

# **Sydney Desalination Plant - Efficiency and Energy Adjustment Mechanisms**

**Water — Methodology Paper**  
April 2012



# **Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms**

**Water — Methodology Paper**  
April 2012

© Independent Pricing and Regulatory Tribunal of New South Wales 2012

This work is copyright. The *Copyright Act 1968* permits fair dealing for study, research, news reporting, criticism and review. Selected passages, tables or diagrams may be reproduced for such purposes provided acknowledgement of the source is included.

ISBN 978-1-921929-80-9

The Tribunal members for this review are:

Dr Peter J Boxall AO, Chairman

Mr James Cox PSM, Chief Executive Officer and Full Time Member

Ms Sibylle Krieger, Part Time Member

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

Amanda Chadwick (02) 9290 8414

Ken Maxwell (02) 9113 7712

Independent Pricing and Regulatory Tribunal of New South Wales

PO Box Q290, QVB Post Office NSW 1230

Level 8, 1 Market Street, Sydney NSW 2000

T (02) 9290 8400 F (02) 9290 2061

[www.ipart.nsw.gov.au](http://www.ipart.nsw.gov.au)

# Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
1.1	Review process	2
1.2	Structure of this paper	2
<b>2</b>	<b>Issues raised in submissions</b>	<b>2</b>
2.1	Energy adjustment mechanism - threshold and pass-through formula	2
2.2	Energy adjustment mechanism - gain or loss calculation: financial or calendar year basis	5
2.3	Energy adjustment mechanism - market price of RECs	5
2.4	Energy adjustment mechanism - termination of the energy adjustment mechanism	7
2.5	Energy adjustment mechanism - gain or loss on assignment or termination of energy Contracts	8
2.6	Efficiency adjustment mechanism - mode-specific pass-through	9
2.7	Efficiency adjustment mechanism - efficiency saving calculated on an incremental basis	11
<b>3</b>	<b>IPART's approach to price setting</b>	<b>12</b>
3.1	The 'building block' method	12
3.2	Strengthening SDP's incentives to make efficiency gains	13
3.3	Apportioning gains and losses on surplus energy	14
3.4	Implementing the mechanisms	14
3.5	IPART's interpretation of the methodology	15
<b>4</b>	<b>Efficiency adjustment mechanism</b>	<b>15</b>
4.1	Amended Terms of Reference	15
4.2	Scope of allowable efficiency gains and losses	16
4.3	Modes of plant operation	16
4.4	Operational principles	19
<b>5</b>	<b>Energy adjustment mechanism</b>	<b>21</b>
5.1	Amended Terms of Reference	21
5.2	SDP's exposure to gains and losses on surplus energy	22
5.3	Calculation methodology	23
<b>6</b>	<b>Incomplete final year data</b>	<b>27</b>
<b>7</b>	<b>SDP reporting requirements</b>	<b>28</b>

<b>Appendices</b>	<b>29</b>
A    Terms of Reference	31
B    Worked examples of efficiency adjustment mechanism	35
C    Worked example of energy adjustment mechanism	37
<b>Glossary</b>	<b>38</b>

# 1 Introduction

Sydney Desalination Plant Pty Limited (SDP) is the only supplier of non-rainfall-dependant drinking water in NSW. The Independent Pricing and Regulatory Tribunal of NSW (IPART) sets the maximum prices SDP can charge for its water supply services.

IPART's first determination of the prices that SDP can charge its customers was released in December 2011 and covers the period from 1 July 2012 to 30 June 2017.<sup>1</sup>

Subsequently, the NSW Government has amended the standing Terms of Reference, under which IPART sets SDP's maximum prices, for *future* price determinations to provide for:

- ▼ an efficiency adjustment mechanism, and
- ▼ an energy adjustment mechanism.

The **efficiency adjustment mechanism** will provide the opportunity for SDP to retain the benefit of an efficiency gain (or loss) for a period of 4 years following the year in which the efficiency saving was achieved before it is passed through to users in the form of lower (or higher) prices. In the absence of the efficiency adjustment, SDP would be able to retain the efficiency gain only for the remaining term of a current price determination period. Both efficiency gains and losses will be included.

The **energy adjustment mechanism** addresses SDP's risk exposure to gains and losses associated with the sale of surplus electricity and Renewable Energy Certificates (RECs). This mechanism provides for the carryover and pass-through to SDP's customers of gains or losses outside a core band from one price determination period to the next.

This Methodology Paper sets out the methodology that we intend to apply to implement these mechanisms. The changes proposed will not affect SDP's 2012 price determination, which covers the period from 1 July 2012 to 30 June 2017.

Under the Terms of Reference, future determinations of SDP's prices will be made by the Tribunal prior to the expiry of each determination.

The Terms of Reference require us to apply the methodology in implementing the mechanisms. The methodology provides guidance to stakeholders on the Tribunal's view on how these mechanisms would be implemented in the future.

IPART may update the Methodology Paper from time to time. We will consult with stakeholders before making any changes to the methodology. For future SDP price determinations, IPART will implement its efficiency and energy adjustment mechanisms policy current at that time.

---

<sup>1</sup> IPART, *Review of water prices for Sydney Desalination Plant Pty Limited, from 1 July 2012 – Determination and Final Report*, December 2011.

## 1.1 Review process

In March 2012 we released a Discussion Paper<sup>2</sup> setting out the methodology that we proposed to apply to implement these mechanisms. We invited all interested parties to make submissions in response to the proposals. We received 3 submissions from stakeholders.

