comparison of Actual and Allowed Expenditure for the 2012-17 Regulatory Period ($nominal, $'000)

	2012/13	2013/14	2014/15	2015/16	2016/17 Projection	Total
Actual Costs	17,589	16,126	16,625	16,308	17,850	84,498
IPART Allowance	14,298	14,774	15,792	15,777	15,465	76,106
Variance	3,291	1,352	833	531	2,385	8,392

Note: totals may not add due to rounding.

7. Forecast capital expenditure

Key messages

- Our forecast capital expenditure for the 2017-22 regulatory period is minimal.
- The most significant project is the acquisition and installation of an additional pump in the DWPS to provide necessary reserve pump capacity to ensure the plant can achieve its full production supply at 91.3GL/year and also allows for flexibility to provide low flow operations if required in future.
- Some minor corporate capital expenditure is also proposed.

Forecast capital expenditure is an input to the return on and of capital components of our revenue requirement (see chapter 5). We have proposed the total capital expenditure necessary to provide our services, and comply with all relevant regulatory obligations and requirements in each year of the 2017-22 regulatory period.

We must propose the total prudent and efficient capital expenditure we will require to provide our water security and water supply services in each year over the 2017-22 regulatory period. We have proposed the total capital expenditure necessary to comply with all relevant regulatory obligations and requirements and to ensure the safety, reliability and responsiveness of our water supply and water security services as envisaged under the MWP over the 2017-22 regulatory period.

Section 7.1 provides an overview of our forecast capital expenditure over the 2017-22 regulatory period. Subsequent sections then explain:

- The approach we used to forecast this capital expenditure over the 2017-22 regulatory period to ensure it is consistent with the costs that would be incurred by a prudent service provider acting efficiently
- The difference between our forecast capital expenditure for the 2017-22 regulatory period and allowed expenditure for the 2012-17 regulatory periods, and the key drivers of any difference.

7.1 Long-term investment plan

Our capital expenditure includes the investments we make to buy and build the physical assets required to meet our service levels now and in the future. Our long term investment plan for the plant is contained within the O&M Contract. This arrangement provides for the delivery of best practice asset management over the 20 year duration of the contract. Risk allocation and incentives within the contract ensure that the O&M Operator manages the assets in a way which optimises the efficient use of resources with the reliability of the plant. The long term investment plan for the pipeline is detailed in Appendix 6.5 KBR Pipeline Asset Management Review.

7.2 Overview of forecast capital expenditure for 2017-22 regulatory period

Our proposed capital works for the 2017-22 period range from small standard projects (such as investments in IT) to large multi-million-dollar projects (like installing an additional drinking water pump).

The forecast capital expenditure over the 2017-22 regulatory period is $1.4m higher than the allowed expenditure for the 2012-17 regulatory periods. The major drivers of the forecast capital expenditure over the 2017-22 regulatory period include:

- An extra pump in the DWPS to support water security ($2.1m).
- Corporate capital expenditure.

No capital expenditure is proposed on the pipeline.

Table 7.1: Forecast capital expenditure for the 2017-22 regulatory period ($2016-17, $2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Forecast capital expenditure	0.315	0.015	2.115	0.015	0.015	2.475

7.3 Approach to forecasting capital expenditure

We are confident that our forecast capital expenditure is consistent with the costs incurred by prudent service provider acting efficiently and are necessary to:

- To provide greater surety that the plant can supply water at full production when called upon to do so
- To increase the level of confidence that the plant will be able to be brought back into full production in a timely manner.

Box 25 sets out our capital expenditure approval process. This process ensures that our investment is prudent and that we achieve value for money in procurement.

Box 25: Our approach to developing our forecast capital expenditure over the 2017-22 regulatory period

For larger capital expenditure items we developed our forecast capital expenditure over the 2017-22 regulatory period by using:

- A risk management framework to identify risks requiring capital expenditure to mitigate
- A feasibility study to identify options
- A business case considering costs, benefits and options to select a preferred approach

The forecast capital expenditure over the 2017-22 regulatory period does not vary by operating mode.

7.3.1 Extra pump in the Drinking Water Pumping Station (DWPS)

SDP is proposing a one off capex allowance of $2.1m to provide for the acquisition and installation of an additional pump in the DWPS to enhance the availability of the DWPS.

Inherent in the plant design, the DWPS capacity presents a risk that has the potential to impact on water security during operations.

The plant's DWPS was constructed by an Alliance between SWC and other private sector constructors/designers and was designed to a lower availability than the overall plant. Therefore, the DWPS has a higher probability of failure than the overall plant which can potentially restrict the plant from achieving an average water production rate of 91.3GL per year.

Improved DWPS availability is a necessary mitigation action to manage SDP's water security risk related to maintaining supply after restart, that is, confirm the ability to sustain supply to meet 266ML/d at 94 per cent availability. SDP is therefore seeking to install a third drinking water pump to ensure water security via some redundancy in delivery pump capacity.

A pump with lower capacity than the existing two pumps is proposed as it can be accommodated within the existing building and would provide a cost effective solution. The smaller pump could also be used for low flow operations in the future.

KBR has undertaken a feasibility analysis regarding expansion of the pumping station, considering alternative options. KBR initially considered 11 different options that could improve the capacity of the plant and the DWPS to 266 ML/day at 94% availability. Options considered included different operating scenarios for the existing pumps and replacing the existing pumps.

It then shortlisted four options for detailed analysis before recommending the preferred option. The preferred option delivers the following benefits:

- Establishes water security for customers by increasing drinking water pump station availability to meet plant availability.
- Low flow pump allows for flexibility to provide low flow operations if required in future.

A business case supporting the proposal to install the additional pump has been developed by Advisian (see Appendix 6.3).

Our O&M contractor will procure, install and commission the pump. Pricing will be market tested through a minimum of three quotations and transparent pricing.

The delivery approach targets the middle of the 2017 regulatory period, due to the current high water storage levels. The new pump is required before a plant restart to address the water security risk. It would not be possible to install the new pump when the DWPS is operating due to the need to connect to the existing pump work (at least not without interrupting supply).

7.3.2 Corporate capital expenditure

Corporate capital expenditure includes $300K for a new office fitout and $15K/year for IT related expenditure (e.g. replacement laptops, screens etc).

This is needed to provide for the continued administrative efficiency of SDP. SDP intends to expand its head office premises to accommodate the current number of employees, which has increased over the 2012-17 regulatory period as the new stand-alone entity became established, resulting in a shortage of office space.

Box 26: Our capital expenditure approval process

The key objectives of procurement within SDP are to:

- Achieve value for money
- Encourage sustainable competition
- Demonstrate probity, ethical behaviour, and accountability
- Make efficient and effective use of resources
- Mitigate risk.

SDP has a procurement policy which covers all procurement to ensure that these objectives are met. The policy sets out the minimum requirements for approval processes and market testing, which vary depending on risk and procurement value. For significant or high risk procurement, such as O&M contracts, the policy requires a tailored Board-approved strategy using a competitive process.

7.4 Capital Expenditure in the 2012-17 Determination Period

SDP's capital expenditure over the 2012-17 Determination period was minimal because:

- the plant was new
- SDP negotiated an extended defect period from 2010 to 2014 as part of the Design and Construct contract for the plant
- SDP negotiated with its operator a 10 year warranty for assets found to be defective or faulty which covers all the rectification costs (including labour). The warranty expires in 2020.

The only significant project related to an upgrade of a backup electricity feeder (i.e. a power cable connecting the plant to the local substation) because of Ausgrid's decommissioning of the 33kV/11kV Kurnell Zone Substation.

This project was delivered substantially under budget.

Table 7.2: Historical capital expenditure for the 2012-17 regulatory period ($2016-17, $nominal)

	2012-13	2013-14	2014-15	2015-16	2016-17	Total
Corporate	0.12	0.02	0.07	0.01	0.02	0.23
Plant	0.29	0.01	0.22	0.36	0.00	0.88
Pipeline	0	0	0	0	0	0
Total	**0.41**	**0.03**	**0.29**	**0.38**	**0.02**	**1.12**

Forecast capital expenditure for 2016-17 is $15 000 for IT-related expenditure.

