Supporting Appendices: SDP Regulatory proposal to IPART

Review of prices for Sydney Desalination Plant Pty Ltd

From 1 July 2017

Public
24 October 2016

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Appendix 1 About this proposal

1.1 CEO's Declaration of accuracy and consistency of data in the proposal

In accordance with the Guidelines for Water Agency Pricing Submissions, December 2015 (the Guide), of the Independent Pricing and Regulatory Tribunal of New South Wales, I declare that:

a. The information provided in our pricing proposal submitted on 24 November 2016 is the best available information of the financial and operational affairs of the Sydney Desalination Plant Pty Ltd and has been checked in accordance with section 2.17 of the Guide; and

b. There are no circumstances of which I am aware that would render any particulars included in the information provided to be misleading or inaccurate.

Certified by the Chief Executive Officer

Keith Davies 24 October 2016

1.2 Claims for Confidentiality

SDP values the transparency that IPART's regulatory process brings to SDP's pricing proposals including forecast costs. However, there are a number of areas of SDP's submission which are commercial in confidence due to one of the following factors:

- Information has been provided to SDP by a third party on a confidential basis
- Information relates to confidential commercial arrangements with third parties
- Release of the information may adversely impact current and future commercial negotiations, which is not in customers' interests
- Release of the information may hinder access to low cost finance

Consequently, there are a limited number of sections of our proposal and its supporting documentation which have been redacted due to confidentiality.

1.3 Response to IPART's Issues Paper Questions

The table below provides a high level summary of SDP's responses to the questions in the Issues Paper. It must be read in conjunction with SDP's full submission and should not be considered in isolation.

No.	Question	Overview response	Submission reference
1	Under the TOR, the prices for making the plant available should be a periodic payment. These prices should reflect fixed costs, including the fixed component of operating costs, a return of assets and a return on assets. Should we refine the current price structures for making the plant available by splitting the fixed charges into the following two components: – a base 'water security' charge reflecting the minimum costs of maintaining the plant (payable in all shutdown and operation modes), and – mode-dependent incremental service charges reflecting the different fixed operating costs in each shutdown and operation mode?	IPART's proposed approach to splitting the fixed charges into a base 'water security' charge and mode-dependent incremental service charges should be adopted.	Section 9.2
2	Are the current four shutdown (and restart) modes still appropriate?	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. The risk of "incorrect" mode selection should be borne by the party best able to manage that risk.	Section 4.2.2 and 9.2
3	Under the TOR, the prices for the supply of drinking water should reflect all efficient costs that vary with output. –Does the unit cost (per ML of output) vary depending on the amount of water produced? If so, should we set usage charges to accommodate varying levels of output?	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.	Section 9.4
4	SDP currently has one-off transition charges to reflect the fixed costs when SDP is moving between modes. – Are the current transition charges still appropriate? – Should the transition charges be adjusted if SDP operates more flexibly outside its drought response role (i.e., when dam levels are high)? If so, how?	As there are one-off costs associated with the transition between modes, these one-off transition charges should be retained. Greater flexibility in how the plant is operated may or may not change the number of times the transitions between the modes is required, but this does not change the costs of the transition itself. SDP proposes that a set of contingent differential transition from extended water security restart charges be introduced which better reflect the underlying costs of membrane replacement depending on the time at which restart occurs.	Section 9.5

No.	Question	Overview response	Submission reference
5	SDP has a separate charge for its pipeline asset (i.e., distinct from the plant), which applies in all modes of operation. – Should we continue setting a separate charge for the pipeline? – If so, should the pipeline charge vary by mode of operation? – How should pipeline charges be shared in the event SDP has multiple customers?	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. As noted below, SDP considers further analysis and consultation are required on cost allocation methodologies.	Section 9.3
6	How should SDP's base 'water security' costs be shared between customers? – Should SDP's base 'water security' costs continue to be shared between SDP's customers based on the user pays principle? That is, should this base charge be shared between SWC and any other SDP customer based on their respective share of total drinking water supplied by SDP? Or – Should SDP's base 'water security' costs be shared between bulk water customers based on the impactor pays principle? That is, should this base charge be shared between SWC and any other bulk water customers based on their respective share of total water system demand (being bulk water sourced from both dams supplying greater Sydney and the desalination plant)?	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.	Section 9.7
7	If the impactor pays principle applies to SDP's base 'water security' costs, are there any circumstances where bulk water customers should not contribute to these costs?	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), it is conceivable that they not be liable for any share of the fixed cost of water security.	Section 9.7
8	How should incremental fixed costs and usage charges be shared between SDP's customers? – Should the incremental fixed costs be shared between SDP's customers based on the user pays principle? That is, should the incremental charges be shared between SWC and any other customers based on their respective share of water purchased from SDP?	See response to question 6 above.	Section 9.7
9	Is there a case for extending the impactor pays principle to all SDP's costs during drought – i.e., incremental fixed costs and/or usage costs?	See response to question 6 above.	Section 9.7

No.	Question	Overview response	Submission reference
10	How could prices (both fixed and usage charges) be set to allow greater operating flexibility to enhance efficiency?	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.	Section 9
11	Is there a need to refine our regulatory settings to better align SDP's incentives to fulfil its water security role? In particular, should SDP be able to: – Operate at less than full capacity without penalty when ramping up production to fulfil its water security role ('soft' restart mode)? – Sell drinking water to SWC when transitioning to a shutdown mode after a period of operation fulfilling its water security role ('soft' shutdown mode)?	See response to question 10 above.	Section 4 and 9
12	Is there a need to refine our regulatory settings to accommodate greater operating flexibility outside of SDP's water security role (ie, when dam levels are high)? – In particular, should SDP be able to sell drinking water to SWC upon request (ie, should we remove the nil price for any water supplied to SWC when dam levels are high)?	SDP proposes that in its 2017 Determination IPART allows SDP to recover its variable costs (as determined by IPART) whenever SWC (or other customer) requests water. In order to avoid any disincentive to supply under these circumstances we further propose that the charges include energy adjustment, where relevant.	Section 9.4.1
13	Could greater operating flexibility outside of SDP's water security role provide system-wide benefits by lowering SWC's costs or improving its service standards, ultimately benefiting SWC's retail customers?	This is a matter for SWC to consider.	N/A
14	Are there any impediments to SDP and SWC operating more flexibly and efficiently outside of SDP's water security role?	See response to question 10 above.	Section 9

No.	Question	Overview response	Submission reference
15	Are there any other circumstances when SDP should have operating flexibility?	Several other reviews are being undertaken at the same time as this price review which may lead to changes in SDP's operating rules and licence requirements. 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. In addition, while the focus of the operating rules under the MWP 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. There are a number of situations where this may be desirable, including: • Where the plant is restarting and is able to produce some water but is not yet at full production. • When needed to supply SWC when it has with a constraint within its supply network. • When fully testing the plant in shutdown mode. • When SWC (or any other new customers) wish to be supplied with desalinated water outside of the 70/80 rule. This underlines the need to preserve operating flexibility in the way in which SDP is regulated.	Section 2.2 and 3.2.3
16	Is there a case to allow periodic partial testing of the plant when in extended shutdown to improve SDP's availability and reliability as a drought response measure? If so, what are the appropriate protocols for operating the plant in this capacity, such as the technically prudent: – frequency and duration of the testing period, and – volumes of drinking water produced during a testing period?	SDP is proposing to conduct a partial test of the plant during the 2017-22 Determination period at an estimated cost of $17.5m ($2016/17). The underlying objective of the partial plant test is to mitigate two key water security risks for customers, namely the ability to restart and maintaining reliability of supply after restart.	Section 6 and Appendix 6.3
17	An abatement mechanism applies to SDP's fixed charges if it produces volumes of water less than the plant's full production capacity when it is fulfilling its water security role. – Are there current aspects of the abatement mechanism that need modifying? – Is this financial incentive still relevant or are there other performance mechanisms that could better ensure SDP maximises supply when required?	SDP supports an abatement mechanism in addition to the other regulatory and commercial mechanisms in place which provide strong incentives for SDP to ensure it operates at full capacity when it is called upon to do so. SDP proposes a number of minor modifications to its design to ensure it is best able to achieve its objectives and avoids any perverse incentives.	Section 4.3.2 and Appendix 4.1

No.	Question	Overview response	Submission reference
18	Should the length of SDP's determination period continue to be set for five years?	SDP agrees with IPART's preliminary view that a five year determination period provides an appropriate balance between the risk of structural changes in the industry, the need to minimise regulatory instability and the administrative costs of more frequent price reviews.	Section 4.2.1
19	The revenue requirement represents SDP's total efficient costs of providing its monopoly services in each year of the determination period. SDP's costs, and thus its prices, vary depending on what operating mode it is in. – Should we continue using a 'building block' method to calculate SDP's revenue requirement? – Should we continue to set mode-dependent notional revenue requirements? – Should we continue to set a separate notional revenue requirement for SDP's pipeline?	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. SDP supports continuing to set a separate notional revenue requirement for SDP's pipeline.	Section 4.2.2
20	SDP's pricing proposal is due on 24 October 2016 and will be made available at our website for stakeholder comment. Does SDP's proposed revenue requirement in each mode of operation represent efficient costs, taking into account its proposed: – operating and capital expenditure – return on assets – regulatory asset base – regulatory depreciation and asset lives – tax allowance, and – return on working capital?	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 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.	Section 5, 6, 7 and 8
21	What scope is there for SDP to achieve efficiency gains over the 2017 determination period?	To minimise our operating expenditure and our prices we have: • Included cost reductions in energy and insurance costs in all operating modes and [redacted]. • Procured key contracts for services (such as our O&M and energy contracts) through a competitive process and the contracts contain efficiency incentives. • Where possible, benchmarked our key contracts against publicly available information and other benchmarks previously used by IPART.	Section 6 and 7

No.	Question	Overview response	Submission reference
22	The desalination plant sustained significant damage from a storm event on 16 December 2015. Since that time, the plant has been unable to operate (not capable of providing non-rainfall dependent drinking water). – What are the implications of this storm event on SDP's efficient costs? – Should we establish a new revenue requirement (and pricing mode) to account for when the plant is inoperable? – Who should bear the SDP's costs if the plant is inoperable?	The storm caused significant damage to the Sydney Desalination Plant located at Kurnell. While many of the costs of rebuilding the plant will be covered by SDP's insurance, there may be an 'insurance gap', which can be defined as a situation where the costs associated with uncontrollable and unforeseen events are in effect 'uninsurable'. 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. 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 funding to invest, operate and maintain a water supply and water security service as envisaged under the MWP. SDP proposes that the 2017 Determination include a specific pass-through mechanism for the net costs associated with the Kurnell tornado.	Section 3.2.2, 4.4.3 and 9.6 and Appendices 3-2 and 9-1.
23	What are SDP's efficient energy costs for the 2017 determination period?	SDP has forecast efficient energy costs in shutdown, full operation and restart modes.	Section 6.3
24	Should we continue to pass through into prices SDP's fixed and variable network charges (as determined annually by the AER)?	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 judicial review processes).	Section 4.4.2

No.	Question	Overview response	Submission reference
25	We consider that cost pass-through mechanisms should only be applied in exceptional circumstances and have outlined criteria to determine where cost pass-through mechanisms should apply. – Is there a case to manage any other of SDP's proposed costs through a cost pass-through mechanism?	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 and its prices. We agree with many of these criteria outlined by IPART. However, in our view, some of the criteria 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. We propose that a pass-through mechanism apply for the 2017-22 regulatory period that allows SDP to apply to IPART to pass through the efficient and incremental costs associated with four eligible events: • Extraordinary events. • Regulatory change events. • Taxation change events. • Legal change events.	Section 4.4 and Attachment 4-2
26	Is there a case to reconsider the asset classes established in the 2012 review?	SDP considers that the asset classes and asset lives for the 2012 Determination should be largely maintained for the 2017-22 regulatory period. One exception to this is that there is a strong case for a reduction to pipeline asset life to more closely match design lives of assets. SDP is proposing that the asset lives be adjusted to reflect the original design lives for the assets – adjusting the pipeline depreciation from a 140 year life, to 100 years.	Section 5.3.
27	Is there a case to review SDP's asset lives as a result of the damage to the plant caused by the recent storm event?	In our view there is no case for varying the plant asset lives for either the replacement of assets through insurance remedial work undertaken as a result of the damage caused by the tornado, or the impact of long periods of shutdown on the plant's asset lives. 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. Extending asset lives would impact adversely on SDP's cashflows and financeability and increase asset stranding risk.	Section 5.3.3 and Attachment 5-2