## 1.2 Structure of this paper

The following chapters explain our decisions on the methodology in detail:

- ▼ Chapter 2 outlines the issues raised in submissions.
- ▼ Chapter 3 discusses IPART's approach to price setting.
- ▼ Chapter 4 sets out the methodology for the efficiency adjustment mechanism.
- ▼ Chapter 5 sets out the methodology for the energy adjustment mechanism.
- ▼ Chapters 6 and 7 discuss data issues and reporting requirements.

## 2 Issues raised in submissions

In response to our Discussion Paper, we received submissions from Sydney Desalination Plant Pty Ltd (SDP), Sydney Water and a third confidential submission.<sup>3</sup> In making our decisions, we considered all submissions to the Discussion Paper.

### 2.1 Energy adjustment mechanism - threshold and pass-through formula

#### Discussion Paper

Our Discussion Paper put forward 3 possible options for the threshold and pass-through formula in the energy adjustment mechanism.

---

<sup>2</sup> IPART, *Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms: IPART's proposed methodology*, March 2012. This paper is available on our website.

<sup>3</sup> Copies of the public submissions are available on the IPART website.



#### Option A:

**Pass through 100% of gains or losses above a 10% threshold, applied over the 5 years of the price determination period as a whole.<sup>4</sup>**

This option allows a full pass-through of gains or losses above the threshold. However, given the plant's variable operating regime and competitive energy markets, the fact that the SDP will only know whether the threshold will be reached towards the end of the price determination period provides an incentive for the efficient management of risk.

#### Option B:

**Pass through 90% of gains or losses above a 7.5% threshold, applied over the 5 years of the price determination period as a whole.<sup>5</sup>**

This option also provides an incentive for the efficient management of risks given the difficulty of predicting the plant's operation over 5 years. While the lower threshold in this option provides greater protection to SDP, this is balanced with a modest degree of risk sharing above the threshold.

#### Option C:

**Pass through 80% of gains or losses above a 10% threshold, applied on an annual basis during the price determination period.**

This option provides the same threshold as in Option A. It incorporates a larger risk sharing above the threshold compared with Option B, but has the benefit of an annual threshold test.

### Issues raised

All submissions took issue with the 3 options (A, B & C) proposed in the Discussion Paper on the grounds that the effective thresholds (the combination of threshold base and threshold percent) are set too high for the pass-through of "significant" gains or losses as stipulated in the Minister's letter to IPART.

SDP advocated an alternative option: a straight pass-through of 90% of the gain or loss on surplus electricity and Renewable Energy Certificates, calculated on a yearly basis. SDP argued that, based on its analysis, none of Options A, B & C were expected to pass through a significant gain or loss. SDP suggested that the Minister's letter clarifies that the "core band" referred to in the amended Terms of Reference should apply to gains and losses that are insignificant to SDP. SDP argued that any gain or loss that is "significant" should be passed through to customers.

---

<sup>4</sup> 4 years for the first price determination period. See section 6 below.

<sup>5</sup> 4 years for the first price determination period. See section 6 below.

## Discussion

We note the concerns of stakeholders regarding the levels of the effective thresholds under the options canvassed in the Discussion Paper. The actual magnitude of the pass-through amounts that would result under these options cannot be predicted with any precision. That will depend heavily on the rate of plant utilisation and future market prices for energy.

We acknowledge the possibility that the threshold parameters in Options A, B and C could, in a range of possible circumstances, considerably constrain the pass-through of gains and losses to customers. Also, we accept that a 5-year definition of the threshold base would increase the effective threshold during periods of high plant use.<sup>6</sup>

On the other hand, we consider it important that the formula provides an incentive for SDP to efficiently manage energy risk, consistent with the principle that risk should be allocated to the party best placed to manage that risk.

While the amended Terms of Reference require the mechanism to reduce significant energy risk to SDP, we are concerned at the lack of any materiality threshold in SDP's proposal. Specifically, that proposal may not create sufficient incentive for SDP to manage risk, particularly the incentive to prudently trade surplus energy.

In assessing the magnitude of the amounts of gains and losses that might be passed-through to consumers we need to consider not only the proportion of the gains and losses passed-through but also their size relative to SDP's energy cost exposure.

In our view, 5% of SDP's minimum energy contract cost represents a reasonable materiality threshold. Our analysis suggests that under a plausible set of assumptions for plant usage and energy prices over the next 5 years, a pass-through of 90% of gains or losses above a 5% threshold, calculated on an annual basis, would result in a majority of SDP's net gain/loss outcome being passed through to customers.

## Decision

On balance, we have decided to adopt an energy adjustment mechanism which passes through 90% of gains or losses above a threshold of 5% of minimum contract cost, applied on an annual basis during the price determination period.

This threshold formula is lower than any of the options we proposed in our Discussion Paper. It will provide greater protection to SDP against uncontrollable costs. At the same time, the 90% pass-through rate above the threshold provides a modest degree of risk sharing and an incentive to efficiently manage risks.

---

<sup>6</sup> Plant use in one or more years reduces the scope for surplus energy and hence the scope for gains and losses but there is no corresponding reduction in the threshold base.

## **2.2 Energy adjustment mechanism - gain or loss calculation: financial or calendar year basis**

### **Discussion Paper**

We proposed that gains and losses be calculated on a financial year basis, commencing 1 July 2012.<sup>7</sup>

### **Issue raised**

SDP proposes<sup>8</sup> instead that the pass-through be calculated on a calendar year basis to match the calculation of electricity shortfall amounts under SDP's electricity contract. SDP argues that if the pass-through is calculated on a financial year basis, there may be some misalignment between the pass-through amount and the amount that SDP incurs under its electricity contract.

### **Discussion**

Calculation on a financial year basis, commencing 1 July 2012, was proposed to align the commencement of the energy adjustment mechanism with the 2012 price determination period. Calculation on a financial year basis provides consistency and transparency with SDP's 2012 price determination which also applies on a financial year basis.