8. Proposed rate of return

Key messages

- SDP needs to be able to earn an adequate rate of return on capital to continue to invest, operate and maintain a water supply and water security service as envisaged under the MWP.
- We propose a post-tax real rate of return of 4.52% — which is significantly lower than our allowed rate of return for the 2012-17 regulatory period. This reflects a significant reduction in the risk-free rate and corporate debt premiums since the global financial crisis.
- Our proposed rate of return is consistent with IPART's current rate of return methodology.
- The proposed rate of return reflects the efficient costs associated with borrowing in debt markets and providing returns to investors in equity markets, and reflects the risks associated with providing our services over the 2017-22 regulatory period. It is therefore likely to promote the long-term interests of our customers.

The rate of return is a key input used to calculate the return on capital allowance – the largest 'building block cost' in our proposed annual revenue requirement (see chapter 5). The rate of return represents the costs of funding investments in the SDP through borrowings from debt markets and investments from equity holders. Both of these funding costs are influenced by financial market conditions – and like all businesses, we must pay the going rate for debt and equity capital.

Section 8.1 provides an overview of the rate of return methodology we have followed. The following sections outline the approach we used to calculate this rate of return, and explain how we calculated the return on equity and return on debt components in more detail.

8.1 Overview of proposed rate of return

Our proposed rate of return over the 2017-22 regulatory period is 4.52% (on a post-tax real WACC basis), as shown in Table 8.1.

Our proposed rate of return is lower than the rate of return we were allowed for the 2012-17 regulatory period, 4.97% (real post-tax).[82] This reflects a significant reduction in the risk-free rate since 2011 and a reduction in corporate debt premiums since the peak of the global financial crisis. In our view, our proposed rate of return ensures that the benefits of reduced interest rates are passed on to our customers while ensuring that we are able to continue to invest, operate and maintain a water supply and water security service as envisaged under the MWP. This is one of the reasons we consider our proposal strikes the right balance between our business and customer outcomes necessary to promote the long-term interests of our customers.

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[82] For the 2012-17 regulatory period IPART determined a real pre-tax rate of return of 6.70%. However, for the forthcoming period IPART intends to use a real post-tax rate of return. In order to make a like-for-like comparison between the rate determined by IPART for the last regulatory period and the rate we propose for the forthcoming period, we have expressed the rate of return allowed for the 2012-17 period as a real post-tax rate of return. We have done so using the following parameters determined by IPART for the 2012-17 period: (1) a post-tax return on equity of 8.15%; (2) a pre-tax return on debt of 7.40%; (3) a gearing assumption of 60%; and (4) an inflation rate of 2.60%. This results in a real post-tax rate of return of 4.97%.

Table 8.1: Proposed rate of return ('post-tax real WACC') (%)

	SDP proposal
Return on equity	8.36
Return on debt	6.23
Inflation	2.45
Leverage	60.00
Gamma	25.00
Corporate tax rate	30.00
Post-tax real WACC	**4.52**

Source: Frontier Economics calculations

The proposed rate of return is consistent with:

- IPART's preference for moving to a real post-tax WACC[83] and accounting for the cost of tax liabilities through a separate allowance in the building block calculations (see Section 5.3.4)
- IPART's current rate of return methodology, including the most recent biannual WACC update which set out a post-tax real estimate for the water industry (which included SDP) of 4.5%.[84]
- The standing TOR requirement for the rate of return to reflect the commercial risks faced by the asset owner in providing services.

8.2 Our approach to the proposed rate of return

IPART's Issues Paper notes IPART's intention to use its current methodology and process for calculating the WACC, which has been revised since the 2012 Determination.[85] This approach involves moving to a real post-tax WACC[86] and accounting for the cost of tax liabilities through a separate allowance in the building block calculations (see Section 5.3.4).

This rate of return methodology has been applied by IPART in its most recent biannual WACC update, which was published in August 2016, and in recent determinations by IPART for regulated water businesses.

Our proposed rate of return is consistent with IPART's current rate of return methodology.

We engaged Frontier Economics to advise us on IPART's current rate of return methodology and to provide estimates of the rate of return for SDP using that methodology. Box 27 sets out the high-level approach Frontier Economics used to derive the rate of return and

83 IPART, Review of prices for Sydney Desalination Plant Pty Ltd: From 1 July 2017 - Issues Paper, August 2016, p62.

84 http://www.ipart.nsw.gov.au/Home/Industries/Research/Market_Update

85 IPART, Review of prices for Sydney Desalination Plant Pty Ltd: From 1 July 2017 - Issues Paper, August 2016, p63.

86 IPART, Review of prices for Sydney Desalination Plant Pty Ltd: From 1 July 2017 - Issues Paper, August 2016, p62.

Table 8.2 provides the methodology and individual assumptions that are used to estimate the proposed rate of return consistent with IPART's current rate of return methodology.

Appendix 8.1 sets out Frontier Economics' expert advice[87] on the rate of return consistent with IPART's current rate of return methodology.

Box 27: Approach to deriving the proposed rate of return

We asked Frontier Economics to derive the proposed rate of return using IPART's current rate of return methodology. This methodology involves:

1. Estimating the nominal post-tax 'vanilla' WACC using the standard formula:

$$WACC = Cost\ of\ equity\ \times (1 - Gearing) + Cost\ of\ debt\ \times Gearing$$

where the cost of equity is estimated using the Sharpe-Lintner Capital Asset Pricing Model (**CAPM**):

$$Cost\ of\ equity = Risk\text{-}free\ rate + Beta\ \times Market\ risk\ premium$$

and the cost of debt is estimated as:

$$Cost\ of\ debt = Risk\text{-}free\ rate + Debt\ premium + Debt\ raising\ costs.$$

2. Converting the nominal WACC into real terms by deflating the nominal WACC estimate using a forecast of inflation:

$$Real\ rate\ of\ return = \frac{1 + Nominal\ WACC}{1 + Expected\ inflation\ rate} - 1.$$

87 Frontier Economics, Allowed rate of return for SDP, September 2016.

Table 8.2: Summary of IPART's estimation approach per parameter

WACC parameter	Current estimate	Long-term estimate
Risk-free rate	40-day average of annualised yields on 10-year Commonwealth Government Securities (**CGS**), obtained from RBA	10-year average of annualised yields on 10-year CGS obtained from RBA
Inflation	10-year geometric average of: • RBA's forecast of underlying inflation for the next year • Midpoint of the RBA's target band of inflation, i.e., 2.5%, for the remaining nine years.	
Debt premium	40-day average of annualised spreads on 10-year BBB-rated Australian corporate bonds, relative to 10-year CGS yields, obtained from RBA	10-year average of annualised spreads on 10-year BBB-rated Australian corporate bonds, relative to 10-year CGS yields, obtained from RBA
Gearing	Australian regulatory precedent and empirical evidence from companies used to estimate equity beta	
Market risk premium	Derived using 6 different formulations of the Dividend Growth Model	Derived using average of long-run historical market excess returns
Equity beta	Derived empirically using a sample of listed water businesses in the UK and US	

9. Tariff Structure and cost sharing

Key messages

- The structure of our tariffs has important implications for the optimal allocation of risk and the incentives to optimise our role in water security and supply. In our view, a structure of charges which includes fixed charges depending on the mode of plant operation, volumetric charges for volumes of water supplied, and one-off charges reflecting the cost of transitioning between modes remains appropriate.
- However there is scope for some changes within this broad tariff structure to provide more operating flexibility and to remove some perverse incentives in the current pricing arrangements which might hinder SDP optimising its role in water security and supply. In particular SDP proposes that:
  - IPART's proposed approach to splitting the fixed charges into a base 'water security' charge and mode-dependent incremental service charges be adopted.
  - The fixed charges able to be levied by SDP should automatically change when the plant enters another mode, rather than for the charge to apply for the entire pre-determined duration of a mode and be subject to subsequent adjustments (up or down). As a corollary, decisions about which modes to enter should be subject to an agreed protocol that the plant will always be placed into water security mode after a period of operation once the storages return to 80%, unless SWC (or another customer) requests otherwise. In this scenario, SWC would bear the risk of "incorrect" mode selection.
  - In the interests of transparency SDP believes it is appropriate to continue to levy a separate pipeline charge. However, as pipeline costs do not vary by mode of plant operation there would not appear to be any benefit from establishing mode-dependent pipeline charges.
  - Addressing the nil water usage charge outside of the 70/80 rules (together with the perverse incentives of the current abatement mechanism) would appear to be the most important changes to the current pricing arrangements which would promote greater operating flexibility. In our view there is merit in these charges being negotiated between SDP and SWC (or other customers) as unregulated pricing agreements.
  - The current service charges should continue to apply when the plant is inoperable.
- SDP considers that further analysis and consultation is required to develop approaches to sharing costs between multiple customers which provide sufficient flexibility to facilitate growth in the bulk water market. SDP is keen to participate constructively with IPART, SWC and other potential customers in progressing this issue. This might best occur within the context of a broader review of the evolving water market in NSW.