No.	Question	Overview response	Submission reference
28	Is our proposed implementation of the EnAM for the current price review appropriate?	In SDP's view the current specification of the EnAM as it applies during these modes remains broadly appropriate given it results in a reasonable allocation of energy price and volume risk between SDP (who has little control of when it operates), SWC and its household and business customers, and continues to incentivise SDP to manage its energy costs.	Section 4.4.4
29	What aspects of the EnAM should be updated or amended for implementation at future price reviews?	The EnAM should be retained in its current form.	Section 4.4.4
30	Is our proposed implementation of the efficiency adjustment mechanism for the current price review appropriate?	SDP proposes that the EfAM applying to SDP be modified to allow mode-specific savings (overruns) to carryover 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.	Section 4.3.1 and Appendix 4-1
31	What aspects of the efficiency adjustment mechanism should be updated or amended for implementation at future price reviews?	See response to question 30 above.	Section 4.3.1 and Appendix 4-1
32	Should we extend the ECM that we introduced for SWC, Hunter Water and WaterNSW to SDP?	SDP does not support the adoption of the temporary/permanent savings/over-runs distinction as applied in the recent ECM 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.	Section 4.3.1 and Appendix 4-1

Appendix 2 Our role in securing Sydney's water supply

2.1 SDP's Key Operational Relationships

SDP has two major contractual arrangements in place which cover the majority of our operating expenses.

2.1.1 Operations and Maintenance

SDP currently outsources all of its operating and maintenance activities via contractual arrangements with Veolia Water Australia. These arrangements comprise the following agreements with Veolia Water Australia:

- The desalination plant O&M Contract executed in July 2007, amended in 2012
- The DWPS Deed, executed in 2009, amended in 2012;
- The pipeline maintenance contract, established in 2013

The primary contract, the O&M Contract, and the DWPS are both 20 year contracts, expiring in 2030.

Veolia is a world-wide leader in desalination and water supply management. In addition to holding the O&M contracts for the SDP plant and pipeline, Veolia also operates and maintains the Gold Coast Desalination Plant, the Illawarra and Woronora Water treatment Plants for SWC and it holds the contract for the operation and maintenance of water and waste water treatment for Hunter Water Corporation.

Through the O&M contracts, Veolia delivers best practice certified asset management and operations at the plant and pipeline, including both operating and capital expenditure. The O&M Contract was procured simultaneously with the design and construct contract for the plant to maximise the efficient risk transfer to the successful Operator as part of a competitive tender process. As a result, the O&M contract includes a number of incentives for efficient operations and transfer of risk to the Operator. The O&M Contract also permits SDP to instruct the Operator to shutdown the plant for a specified period of time in order to minimise plant operating costs. These cost reductions are passed on to customers via the mode-based charges. In the case of a Water Security shutdown exceeding 5 years, the Contract requires some transfer of risk back to SDP although it still allows fixed costs savings to be maintained.

Further information on the O&M contracts is provided in the Advisian 2017 Price Reset Report in Appendix 6.2.

2.1.2 Energy

Planning Requirements

In November 2006, the Minister for Planning granted approval to SWC to build the desalination plant under Section 75 J of the *Environmental Planning and Assessment Act 1979*. The project approval was subject to a number of conditions to:

- prevent, minimise and/or offset adverse environmental impacts
- set standards and performance measures for acceptable environmental performance
- require regular monitoring and reporting and
- provide for the ongoing environmental management of the project.

Specific conditions that were imposed to meet these requirements included:

> *Prior to commencing operating the Proponent shall develop and submit for the approval of the Director-General, a Greenhouse Gas Reduction Plan to develop a strategic plan for the*

management, minimisation and the offset of greenhouse gas generation associated with electricity supply for the desalination plant. The plan must be consistent with the Proponent's Statement of Commitments and shall include (but not be limited to):

a. *The desalination plant be powered by 100% renewable energy (or equivalent)*

b. *Details of how renewable energy will be purchased such as using "Green Power" or equivalent*

c. *Details of regulatory requirements with respect to energy and greenhouse gases and a system for managing change in these requirements over time*

d. *A monitoring and recording system to track the energy consumption of the desalination plant project and the resultant equivalent emissions of carbon dioxide*

e. *A framework for considering and managing factors such as availability, certainty, flexibility, adaptability, additionality and any co-benefits of options identified and applied to achieve (a).*

f. *A framework and management principles for accommodating any shortfalls in the availability of renewable energy that may occur from time to time*

g. *Systems to monitor and audit under the Plan*

h. *A program for periodic review of the energy performance and consideration of additional or improved energy efficiency measures that may be reasonably applied from time to time to ensure efficiency energy use.*

The regulator of the SDP Project Approval is the Department of Planning. The Department can take a number of different enforcement actions in relation to non-compliance:

- Issue an order or a notice requiring action to be taken
- Commence civil enforcement proceedings in the Land and Environment Court seeking orders to remedy or restrain the non-compliance
- Issue a penalty notice (also called an 'infringement notice' or PIN) requiring payment of a fine (generally payable within 21 days)
- Commence a criminal prosecution which results in imposition of a fine or imprisonment.

Fines under a penalty notice for non-compliance with a project approval conditions are currently in the range of $6,000- $15,000 for corporations. For prosecutions, fines of up to $2 million, with a further $20,000 for each day the offence continues, can be ordered against corporations.

Securing a Renewable Energy Supply

In order secure an energy supply for the plant that complied with these conditions, SDP undertook a competitive tender process which resulted in SDP entering into two long-term contracts with Infigen for the supply of electricity (the ESA) and the supply of LGCs (Large Generation Certificates) (the RSA), both expiring in 2030.

Together, these two contracts ensure that SDP has a dedicated supply of renewable energy whenever it is required to operate.

The ESA has a [redacted]. Prices are escalated annually and include a range of retail costs such as the cost of complying with the NSW Energy Savings Scheme, electricity transmission losses, prudential costs and retail operating cost and margin. Network costs and AEMO market charges are pass through items under the ESA.

Any shortfall quantities in energy taken by SDP are treated as difference payments based on the difference between the contract price and the going market price, such that, if a shortfall occurs, SDP will receive a payment from Infigen and vice versa.

The RSA has a minimum annual supply volume of LGCs and prices are escalated annually by CPI.

Further information on SDP's ESA and RSA is provided in Chapter 6.

Appendix 3 Challenges and priorities over the 2017-22 regulatory period

3.1 Our customer and stakeholder engagement

As part of the development of our submission, SDP consulted over a period of time with our customer, SWC, as well as the MWD. The insight we gained from this consultation informed our submission and was a key driver of the Water Security Program which allows SDP to minimise operating costs whilst ensuring ongoing water security.

3.1.1 Sydney Water Corporation

SDP has a 50 year non-exclusive Water Supply Agreement (**WSA**) with SWC for the supply of drinking water and the making available of the plant to supply drinking water. The WSA establishes a Water Supply Group which aims to meet quarterly to review SDP's performance, provide a forum for discussion and co-ordination of services and other technical and operational matters.

These meetings provided the initial forum for the discussion of regulatory matters, including pricing, where those matters are relevant to SDP's provision of services to SWC under the WSA. During the 2012-17 regulatory period, SDP and SWC consulted on a range of issues including:

- options for SDP and SWC to improve operational readiness; and
- the potential changes to the operating rules within the MWP and the potential for SDP to be in water security mode for extended periods.

These discussions, together with SDP's impending IPART determination, resulted in SDP and SWC commissioning GHD to undertake a Reduced Flow/Alternative Modes Analysis report ahead of SDP's proposal to IPART's 2017-22 review of prices. GHD developed a range of alternative modes targeting a low rate of water production so as to balance operational readiness needs with the cost of operations. These modes were distilled into four options. GHD undertook a risk assessment of the identified alternative modes in 3 stages, with SWC participating in the first two stages:

1. A Criteria Workshop, which sought to identify the issues of concern to the stakeholders. The criteria utilised included:

- plant reliability when in operation under the mode,
- network impacts,
- water quality impacts,
- customer satisfaction,
- plant restart and ramp up duration, and
- operational changes required to implement the Mode.

2. Risk Assessment Workshop, where the issues identified during the criteria workshop were assessed and benefits and risks identified for the alternate modes.

The report concluded that although the current form of water security was the least cost, it was also the least likely to satisfy SDP's role on water security. The next lowest cost option identified in the report was the annual capacity test.

Following the conclusion of the Reduced Flow/Alternative Modes Analysis report, SDP undertook two further rounds of consultation with SWC, firstly outlining a range of draft proposals and then providing further details on the selected proposals.

SDP notes that SWC has not provided any endorsement of SDP's proposal, however this consultation shaped our submission in a number of important ways:

- The Partial Plant Test is a further refinement to the capacity test option in the GHD report to ensure ongoing water security at the lowest cost to customers.
- SDP is seeking to enter into unregulated pricing agreements with SWC (or any other customer), to allow it to fulfil its obligations to operate outside of the 70:80 rules, if required by SWC (or other customer).
- The proposed amendments to the abatement mechanism allow SDP to provide water to SWC (or other customer) during restart as production is ramping up to ensure that customers receive the maximum amount of water that the plant is able to produce.

3.1.2 Metropolitan Water Directorate

The NSW Government's review of the MWP is being led by the Metropolitan Water Director, within the NSW Department of Primary Industry. SDP engaged directly with MWD as part of its current review of the Plan with the aim of ensuring that the impacts on SDP and its operations did not compromise water security for customers. This included:

- providing updated information to the MWD to assist the modelling of the various supply options; and
- consulting with MWD on the findings of the GHD Reduced Flow/Alternative Modes Analysis report to determine whether there were additional benefits to customers associated with the alternative operating modes.

The consultation informed the development of SDP's pricing submission and in particular its understanding of the likely operating mode during the 2017-22 regulatory period, and was a key driver in the development of the Water Security Program.

3.2 Assessment of damage caused by the 2015 Kurnell tornado (Commercial in Confidence)

[Redacted]

Appendix 4 Proposed changes to the regulatory framework

4.1 Efficiency Adjustment Mechanism (EfAM)

Key messages

- In principle the EfAM can provide incentives for SDP to achieve efficiency savings as soon as possible and share these with customers
- However, the current formulation of the EfAM provides relatively weak incentives 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.
- Modifying the EfAM applying to SDP 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 would strengthen the incentive properties of the mechanism and also be more consistent with the intent of the Standing TOR.

4.1.1 What is the Efficiency Adjustment mechanism?

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 (EBSSs) or efficiency carryover mechanisms (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 ESC, QCA, ACCC and AER.

In its 2012 determination, IPART recommended that its standing TOR be amended to provide for an EfAM for SDP. 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[1]. The key features of the current SDP ECM are set out in Box 1.

Box 1: The current EfAM for SDP

The key features of the current EfAM include:

- The incremental efficiency gain/loss carryover will be available for 4 years after the year in which it was first realised.
- Efficiency gains and losses will be measured for each operating mode on a daily basis to exclude the impact of any influences arising from the scale or mode of SDP's operations.
- The EfAM will apply on an operational mode-specific basis. However, to the extent that SDP can demonstrate that gains/losses are not directly attributable to that mode, the carryover amounts may be apportioned across all relevant modes in the next price determination period.
- The EfAM applies only to operating expenditure, and not to capital expenditure.
- Annual variances between the benchmark costs allowed in IPART's price determination and the actual cost incurred by SDP will be adjusted to exclude windfall gains and losses and other factors not related to efficiency including possible cost offsets in the form of any associated changes in capital expenditure and changes in capitalisation policy. This will identify any potential efficiency gains for further investigation.
- IPART may determine claims by SDP for the exclusion of additional uncontrollable costs consistent with the concept of internal productive efficiency. In this assessment, IPART will consider both gains and losses.
- Both efficiency gains and losses will be taken into account on a symmetrical basis.
- Gains or losses on the resale of surplus electricity and RECs are excluded from efficiency gains or losses, but are dealt with separately under the EnAM.
- Efficiency carryover amounts will be indexed for inflation.
- An efficiency gain will only be recognised where it can be demonstrated that costs have been reduced by SDP without any deterioration in service quality.