### **Decision**

We have decided to calculate gains and losses on a financial year basis, commencing 1 July 2012.

## **2.3 Energy adjustment mechanism - market price of RECs**

### **Discussion Paper**

We proposed to calculate the RECs Resale Gain or Loss in a manner similar to that for electricity in which case the market price may reflect either a spot price or a forward contract price.<sup>9</sup>

---

<sup>7</sup> IPART, *Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms: IPART's proposed methodology*, March 2012, p 17.

<sup>8</sup> SDP submission to IPART Discussion Paper, April 2012, p 9.

<sup>9</sup> IPART, *Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms: IPART's proposed methodology*, March 2012, p 14.

We also proposed to treat any unrealised gains or losses arising from the ‘banking’ of surplus RECs as if they were sold at the time of banking similar to the calculation of the Shortfall Adjustment in SDP’s Electricity Supply Agreement. SDP will experience an economic gain or loss on surplus RECs depending on the market price at the time relative to the contract price irrespective of whether or not the surplus RECs are sold at the time the RECs become surplus. We consider that including any unrealised gains or losses in the energy adjustment mechanism to be consistent with the intent of and principle of symmetry in the Terms of Reference.

### **Issues raised**

SDP submitted that the point in time at which the surplus RECs are assumed to have been sold needs to be defined.

SDP recommends<sup>10</sup> that the market price of surplus RECs be assumed to be the spot price at the time that SDP receives its surplus RECs from Infigen. Under this approach, the market price of RECs would be defined as the time weighted average of the “last / mkt” prices specified in A\$/MWh for “all spot T+3” transactions of “LGCs (LRETs)” occurring in the final month of each calendar quarter, as published in the Greenroom report (or equivalent).

SDP argued that it is not appropriate under this approach to also adopt a forward contract price for RECs as the assumed market price, as suggested in IPART’s draft paper.

### **Discussion**

We agree that the point in time at which the surplus RECs are assumed to have been sold needs to be defined and we accept SDP’s proposed definition as the default position.

However, as SDP acknowledges, SDP may influence some control over the quantum of gains or losses on the sale of surplus RECs. It may do this by selling surplus RECs at a time when market prices are high and by releasing RECs in blocks that are not so large as to depress the market.

SDP may also utilise banked RECs in a future period when the plant is operational. In this case, SDP may realise a gain or loss to the extent that the market price at the future time of use differs from the acquisition price.

The energy adjustment mechanism should encourage SDP to manage and mitigate the risk of loss in this way. The benefits of risk mitigation should be included in the calculation of gains and losses for potential pass-through to customers. Under SDP’s proposal, the gains from risk management and future use would be fully retained by

---

<sup>10</sup> SDP submission to IPART Discussion Paper, April 2012, p 13.

SDP and not be available for sharing with customers. In our view, the outcome of risk mitigation should be included in the calculation of gains and losses and be subject to the threshold and pass-through formula.

## **Decision**

We will calculate the overall annual gain or loss on surplus RECs as the net amount of 2 components.

Firstly, we will calculate a hypothetical gain or loss on the assumption that all surplus RECs acquired in the year are sold at the time of receipt at the spot price (using the definition recommended by SDP), at the time SDP receives the surplus RECs.

Secondly, we will adjust the hypothetical gain or loss to take account of realised gains or losses for RECs during the year that are not sold at the spot as assumed in the hypothetical calculation. These realised gains or losses will be calculated relative to the spot price assumed in the hypothetical calculation.

## **2.4 Energy adjustment mechanism - termination of the energy adjustment mechanism**

### **Discussion Paper**

Our Discussion Paper proposed<sup>11</sup> that the energy adjustment mechanism would not apply if the Infigen Contracts are:

1. assigned to a third party, or
2. terminated.

### **Issues raised**

In its submission, SDP states:

SDP does not agree that the adjustment mechanism should not apply if the Infigen Contracts are assigned to a third party. SDP can only assign the contracts, with Infigen's consent, to a party who purchases all of SDP's interest in the desalination plant. That party will continue to require the contracts to operate the plant and to meet the conditions of the plant's Planning Approval. Further, the terms of the contracts will not change. As such, the mechanism will still be required. The contracts could also be assigned to an alternative provider of electricity and RECs. However, the terms of the contracts would remain and, again, the mechanism would still be required.<sup>12</sup>

---

<sup>11</sup> IPART, *Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms: IPART's proposed methodology*, March 2012, p 17.

<sup>12</sup> SDP submission to IPART Discussion Paper, April 2012, p 14.

## Discussion

We agree that the mechanism should continue to apply in the event that Infigen assigns the contracts to an alternative provider of electricity or RECs. SDP has also requested that the mechanism continue to apply in the event that SDP assigns the contracts to a person who purchases SDP's entire interest in the Desalination Plant. We do not see any reason why the mechanism should not apply in such circumstances.

## Decision

We have decided that the methodology should specify that the energy adjustment mechanism will cease to apply from the date of the termination, assignment or novation (as the case may be) in the event that:

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

Notwithstanding the above, any loss or gain accruing to SDP as a result of assignment, termination or novation will be subject to the mechanism.

## 2.5 Energy adjustment mechanism - gain or loss on assignment or termination of energy Contracts

### Discussion Paper

We proposed<sup>13</sup> that any loss or gain accruing to SDP as a result of the assignment or termination of one of the Infigen Contracts – including any payment received or made by SDP – will be subject to the energy adjustment mechanism.