9.1 Introduction

Having determined the efficient costs of providing our services and meeting the safety and service levels our customers expect and value, the question becomes how the structure of tariffs should be designed to generate the revenue required to recover these costs. In addition to recovering our efficient costs, the structure of tariffs can influence decisions made both by us and our customers.

Box 28: Our objectives in design of tariff structure

To set our proposed prices and charges, we considered the appropriate objectives including:

- To recover efficient costs of operation — we need to ensure that we have sufficient funding to provide a safe and reliable service now and into the future.
- To drive economic efficiency — we set prices that are cost-reflective and empower our customer to make efficient consumption decisions and to provide incentives to us to operate in a manner consistent with optimising water security.
- To provide simple and transparent tariffs — our customers can understand our tariffs and respond to price signals.
- To comply with the standing TOR requirement for financial indifference.

The standing TOR require IPART to set prices for our declared monopoly services to ensure we can recover our efficient costs in all shutdown and operation modes, and encourage us to be indifferent as to whether or not SDP supplies drinking water.

For the 2012 Determination, IPART approved a tariff structure comprising:

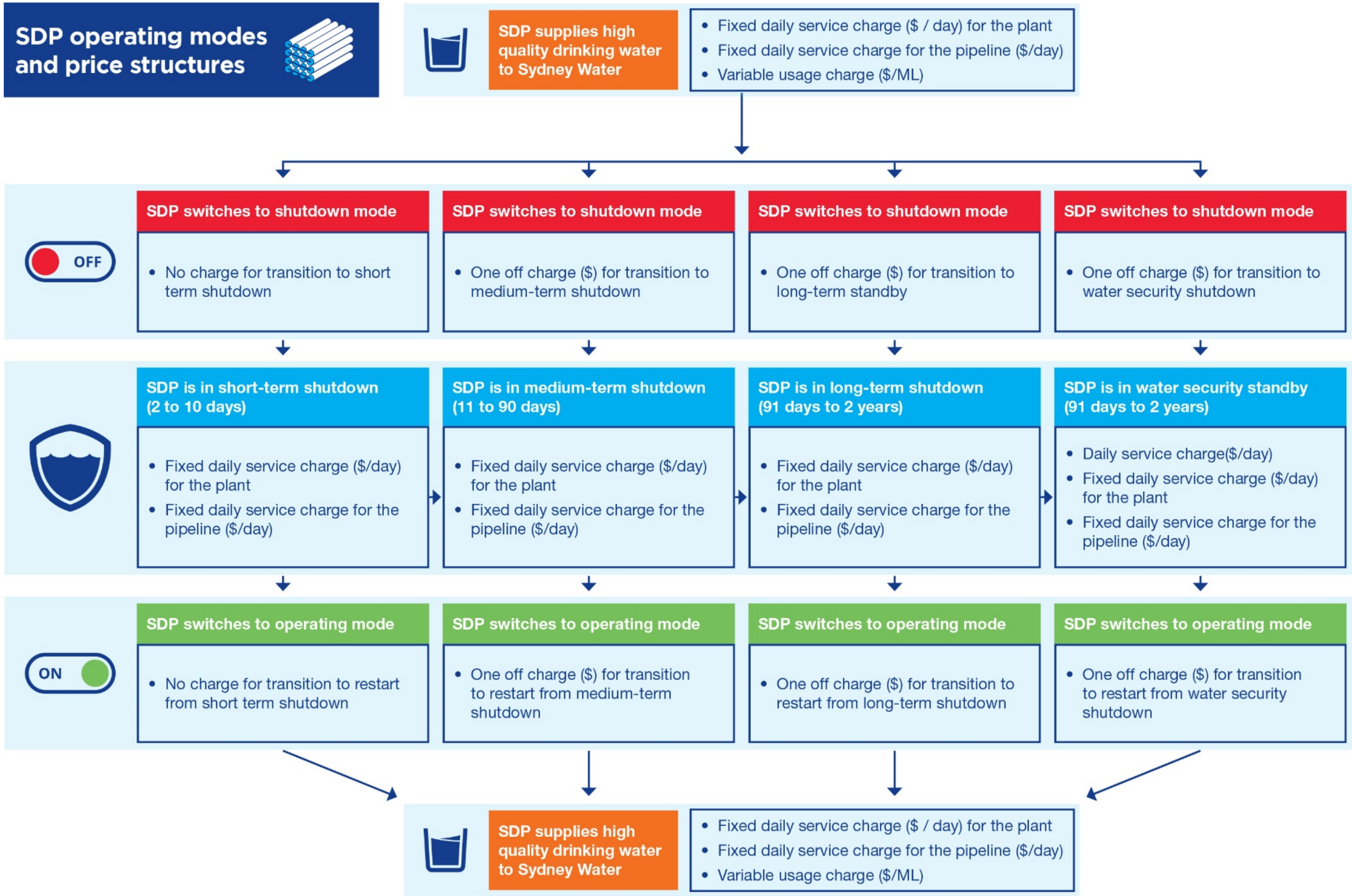
- A separate set of charges for each mode of operation of the plant, designed to recover the efficient cost incurred in each of those modes. These charges encompass:
  - A set of fixed charges for making the plant available to supply drinking water (water service charges) which varied in each of the shutdown modes and in operation mode, set at a level designed to recover the fixed costs incurred in each of these modes
  - A variable charge for water supplied during production mode, set at a level designed to recover the variable costs of supplying water when the plant is operating at full capacity (defined as IPART's interpretation of SDP's nameplate capacity for 250 ML per day. The variable usage charge was set to nil for water supplied outside of the 70/80 rule[88]
- A separate service charge to recover the costs attributable to the pipeline.
- Separate fixed one-off charges for transitioning the plant to and from the different shutdown modes.

Figure 9.1 sets out the structure of SDP prices in the 2012 Determination, including the applicable charges the SDP moves from full production mode into standby mode and back into full production mode.

IPART also prescribed a methodology for allocating costs between multiple customers, should any new customers emerge.

[88] This means at any time when the Available Storage is equal to or greater than 70%, and has not been less than 70% since it was last equal to or greater than 80%; or is equal to or great than 80%.

Figure 9.1: Structure of SDP prices in the 2012 Determination



*Daily service charge is adjusted to include pass through of fixed and some variable electricity network charges
** Usage charge is adjusted to include pass through of variable electricity network charges

For the 2017 Determination, IPART proposes to maintain this broad pricing approach, but is seeking views on possible refinements which might lead to better outcomes. In particular, in its Issues Paper IPART outlined some options for refining the price structure to provide SDP with more pricing and operating flexibility where it enhances efficiency.

The following discussion outlines SDP's views on these opportunities, encompassing:

- pricing structure for making the plant available (i.e. fixed charges)
- pricing for the supply of drinking water (i.e. variable charges)
- one-off charges for transitioning between modes
- pipeline charges
- recovering efficient costs when the plant is inoperable
- methodology for allocating costs between multiple customers.

9.2 Pricing structure for making the plant available

9.2.1 Base water security charge and incremental service charges by mode

Background

The standing TOR specify that the price for making the plant available should be a periodic payment which should reflect the underlying fixed costs (including the fixed component of operating costs, a return of assets and a return on assets).

In the 2012 Determination IPART established a fixed availability charge for each mode, reflecting the different fixed costs associated with each mode. In its Issues Paper, IPART asks whether it should 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.

Assessment

The quantum of fixed charges for each mode under IPART's proposed approach would be the same as it is under existing charges. The only difference is that instead of presenting a total fixed charge for each mode, the charge would be presented as a base component and a differential component reflecting the different additional fixed costs associated with each mode relative to water security shutdown mode.