Source: IPART Methodology Paper

However, 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 to the extent that 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[2]), so long as that mode recurs at the same stage of each regulatory period for the same duration. However, the 29% constant sharing ratio (which is generally seen by regulators as an appropriate benchmark) is in fact a special case. The actual sharing ratio will be:

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

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

- > 29% if the mode in which savings are made persists for several years and then does not reoccur for some time.
- < 29% if the mode in which savings are made does not persist and then reoccurs several years later for an extended period.

Table 4.1 shows the sharing ratios which would apply under a number of efficiency and operating scenarios (referred to as Cases). The sharing ratios in the Table are based on the assumption that SDP has made a permanent opex saving of $10 that accrues only when the plant is in a particular operating mode (say, when the plant is running). For each Case, the year in which the plant is running is denoted by a '✓'.

Therefore:

- In Case 1, the plant is running in the first two years of each regulatory period. Given a 5-year regulatory period, that means that the saving accrues in years 1, 2, 6, 7, 11, 12 and so on.
- In Case 2, the plant is running in the final two years of each regulatory period. That means the saving accrues in years 4, 5, 9, 10, 14, 15 and so on.
- In Case 3, the plant is running in the final two years of the first regulatory period and then the first three years of every subsequent regulatory period. That means the saving accrues in years 4, 5, 6, 7, 8, 11, 12, 13 and so on.
- In Case 4, the plant is running in the first year of the first regulatory period and then the first four years of every subsequent regulatory period. This means the saving accrues in years 1, 6, 7, 8, 9, 11,12,13,14 and so on.
- In Case 5, the plant is running continuously and therefore the saving accrues in every year.

Because SDP only benefits from the saving to the extent that plant is running within the four years after the year in which the saving is first made, the share of NPV benefits SDP obtains can vary quite widely.

Table 4.1: Current SDP EBSS assuming 7% real WACC (bracketed figures with 5%)

Years in which a (real) $10 saving accrues = ✓											
Regulatory period	**1**					**2 (and repeated all future periods)**					**Sharing Ratio**
Year	1	2	3	4	5	6	7	8	9	10	
Case 1	✓	✓				✓	✓				29% (22%)
Case 2				✓	✓				✓	✓	29% (22%)
Case 3				✓	✓	✓	✓	✓			42% (33%)
Case 4	✓					✓	✓	✓	✓		10% (7%)
Case 5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	29% (22%)

The table also shows that with a more realistic 5% real WACC, the 29% sharing ratio falls to 21.6%. The sharing ratios under the scenarios range from 7% to 33%.

Thus, in practice, the actual sharing ratio depends on which mode the plant is in and this is outside of SDP's control. This uncertainty in itself reduces incentives for SDP to make efficiency savings. In principle, it could also incentivise SDP to try 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 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.

Potential options to address problems with the EfAM

The EfAM applying to SDP could 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.

4.2 Analysis of the abatement mechanism

Key messages

- 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.
- However, the current formulation of 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. It could also impose disproportionate financial penalties on SDP that do not reflect any impact on SDP's contribution to recovery of storages.
- Changes to the abatement mechanisms are required to address these problems. SDP considers the most appropriate formulation is to integrate a grace period and 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.

4.2.1 What is the abatement mechanism?

In its 2012 Determination IPART established a mechanism to abate the water service charge (**WSC**) 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 WSC applicable in that day’s full operation mode if the average production of the preceding 365 days of full production is less than nameplate capacity (i.e. 250ML/day). In calculating the average daily production over 365 days of full production, shutdown event days and force majeure events are excluded.

In the case where SWC is SDP’s only customer, the equation is

$$Water\ service\ charge = (WSC + FNC + VNC * 26.5) * 1 * \frac{AC}{TC}$$

Where:

WSC = Water Service Charge for the relevant day

FNC = the Fixed Network Charge applicable for the relevant day

VNC = the Variable Network Charge for the relevant day

AC = the Available capacity (in ML) for the relevant day

TC = Total (nameplate) capacity of 250/ML per day

The abatement factor operates via the term: “Available Capacity/Total (nameplate) Capacity” (AC/TC). If the average daily volume for the past 365 production days (AC) is less than 250ML/day (TC) the WSC is reduced (i.e. AC/TC<1). AC cannot exceed nameplate capacity.

For example, if there is a month-long engineering fault that limits SDP production and reduces the calculated AC to 235 ML, then the abatement mechanism would operate to reduce the WSC to 94% (=235/250) of its full level.

- If production continues at 250 ML per day for the following year, the daily WSC would remain at 94% (of its full level) for the 11 months following the fault (while the period of reduced production during the ‘fault month’ continues to be included in calculations of AC). The daily WSC would then progressively return to 100% of its full level over the twelfth month as fewer of the days of the fault month are included in the calculation of ‘average daily volume for the past 365 production days’.
- If production continues at a rate higher than 250 ML after the ‘fault month, the daily WSC will return to 100% of its full level in a period less than 12 months. For example, if production continues at 255 ML, then the calculated AC will increase from 235 ML to 250 ML over a period of three months. After one month the daily WSC will be 96% of its full level, after two months the charge will be at 98% of its full level, and at the end of three months it will be at 100%. Once AC/TC has reached 100%, the ratio does not further increase because AC cannot exceed nameplate capacity.

4.2.2 Effectiveness of the abatement mechanism

As noted above, the stated objective of the abatement mechanism is to ensure SDP has no incentive to withhold supply when available dam storages are below 70% or until levels rise again above 80%.

This stated objective appears to assume that, in the absence of the abatement mechanism, SDP would have an incentive, and would act on this incentive, to deliberately withhold supply. A number of considerations suggest this assumption is unlikely to hold in practice.

- First, there are already regulatory mechanisms in place to address any such concern. SDP’s Network Infrastructure Licence contains requirements for SDP to maximise the production of water when SCA’s storage levels fall below 70% and until they rise above 80%. Under the WICA Act, IPART has the ability to audit SDP’s compliance with all licence requirements, and deal with any instances of non-compliance directly. Compliance action can include monetary penalties and suspension or cancellation of the licence (with the approval of the Minister).
- In addition, the corporate reputational damage incurred by SDP of withholding supply during times of shortage would likely be significant.

Nevertheless, 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.

However, SDP has a number of 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 during restart in a period of low water availability.
- It could impose disproportionate financial penalties on SDP that do not reflect any impact on SDP’s contribution to recovery of storage levels.

These issues are discussed below.

Perverse incentives to 'dump' water during SDP restart

When SDP is restarting, under the current formulation the abatement mechanism takes effect from the first day any water is delivered to SWC.

Given that SDP expects a four-month 'ramp up' period of increasing production before full production capacity is reached, delivering this water to SWC will result in significant financial penalties via the abatement mechanism. These penalties result from the ramp-up production levels being below the nameplate production capacity, which results in the calculated AC falling and the ratio of AC/TC in the WSC to drop below unity.

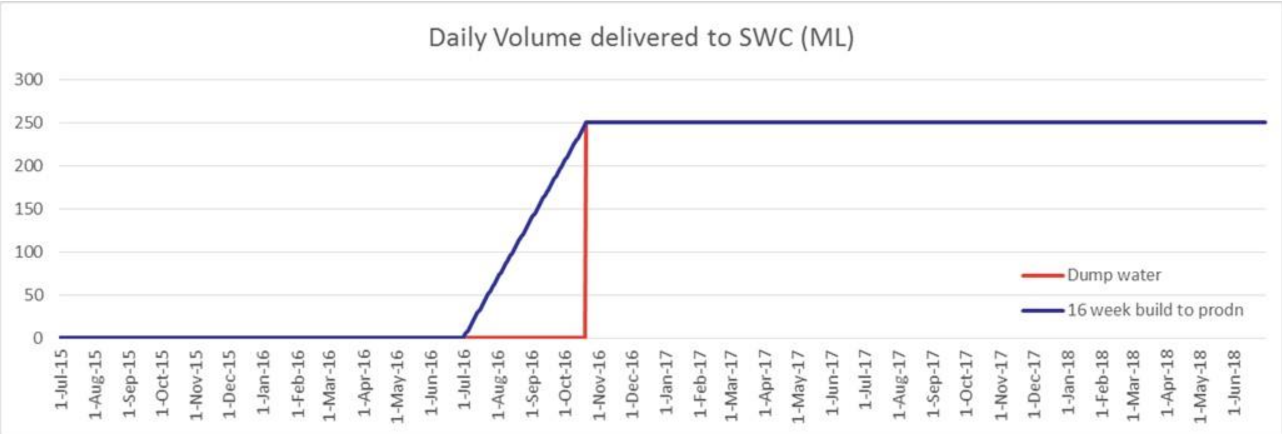
This means the abatement mechanism currently provides SDP with an incentive to dispose of water that is produced during a ramp-up period, rather than delivering it to SWC.

Clearly this is inefficient water resource management since this water would be highly valuable to SWC since it is produced (and potentially delivered) during a period when SDP restart has been triggered by storages dropping below 70%.

To illustrate how this perverse incentive arises under the current formulation of the abatement mechanism, the chart below presents the alternative actions of:

- Blue — delivery of produced water to SWC from the first day of restart, with water production volumes increasing to nameplate capacity over a ramp up period of 16 weeks.
- Red — produced water is disposed of until SDP production reaches nameplate capacity at the end of the ramp up period of 16 weeks.

Figure 4.1: Water Delivery Scenarios



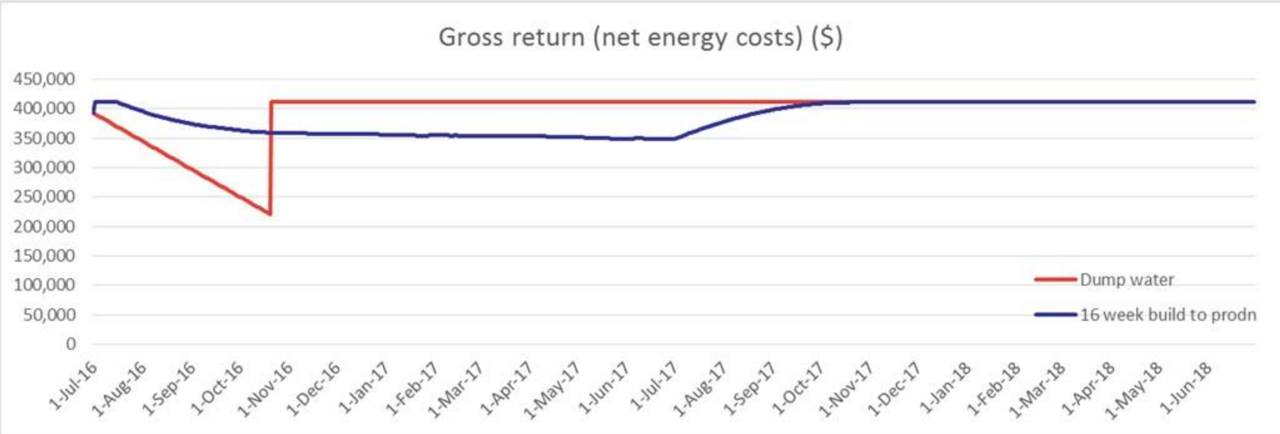
The example calculations presented below consider the return to SDP of alternative actions, taking into account:

- Variable Network Charge (**VNC**), Water Usage Charge (**WUC**), Water Service Charge (WSC), Fixed Network Charge (**FNC**) and Daily Restart Charge (**DRC**). The full level of the WSC (i.e. when AC/TC=1) is greater than the DRC.
- The energy costs of production are equal to the WUC (and not recovered if water is dumped).
- The historical production data, with the average daily volume for the past 365 production days being greater than 250 ML. This means that there is a small buffer for production to be below 250 ML before the calculated AC starts to fall below 250 ML.