In the event that SDP makes or receives a payment as a result of the assignment or termination of a contract, IPART may, at its discretion and having regard to the materiality of the payment, apportion the loss or gain over the remaining term of the current contract for purposes of the energy adjustment mechanism.

---

<sup>13</sup> IPART, *Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms: IPART's proposed methodology*, March 2012, p 18.

### **Issue raised**

SDP agrees<sup>14</sup> that gains or losses on termination of the contracts should be subject to the mechanism. However, SDP submits that the amount subject to the mechanism should be the net gain or loss after SDP has satisfied all of its working capital funding obligations pending recovery of those losses through the energy adjustment mechanism.

### **Discussion**

The energy adjustment mechanism compensates for the time value of money by applying an interest rate to increase those gains or losses eligible for pass-through as the case may be at the end of each year. We agree that the mechanism should allow for financing costs on any amounts eligible for pass-through.

### **Decision**

We have decided to amend the proposed methodology to state:

Any net loss or gain accruing to SDP as a result of the assignment or termination of one of the Infigen Contracts – including any payment received or made by SDP – will be subject to the energy adjustment mechanism. We will allow for financing costs on any such amount eligible for pass-through at the financing interest rate specified at Section 5.3.3.

## **2.6 Efficiency adjustment mechanism - mode-specific pass-through**

### **Discussion Paper**

We proposed<sup>15</sup> that the efficiency adjustment mechanism would apply on an operational mode-specific basis. However, to the extent that SDP can demonstrate that gains/losses are not directly attributable to a particular mode, the carryover amounts may be apportioned across all relevant modes in the next price determination period.

---

<sup>14</sup> SDP submission to IPART Discussion Paper, April 2012, p 14.

<sup>15</sup> IPART, *Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms: IPART’s proposed methodology*, March 2012, p 7.

## Issues raised

SDP's recommends<sup>16</sup> that IPART adopt a *non-mode specific* pass-through for the efficiency sharing mechanism:

- ▼ SDP submits that this would be consistent with the Terms of Reference which say SDP should carryover efficiency savings for 4 years to give SDP an incentive to make those savings.
- ▼ SDP suggests that under a mode-specific pass-through, it will not be able to keep efficiency savings for 4 years, if those 4 years cross 2 regulatory periods and there is a change in the mode of operation of the plant (assuming SDP cannot demonstrate that the saving is applicable to all modes).
- ▼ SDP also suggests that it may choose not to invest in efficiency savings measures on the basis that it has little certainty about the extent to which it will benefit.

Further, within a price determination period, SDP submits that a backwards looking adjustment to prices would be required to allow SDP to realise savings achieved within a regulatory period where there is a change in operation within that period.

## Discussion

The reasons for adopting a mode-specific mechanism were set out in the Discussion Paper and in Section 4.3 below.

Our concern with a non-mode-specific mechanism is that it can deliver a financial benefit in a period in which no efficiency saving is made. As shown in the case study in Section 4.3, a non-mode specific mechanism may result in SDP receiving an financial benefits that exceed that needed to equalise the incentive to make efficiency gains across all years of the price determination period.

SDP has interpreted the Terms of Reference as conferring an entitlement to a benefit, equal to the amount of an efficiency saving in any one year, for each of the following 4 years *irrespective of whether or not the efficiency continues to be realised in those 4 years*. However, the Terms of Reference provide an entitlement "to carryover" demonstrated efficiency savings for the following 4 years following the year in which the efficiency saving was achieved.<sup>17</sup> The worked examples in the Discussion Paper (and in Appendix B of this paper) make it clear that the carryover amounts do not give rise to any additional financial benefit in the current price determination period and are only applied to the relevant mode of operation in the next price determination period.

---

<sup>16</sup> SDP submission to IPART Discussion Paper, April 2012, p 14.

<sup>17</sup> A carryover is "an item transferred to the next group or column in accounts or in a calculation" *Encarta Dictionary*.



Nonetheless, our proposed mode-specific methodology allows for carryover amounts to be applied to all modes where SDP can demonstrate that gains/losses are applicable to all modes.

## Decision

We have decided not to change the efficiency adjustment methodology proposed in the Discussion Paper.

## 2.7 Efficiency adjustment mechanism - efficiency saving calculated on an incremental basis

### Discussion Paper

We proposed<sup>18</sup> that an annual efficiency gain/loss be calculated on an incremental basis. That is, that it be calculated as the difference between adjusted benchmark costs and adjusted actual cost in each year of the determination period less the difference in the previous year.

### Issues raised

SDP considers<sup>19</sup> that this reduces the proportion of the saving that SDP may retain. Further, SDP submits that it is not clear why an incremental calculation is warranted. SDP states that if, for example, it achieves a 5% annual saving through contract renegotiation it is not clear why it should only realise that saving for 1 year rather than 4.

### Discussion

Other regulators calculate operating expenditure efficiencies on an incremental basis.<sup>20</sup>

The worked examples in the Discussion Paper illustrated the operation of the incremental calculation. They show that in the case of a permanent (ongoing) efficiency saving, the incremental calculation allows for an equivalent benefit to SDP for all 4 years after the saving is initially realised for an operational mode in continuous operation.

---

<sup>18</sup> IPART, *Sydney Desalination Plant – Efficiency and Energy Adjustment Mechanisms: IPART’s proposed methodology*, March 2012, p 9.

<sup>19</sup> SDP submission to IPART Discussion Paper, April 2012, p 16.

<sup>20</sup> See Queensland Competition Authority, *Issues Paper: Efficiency Carryover Mechanism*, September 2004, p 5 and Australian Energy Regulator, *Electricity distribution network service providers, Efficiency benefit sharing scheme, Final decision*, June 2008.