SDP Position

SDP supports IPART's proposed approach. A potential benefit is that it would more clearly highlight the costs associated with each mode.

9.2.2 Application of fixed charges for the duration of a mode

Background

In the 2012 Determination IPART established a suite of fixed charges to apply under each of the defined operating and shutdown modes for the plant.

As noted in the Issues Paper, 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 (i.e. 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 mode. The 2012 Determination also includes a mechanism to correct for any over-charging 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.

Assessment

As discussed in chapter 4, given that there are different costs associated with each of the four shutdown modes, and discrete costs associated with restart, it would seem appropriate to retain these different modes for pricing purposes. However, there may be scope to rationalise some of these modes where the cost differentials are not significant (e.g. short-term shutdown and medium-term shutdown modes).

One key issue however relates to the application of these modes for pricing purposes. As noted by IPART, the likelihood of entering the various shutdown periods, and the timing within a mode are difficult to predict, given the plant's operating regime and the high variability in Sydney's catchments. In its 2012 Determination IPART recommended that SDP develop clearer protocols for deciding which shutdown mode to enter. IPART's Issues Paper for the 2017 Determination flags that it will review SDP's progress in developing clearer protocols for its decisions on entering shutdown modes, and whether the over- and under-charging mechanisms should continue to apply.

In this regard, it is not clear that a decision to enter a particular shutdown mode and then subsequently entering another shutdown mode can be viewed as a 'mistake', for which SDP should be penalised. At each point in time, there is a decision to be made on the trade-offs between lower fixed costs of different shutdown periods, the one-off cost of entering a particular shutdown mode, and the time and costs it will take to restart the plant. This trade-off will vary depending on, for example, the prevailing level of system storage and the forecast for inflows over forthcoming months/years.

In principle, for example, it might be quite prudent to go into water security shutdown when the storage hits 80% if it is considered unlikely that the storages may again soon drop below 70%. If it subsequently turns out that the plant is needed sooner than that (e.g. because of a failure in part of the bulk supply system), this does not make the initial decision 'wrong'. It is generally accepted that predicting future inflows is problematic and it is not clear that SDP is best placed to manage this risk.

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

IPART suggests that its proposals to refine price structures may remove the need to price for the entire period of the shutdown and the protocols for deciding which shutdown mode to enter. It states that it will investigate whether it can structure prices in a way that incremental service charges seamlessly transition from one shutdown mode to the next. It suggests this might mean SDP could avoid having to predict which shutdown mode it is entering, and charge according to the shutdown period it actually enters.

SDP concurs that it is not well-placed to bear the risk of predicting which shutdown mode it enters. At present SDP would suffer a financial loss from having to refund money if it predicts 'incorrectly'.

SDP proposal

SDP proposes that the fixed charges able to be levied by SDP should automatically change when the plant enters another mode, rather than for the charge to apply for the entire pre-determined duration of a mode and be subject to subsequent adjustments (up or down). As a corollary, decisions about which modes to enter should be subject to an agreed protocol that the plant will always be placed into water security shutdown after a period of operation once the storages return to 80%, unless SWC (or another customer) requests otherwise. In this scenario, SWC (or other customer) would bear the risk of mode selection and therefore the costs of moving between modes if that selection was “incorrect”.

Similarly, outside of shutdowns triggered by the 70/80 operating rule, whichever entity initiates the shutdown (e.g. SWC for network reasons, or SDP for maintenance requirements) should bear the costs of selecting the “incorrect” mode.

9.3 Pipeline charge

Background

SDP has a separate service charge for its pipeline asset (distinct from the plant), which applies in all modes of operation. At the time of the 2012 Determination, the pipeline had not been transferred from SWC to SDP and so IPART established the separate pipeline charge, in case the transfer was not completed.

While the pipeline has now been transferred to SDP, IPART’s preliminary view in its Issues Paper is that the separate charge should continue. IPART suggested that maintaining a separate pipeline charge would facilitate component pricing and allow IPART to apply a different approach to sharing the pipeline costs between multiple customers, if required in the future.

IPART also raised the question as to whether the pipeline charge should vary by mode of operation, and how should pipeline charges be shared in the event SDP has multiple customers.

Assessment

In the interests of transparency SDP believes it is appropriate to continue to levy a separate pipeline charge as preferred by IPART.

However, SDP does not consider that a mode-dependent charge should be introduced for this asset. As shown in section 5, pipeline costs do not vary by mode of plant operation (other than flushing at plant restart). As a consequence, there would not appear to be any benefit from establishing mode-dependent pipeline charges.

The question of allocating costs between multiple customers is addressed in section 9.7 below.

SDP proposal

SDP proposes that a separate pipeline charge continues to be levied by SDP. This charge should not vary by mode.

9.4 Pricing for the supply of drinking water

9.4.1 Pricing of water supplied outside of 70/80 Rule

Background

The current IPART Determination only permits SDP to charge SWC a variable charge for water supplied by SDP to SWC when the plant is operating in accordance with the 70/80 rule under SDP’s Network Operator’s Licence. Specifically, the Determination states that:

> *The water usage charge leviable on SWC for any Desalinated Water supplied by SDP from the Plant to SWC at a time when available Storage:*
>
> - *Is equal to or greater than 70%, and has not been less than 70% since it was last equal to or greater than 80%; or*
> - *Is equal to or greater than 80%' shall be nil.*

This provision applies during a plant operation period, a shutdown period and a restart period. The Determination recognises that although the plant will not produce desalinated water for supply during a shutdown or restart period, SDP may continue to supply desalinated water out of storage during these periods.

As noted in IPART's Issues Paper (p.18), setting the water usage charge to nil when the plant supplies drinking water to SWC outside the 70/80 rule is intended to remove the financial incentive for SDP to supply drinking water that SWC is obliged to take (under its WSA) when dam levels are high.

More recently, however, IPART's Issues Paper recognised (p.45) the anomaly that setting a nil price for any water supplied by SDP outside the 70/80 rule effectively creates no financial incentive for SDP to supply SWC outside this rule, even when this would benefit both parties. It proposes to provide for a variable charge for water supplied outside the 70/80 rules to enable SDP to sell drinking water under a range of circumstances including:

- when it is operating at less than full capacity when ramping up production under the 70/80 rule
- when transitioning to a shutdown mode after a period of operation under the 70/80 rule
- when SWC requests SDP to supply water to SWC outside the 70/80 rule, and
- when producing water under a partial test of the plant to maintain its asset during a prolonged period under Water Security Shutdown.

IPART also flags that in considering the supply of water under these scenarios, it will need to consider whether the unit cost per ML of output varies depending on the amount of water produced. It suggests that if this is the case, it may need to set a schedule of charges based on different levels of output.

Assessment

In SDP's view the provisions in the current determination about when SDP is able to levy a variable charge for water supplied are excessively prescriptive and may result in unintended inefficient outcomes which undermine SDP's ability to optimise its role in water security and water supply.

There may be a number of situations where SDP might supply water outside the operating rules, initiated by either SDP or SWC. For example:

- SDP is contractually obliged to supply water to SWC if required for public health, network stability, unavailability or maintenance. While the WSA between SDP and SWC requires SWC to reimburse SDP for 'reasonable costs' in doing so, the current IPART Determination would prevent this.
- In future SDP may wish to produce water under 'low flow' regimes outside of Rules but cannot sell this to SWC even though SWC may be prepared to pay marginal costs of delivering water.
- New customers which may emerge in the future may wish to be supplied outside of the 70/80 rules.

The current determination does not address these situations, and SDP would currently be unable to levy a variable charge to recover its costs in supplying these volumes of water.

The inability for SDP to charge for the supply of water outside of the 70/80 Rules may lead to a perverse incentive for SDP to return treated water to the ocean even though SWC would be happy to take the water at an agreed price. There is clearly a need for the determination to allow for SDP to levy charges outside the 70/80 operating rules, when mutually agreed with SWC in accordance with the Water Supply Agreement.

This approach would be more consistent with the IPART's TOR for SDP, as SDP is entitled to recover the efficient costs of supplying non-rainfall dependent drinking water. It would also better enable SDP to meet its contractual commitments to SWC. It would also be consistent with other recent IPART decisions to provide greater price flexibility for non-residential customers in the SWC and HWC determinations.