The two strategies lead to significantly different financial outcomes for SDP (see Figure 4.2):

- Initially, the returns to immediately delivering water (blue) exceed the returns from dumping water (red). This is because the blue strategy provides a higher daily fee (since WSC>DRC) and the variable energy costs of producing the water are recovered by variable water payments from SWC. Since the red strategy would require the produced water to be disposed of, there are no volumetric payments from SWC to cover the variable costs of production.
- This continues, even though the daily WSC from the blue strategy starts to fall as the abatement mechanism takes effect.
- Once production reaches the nameplate capacity, the daily return to the red strategy is higher. This is because the abatement mechanism is not reducing the daily WSC under the red strategy, while the equivalent charge under the blue strategy is significantly reduced due to the abatement mechanism and the impact of the ramp-up production being below nameplate capacity.

Figure 4.2: Gross Return Abatement Scenarios



In aggregate, the penalties imposed through the abatement mechanism outweigh the lost revenue from disposing of the ramp up production volumes (see figure below).

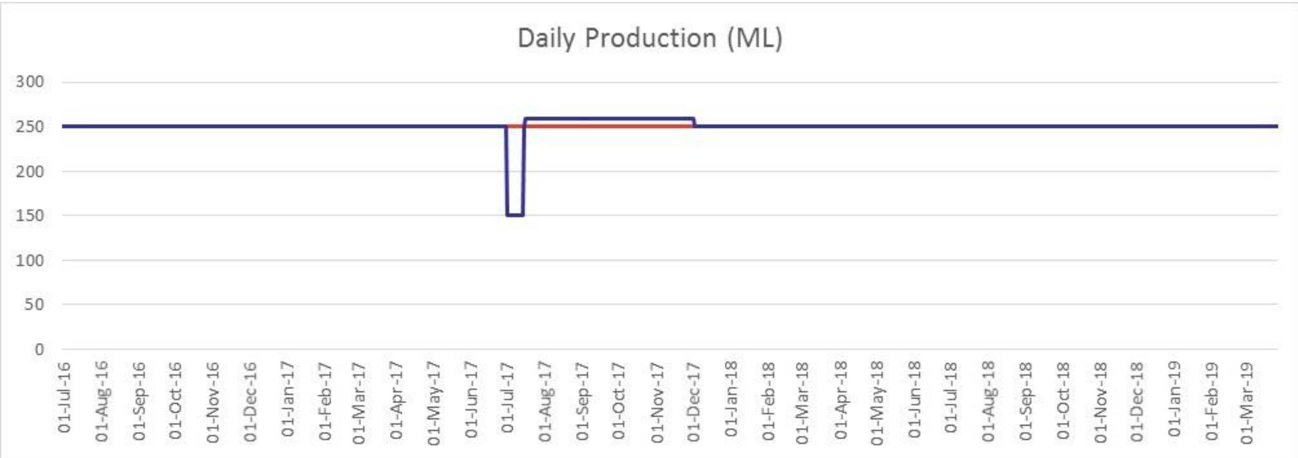
Effectively, the abatement mechanism currently provides SDP with an $8 million incentive to dump water during a ramp-up period, rather than supply it to SWC.

Disproportionate financial penalties on SDP that do not reflect any impact on SDP's contribution to recovery of storages

The current abatement mechanism is not symmetrical — SDP is penalised for any days in which its output falls below nameplate capacity ('unders') but is not rewarded for any days in which production is above nameplate capacity ('overs'). This is because the calculated AC is the average daily volume for the past 365 production days, but is capped at the nameplate capacity. As described below, 'unders' are penalised by a reduction in the WSC, while 'overs' cannot recoup these lost revenues. This formulation of the abatement mechanism penalises SDP even when delivered volumes are the same over an acceptable period. It is important to recognise that recovery of storages occurs over an extended period and daily fluctuations have very limited impact on the underlying objective of long-term water security.

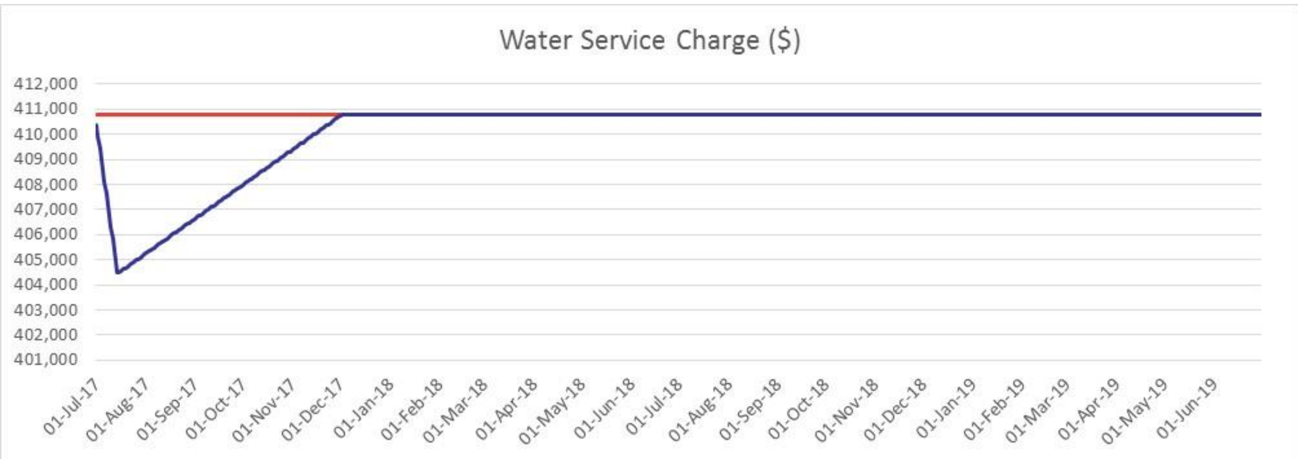
To illustrate how this disproportionate penalty could arise under the current formulation of the abatement mechanism, consider two production scenarios (see figure below):

- Blue — variable production — a two-week engineering fault that limits SDP production to 150ML/day, instead of 250ML/day. Following the fault, production is raised to 260ML/day for 20 weeks, then continues at 250ML/day
- Red — constant production — production is maintained at the nameplate capacity of 250ML/day.



The aggregate production for both these scenarios is the same — an overall average of 250ML/day. However, the abatement mechanism will lead to significantly different revenue outcomes for SDP.

If the average daily volume for the past 365 production days prior to the fault was 250ML, the blue (variable production) scenario shortfall would trigger the abatement mechanism and reduce the WSC to a level below that applying in the red scenario (see figure below).



The production increase in the blue scenario that quickly returns the ratio of AC/TC to unity ends the penalty period, but does not recoup the lost revenue. (If production remained at 260ML/day it would not increase the WSC above its full rate since the ration of AC/TC cannot exceed 1).

Even though the same aggregate volume is delivered (as if constant production at 250ML/day), the abatement mechanism results in a WSC penalty totalling nearly $500,000. This would seem to be an unjustifiable penalty to impose on SDP given that the net effect of the 'unders' and 'overs' means that it has made the same contribution to recovery of storages under both scenarios.

4.2.3 Options to address problems with the abatement mechanism

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.
- 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.

4.3 Regulatory precedents on mechanisms to manage unforeseen and uncontrollable events

Key messages

- There is considerable regulatory precedent for pass-through mechanisms to apply when unforeseen and uncontrollable events occur which have a material impact on regulated businesses.
- The aim of these mechanisms are to enable businesses to recover their efficient costs in the advent of an unexpected event, while ensuring that the prices for consumers are no more than necessary to provide an appropriate level of service.

In the natural course of business, regulated businesses are exposed to a variety of risks, both foreseeable and unforeseeable. A key element of the regulatory framework relates to how well it allocates and manages these risks. While it is generally assumed that regulated businesses should, as much as is practicable, bear the costs associated with foreseeable risks (thus incentivising businesses to take the appropriate steps to minimise their risks), various regulatory mechanisms exist across a range of regulatory frameworks – particularly in the infrastructure sector – to allow businesses to pass through costs associated with uncertain and unforeseen events that are not within the business' control.

This is because a pass through mechanism can be an efficient and least cost way of managing these risks compared to other mechanisms (including allowed rates of return, or self-insurance allowances). For example, provision of 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 can ensure that material risks in the policy, regulatory and commercial operating environments are managed efficiently by:

- Allocating costs to those parties best able to manage those risks (i.e. controllable costs managed by the regulated business) thus lowering the regulated business' risk profile and prices, while ensuring the regulated business is incentivised to manage its controllable costs.
- Ensuring only material movements in uncontrollable costs are borne by customers, to reduce administrative costs of pass through mechanisms.

As IPART acknowledges

> *Where there is a significant cost that may or may not occur during the regulatory period, and if the business has no meaningful influence over whether the cost is incurred or how big the cost will be, there can be a case to provide a mechanism in the determination to pass through these costs into prices as they are incurred. Cost pass-through mechanisms allow the efficient costs of uncertain and uncontrolled events that arise during the regulatory period to be passed through to customers within the regulatory period.*[3]

Table 4.2 summarises the regulatory mechanisms that exist across a variety of industries, both internationally and throughout Australia, to manage unforeseen events, that are not within the business' control, but may result in material costs (or savings) being incurred in the course of providing regulated services.

For example, the NER recognises that a distributor can be exposed to risks beyond its reasonable control, which may have a material impact on its costs. A cost pass through event enables a distributor to recover

[3] IPART 2016, *Review of prices for Sydney Desalination Plant Pty Ltd from 1 July 2017,* p.61.

(or pass through) the efficient costs of defined, unpredictable, high cost events that are not built into the AER's distribution determination, such as regulatory and tax change events, retailer insolvency and any other event specified in a determination as a pass through event including insurance pass through events.[4]

As noted by the AEMC when it made amendments to the cost pass through provisions of the NER in 2012:

> *The aim of these amendments is to enable network businesses to recover their efficient costs in the advent of an unexpected event, while ensuring that the prices for consumers are no more than necessary to provide an appropriate level of service.*[5]

Box 2 outlines a case study relating to the costs (or insurance gaps) associated with the 2009 Victorian bushfires.

Table 4.2: Summary of regulatory frameworks that manage unforeseen events through cost pass through mechanisms

Industry	Regulator	Nature of the event	Regulatory framework
Electricity Networks	IPART (NSW) (2004-2009)	Regulatory and taxation charge events and specific cost pass through events	Mechanism exists for network businesses to pass through costs associated with positive and negative charge pass through events and forecasts associated with specific cost pass through events.
Retail electricity	IPART (NSW) (2010-current)	Regulatory and taxation events	Mechanism exists to allow retailers to pass through incremental and efficient costs associated with regulatory change events and taxation change events.
Energy networks	AER (AUS) (2008-current)	Regulatory change event, service standard event, tax change event, retailer insolvency event and any other event specified in a determination as a pass through event	The NER recognise that a distributor can be exposed to risks beyond its reasonable control, which may have a material impact on its costs. A cost pass through event enables a distributor to recover (or pass through) the costs of defined unpredictable, high costs events that are not built into the AER's distribution determination.
Gas distributors	AER (AUS) (2012- current)	Retailer insolvency events resulting in failure of a retailer to pay distribution service charges	NGR r 531(4).recognises that a service provider can be exposed to risks beyond its control. A cost pass-through enables a service provide to recover the costs that are not built into its access arrangement. The NGR includes a prescribed pass-through related to unpaid distribution service charges should a retailer insolvency event occur (net of any credit support)
Water	ESC (VIC) (2008-current)	Uncertain and unforeseen events, including catastrophic events	Mechanism has existed since 2008 to allow water businesses to apply for tariff adjustments to deal with the impact of uncertain and unforeseen events.
Water	ESCOSA (SA) (2013- current)	Significant changes in a legal obligation or an extraordinary event (foreseen or unforeseen)	Mechanism has existed since 2013 enabling revenue caps to be adjusted in the next regulatory period if there is a significant change in legal obligation or an extraordinary event that is not within SA Water's direct control.