The following table shows the calculation of the carryover mechanism on an incremental basis in the case of an efficiency saving of 5% in year 2 of a 5-year price determination period.

**Table 2.1 Example of carryover mechanism - permanent 5% efficiency gain (\$)**

Year	1	2	3	4	5	6	7	8	9	10
Planned expenditure	100	100	100	100	100	95	95	95	95	95
Actual expenditure	100	95	95	95	95					
Gain/loss	0	5	5	5	5					
Incremental gain/loss	0	5	0	0	0					
Efficiency carryover										
Year1		0	0	0	0					
Year2			5	5	5	5				
Year3				0	0	0	0			
Year4					0	0	0	0		
Year5						0	0	0	0	
Carry forward amounts						5	0	0	0	0
Expenditure used for pricing purposes	100	100	100	100	100	100	95	95	95	95

Table 2.1 shows that in this example the business receives a benefit in years 2, 3, 4 and 5 of the current price determination period (because prices are not reset in that period) as well as a carryover benefit in year 6. All up, the business benefits for 4 years after the saving is realised using an incremental calculation – not for only 1-year as suggested by SDP.

## Decision

We have decided not to change the efficiency adjustment methodology proposed in the Discussion Paper.

## 3 IPART’s approach to price setting

### 3.1 The ‘building block’ method

In our determination of water prices for SDP, from 1 July 2012, we used the standard ‘building block’ approach to price setting. Under this method, an agency’s revenue requirement is the sum of a number of building blocks, including a return on capital, a return of capital (also known as depreciation) and operating expenditure.

For the 2012 SDP determination, we adapted our normal building block method to allow for the variable operating regime stipulated in the *2010 Metropolitan Water Plan* and SDP's *Water Industry Competition Act 2006* (NSW) (WICA) network licence. SDP's operating costs will vary depending on whether it is in full operation mode or in one of its 4 shutdown or restart modes. As a result, its annual notional revenue requirement will vary, depending on the proportion of time the plant is in full operation or in one of its shutdown or restart modes during that particular year.

For each year in the price determination period, we calculated a notional daily revenue requirement when the plant is in full operation mode using our standard approach. We also calculated a notional daily revenue requirement when the plant is in each of the shutdown modes.

An important property of the building block method is that it provides an incentive for utilities to make efficiency improvements above and beyond those incorporated in forecast or planned costs. It does this by setting prices based on forecast efficient costs at the time of the determination and so delinking the price path from the course of actual costs. During the period of the price determination, prices are not adjusted if actual costs are lower or higher than forecast. The business retains the benefit or detriment for the remaining term of the price determination period.

A key determinant of the shape and strength of the incentive created is the time period over which the delinking occurs. Prices are reset in the following price determination period to reflect costs that are expected to be incurred in that period, including any efficiency gains that flow through to that price determination period. Savings are passed on to consumers via lower prices from the start of the next price determination period. As a result, the incentive for efficiency savings diminishes as the price determination period proceeds.<sup>21</sup>

### **3.2 Strengthening SDP's incentives to make efficiency gains**

We consider it important that SDP has incentives to continually strive to improve its efficiency. Based on advice from the recently established National Centre of Excellence in Desalination and a submission from Degremont Ltd<sup>22</sup>, we consider there are opportunities for it to make efficiency gains.

In the course of our price determination for SDP we recommended that the Minister for Finance and Services include an efficiency carryover mechanism in the standing Terms of Reference for future reviews of SDP's prices.<sup>23</sup> Such a mechanism would provide an opportunity for SDP to retain any efficiency savings it makes for a period of 4 years after the gain is realised regardless of when in the regulatory cycle the

---

<sup>21</sup> IPART, *Incentives for cost savings in CPI-X regimes*, Mahoney, Jorgensen and Clay, Working Paper, July 2011.

<sup>22</sup> Degremont Ltd submission to SDP Price Review, 31 August 2011.

<sup>23</sup> Letter to Minister Greg Pearce from Mr Jim Cox, 18 November 2011.

savings are achieved. At the end of that period, the benefits of cost savings would be shared with customers through lower prices.

The efficiency adjustment mechanism seeks to ensure that the share of the gain that is retained by SDP remains the same regardless of the timing of the initial efficiency gain.

### **3.3 Apportioning gains and losses on surplus energy**

SDP has entered into long-term contracts to acquire fixed minimum volumes of electricity and RECs at fixed prices. In our 2012 price determination, we decided to adopt benchmark estimates of efficient energy costs rather than base our calculations on the contracts that exist between SDP and Infigen Energy Limited.

The contracts that SDP entered into provide price certainty against fluctuations in the market price of electricity when SDP is consuming energy because they provide for enough energy to run the plant at full capacity. However, when the plant is not operating, the minimum quantity of electricity under the contract applies and SDP is exposed to the risk of reselling electricity that is not needed at an uncertain price.

When the market price of electricity is below the contract price, SDP incurs a loss on the resale of surplus electricity. On the other hand, in the event that the market price exceeds the contract price, SDP makes a gain on the resale of surplus electricity.

At the time of drafting this paper, the market price of electricity was below the contract price. However, this may change over time. Under SDP's long-term electricity contract the electricity price is fixed in real terms for 20 years and adjusted only for inflation.

The NSW Government has decided that not all of SDP's gains and losses on surplus energy should remain with SDP. The Government has asked IPART to develop a methodology for calculating gains and losses outside a core band associated with the resale of surplus electricity and RECs when the desalination plant is in a Shutdown Mode or Restart Period (and complying with the plant's operating rules under the Metropolitan Water Plan) which are to be carried over and be available for pass-through to prices in the next price determination period.