Thus, in SDP's view, addressing the nil water usage charge outside of the 70/80 rules (together with the perverse incentives of the current abatement mechanism) would appear to be the most important changes to the current pricing arrangements which would promote greater operating flexibility.

SDP proposal

SDP proposes that in its 2017 Determination IPART allows SDP to recover its variable costs (as determined by IPART) whenever SWC, or any other customer, requests water.

As noted by IPART, however, the non-application of the EnAM outside of restart or shutdown modes could result in a disincentive for SDP to supply water in these circumstances, as it would be liable for significant difference payments to Infigen. As noted in section 4.4.4, there are several options for addressing this issue. In our view there is merit in these charges being negotiated between SDP and SWC (or other customers) as unregulated pricing agreements.

SDP confirms that there are significant differences in the cost of producing water at different levels of output such that cost-reflective pricing would suggest there should be different prices. There may however be practical issues with developing and applying a price schedule over the full potential range of output.

9.5 Transition charges

Background

SDP currently has one-off transition charges which seek to reflect the fixed costs when SDP is moving between modes. Separate one-off charges are established for both transition to restart and transition to shutdown modes.

In its Issues Paper IPART sought views on whether the current transition charges are still appropriate.

Assessment

As discussed in chapter 4, given that there are one-off costs associated with the transition between modes, it would seem appropriate to retain these one-off transition charges. Greater flexibility in how the plant is operated may or may not change the number of times the transitions between the modes are required, but this does not change the costs of the transition itself.

According to IPART's 2012 Determination, the transition to restart charges were set to recover the costs that are incurred to restart the plant after each particular shutdown mode and were set based on data provided by SDP, recommendations by IPART's consultants (Halcrow), and its own analysis.

However, the structure of current transition to restart charges is not fully cost-reflective. [redacted]

[redacted]

[redacted]

In addition, SDP incurs energy costs and pipeline flushing costs which are not reflected in current restart charges.

During restart, it takes approximately four months to commence producing drinking water. It takes a further four months for the plant to reach full production levels. SDP does not begin recovering variable costs such as energy until the plant is producing and supplying drinking water to SWC. Consequently, the cost of the energy used by the plant in restart until the commencement of the supply of drinking water has been included in the restart charge.

[redacted]

SDP proposal

[redacted]

9.6 Recovering efficient costs when the plant is inoperable

Background

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).

In its Issues Paper IPART stated that it would consider what SDP's charges should be in the event the plant is inoperable for a period of time (due to an event such as the recent storm event). IPART suggested that there may be an argument that SWC should not have to pay a fixed charge if the plant is inoperable, but rather SDP's efficient BI insurance costs should be included in its operating expenditure allowance (to be recovered via its prices when it is operable). Alternatively, the Issues Paper asks whether it may be considered more appropriate for SWC (and its customers) to pay for SDP's efficient fixed costs while the plant is inoperable – particularly if SDP is unable to obtain BI insurance (or unable to obtain this insurance at reasonable cost).

IPART stated that in considering what SDP's charges should be if the plant is inoperable, it would consider its consultants' advice on whether the level of insurance coverage held by SDP is prudent and efficient, and stakeholder views on 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.

In addition to considering who should bear the costs if the plant is inoperable, IPART also sought comment on the implications of the storm event on SDP's costs. This question is addressed in section 4.4.3 of this submission.

Assessment

SDP understands IPART wishes to consider the question whether SDP's fixed charges should be set to zero in circumstances when the plant is inoperable. However, SDP submits that the principles of good regulatory practice including in relation to the efficient allocation of risk are consistent with the current regulatory setting in which SDP receives its fixed costs including in circumstances where unforeseen events beyond its control adversely impact the operation of the plant.

The starting point of any analysis of this question must be an acceptance of the fact that the fixed costs of the plant do not cease to be incurred on the occurrence of unforeseen and uncontrollable catastrophic damage to the plant. The question becomes on the occurrence of such an event should those capital costs be borne by investors or customers. If the regulatory settings (and contractual arrangements) are such that the risk is borne by investors, the costs of capital to the business increase relative to the alternative. If the costs are to be borne by customers a subsidiary question is whether customers bear those costs directly or whether they are borne indirectly or partially as a consequence of the insurance arrangements in place (in which case the costs are incurred by customers on an ongoing basis through operating expenditure allowances).

As discussed further below, it is generally recognised that regimes which impose those costs on shareholders will inefficiently increase the costs of capital. The general regulatory practice is that consumers bear the risk of interruption to a utility service caused by unforeseeable and uncontrollable events.

In this context, SDP submits that IPART should not determine that SDP's fixed charges should be set to zero in circumstances when the plant is inoperable, including for the following reasons:

- It is not consistent with good regulatory practice and would represent a retrospective change to the regulatory framework which would undermine confidence in its stability and predictability and result in a loss of confidence in the regulatory framework
- It is likely to contravene IPART's compliance with its legislation and with the Standing TOR applying to SDP Determinations
- It is likely to be counter to the long-term interests of customers by increasing costs through inefficient allocation of risk, increasing the costs of capital and by adversely impacting incentives for investment
- No clear rationale for the suggestion has been made
- It would be internally inconsistent with other elements of IPART's regulatory framework for SDP
- It would be impractical to implement.

The following discussion briefly addresses each of these concerns. SDP will provide further information and expert reports on this issue when available in a supplementary submission.

9.6.1 Undermining confidence in regulatory framework

The current investors have made a substantial investment in SDP in good faith based on the existence of a stable regulatory framework which is consistent, transparent and predictable.

A recent report for Water Services Association of Australia (**WSAA**) on best practice economic regulation of the urban water sector identified a number of principles or characteristics of effective regulation. A key one was that of consistency and predictability, namely: that the framework for economic regulation should:

- provide a stable and objective environment enabling all those affected to anticipate the context for future decisions and to make long-term investment decisions with confidence

- not unreasonably unravel past decisions, and should allow efficient and necessary investments to receive a reasonable return, subject to the normal risks inherent in markets
- ensure consistency of treatment of participants across service sectors, over time and across jurisdictions[89].

In a recent speech, the Chair of IPART made the following comments endorsing these principles:

> *Unlike some other jurisdictions in Australia, IPART is an independent regulator as I mentioned, that determines prices at arm's length from the Government. As an independent regulator, we simply inform the Minister of the prices that have been set. This, in our view, provides greater certainty for regulated utilities and their shareholders.*
>
> *We seek to regulate in a transparent, consistent and consultative way — releasing draft reports and determinations for public comment, and publicly outlining the reasons for our decisions.*
>
> *We try to provide a stable, transparent form of regulation, to allow utilities to make investment decisions with confidence in terms of how they will be assessed by IPART. A stable regulatory environment, in our view, can also help reduce barriers to private investment or entry into the industry[90].*

In our view, the proposition that SDP's fixed charges should be set to zero if an event occurs which renders the plant inoperable runs completely counter to these principles. This is because the suggestion to set fixed charges to zero would represent a major and unexpected departure from IPART's previous Determination and from any regulatory precedent. It is retrospective in nature, and does not appear to be consistent with the Standing TOR and other elements of the legislative framework within which IPART is required to operate.

The question IPART asks "*who should bear the loss of revenue if the plant is inoperable*?" seems to presume that there should be a loss of revenue in such circumstances. There is nothing in the regulatory framework under which IPART is required to operate which contemplates such an outcome. To the contrary, a core tenet of the economic regulatory framework applying to SDP, including the Standing Terms of Reference, is that SDP, as a regulated business, should be provided with a reasonable opportunity to recover its prudent and efficient costs. If revenue recovery is denied during periods of inoperability arising from an uncontrollable event (and these foregone revenues cannot be recouped at any other time), that is equivalent to stranding a part of SDP's efficient costs.

In effect the suggestion to set fixed charges to zero when the plant is inoperable entails an ex post re-allocation of force majeure risk from customers to SDP investors. This constitutes a major change in the framework under which the investment in SDP was made. A number of elements of the regulatory framework clearly allocate force majeure risk to customers. For example, the first principle under the standing TOR1 specifies that maximum prices should be set so that expected revenue generated will recover the cost of providing SDP's services over the life of the assets. TOR1 effectively requires force majeure risk to be allocated to customers, as not allowing SDP to recover its efficient costs during such periods would breach TOR1.