4 NER cl.6.6.1

5 AEMC, Cost Pass Through Amendments: Final rule determination – Information note, August 2012

Industry	Regulator	Nature of the event	Regulatory framework
Water	QCA (2014)	Changes in Government legislation, market driven changes in WACC and bulk water costs	The regulated entity, or the regulator, can request a review when prices are inadequate to recover costs by way of: (a) cost pass-through mechanisms which allow costs beyond the entity's control to be passed through to users prior to the next formal regulatory review or (b) review triggers which bring forward or re-open a review as a result of a pre-specified event
Rail	QCA (QLD) (2010-current)	Force majeure events including floods	Access undertaking provides for the network to seek approval from QCA to vary reference tariffs in response to a "review event" including a force majeure event.
Electricity networks	NZ Commerce Commission (NZ) (208-current)	Catastrophic events	Suppliers can submit a cost pass through proposal at any time if a catastrophic event occurs.

Source: IPART 2004. *NSW Electricity Distribution Pricing 2004-2009 final determination*, pp. 24-27. IPART 2006, *NSW Distribution Network Cost Pass through Review*, p.1. AER, *National Electricity Rules*, cl 6.5.1. AER 2016, *National Gas Rules*, cl 531. ESC 2008. *2008 Water Price Review*, p.175. ESC 2015, *Review of water pricing approach*, p.30. ESCOSA, *SA Water's water and sewerage revenues 2013/14-2015/16, Final determination statement of reasons*, Section 11. ESCOSA, *SA Water regulatory determination 2016 final determination*, p.5. QCA 2014*, Long Term Regulatory Framework for SEQ Water Entities*, p.vi, p.33. QCA, Queensland Competition Authority 2012, *QR Network's Review Event Submission- Central Queensland Flooding*, p.5. NZ Commerce Commission, *Setting the customised price-quality path for Orion New Zealand, Final reasons paper*, November 2013.

Box 2: Insurance gap pass through case study in Victoria

On Black Saturday (the 7 February 2009), catastrophic bushfires ignited and burnt in several regions of Victoria, causing extensive damage and numerous deaths and injuries. One of these fires, the Kilmore East bushfire, caused 119 deaths and damaged or destroyed more than 1,200 homes and properties. While the Bushfires Royal Commission was not charged with responsibility for attributing liability for the fires, it concluded that SP AusNet's broken conductor caused the ignition of the Kilmore East bushfire, and that SP AusNet could have prevented this by adopting more vigilant inspection processes.

This resulted in the largest class action suit in Australian legal history, and although SP AusNet had liability insurance in place which provided cover for bushfire liability, given the recent change to the regulatory environment, the insurance event in SP AusNet's determination at the time, did not cover the limits for prior policies. Under the previous arrangements, were an insurance claim made, SP AusNet could have applied to the ESCV to recover costs above insurance levels.[6]

SP AusNet applied to the AER under section 6.5.10 of the NER to extend the definition of an insurance event to fill this 'gap' in the application of the insurance event. Taking this into account, the AER redefined the definition of insurance pass through event in SP AusNet's 2011-15 distribution to allow SP AusNet to apply to the AER to recover costs that exceed the limits of coverage of its relevant insurance policies, consistent with previous regulatory arrangements administered by the ESCV. [7]

While the majority of these pass through events are low probability (but potentially high cost events), Table 4.3 highlights that these mechanisms have been utilised across a range of industries to ensure the efficient costs of eligible events are incorporated into regulated prices.

6 Victorian Electricity Supply Industry Tariff Order cl.3.2.

7 AER 2013, *SPI Electricity Pty Ltd, 2011-15 Distribution Determination Insurance Pass through Event*, p 1.

For instance, as discussed in Box 3, the QCA allowed QR Networks to pass through efficient costs arising from the damage caused by the storms in Queensland in 2010/11.

Box 3: Force Majeure event cost pass through in Central Queensland

Central Queensland suffered some of the most severe and destructive flooding in recorded history in the period between December 2010 and January 2011. Uncharacteristically persistent monsoonal rainfall during this period brought wide-spread flooding across the central Queensland coal region causing substantial damage to rail infrastructure in QR Network's Blackwater and Moura rail systems.

QCA allows for the application of a cost pass-through for events outside of the control of the regulated entity. Specifically, QR Network's 2010 access undertaking provides for QR Network to seek approval from the Authority to vary reference tariffs in response to a review event, which can include a force majeure event caused by, amongst other things, a flood, with an impact of greater than $1 million.

In light of the scale of this natural disaster and consequential major recovery effort, and in accordance with clause 2.2.3 of Schedule F of its 2010 access undertaking, QR Network submitted a cost pass-through application in relation to the necessary repair and restoration costs of affected infrastructure.

The total value originally claimed was $5.9 million, represented by $5.0 million damage on the Blackwater system and $0.9 million on the Moura system. QR Network's proposed pass-through approach claimed for only incremental costs associated with QR Network's flood event response, not costs that were otherwise provided for in allowances included in the build-up of reference tariffs.

QCA found allowed QR Network to pass through the $5.9 million in costs to be recovered through adjustments to reference tariffs. In coming to their decision QCA noted that costs would only be pass-through if they were not covered by the regulated business' existing self-insurance arrangements.[8]

Table 4.3: Regulatory precedents for cost pass through to manage unforeseen events

Business	Regulator	Nature of event	Proposal	Regulatory Outcome
Country Energy, EnergyAustralia and Integral Energy (NSW)	IPART (2004-2009) Determination	Regulatory and taxation change events and specific event change	Network businesses proposed a pass through of costs in 2005 resulting from the introduction of a licence condition – *the Design Reliability and Performance license Condition imposed on Distribution Network Service Provides by the Minister for Energy Utilised (2005)*.	Although IPART rejected EnergyAustralia and Integral Energy's proposal for the introduction of ex-post adjustment mechanisms, the Determination approved the pass through to Distribution Customers of cost associated with modifications to the *New Licence Condition.*
EnergyAustralia and Origin Energy (NSW)	IPART (2013-2016)	Regulatory and taxation change events	Standard Retailers applied to pass through costs relating to the *Small-Scale Renewable Energy Scheme* (**SRES**) in 2012/13.	IPART found that the SRES constituted a Regulatory Change Event, which passed the materiality threshold.

8 Queensland Competition Authority 2012, *QR Network's Review Event Submission- Central Queensland Flooding*, p.5.

Business	Regulator	Nature of event	Proposal	Regulatory Outcome
Murraylink	AER (2008)	Insurance pass through event	Fire in converter station caused significant damage. Insurance provided coverage above the $250,000 deductible. Murraylink sought to recover the deductible.	AER approved the pass through of $250,000 to customers for 2009-10.
Directlink	AER (2009)	Insurance pass through event	In 2007 a converter tripped twice due to forces outside of Directlink's control. In 2009 the insurer offered to settle the claim for the cost of the replacement reactor and installation less the deductible. Directlink requested to pass through the deductible amount.	AER approved the pass through of $500,000 to Directlink's maximum allowed revenue for 2010-11.
SP AusNet	AER (2013)	Insurance cap event	Victorian bushfires resulted in class action suit – AusNet was liable to pay hundreds of millions to the victims	AER draft ruling opened the way from the company to pass on costs that exceed the limits of its coverage on its relevant policies to its customers from the Black Saturday settlement.
Ausgrid	AER (2015)	General nominated pass through event	Ausgrid applied for additional CAPEX and OPEX in the current regulatory period to cover costs associated with supply restoration under the general nominated pass through event they specified in their 2014-15 transitional distribution determination.	AER approved a positive pass through amount of $43.2 million over three years commencing 1 July 2016.
Jemena Gas Networks	AER (2016)	Retailer insolvency event	Jemena Gas Networks submitted an application to the AER for a pass-through of costs related to unpaid distribution charges due to retailer GoEnergy Pty Ltd entering administration.	AER determined that Jemena Gas Networks has correctly identified the pass-through amount and as such, can seek an adjustment of its maximum allowed revenue in 2017-18 by this amount.
QR Networks	QCA (2012)	Force majeure event	Central Queensland suffered severe flooding between December 2010 and January 2011 leading to significant damage. QR Networks proposed a cost pass through where the incremental costs associated with floor response would be recovered through a variation of their tariffs.	QCA approved QR Network's proposed floor review event claim.
Aurizon	QCA (2014)	Force majeure events	Central Queensland was subject to wide spread flooding as a result of ex-tropical cyclone Oswald causing substantial damage. Aurizon applied to recover costs associated with repair and restoration of the affected infrastructure via an adjustment to the System Allowable Revenue for 2014-15	QCA allowed for $16.10 million to be recovered through AT3 and AT4 tariff in 2014-15.
Orion	NZ Commerce Commission (2012)	Catastrophic event	Canterbury earthquakes in 2010 and 2011 lead to significant damage.	NZ Commerce Commission found that the risks of any future catastrophic event should be shared between Orion and consumers.

Source: IPART 2004, *NSW electricity distribution pricing 2004-2009 Final determination*, pp. 24-27. IPART 2006*, NSW distribution network cost pass-through review,* p.1. IPART 2010, *Review of regulated retail tariffs and charges for electricity 2010-2013 Final report*, p.143 and pp. 158-165. IPART 2013*, Review of regulated retail prices and charges for electricity 2013-2016 Final report*, p.130 and pp.136-140 and p.216. AER 2008, *Murraylink Letter of approval*. AER, *Notice of proposed pass through claim for Murraylink*. AER 2009, *Directlink Letter of approval*. AER 2013*, Final decision SP AusNet insurance pass-through event*. AER 2015, *Determination Ausgrid cost pass through application*. AER 2016*, Determination unpaid distribution charges pass-through for 2017-18 regulatory year Jemena Gas Networks*, p.1. QCA 2012, *Decision QR Networks' review event submission – Central Queensland flooding*. QCA 2014, *Aurizon Network's 2013 review event application*. QCA 2014, *Final decision letter Aurizon*. NZ Commerce Commission 2013, *Setting the customised price-quality path for Orion New Zealand Final reasons paper*.

4.4 Formulation of proposed cost pass-through mechanism

Key messages

- We propose that risks associated with:
  - Unforeseen and uncontrollable regulatory, taxation and extraordinary events be managed through a general cost pass-through mechanism.
  - Unknown costs (or savings) associated with the Kurnell Tornado be managed through a specific cost pass through mechanism (after accounting for the relevant insurance policy limit and avoided maintenance costs).
- The aim of these pass-through mechanisms is to enable the recovery of efficient costs in the advent of an unforeseen event – 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.
- Well targeted cost pass through mechanisms to manage risks associated with these 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 (including the IPART Act) for a cost pass-through mechanism.
- We have developed definitions of the eligible events that we propose be included in the 2017 Determination and have outlined a number of other aspects of the cost pass through mechanisms for IPART's consideration. We would welcome further engagement with SWC, IPART and other stakeholders in finalising the other detailed aspects of the cost pass through mechanisms.

We propose that risks associated with a number of unforeseen and uncontrollable events be managed through a general and specific cost pass-through mechanism.

This appendix sets out definitions of the eligible events that we propose be included in the 2017 Determination and sets out a number of other aspects of the cost pass through mechanism for IPART's consideration.

4.4.1 Proposed eligible pass through events

We propose that a pass-through mechanism apply for the 2017-22 regulatory period that allow SDP to apply to IPART to pass through the efficient and incremental costs associated with a:

- **General Pass Through Event,** designed to manage the risk associated with unforeseen and uncontrollable events such as:
  - Extraordinary events, such as natural disasters or events that cannot be adequately or cost effectively insured
  - Regulatory change events such as changes to MWP or licence conditions

  - Taxation change events
- **Specific Pass Through Event,** designed to manage the uncertainty in timing and nature of any cost increases (or decreases) associated with the Kurnell Tornado remediation (after accounting for the relevant insurance policy limit and avoided maintenance costs).