### **3.4 Implementing the mechanisms**

The efficiency adjustment mechanism and the energy adjustment mechanism have different purposes and incentive properties. While they have some common features in their implementation, we propose to calculate each mechanism separately. IPART will publish the separate adjustments for each mechanism.

Each mechanism will comprise a carryover adjustment from one price determination period to the next. At the time of each future price determination, IPART will decide the amounts, if any, to be carried over due to the efficiency adjustment mechanism and the energy adjustment mechanism for purposes of adjusting the notional revenue requirement. The notional revenue requirement will be used to calculate prices in the following price determination period. The pass-through amounts for each mechanism will be calculated independently of each other and could result in the notional revenue requirement being higher, lower or unchanged from what might otherwise be the case.

### **3.5 IPART's interpretation of the methodology**

Given the range of circumstances that may occur, IPART as constituted from time to time will necessarily need to exercise its judgment in applying the methodology to the facts as they arise from time to time.

## **4 Efficiency adjustment mechanism**

There is potential for efficiency improvements that have not been anticipated in the 2012 SDP price determination. We would like SDP to harness such improvements. We have developed an efficiency adjustment mechanism that encourages the realisation of efficiency gains by ensuring that the benefit of an efficiency gain is available for 4 years after the year in which it is achieved.

The objective of the proposed efficiency adjustment mechanism 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. By encouraging the early adoption of efficiency gains the efficiency adjustment mechanism is designed to facilitate price reductions earlier than would otherwise be the case. It will fairly share the efficiency gains achieved by SDP between users and SDP while equalising across all years of the price determination period the incentive to make efficiency gains.

### **4.1 Amended Terms of Reference**

On 16 February 2012, the Minister for Finance and Services amended the standing Terms of Reference<sup>24</sup> for Referral of Sydney Desalination Plant Pty Ltd to IPART under Section 52 of the *Water Industry Competition Act 2006* (NSW) to provide for an efficiency adjustment mechanism as follows:

8. For each *price determination* other than the first price determination:
  - i. SDP should be allowed to carryover demonstrated efficiency savings, net of efficiency losses, in operating expenditure in providing the water supply services

---

<sup>24</sup> The full Terms of Reference are in Appendix A.

specified at (a) and (b) above for a period of 4 years following the year in which the efficiency saving was achieved.

- ii. In calculating the notional revenue requirement, IPART should determine the demonstrated efficiency savings and treatment of energy gains or losses in accordance with the Methodology Paper.

## 4.2 Scope of allowable efficiency gains and losses

For the purposes of the efficiency adjustment mechanism, efficiency refers to SDP's internal productive efficiency. Productive efficiency is achieved when a firm uses the lowest amount of resources to produce at lowest unit cost. Energy efficiency, for example, refers to using less energy to produce the same output.

Only efficiency gains and losses directly attributable to management initiatives are allowable for the purposes of the efficiency adjustment mechanism. Windfall gains, for example, arising from a reduction in the market price of an input are excluded. Losses arising from cost increases that are not controllable by management are also excluded.

## 4.3 Modes of plant operation

SDP is required to operate the desalination plant in line with a variable regime stipulated in the *2010 Metropolitan Water Plan*. The plant must be in full operation whenever the Sydney region's total available dam storage level (available storage) is below 70%, and continue to operate only until this level exceeds 80%. The plant's modes include:

- ▼ Full operation when the plant operates at full production.
- ▼ Short term shutdown for 2 to 10 days.
- ▼ Medium term shutdown for 11 to 90 days.
- ▼ Long term shutdown for 91 days to 2 years.
- ▼ Water security shutdown for more than 2 years.

The efficiency adjustment mechanism also applies on an operational mode-specific basis. Efficiency gains and losses will be measured for each operating mode on a daily basis. This will remove any impacts on measured efficiency arising from changes in the scale or mode of SDP's operations.

Under a mode-specific approach, gains or losses generated from a particular mode will, in principle, only be available to be applied against the same mode in the future under the efficiency adjustment mechanism.

Where an efficiency gain or loss is directly attributable to a particular mode of operation, the carryover amounts will be tied to that mode. As a practical matter, the carryover will only apply if, or to the extent that, that particular mode is used during the carryover period. For example, if a mode-specific efficiency gain were made in year 3 of a 5-year price determination period, it would give rise to a potential carryover benefit for years 1 and 2 of the next price determination period but would only take effect to the extent that that particular mode operates during those 2 years.

We have considered an alternative non-mode-specific approach. Under this approach, an efficiency gain in a particular mode would lead to a carryover benefit for all modes during the carryover period – irrespective of whether or not the efficiency gain is actually being realised. We have adopted the mode-specific method because our objective is to equalise the incentive to make efficiency gains across all years of the price determination period. Under a non-mode-specific method, the gain share to SDP from an efficiency gain in the latter period of the cycle could exceed the share needed to neutralise the original counter incentive at that time.

Table 4.1 presents the results of a case study considering the position where gains are made at different times within the price determination period. For this example, we assume that the plant is in operational mode for only 2 years of each period and, for simplicity, assume that the operational mode occurs in the same 2 years of each period. For simplicity, we assume that there are only 2 modes – operational and shutdown. In each scenario, we assume that SDP makes an ongoing efficiency gain in the operational mode which has no impact on costs in the shutdown mode.

#### Scenario 1

The plant is operational only in years 1 and 2 of each 5-year period. SDP makes a gain in year 1. It retains the benefit of that gain during the first 5-year period – but effectively only for the 2 years of plant operation. There is no carryover benefit in the next period because of the 4-year limit on carryovers. Prices are reset to the newly observed efficient level from year 6.