The retrospective nature of the suggestion is particularly evident by IPART's reference to the recent storm event. This implies that the zero price would come into effect from 1 July 2017 and therefore cover part of the present reconstruction period. Clearly, SDP cannot now take out BI insurance for an event which has already occurred to cover loss of revenue associated with a pricing arrangement which was not in place at

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[89] Water Services Association of Australia (WSAA) *2014 Improving economic regulation of urban water: A Report Prepared for the Water Services Association*

[90] Ownership A regulator's perspective- Infrastructure Partnerships Australia (IPA) 2016 Urban Water Symposium – July 2016

the time and which could not have been contemplated at the time. Furthermore, had IPART expressly considered the question of the appropriate treatment of the impact of force majeure events on revenue, it is not clear that IPART would have concluded that the consequential impact of the premium associated with full BI insurance coverage on the operating expenditure allowances was efficient (in the sense of achieving the lowest cost associated with such event over the long run).

A change in the regulatory framework for SDP which had the effect of transferring the risk of uncontrollable interruptions to service to the shareholders would be inconsistent with current regulatory practice in Australia. Network businesses under the NER and NGR are subject to periodic revenue caps determined by the AER. When force majeure events occur causing an interruption to service the fixed costs (and other costs) of the networks are still recovered by the businesses during the period of interruption (see Box 29).

Box 29 Directlink Mullumbimby Fire

One example of a regulatory precedent on this point is the Directlink Mullumbimby fire. Directlink consists of three parallel high voltage transmission lines connecting the Queensland and New South Wales electricity networks. Directlink receives a regulated return from the AER. In August 2012, a fire in Directlink's Mullumbimby converter station caused substantial damage, resulting in one of the three lines being out of operation for approximately three years. As a result of the outage the DC interconnector operated at substantially lower capacity for three years. During this period, Directlink continued to receive the standard regulatory allowance for the return on capital – no amendment was made to the value of the regulatory base or allowed revenues in relation to this event.

The Directlink example is closely analogous to the SDP case in that the force majeure event caused the single customer to find alternative sources of service provision. In the case of Directlink, the customer is the AEMO, which utilised other interconnectors and generation during the relevant period. If SDP should go offline, SWC would either have to source water from elsewhere, or it may be the case that SWC had no need for SDP's production anyway under the 70/80 rule.

Adoption of this proposal suggestion runs the risk of undermining confidence in the regulatory framework not just applying to SDP but more broadly, with adverse impacts on the willingness of the private sector to invest in infrastructure assets.

9.6.2 IPART's compliance with its legislation and with the Standing TOR

In our view the suggestion to set fixed charges to zero when the plant is inoperable is likely to contravene the existing legislative framework.

IPART's system of regulation is predicated on the full recovery of prudent and efficient costs. Section 16A of the IPART Act directs it to include in prices an amount representing the efficient costs of complying with a specified requirement imposed on the agency. The Standing TOR reinforces this by requiring that:

> *"maximum prices be set so that the expected revenue will recover the efficient cost of providing the two types of services over the life of the assets. These costs include operating costs, a return on the assets and return of assets (depreciation).*

Given that there is some positive probability that an event which renders the plant inoperable will occur over the life of the asset, a suggestion to set fixed charges to zero (with the consequence of SDP foregoing its right to recover the efficient costs incurred during this period) if such an event occurs would seem to be inconsistent with this TOR.

9.6.3 Higher costs to customers from inefficient allocation of risk

Although at face value the suggestion that SWC (and its customers) not be required to pay a fixed charge if the plant is inoperable might seem to benefit customers, a more detailed analysis suggest this is not necessarily the case. The key question relates to the optimal (cost efficient) allocation of risk: if SDP is not well-placed to bear the relevant risks, then the suggestion will end up costing customers more overall, either through an increase in the cost of capital or in the cost of insurance, or both (notwithstanding the fact there may be some savings to customers during a period of inoperability).

The suggestion canvassed by IPART proposes that SDP would take out BI insurance to cover it for loss of revenues (due to IPART setting fixed charges to zero) during the time the plant is inoperable. IPART accepts that under this approach it would need to allow for the cost of such insurance to be included in SDP’s operating expenditure allowance. SDP is currently seeking estimates of what such insurance might cost and will provide these estimates to IPART as soon as they are available.

As discussed further in Appendix 9.1, if the potential loss in revenues is fully covered by the BI coverage, theoretically there would be no impact on WACC. In practice, however, SDP would likely not be able to obtain BI insurance that fully covers the potential loss of revenues as BI insurance will be capped and include higher deductibles.

If no BI insurance exists to completely cover these foregone revenues, with no residual risk, then the only option would be for SDP to self-insure by holding more capital as a buffer against such events (e.g. by increasing its borrowing and/or retaining more earnings as cash). Moreover, the fact that SDP was fully exposed to such losses is likely to impact its credit metrics and credit rating and increase (other things being equal) its cost of debt finance. In this case, the allowed return would also have to be set above the WACC estimate to ensure that investors receive the appropriate expected return. This higher WACC would in turn lead to a second new and permanent increase in SDP’s revenue requirement and thus higher charges to SWC and end users. SDP is seeking expert advice on the potential for an increase in WACC and will provide this when available.

9.6.4 Inconsistency with other elements of the regulatory framework

The suggestion that SDP should bear force majeure risk would also appear to be inconsistent with other aspects of the regulatory framework which IPART has previously established.

For example, the abatement mechanism which explicitly exempts ‘unavailability days’ including those which arise from force majeure events. This recognises that it would be inappropriate to penalise SDP for an event outside its control. It is difficult to reconcile this sound approach with the suggestion that SDP should not be disadvantaged by being unable to levy fixed charges when it is inoperable, all the more so given (as at present) this may coincide with a period when the plant is not required to supply water.

We also note that in its discussion of cost-pass through mechanisms (pp.61-62 of the Issues Paper), IPART accepts that there may be a number of situations where a significant cost may occur during a regulatory period which - if the business can have no meaningful influence over whether the cost is incurred and the cost is material - may be legitimate to pass through to customers during the period. A force majeure event is quite likely to simultaneously impose significant costs and also render the plant inoperable. It would be inconsistent to on the one hand contemplate the cost pass-throughs of such events clearly outside the control of the business and on the other hand to remove the pricing mechanism whereby such costs would be recovered.

9.6.5 Absence of clear rationale

In its Issues Paper IPART states that “there may be an argument that SWC should not have to pay a fixed charge if the plant is inoperable” but does not explain what this argument is.

SDP assumes that the argument is that if the plant is inoperable it is not providing the underlying water security service for which it is being paid. This argument overlooks several key considerations:

- The fixed charge reflects, amongst other things, the capital cost of the asset over its life, which, under the TOR needs to be recovered over the life of the asset.
- Even when the plant is inoperable, it can be argued that there is a water security benefit from its mere existence as it can supply water again once the plant is repaired. In a sense being inoperable is just extending the time it would take for restart from shutdown mode.

If the real underlying concern is that once a force majeure event occurs, SDP may have little incentive to reinstate the plant in a timely manner, it needs to be recognised that there are already a number of other instruments in place to address this issue. These include SDP's network operator's licence, which requires SDP to manage the assets in line with Good Industry Practice, and the stewardship documents governing the lease of the assets from NSW Government, which contain obligations regarding the reinstatement of any damage.

9.6.6 Implementation issues

SDP considers that implementation of the suggestion would be problematic.

First, as noted above, in practice SDP will likely not be able to obtain full coverage BI insurance, or do so at reasonable cost, to fully compensate it for the loss in revenue.

Second, defining when the plant is deemed to be 'inoperable' for the purposes of pricing is not straightforward. The definition cannot simply refer to not being immediately capable of producing water, as this is also the case when the plant is in shutdown mode. Similarly, would the plant be deemed 'inoperable' when it was undergoing essential maintenance in line with Good Industry Practice as required under the network operator's licence?