We have developed definitions of the eligible events that we propose be included in the 2017 Determination (Box 4).

Where possible, these events have been defined consistent with other regulatory determinations that apply to infrastructure services in Australia.

4.4.2 Process and mechanism for passing through efficient costs (or savings) associated with eligible pass through events

The aim of these pass-through mechanisms is to enable the recovery of efficient costs (or pass through savings) in the advent of an unforeseen event – 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.

In our view, a well targeted cost pass through mechanism to manage risks associated with a number of unforeseen and uncontrollable 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 (including the IPART Act) for a cost pass-through mechanism.

A summary of how the proposed cost pass-through mechanism would apply are provided in Figure 4.3.

This process would involve:

1. An eligible event occurring (as defined in Box 3) 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.

Box 4: Definitions of proposed eligible pass through events

We have developed definitions of the eligible events that we propose be included in the 2017 Determination. These eligible events include:

1. General Pass Through Event means:
   - an Extraordinary Change Event – any event or circumstance the occurrence of which is beyond the reasonable control of SDP that results in SDP incurring Materially higher or Materially lower costs in providing Pass Through Water Services than it would have incurred but for that event, which could not have been prevented or overcome by SDP using reasonable foresight, planning and implementation.
   - a Regulatory Change Event – any of:
     - a decision made by any Authority;
     - the coming into operation of an Applicable Regulation; or
     - the coming into operation of an amendment to an Applicable Regulation, on or after 1 July 2017 that has the effect of:

     i. imposing minimum standards on SDP in respect of the provision of Pass Through Water Services that are different from the minimum standards imposed on SDP in respect of the provision of Pass Through Water Services immediately prior to that event;

     ii. substantially altering the nature or scope of the services that, immediately prior to that event, collectively comprise the Pass Through Water Services; or

     iii. substantially varying the manner in which SDP is required to undertake any activity forming part of the Pass Through Water Services; and

     - results in SDP incurring Materially higher or Materially lower costs in providing Pass Through Water Services than it would have incurred but for that event, but does not include:

     i. the making of the 2017 Determination;

     ii. an Extraordinary Change Event; or

     iii. a Tax Change Event.
   - A Tax Change Event –
     - a change in (or a change in the application or official interpretation of) a Relevant Tax or the way in which a Relevant Tax is calculated;
     - the removal of a Relevant Tax; or
     - the imposition of a Relevant Tax, which:

     i. occurs on or after 1 July 2017; and

     ii. results in SDP incurring Materially higher or Materially lower costs in providing Pass Through Water Services than it would have incurred but for that event.
2. Specific Pass Through Event means a specific circumstance where:
   - SDP makes a claim or claims and receives the benefit of a payment or payments under an insurance policy related to damage to SDP caused by the Kurnell Tornado; and

– SDP incurs costs in repairing the damage caused by the Kurnell Tornado in excess of the policy limit(s) of its insurance; and

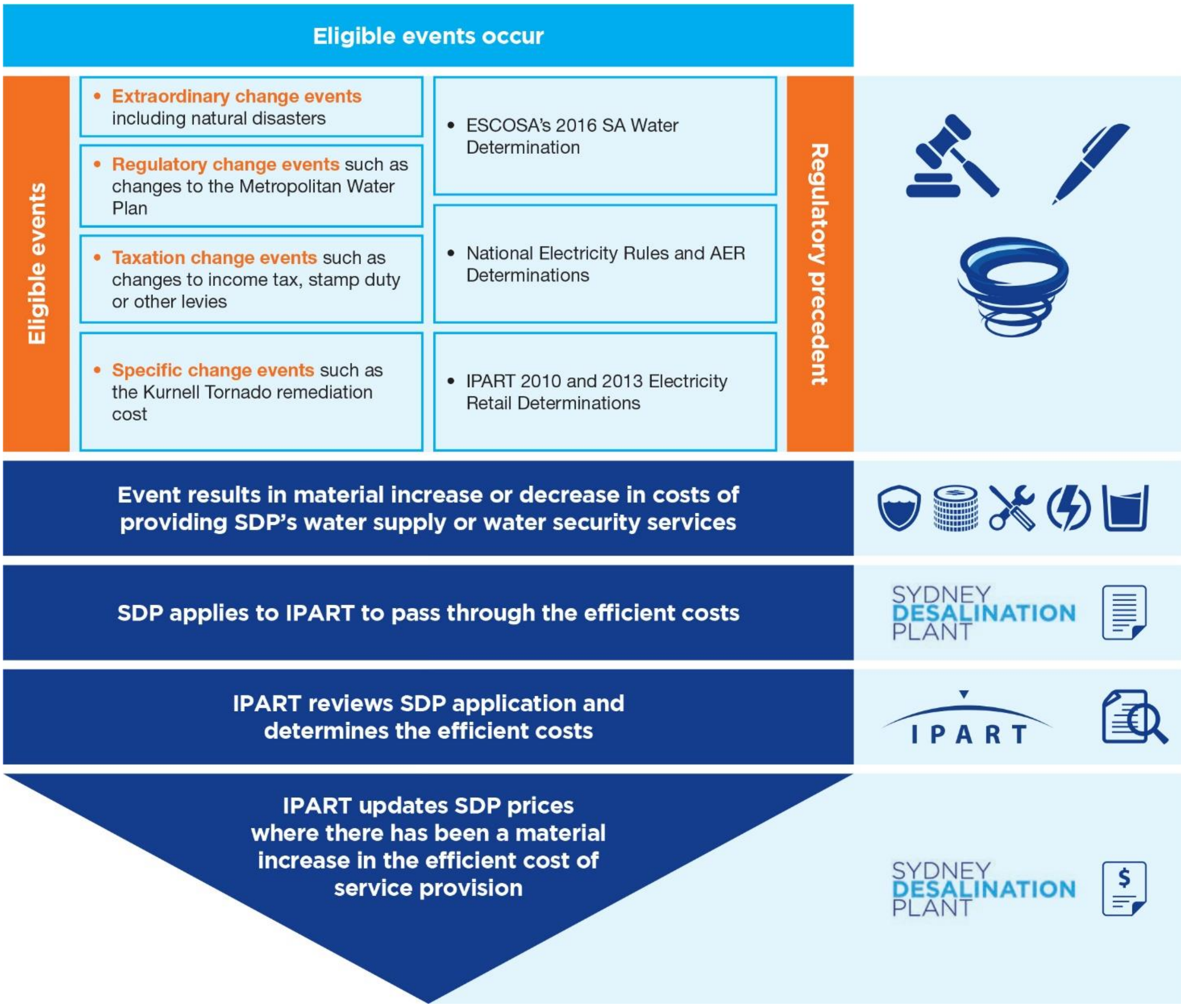
– the costs beyond the relevant policy limit materially increase the costs to SDP in providing Pass Through Water Services; where the policy limit is the greater of:

i. SDP's actual policy limit at the time of the Kurnell Tornado that gave rise to the claim;

ii. subject to paragraph (f), the policy limit that is explicitly or implicitly commensurate with the allowance for insurance premiums that is included in the notional revenue requirement was used by the IPART to set tariffs for SDP for the determination period commencing on 1 July 2012 and ending on 30 June 2017; and

iii. the policy limit in paragraph (e) will not be taken as the greater policy limit if that policy limit at the time of the Kurnell Tornado, was not available to SDP for reasons beyond its control.

Figure 4.3: Proposed cost pass-through mechanism to apply for the 2017-22 regulatory period



Source: SDP

Box 5 sets out definitions that will be required in the 2017 Determination to specify the process and mechanism for passing through efficient costs (or savings) associated with eligible pass through events. These have been developed in line with the following regulatory principles:

- Ensuring the trigger event is clearly defined and can be identified in any cost pass through application
- Requiring SDP to substantiate the efficient increase (or decrease) in costs associated the eligible events (within a reasonable timeframe, say 90 business days, following the event), including actions taken to reduce the magnitude of any increase in costs
- Ensuring IPART (and potentially stakeholders) have sufficient time to review, consult on and assess the proposal (say 120 business days) to ensure that only material (0.25% of annual regulated revenue) increases (or decreases) in the efficient costs associated with the event are passed through to customers
- Allowing prices to be updated, following IPART's decision, within a reasonable timeframe (or ensures SDP is not worse off for any delays) to allow the SDP to continue to invest, operate and maintain a water supply and water security service as envisaged under the MWP
- Where possible, drawing from other regulatory precedents, including in Australia.

We would welcome engagement with SWC, IPART and other stakeholders in developing the process and mechanism for passing through efficient costs (or savings) associated with eligible pass through events. This would include the items discussed in Box 5, as well as specification of other matters such as:

- The timeframe and information provision requirements on SDP as part of any pass through application
- The timeframe, decision-making process – including matters to be considered by IPART in determining the efficient increase (or decrease) associated with the event are passed through to customers[9] – and reporting requirements on IPART in making a decision on any pass through application.
- The price control formula that would include mechanisms to update prices to account for the proposed cost pass through mechanism (in addition to the pass through of electricity network charges under the current price control formula)

[9] One of the matters for IPART's consideration may be the implications for efficient costs of SDP's decisions and actions, including whether (in the case of a Positive Change Event) SDP has failed to take any action that could reasonably be taken to reduce the magnitude of the Eligible Pass Through Amount.

Box 5: Other definitions necessary for refining the process and mechanism for passing through efficient costs (or savings) associated with eligible pass through events

We have developed definitions that will be required to specify the process and mechanism for passing through efficient costs (or savings) associated with eligible pass through events.

These definitions include:

- Approved Pass Through Amount means the amount which the Tribunal determines should be passed through to customers in respect of that Positive Change Event or Negative Change Event
- Eligible Pass Through Amount means in respect of a Positive Change Event or Negative Change Event the increase (or decrease) in costs in the provision of Pass Through Water Services that SDP has incurred since 1 July 2017 and is likely to incur until the end of the Regulatory Control Period as a result of that Positive Change Event or Negative Change Event.
- Kurnell Tornado means the tornado and weather event that occurred on 16 December 2015 causing damage to SDP
- Materially means 0.25% of regulated revenue for the year in which the event occurs with the threshold defined on a per event basis
- Negative Change Event means a General Pass Through Event or Specific Pass Through Event which entails SDP incurring Materially lower costs in providing Pass Through Water Services than it would have incurred but for that event.
- Pass Through Water Services Pass Through means the water services provided by SDP in accordance with the NSW Government's MWP.
- Positive Change Event means a General Pass Through Event or Specific Pass Through Event which entails SDP incurring Materially higher costs in providing Pass Through Water Services than it would have incurred but for that event.
- Relevant Tax means any Tax payable by SDP other than:
  - income tax and capital gains tax;
  - stamp duty, financial institutions duty and bank accounts debits tax;
  - penalties, charges, fees and interest on late payments, or deficiencies in payments, relating to any Tax; or
  - any Tax that replaces or is the equivalent of or similar to any of the Taxes referred to in sub-clauses (a) to (c) (including any State equivalent tax), and also includes any fee payable by SDP in respect of a Licence.
- Specific Pass Through Event (refer Box 4).

Appendix 5 Revenue requirement for our water supply and security services

5.1 Detailed Breakdown of Revenue Requirement under all modes

The following tables represent SDP's proposed revenues under all possible modes.