#### Scenario 2

The plant is operational only in years 3 and 4 of each 5-year period. SDP makes a gain in year 3. It retains the benefit of that gain during the first 5-year period – but effectively only receives the benefit in the 2 years of operation. The carryover limit now extends to year 6. There is no carryover benefit in the next period under a mode-specific mechanism because the plant is not in operational mode in year 6. However, under an unrestricted carryover mechanism there would be a carryover benefit to SDP in year 6 (although no gain is actually realised in that year).

### Scenario 3

The plant is operational only in years 4 and 5 of each 5-year period. SDP makes a gain in year 4. It retains the benefit of that gain during the last 2 years of the first 5-year period when the plant is operational. The potential carryover benefit now extends to year 3 in the next period but there is no actual carryover benefit in the next period under a mode-specific mechanism because the plant is not in operational mode until year 4 of that period. However, under an unrestricted carryover mechanism, there would be a carryover benefit to SDP in years 1, 2 and 3 of the next period (although no gains are actually realised in those years).

Table 4.1 shows that, under a mode-specific mechanism, SDP's benefit is equal to 29% of the total lifetime gain under each scenario.<sup>25</sup> However, under a non-mode-specific carryover mechanism, the gain share to SDP is also 29% in scenario 1 but increases to 65% in Scenario 3. The gain share to SDP from a gain in the latter period of the cycle under a non-mode-specific mechanism exceeds the share needed to neutralise the counter incentive towards the end of the regulatory period.

**Table 4.1 Efficiency adjustment mechanism - case study**

Scenario	Plant operational in:	Efficiency gain made in:	Gain share to SDP <sup>a</sup>	
			Mode-specific pass-through	Non-mode specific pass-through
1	Years 1 & 2	Year 1	29%	29%
2	Years 3 & 4	Year 3	29%	52%
3	Years 4 & 5	Year 4	29%	65%

<sup>a</sup> Ratio of NPV of efficiency benefit accruing to SDP to the NPV of the total efficiency benefit in perpetuity (discounted at 7% pa).

Nonetheless, we acknowledge that an efficiency gain that arises in a particular mode may also apply in other modes. To the extent that SDP can demonstrate that gains/losses are not unique to the mode in which they arose, the carryover gains/losses will be apportioned across all relevant modes as appropriate in the next price determination period.

<sup>25</sup> SDP's lifetime gain share is calculated as the ratio of the NPV of the efficiency benefit accruing to SDP to the NPV of the total efficiency benefit in perpetuity (discounted at 7% pa).



## 4.4 Operational principles

The SDP efficiency adjustment mechanism has a number of features in common with the Efficiency Benefit Sharing Scheme developed by the Australian Energy Regulator for electricity distribution network service providers<sup>26</sup> as well as efficiency carryover mechanisms developed by other regulators.<sup>27</sup>

The starting point for analysis will be the calculation, for each year of a price determination period, of a gross gain or loss. This will be calculated as the difference between the level of benchmark costs in our price determination for that year for the relevant operational mode and the actual cost incurred. The gross gain or loss will be adjusted to remove the effects of factors not relevant to SDP's internal productive efficiency.

An annual efficiency gain/loss will be calculated on an incremental basis. That is, it will be calculated as the difference between adjusted benchmark costs and adjusted actual cost in each year of the determination period less the difference in the previous year.<sup>28</sup>

The incremental efficiency gain/loss will be available for a period of 4 years after the year in which it was first realised. Incremental efficiency carryover gains/ losses falling within the *current* price determination period will not affect prices in that period. However, efficiency carryover gains/losses falling within the *next* price determination period will affect prices for applicable modes for the balance of the carryover period. For each year of the next price determination period, the annual carryover amounts from each year of the previous period will be summed to determine the adjustment to notional revenue.

The key features of the SDP efficiency adjustment mechanism are:

- ▼ 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 efficiency adjustment mechanism 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 efficiency adjustment mechanism applies only to operating expenditure, and not to capital expenditure.

---

<sup>26</sup> Australian Energy Regulator, *Electricity distribution network service providers, Efficiency benefit sharing scheme, Final decision*, June 2008.

<sup>27</sup> Queensland Competition Authority, *Issues Paper: Efficiency Carryover Mechanism*, September 2004.

<sup>28</sup> Modifications to this calculation are made to the first year of the determination period – See Appendix B.

- ▼ 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 outlined in this paper. 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 energy adjustment mechanism.
- ▼ Efficiency carryover amounts will be indexed for inflation.
- ▼ An efficiency gain will only be recognised where it can be demonstrated that SDP has reduced costs without any deterioration in service quality.

We will examine SDP's reasons for differences between the actual and benchmark costs to assess whether the differences are attributable to SDP's direct action or to external factors. We will make decisions on:

- ▼ whether there has been a net gain/loss in efficiency
- ▼ the quantum of the gain/loss and the year in which it was made
- ▼ the modes of the plant to which that gain/loss applies
- ▼ the extent to which the modal gain/loss is directly attributable to that mode.

At the next price reset, IPART will set prices for each mode based on efficient costs. For each year, we will:

- ▼ add the value of the carryover gain/loss *directly attributable to that mode*, indexed for inflation, to the daily notional revenue requirement of that mode and
- ▼ apportion the value of the carryover gain/loss *not directly attributable to that mode*, indexed for inflation, to the daily notional revenue requirement for all modes.

Appendix B provides worked examples of the calculation of the efficiency carryover mechanism.

## 5 Energy adjustment mechanism

The energy adjustment mechanism provides for a sharing of gains and losses on the resale of surplus energy between SDP and its customers. Under the mechanism, eligible gains or losses associated with surplus energy are carried forward to the next price determination period and passed through to SDP's customers.