SDP proposal

SDP proposes that fixed charges should continue to apply when the plant is inoperable due to a force majeure event to allow SDP to recover its prudent and efficient costs including the allowed return on capital. This approach is consistent with the regulatory framework of full recovery over the life of the asset and is consistent with previous regulatory precedents. Any suggestion that the current allocation of this risk should be re-allocated ex post (by setting fixed charges to zero when the plant is inoperable after a force majeure event) should be rejected by IPART to avoid an unnecessary increase in costs to customers and the risk of a loss of confidence in the regulatory framework.

9.7 Methodology for allocating costs and adjusting prices in the event SDP serves multiple customers

Background

While at present SDP has only one customer – SWC – under its licence it is able to provide services to other customers provided such customers are not classified as small retail customers under WIC ACT. Given the evolving water market in NSW under WIC ACT, and the potential for SDP to secure additional customers in the future, in the 2012 determination by IPART included a methodology to calculate each customer's prices (both in full operation and shutdown modes). This so-called 'user pays' methodology shares SDP's fixed and variable water charge and shutdown costs in proportion to each customer's share of the total drinking water supplied by SDP (in shutdown mode costs were to be allocated to each customer in proportion to their total desalinated water purchases in the 12 months preceding that shutdown).

In its Issues Paper for the 2017 Determination IPART is proposing to change this approach to allocating water security costs between multiple users to what it describes as an 'impactor pays' approach. More commonly applied in the context of recovering the costs of environmental management activities (e.g. water resource management and planning) rather than commercial service delivery, in general, the principle behind an impactor pays approach is that costs are allocated to those individuals or organisations whose activities result in the costs being incurred. This in turn should ensure that users' decisions reflect the costs associated with their activities and that, at least over the longer term, they are encouraged to change behaviours that lead to high costs.

In this case, IPART suggests that it is total consumption (or demand) from Sydney's dams that creates the need for SDP as a water security measure (pp.32-33). It states that "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%". Under IPART's proposed new approach, costs would be allocated to users based on their share of total system demand, rather than their share of SDP supply.

The likely consequence of this change from a 'user pays' to an 'impactor pays' methodology is for a higher share of these costs to be allocated to SWC vis-a-vis other users, as illustrated in Box 4.1 (p.34) of IPART's Issues Paper. This result stems from the assumption that a new (or smaller) user sources all of their water from SDP, whereas a larger existing user (e.g. SWC) sources much more water from other (i.e. dam) supplies.

IPART views this re-allocation of costs as beneficial because it would encourage new customers to seek supply from SDP, particularly when dam levels are high, by reducing their liability for the fixed water security costs. It also suggests this new approach would reduce the risk of non-payment of fixed costs during shutdown according to preceding use of the plant as some customers may no longer exist when the plant moves from one mode to another.

Assessment

Although this is not a key priority issue at present as SDP has only one customer (SWC), SDP accepts that it is appropriate that SDP's costs of providing water security and water supply services are shared across all of its direct customers in the event that additional customers emerge. It is prudent that such cost sharing arrangements are known in advance.

Economic principles suggest that to promote economically efficient outcomes, joint costs should be allocated within a band such that no user pays more than stand-alone cost or less than incremental cost. The efficient pricing band will be further constrained by willingness to pay. In our view it is instructive to examine the allocation of costs of water security using these concepts to assess the efficiency properties of the alternative approaches.

While the impactor pays approach may encourage third party customers by lowering their share of SDP's fixed costs, it is not immediately clear why this is either more economically efficient or equitable.

In addressing this proposal, it is helpful to consider the underlying nature of the 'water security' service – it is a form of insurance or an 'option' to be supplied with desalinated water at a time when the user wishes to be supplied. The appropriate charging regime also needs to consider the nature of any new customers and the services which they are receiving from SDP.

At present, SWC is paying 100% of the 'base water security' costs in return for the option to be able to be supplied with water (up to the full production level of the plant) during a time when dam levels are low. It is not clear why another customer could pay a significantly smaller share of the ongoing base water security charge yet be able to receive a relatively high share of desalinated water at a time when it is very valuable. This would imply they are getting a higher security product at lower cost than SWC.

The proposed 'impactor pays' approach raises some other questions which do not appear to have been contemplated. For example, one issue is whether any bulk water suppliers who are not direct customers of

SDP (e.g. a bulk supplier who arranges supply from Water NSW or another source of water) should also pay this ‘insurance premium’. As there would be no direct contractual relationship with SDP it is difficult to see how this could be implemented. This would also mean that SDP would not be able to fully recover its efficient costs under IPART’s proposed approach under these circumstances. For example, suppose a new customer emerged who accounted for 5% of Sydney’s overall system demand (leaving SWC with the remaining 95%), but this new customer sourced all of its water from Water NSW. Under IPART’s methodology, SDP’s costs would be allocated 95% to SWC and 5% to the new customer. However, as SDP would have a contractual relationship only with SWC, it would only be able to recover 95% of its total costs.

This discussion highlights some of the complex pricing issues which are likely to arise in a more competitive bulk water market where there is an integrated supply system of rainfall-dependent and rainfall-independent sources, and potentially a range of different types of services on offer.

Charging for the option to be supplied with water based on a measure of capacity of demand (i.e. potential draw on capacity) rather than current or past usage has merit. It is not clear however that it is appropriate to base the charge on the share of each customer’s total water supply system demand (i.e. of both SDP capacity and dam capacity) as proposed under IPART’s ‘impactor’ pays approach.

For example, an alternative approach would be to base the fixed water security charge on the contracted capacity available to each customer during times of water shortage. If new users only wish to receive a supply from SDP when dam levels are high (although it is not clear why they would do this), under this approach they would not be liable for any share of the fixed cost of water security at all. This approach would also address IPART’s concern about the risk of non-payment to SDP if historic customers no longer exist.

Regulation via pricing principles (as applies for example in many jurisdictions with respect to recycled water) may be better than a highly prescriptive regulatory approach to cost allocation in enabling the bulk water market to evolve in line with customers’ preferences and optimising use of the plant.

SDP proposal

SDP considers that further analysis and consultation is required to develop approaches to sharing costs between multiple customers which provide sufficient flexibility to facilitate growth in the bulk water market. SDP would be happy to participate constructively with IPART, SWC and other potential customers in progressing this issue. This might best occur within the context of a broader review of the evolving water market in NSW.

10. Customer and financial impacts of our proposed prices

Key messages

- In total, our proposed prices for our water supply and water security services will decrease over the 2017-22 regulatory period (excluding the impact of inflation) reflecting reductions in the revenue required to fund, operate and maintain the SDP (Chapter 5).
- Our proposal includes a 20.9% decrease in the revenue to be recovered from customers in water security for the 2017-22 regulatory period compared to the approved revenue requirement for the 2012-17 regulatory period (excluding the impact of inflation), on a cost per customer basis, delivering average annual savings of around $23 per customer over the 2017-22 regulatory period or 2.0% on a larger residential end-customer water and wastewater bill (excluding the impact of inflation).
- Our proposal includes increases in the charges for transitioning from water security to full operation mode to reflect the efficient costs required to restart the plant in a safe and reliable way.
- Our proposed prices allow us to pass on the reductions in the revenue required to fund, operate and maintain the SDP over the 2017-22 regulatory period, while also ensuring we recover the efficient costs necessary to maintain the safety, reliability and responsiveness of our water supply and water security services. We think our proposal strikes the right balance between our business and customer outcomes necessary to promote the long-term interests of our customers, including SWC and end-use water customers.
- Consistent with the standing TOR, our proposed prices also encourage us to be financially indifferent as to whether or not the SDP supplies water to our customers, including SWC and end-use water customers.

Our prices include the charges for our water supply and water security services, as well as the one-off charges for transitioning between the relevant modes within these services – for example transitioning from shutdown to restart, and from full operation to one of the shutdown modes. Under water security mode, our charges make up around 9% of a typical residential end-customer water and wastewater bill (Figure 2.6).[91]

In developing our proposed prices, we were guided by the requirements in the standing TOR, our proposed form of regulation – including the use of price caps to recover mode based revenue requirements – our proposed tariff structures and our customers' priorities and preferences.

Section 10.1 provides an overview of our proposed prices over the 2017-22 regulatory period.

Section 10.2 outlines the customer and financial impacts of our proposed prices.