Table 5.1: Revenue Requirement for Water Security Mode ($2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22
Fixed Operating Expenditure	18,802,939	21,429,363	21,618,060	31,241,146	30,411,271
Variable Operating Expenditure	-	-	-	-	-
Depreciation	48,716,971	48,757,052	48,798,178	48,790,352	48,741,445
Return on Assets	87,263,035	85,068,323	82,911,590	80,752,998	78,548,337
Return on Working Capital	774,216	768,333	747,230	762,820	749,029
Other	6,833,716	6,833,716	6,833,716	6,833,716	6,783,716
Tax Allowance	4,830,463	5,830,802	6,677,193	7,465,720	8,153,747
Total Revenue Requirement	**167,221,339**	**168,687,589**	**167,585,966**	**175,846,752**	**173,387,544**

Table 5.2: Revenue Requirement for Operating Mode ($2016-17)

[Numbers redacted]

	2017-18	2018-19	2019-20	2020-21	2021-22
Fixed Operating Expenditure					
Variable Operating Expenditure					
Depreciation	48,716,971	48,757,052	48,798,178	48,790,352	48,741,445
Return on Assets	87,263,035	85,068,323	82,911,590	80,752,998	78,548,337
Return on Working Capital	914,897	904,229	881,726	881,756	869,917
Other	6,783,716	6,783,716	6,783,716	6,783,716	6,783,716
Tax Allowance	4,837,644	5,838,531	6,685,609	7,473,822	8,162,637
Total Revenue Requirement	**244,747,476**	**243,575,340**	**242,314,915**	**241,383,671**	**240,052,045**

Table 5.3: Annualised Revenue Requirements for Short Term Shutdown Mode ($2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22
Fixed Operating Expenditure	33,899,723	33,891,903	33,750,156	34,369,440	34,614,405
Variable Operating Expenditure	-	-	-	-	-
Depreciation	48,716,971	48,757,052	48,798,178	48,790,352	48,741,445
Return on Assets	87,263,035	85,068,323	82,911,590	80,752,998	78,548,337
Return on Working Capital	801,645	790,977	769,092	768,504	756,665
Other	6,783,716	6,783,716	6,783,716	6,783,716	6,783,716
Tax Allowance	4,831,863	5,832,089	6,678,561	7,466,107	8,154,308
Total Revenue Requirement	**182,296,953**	**181,124,060**	**179,691,293**	**178,931,117**	**177,598,877**

Note: short term shutdowns last between 2 and 10 days however the annualised revenue requirements are shown in the table for consistency with the revenue requirements for the other modes

Table 5.4: Annualised Revenue Requirements for Medium Term Shutdown Mode ($2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22
Fixed Operating Expenditure	31,836,609	31,830,069	31,683,822	32,306,401	32,551,366
Variable Operating Expenditure	-	-	-	-	-
Depreciation	48,716,971	48,757,052	48,798,178	48,790,352	48,741,445
Return on Assets	87,263,035	85,068,323	82,911,590	80,752,998	78,548,337
Return on Working Capital	797,897	787,231	765,369	764,756	752,917
Other	6,783,716	6,783,716	6,783,716	6,783,716	6,783,716
Tax Allowance	4,831,672	5,831,876	6,678,328	7,465,851	8,154,033
Total Revenue Requirement	**180,229,899**	**179,058,267**	**177,621,002**	**176,864,074**	**175,531,814**

Note: medium term shutdowns last between 11 and 90 days however the annualised revenue requirements are shown in the table for consistency with the revenue requirements for the other modes

Table 5.5: Annualised Revenue Requirements for Long Term Shutdown Mode ($2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22
Fixed Operating Expenditure	23,621,560	23,656,967	23,817,827	23,972,132	24,284,286
Variable Operating Expenditure	-	-	-	-	-
Depreciation	48,716,971	48,757,052	48,798,178	48,790,352	48,741,445
Return on Assets	87,263,035	85,068,323	82,911,590	80,752,998	78,548,337
Return on Working Capital	782,971	772,381	751,194	749,613	737,896
Other	6,783,716	6,783,716	6,783,716	6,783,716	6,783,716
Tax Allowance (net of imputation)	4,830,910	5,831,032	6,677,441	7,464,820	8,152,928
Total Revenue Requirement	**171,999,162**	**170,869,470**	**169,739,945**	**168,513,631**	**167,248,609**

Note: long term shutdowns last between 91 and 2 years however the annualised revenue requirements are shown in the table for consistency with the revenue requirements for the other modes

Table 5.6: Comparison of Actual Revenues and Allowed Revenues for the 2012-17 Regulatory Period ($nominal)

	2012/13	2013/14	2014/15	2015/16	2016/17	Total
IPART Allowance	192,079	192,626	195,820	195,106	194,131	969,762
Actual Revenues	192,079	192,626	195,820	195,106	194,131	969,762

Note: SDP was in water security mode for the duration of the 22012-17 regulatory period.

5.2 Impact of extending assumed asset lives

[Redacted]

5.3 Regulatory asset base roll forward

Table 5.7: Regulatory Asset Base Roll Forward ($2016-17)

	2012/13	2013/14	2014/15	2015/16	2016/17
Opening Balance	2,210,261,977	2,163,166,357	2,115,634,050	2,068,347,573	2,021,147,235
Net Capex	439,224	32,189	296,390	385,050	15,000
Depreciation	47,534,843	47,564,496	47,582,867	47,585,388	47,572,298
Indexation	-	-	-	-	-
Closing Balance	2,163,166,357	2,115,634,050	2,068,347,573	2,021,147,235	1,973,589,937

Table 5.8: Notional RAB Roll Forward ($2016-17)

	2017/18	2018/19	2019/20	2020/21	2021/22
Opening Balance	1,973,589,937	1,924,099,131	1,874,267,347	1,826,493,519	1,776,627,691
Net Capex	315,000	15,000	2,115,000	15,000	15,000
Depreciation	49,805,806	49,846,784	49,888,828	49,880,828	49,830,828
Indexation	-	-	-	-	-
Closing Balance	1,924,099,131	1,874,267,347	1,826,493,519	1,776,627,691	1,726,811,862

5.4 Tax asset base roll forward

Table 5.9: Tax asset base roll forward ($nominal, $million)

	2017/18	2018/19	2019/20	2020/21	2021/22
Opening Balance	1,369.915	1,321.452	1,275.414	1,233.793	1,192.359
Capex	0.315	0.015	2.115	0.015	0.015
Depreciation	48.777	46.053	43.736	41.449	39.347
Closing Balance	**1,321.452**	**1,275.414**	**1,233.793**	**1,192.359**	**1,153.027**

5.5 Seed Advisory LGC and Electricity Trading Review

Refer separate report attached.

Appendix 6 Forecast Operating Expenditure

6.1 Forecast operating expenditure by mode

The tables below show SDP's forecast efficient costs by mode, including operation, shutdown and transition modes.

Table 6.1: Forecast operating expenditure in Water Security Mode ($2016-17, $millions)

[Numbers redacted]

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Operating and Maintenance - Total						
O&M - Plant						
O&M - Pipeline						
Energy Costs						
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**

Table 6.2: Forecast Operating Expenditure in Full Operating Mode ($2016-17, $millions)

[Numbers redacted]

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Operating and Maintenance - Total						
O&M - Plant						
O&M - Pipeline						
Energy Costs						
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**

Note: assumes production of 91.3GL/year

Table 6.3: Operating Expenditure in Short Term Shutdown Mode ($2016-17, $millions)

[Numbers redacted]

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Operating and Maintenance - Total						
O&M - Plant						
O&M - Pipeline						
Energy Costs						
Other Operating Costs	9.06	8.95	9.21	9.49	9.48	46.19
Total	**33.90**	**33.89**	**33.75**	**34.37**	**34.61**	**170.53**

Note: short term shutdowns last between 2 and 10 days however the annualised revenue requirements are shown in the table for consistency with the revenue requirements for the other modes

Table 6.4: Operating Expenditure in Medium Term Shutdown Mode ($2016-17, $millions)

[Numbers redacted]

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Operating and Maintenance - Total						
O&M - Plant						
O&M - Pipeline						
Energy Costs						
Other Operating Costs	9.06	8.95	9.21	9.49	9.48	46.19
Total	**31.84**	**31.83**	**31.68**	**32.31**	**32.55**	**160.21**

Note: medium term shutdowns last between 11 and 90 days however the annualised revenue requirements are shown in the table for consistency with the revenue requirements for the other modes

Table 6.5: Operating Expenditure in Long Term Shutdown Mode ($2016-17, $millions)

[Numbers redacted]

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Operating and Maintenance - Total						
O&M - Plant						
O&M - Pipeline						
Energy Costs						
Other Operating Costs	9.06	8.95	9.21	9.49	9.48	46.19
Total	**23.62**	**23.66**	**23.82**	**23.97**	**24.28**	**119.35**

Note: long term shutdowns last between 91 and 2 years however the annualised revenue requirements are shown in the table for consistency with the revenue requirements for the other modes

Table 6.6: Operating Expenditure for Transition to Restart from Water Security Mode (per transition event) ($2016-17, $millions)

[Numbers redacted]

	2017-18	2018-19	2019-20	2020-21	2021-22
Operating and Maintenance - Total					
O&M - Plant					
O&M - Pipeline					
Energy Costs					
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 operating mode following a Water Security shutdown. These costs are not incurred annually.

Table 6.7: Operating Expenditure for Transition to Restart from Medium Term Shutdown (per transition event) ($2016-17, $millions)

[Numbers redacted]

	2017-18	2018-19	2019-20	2020-21	2021-22
Operating and Maintenance - Total					
O&M - Plant					
O&M - Pipeline	-	-	-	-	-
Energy Costs	-	-	-	-	-
Other Operating Costs	-	-	-	-	-
Total					

Note: these costs are one-off costs incurred only when the plant is returning to operating mode following a Medium Term shutdown. These costs are not incurred annually.

Table 6.8: Operating Expenditure for Transition to Restart from Long Term Shutdown (per transition event) ($2016-17, $millions)

[Numbers redacted]

	2017-18	2018-19	2019-20	2020-21	2021-22
Operating and Maintenance - Total					
O&M - Plant					
O&M - Pipeline					
Energy Costs					
Other Operating Costs	-	-	-	-	-
Total					

Note: these costs are one-off costs incurred only when the plant is to a transitioning to operating mode following a Long Term Security shutdown. These costs are not incurred annually.

Table 6.9: Operating Expenditure for Transition to a Water Security Shutdown (per transition event) ($2016-17, $millions)

[Numbers redacted]

	2017-18	2018-19	2019-20	2020-21	2021-22
Operating and Maintenance - Total					
O&M - Plant					
O&M - Pipeline	-	-	-	-	-
Energy Costs	-	-	-	-	-
Other Operating Costs	-	-	-	-	-
Total					

Note: these costs are one-off costs incurred only when the plant is transitioning to a Water Security shutdown. These costs are not incurred annually.

Table 6.10: Operating Expenditure for Transition to a Medium Term Shutdown (per transition event) ($2016-17, $millions)

[Numbers redacted]

	2017-18	2018-19	2019-20	2020-21	2021-22
Operating and Maintenance - Total					
O&M - Plant					
O&M - Pipeline	-	-	-	-	-
Energy Costs	-	-	-	-	-
Other Operating Costs	-	-	-	-	-
Total					

Note: these costs are one-off costs incurred only when the plant is transitioning to a Medium Term shutdown. These costs are not incurred annually.

Table 6.11: Operating Expenditure for Transition to Long Term Shutdown (per transition event) ($2016-17, $millions)

[Numbers redacted]

	2017-18	2018-19	2019-20	2020-21	2021-22
Operating and Maintenance - Total					
O&M - Plant					
O&M - Pipeline	-	-	-	-	-
Energy Costs	-	-	-	-	-
Other Operating Costs	-	-	-	-	-
Total					

Note: these costs are one-off costs incurred only when the plant is transitioning to a Long Term shutdown. These costs are not incurred annually.

6.2 Advisian 2017 Price Reset Review of Operating and Maintenance Costs

Refer separate attachment.

6.3 Advisian 2017 Price Reset Water Security

Refer separate attachment.

6.4 Risk Edge Expert Opinion of the Drinking Water Quality Impacts posed by Options Identified to Maintain Shutdown of the Sydney Desalination Plant

[Redacted]

6.5 KBR Pipeline Asset Management Review

Refer separate attachment.

6.6 AON Insurance Premium Forecasts (Commercial in Confidence)

[Redacted]

6.7 Frontier Economics Report – Estimates of Long Run Marginal Cost (LRMC) of Energy and Cost of LGCs

Refer separate attachment.

6.8 Supporting information on market fees and other retail electricity costs

This appendix sets out supporting information on market fees and other retail electricity costs incurred in supply electricity to end-customers.