10.1 Overview of our proposed prices

This section provides an overview of our proposed prices over the 2017-22 regulatory period for water security and full operation modes, and the one-off charges for transitioning between these modes.

91 SWC includes SDP prices—as well as the other costs for providing water and wastewater services, such as water and wastewater transportation costs—in the fixed supply and water usage charges it levies on residential and business end-customers.

Appendix 10.1 provides further detail on the proposed prices for all of the operating modes, as well as the one-off charges for transitioning between the modes over the 2017-22 regulatory period.

10.1.1 Overview of our proposed prices – water security mode

Table 10.1 sets out the proposed prices for the plant and pipeline in water security mode for the 2017-22 regulatory period, and compares these to prices for 2016-17 (as approved by IPART in its 2012 Determination).

Table 10.1: Proposed prices for the plant and pipeline in water security mode for the 2017-22 regulatory period ($2016-17)

	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Proposed plant and pipeline service charges ($/day)	$531,867	$458,141	$462,158	$457,885	$481,772	$475,034	
Annual change in plant and pipeline charges ($)		-$73,726	$4,017	-$4,273	$23,887	-$6,738	
Change in plant and pipeline charges (%)		-13.9%	0.9%	-0.9%	5.2%	-1.4%	-10.7%

Note: The 2016-17 prices are those determined by IPART in its 2012 Determination (CPI of 2.2% assumed for 2016-17)

Table 10.2 sets out the proposed prices for the plant in water security mode for the 2017-22 regulatory period, and compares these to prices for 2016-17 (as approved by IPART in its 2012 Determination).

Table 10.2: Proposed prices for the plant for the 2017-22 regulatory period ($2016-17)

	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Proposed plant service charge ($/day)	$391,257	$357,809	$361,921	$358,074	$381,872	$375,375	
Annual change in plant charges ($)		-$33,448	$4,112	-$3,847	$23,798	-$6,497	
Change in plant charges (%)		-8.5%	1.1%	-1.1%	6.6%	-1.7%	-4.1%

Note: The 2016-17 prices are those determined by IPART in its 2012 Determination (CPI of 2.2% assumed for 2016-17)

Table 10.3 sets out the proposed prices for the pipeline for the 2017-22 regulatory period, and compares these to prices for 2016-17 (as approved by IPART in its 2012 Determination).

Table 10.3: Proposed prices for the pipeline for the 2017-22 regulatory period ($2016-17)

	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Proposed pipeline service charges ($/day)	$140,610	$100,332	$100,237	$99,811	$99,900	$99,659	
Annual change in pipeline charges ($)		-$40,278	-$95	-$426	$89	-$241	
Change in pipeline charges from (%)		-28.6%	-0.1%	-0.4%	0.1%	-0.2%	-29.1%

Note: The 2016-17 prices are those determined by IPART in its 2012 Determination (CPI of 2.2% assumed for 2016-17)

10.1.2 Overview of our proposed prices – full operation mode

Table 10.4 sets out the proposed prices for the plant and pipeline in full operation mode for the 2017-22 regulatory period, and compares these to prices for 2016-17 (as approved by IPART in its 2012 Determination).

Table 10.4: Proposed prices for the plant and pipeline in full operation mode for the 2017-22 regulatory period ($2016-17)

	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Service charges							
Proposed plant and pipeline service charge ($/day)	$568,901	$498,564	$495,353	$490,082	$489,348	$485,700	
Annual change in plant and pipeline service charges ($)		-$70,337	-$3,211	-$5,271	-$733	-$3,648	
Change in plant and pipeline service charges (%)		-12.4%	-0.6%	-1.1%	-0.1%	-0.7%	-14.6%
Water usage charges (excl. network charges)							
Proposed usage charge ($/ML)	$687	$688	$688	$688	$688	$688	
Annual change in usage charges ($)		$1	$0	$0	$0	$0	
Change in usage charges (%)		0%	0%	0%	0%	0%	0%

Note: The 2016-17 prices are those determined by IPART in its 2012 Determination (CPI of 2.5.% assumed for 2016-17)

Table 10.5 sets out the proposed prices for the plant in full operation mode for the 2017-22 regulatory period, and compares these to prices for 2016-17 (as approved by IPART in its 2012 Determination). The proposed prices for the pipeline in full operation mode are set out in Table 10.3.

Table 10.5: Proposed prices for the plant in full operation mode for the 2017-22 regulatory period ($2016-17)

	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Service charges							
Proposed plant service charge ($/day)	$428,291	$398,233	$395,116	$390,271	$389,448	$386,041	
Annual change in plant charges ($)		-$30,059	-$3,116	-$4,846	-$822	-$3,407	
Change in plant charges (%)		-7.0%	-0.8%	-1.2%	-0.2%	-0.9%	-9.9%
Water usage charges							
Proposed usage charge ($/ML)	$687	$688	$688	$688	$688	$688	
Annual change in usage charges ($)		$1	$0	$0	$0	$0	
Change in usage charges (%)		0.2%	0%	0%	0%	0%	0.2%

Note: The 2016-17 prices are those determined by IPART in its 2012 Determination (CPI of 2.2% assumed for 2016-17)

10.1.3 Overview of our proposed prices for transitioning between modes

Table 10.6 sets out the proposed prices for transitioning from water security to full operation mode for the 2017-22 regulatory period, and compares these to prices for 2016-17 (as approved by IPART in its 2012 Determination).

Table 10.6: Proposed prices for transitioning from water security to full operation mode for the 2017-22 regulatory period ($2016-17)

	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Proposed transition charge ($'000)	$6,053	$37,272	$38,402	$39,372	$40,232	$40,982	
Annual change in transition charge ($'000)		$31,219	$1,130	$970	$860	$750	
Change in transition charge (%)		515.7%	3.0%	2.5%	2.2%	1.9%	577.0%

Table 10.7 sets out the proposed prices for transitioning from full operation to water security mode for the 2017-22 regulatory period, and compares these to prices for 2016-17 (as approved by IPART in its 2012 Determination).

Table 10.7: Proposed prices for transitioning to water security mode for the 2017-22 regulatory period ($2016-17)

	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Proposed transition charge ($'000)	$1,588	$1,686	$1,686	$1,686	$1,686	$1,686	
Annual change in transition charge ($'000)		$98	$0	$0	$0	$0	
Change in transition charge (%)		6.2%	0.0%	0.0%	0.0%	0.0%	6.2%

10.2 Overview of customer and financial impacts of our proposed prices

10.2.1 Impacts of our proposed prices on our customers

Our proposal includes a 20.9% decrease in the revenue to be recovered from customers in water security for the 2017-22 regulatory period compared to the approved revenue requirement for the 2012-17 regulatory period (excluding the impact of inflation), on a cost per customer basis.

This will deliver average annual savings of around $23 per customer over the 2017-22 regulatory period or:

- 2.7% on a small residential end-customer water and wastewater bill (excluding the impact of inflation)
- 2.0% on a larger residential end-customer water and wastewater bill (excluding the impact of inflation)
- 1.6% on a small business end-customer water and wastewater bill (excluding the impact of inflation)

Figure 10.1 outlines the indicative impacts for a range of typical customers of our proposed charges in water security and full operation mode. These have been calculated relative to the allowed revenues for the 2012-17 regulatory period, on a cost per customer basis.

Figure 10.1: Indicative customer impacts of our 2017 regulatory proposal (excluding inflation)

Source: SDP Analysis

Note: These have been calculated relative to the allowed revenues for the respective modes; SDP operating mode excludes the costs of restarting the SDP.

10.2.2 Impacts of our proposed prices on the SDP's financial performance

Based on our proposed revenue requirements and prices, we forecast the SDP's financial position to remain sustainable over the 2017-22 regulatory period.

Our proposed prices ensure we recover the efficient costs necessary to maintain the safety, reliability and responsiveness of our water supply and water security services over the 2017-22 regulatory period and address the challenges in a way that best promotes our customers' long-term interests. Consistent with the standing TOR, our proposed prices also encourage us to be financially indifferent as to whether or not the SDP supplies water to our customers, including SWC and end-use water customers.

Our current financial position is strong enough to offer lower prices to customers, without compromising the safety, reliability and responsiveness of our water supply and water security services over the 2017-22 regulatory period.

Further detail is set out in Titanium's financeability report as Appendix 10.2.