To recover its costs a retailer would ensure that these costs are recovered through the prices it offers to end-customers. For this reason, IPART ensures that it includes both forecasts of market fees and other retail costs in its build-up of regulated retail electricity prices.[10]

Our proposed energy costs include an ‘allowance’ for both these costs.[11] When comparing SDP’s supply contracts and proposed energy costs with other benchmarks for electricity supply (such as bundled prices for energy and LGC supply) it is necessary to ensure these costs are taken into account.

6.8.1 Other market fees and ancillary services

SDP’s contracts with Infigen include AEMO fees and ancillary services as pass through items and as such these are not included in other retail costs. Table 6.12 outlines the NEM market fees and ancillary services, both historically and estimations over the next determination period, with more detail provided on each in the sections below.

Table 6.12: Other market fees and ancillary services ($/MWh)

Cost category	2017-18	2018-19	2019-20	2020-21	2021-22
Total NEM market fees ($/MWh)	$0.48	$0.48	$0.48	$0.48	$0.48
Ancillary services ($/MWh)	$0.70	$0.70	$0.70	$0.70	$0.70
Total market fees and ancillary services ($/MWh)	$1.19	$1.18	$1.18	$1.18	$1.18

Source: SDP analysis

NEM market fees

NEM market fees are payable by retailers to AEMO on a per MWh basis, to cover the costs of operating the market. The market fees charged to participants are based on the operational expenditures of AEMO and include fees for the following functions:

- National Energy Market operational expenditure;
- Full Retail Contestability (**FRC**) electricity;
- National Transmission Planner; and
- The recovery of costs for the Consumer Advocacy panel.

As NEM market fees are based on the budgeted revenue requirement of AEMO, which is relatively stable,[12] we have taken the most recent forecasted values from AEMO across the relevant functions and assumed they remain constant into the future, as shown in Table 6.13.

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

11 However, the costs of the other retail electricity costs have not been added to the costs incurred by SDP under its supply contracts given these costs are borne by Infigen in the provision of services to SDP.

12 AEMO 2016, Fees and charges, https://www.aemo.com.au/About-AEMO/~/link.aspx?_id=D4D713C2180C47A0BEEB01994C8878F2&_z=z.

Table 6.13: NEM market fees ($/MWh)

	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Total NEM market fees ($/MWh)	$0.43	$0.48	$0.50	$0.46	$0.48	$0.48	$0.48	$0.48	$0.48	$0.48

Source: AEMO, SDP Analysis

Ancillary services

Ancillary services are those services used by AEMO to manage the power system safely, securely and reliably. Ancillary services can be grouped under the following categories:

- Frequency Control Ancillary Services (**FCAS**) are used to maintain the frequency of the electrical system;
- Network Control Ancillary Services (**NCAS**) are used to control the voltage of the electrical network and control the power flow on the electricity network; and
- System Restart Ancillary services (**SRAS**) are used when there has been a whole or partial system blackout and the electrical system needs to be restarted.

AEMO operates a number of separate markets for the delivery of FCAS and purchases NCAS and SRAS under agreements with service provides and publishes historical data on ancillary services costs on its web site.

To estimate the future cost of ancillary services we have examined the past five years of ancillary service cost data published by AEMO for the New South Wales region of the NEM. Over this period, ancillary service costs in New South Wales have been relatively stable without an obvious trend, and as such, we have used the arithmetic average over the most recent five years of available data as the best estimate for ancillary service costs for the period of the Determination. As such, the cost of ancillary services in NSW is estimated to be $0.70/MWh, as shown in Table 6.14.

Table 6.14: Ancillary services costs ($/MWh)

	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Ancillary services ($/MWh)	$0.93	$0.80	$0.55	$0.88	$0.35	$0.70	$0.70	$0.70	$0.70	$0.70

Source: AEMO, SDP analysis

6.8.2 Other retail electricity costs

There are a range of other retail energy costs that a retailer would incur when supplying energy to end-customers including SDP. These include the costs associated with:

- the NSW Energy Savings Scheme,
- any losses associated with transmitting electricity from the NSW regional reference node to the "Sydney West" transmission node and
- retail operating costs and the retail margin

The costs associated with each are summarised in Table 6.15, and discussed in more detail below. Where possible, we have developed forecasts of these other retail costs consistent with IPART's 2013 Determination. [13]

SDP's supply contracts with Infigen have an allowance for these other retail costs. When comparing SDP's supply contracts and proposed energy costs with other benchmarks for electricity supply (such as bundled prices for energy and LGC supply) it is necessary to ensure these costs are taken into account.

Table 6.15: Other retail electricity costs ($/MWh)

	2017-18	2018-19	2019-20	2020-21	2021-22
Operating cost and retail margin ($/MWh)	$8.05	$8.05	$8.05	$8.05	$8.05
Energy Savings Scheme ($/MWh)	$3.00	$3.19	$3.29	$3.29	$3.29
Losses ($/MWh)	$0.45	$0.45	$0.45	$0.45	$0.45
Total other retail costs ($/MWh)	$11.50	$11.69	$11.78	$11.78	$11.78

Source: SDP analysis

NSW Energy Savings Scheme

The NSW Energy Savings Scheme (ESS) establishes legislated annual energy savings targets for electricity retailers (and other participants). To meet their target, retailers must surrender an appropriate number of Energy Savings Certificates or pay a penalty. Retailers ESS compliance obligations are defined as a proportion of their liable NSW electricity sales in the relevant calendar year.[14] Targets under the ESS are expected to increase from 7 per cent in 2016 to 7.5 per cent in 2017, 8 per cent in 2018 and 8.5 per cent over the period 2019 to 2025.[15]

In their most recent review of regulated retail prices, IPART utilised the after-tax, base penalty price (at the time $38.70/MWh)[16] as a proxy for the price of ESCs.[17] Consistent with this decision we have assumed that the after tax penalty price will remain constant in real terms at $38.70/MWh.

As such, the costs of complying with the ESS ($/MWh) are expected to increase from $3.00/MWh in 2017-18 to $3.29/MWh by 2021-22, as shown in Table 6.16.

Table 6.16: Costs of complying with the NSW Energy Savings Scheme

Energy savings scheme	2017-18	2018-19	2019-20	2020-21	2021-22
Compliance obligation (%)	7.75%	8.25%	8.50%	8.50%	8.50%
After tax penalty price ($)	$38.7	$38.7	$38.7	$38.7	$38.7
NSW energy savings scheme ($/MWh)	$3.00	$3.19	$3.29	$3.29	$3.29

Source: IPART, ESS, SDP analysis

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

14 These calendar year compliance obligations have been converted to financial year obligations using an arithmetic average.

15 Energy Savings Scheme 2016, Targets and penalties, http://www.ess.nsw.gov.au/Scheme_Participants/Targets_and_penalties.

16 IPART p. 84

17 When the penalty price is paid, a liable entity cannot claim a tax deduction and thus the after-tax price is the most appropriate proxy for the price of ESCs.

Energy losses

In moving energy via the transmission and distribution networks to the appropriate regional reference node (in this case, "Sydney West (Ausgrid)"), retails incur costs arising from energy lost in the transportation process. The cost of these losses are calculated by multiplying the wholesale energy cost by the marginal loss factor in percentage terms for the "Sydney West (Ausgrid)" available on AEMO's website.[18] Given the relatively small changes in marginal loss factor over time and the lack of an obvious trend we have estimated the loss factor as the arithmetic average over the most recent five years of available data, as shown in Table 6.17.

To estimate the cost of energy losses in $/MWh, we apply the loss factor in percentage terms to our estimate of the contract price minus prudential costs, costs of complying with the ESS, retail operating costs and retail operating margin, ancillary costs and NEM fees.

Table 6.17: Energy losses

Energy losses	2017-18	2018-19	2019-20	2020-21	2021-22
Marginal loss factor	1.00378	1.00378	1.00378	1.00378	1.00378
Losses (%)	0.38%	0.38%	0.38%	0.38%	0.38%
Contract prices minus other retail costs ($)	$119.93	$119.73	$119.64	$119.64	$119.63
Losses ($/MWh)	$0.45	$0.45	$0.45	$0.45	$0.45

Source: AEMO, SDP analysis

Retail operating costs and margin

Retail operating costs (**ROC**) and retail operating margin (**ROM**) compensate electricity retailers for the cost associated with running their retail operations and for the risks they take in supplying customers with electricity. SDP's contracts with Infigen Energy are inclusive of ROC and ROM and Infigen Energy does not receive additional compensation for ROC and ROM. As such, to compare the costs of other options for supplying electricity to SDP, with SDP's supply contracts, ROC and ROM need to be taken into consideration.

As IPART does not provide an indication of ROC and ROM allowances for large retail customers, we have based our estimates of ROC and ROM on the Queensland Competition Authority's (QCA) determination of regulated retail prices for 2016-17. In their determination, the QCA did not distinguish between ROC and ROM, but rather provided a fixed and variable allowance for total ROC and ROM costs.

In estimating the ROC and ROM allowance, we used Tariff 48, which is for large business customers with over 4 GWh of consumption. The QCA provides an allowance of around $10,000 for the fixed component of ROC and ROM and 5.7% of total costs (excluding margin) for the variable component of ROC and ROM (applying to variable network and energy costs, but not headroom).[19]

We have excluded the fixed ROC and ROM component of $10,000 given it is immaterial on a variable basis given SDP's consumption (when operating). As such, we are only applying the variable 5.7% to non-network costs (that is, to the SDP contract price plus NEM fees and ancillary services costs). As such, we are erring on the side of providing a lower margin than the QCA provides to these very large customers.

[18] AEMO 2016, Regions and Marginal Loss Factors: FY 2016-17.

[19] QCA 2016, Regulated retail electricity prices for 2016-17, p.120.

Our estimates of retail operating costs and retail margin are shown in Table 6.18.

Table 6.18: Retail operating costs and margin ($/MWh)

Retail operating costs and margin	2017-18	2018-19	2019-20	2020-21	2021-22
Contract price plus market fees and ancillary services ($)	$133.14	$133.14	$133.14	$133.15	$133.14
Retail operating costs and margin ($/MWh)	$8.05	$8.05	$8.05	$8.05	$8.05

Source: QCA, SDP analysis

Appendix 7 Forecast capital expenditure

7.1 KBR Drinking Water Pumping Station Feasibility

Refer Appendix 6.3 Advisian 2017 Reset Water Security Appendix C

Appendix 8 Rate of Return

8.1 Frontier Economics Allowed Rate of Return for SDP

Refer separate attachment.

Appendix 9 Proposed price structure

9.1 Frontier Economics Report: Allowed rate of return when plant is inoperable

[Redacted]

Appendix 10 Proposed prices and the financial impacts of our proposed prices

10.1 SDP detailed price list

Table 10.1: Detailed price list ($2016-17)

	Unit	2017-18	2018-19	2019-20	2020-21	2021-22
Plant service charge - (exclusive of network charges)						
Full operation	$/day	398,233	395,116	390,271	389,448	386,041
Short term shutdown	$/day	399,112	395,994	391,149	390,322	386,913
Medium term shutdown	$/day	393,449	390,334	385,492	384,659	381,250
Long term shutdown	$/day	370,899	367,899	363,959	361,781	358,556
Water security mode	$/day	357,809	361,921	358,074	381,872	375,375
Transition to restart charge (per event)						
following medium term shutdown	$'000	236	236	236	236	236
following long term shutdown	$'000	13,169	13,169	13,169	13,169	13,169
following water security mode	$'000	37,272	38,402	39,372	40,232	40,982
Transition to shutdown charge (per event)						
to medium term shutdown	$'000	220	220	220	220	220
to long term shutdown	$'000	324	324	324	324	324
to water security mode	$'000	1,686	1,686	1,686	1,686	1,686
Water usage charge (exclusive of network charges)						
Water Usage charge	$/ML	688	688	688	688	688
Pipeline service charge						
Pipe service charge	$/day	100,332	100,237	99,811	99,900	99,659

10.2 Titanium Advisory Financeability Review (Commercial in Confidence)

[Redacted]