### 5.1 Amended Terms of Reference

On 16 February 2012 the Minister for Finance and Services amended the standing Terms of Reference<sup>29</sup> for Referral of Sydney Desalination Plant Pty Ltd to IPART under Section 52 of the *Water Industry Competition Act 2006* (NSW) to provide for efficiency adjustment mechanism as follows:

8. For each *price determination* other than the first price determination:
  - iii A mechanism(s) is required to allocate the costs or benefits to SDP customers (in Sydney Water's area of operation) of actual gains or losses beyond a core band that result from the difference between SDP's costs of electricity and RECs under its contracts with Infigen and revenues from the sale of surplus electricity and RECs. The mechanism would only operate at times when:
    - the desalination is in Shutdown or in a Restart Period; and
    - SDP complied with its requirements to maintain and operate the desalination plant under clause A2 of its network operators licence.

The Minister further advised that:

For clarity, the intention of the proposed energy adjustment mechanism is that:

1. It would only apply to electricity and RECs that are not required by SDP when the desalination plant is not in full operation mode when complying with the plant's operating rules, as established by the Metropolitan Water Plan and subsequently included in SDP's Network Operators Licence under the Water Industry Competition Act.
2. It would ensure that SDP customers for water (in Sydney Water's Area of Operations) receive the benefit of significant gains and bear significant losses incurred as a result of the difference between the cost of electricity and RECs under SDP's contracts with Infigen and the market price for electricity and RECs arising from the sale of SDP's surplus electricity and RECs (in the circumstances described in point 1).
3. For electricity, the mechanism would mirror the 'Calculation of Shortfall Adjustment' in SDP's Electricity Supply Agreement with Infigen, with the 'market price' defined as the half-hourly spot price and/or the price of a contracted 'available block'.

---

<sup>29</sup> The full Terms of Reference are in Appendix A.

4. For RECs, the 'market price' would be the price shown in the Nextgen Greenroom Report, or another equivalent report.<sup>30</sup>

## 5.2 SDP's exposure to gains and losses on surplus energy

Desalination is an energy intensive process and the costs of energy are a significant proportion of SDP's operating costs.

Electricity for the desalination plant is provided under a contract<sup>31</sup> between SDP and Infigen Energy Markets Pty Ltd, which is a subsidiary of Infigen Energy Limited. SDP states that the conditions of the Electricity Supply Agreement include:

- ▼ a 20-year term
- ▼ fixed real prices
- ▼ no pass-through of any future tax, levy, impost or charge relating to greenhouse gas or carbon emissions
- ▼ no pass-through of any cost arising from the introduction or operation of any emissions trading scheme
- ▼ a contracted annual volume sufficient to support full operations at the desalination plant
- ▼ the ability to sell load back to the market if electricity demand is lower than forecast.<sup>32</sup>

SDP also has agreements<sup>33</sup> with Renewable Power Ventures Pty Ltd, another subsidiary of Infigen Energy Limited, for the supply of RECs to offset the power used by the desalination plant.<sup>34</sup> The RECs are supplied by the Capital Wind Farm at Bungendore near Canberra, which was built and is operated and maintained by Renewable Power Ventures under a 20-year project deed with SDP.

SDP reports that the RECs are sold to SDP under a 20-year Renewable Energy Certificate Agreement, which provides for the supply of RECs at fixed real prices. The agreement includes a minimum annual number of RECs that SDP must purchase.<sup>35</sup> Any surplus RECs may be sold in the market.

---

<sup>30</sup> Letter to IPART 16 February 2012.

<sup>31</sup> Publicly available versions of the contracts can be accessed at [www.sydneywater.com.au/water4life/Desalination/overalldocumentation.cfm](http://www.sydneywater.com.au/water4life/Desalination/overalldocumentation.cfm) (under desalination renewable energy contracts).

<sup>32</sup> SDP submission to IPART's review of prices, p 3.

<sup>33</sup> Publicly available versions of the contracts can be accessed at [www.sydneywater.com.au/water4life/Desalination/overalldocumentation.cfm](http://www.sydneywater.com.au/water4life/Desalination/overalldocumentation.cfm) (under desalination renewable energy contracts).

<sup>34</sup> SDP submission to IPART's review of prices, p 3.

<sup>35</sup> Ibid, p 3.

## 5.3 Calculation methodology

### 5.3.1 Resale Gain or Loss

For each financial year, we will calculate SDP's Resale Gain or Loss for both electricity and RECs as:

Where actual volume is less than the minimum contract volume,

Electricity Resale Gain or Loss = (minimum contract volume less actual volume)  
X (market price less contract price)

RECs Resale Gain or Loss = (minimum contract volume less actual volume)  
X (market price less contract price)

We will sum Resale Gain or Loss for electricity and RECs to calculate the Combined Energy Resale Gain or loss.

#### Relationship to Shortfall Adjustment in SDP's electricity contract

In calculating the Electricity Resale Gain or Loss we will follow the definitions and procedures specified in the 'Calculation of Shortfall Adjustment' in SDP's Electricity Supply Agreement with Infigen Energy Limited to the extent consistent with the methodology specified in this paper.

Note however that the Combined Resale Loss or Gain may differ from the Shortfall Adjustment in the SDP contract as a result of:

- ▼ the inclusion of RECs
- ▼ restriction to Shutdown and Restart modes of operation according to the *2010 Metropolitan Water Plan*
- ▼ allowance for financing costs (see below)
- ▼ timing differences (financial year vs. calendar year and the treatment of the final year of each price determination period – see below).

#### RECs

In calculating the annual gain or loss on surplus RECs we will take into account any unrealised gains or losses arising from the 'banking' of surplus RECs. SDP will experience an economic gain or loss on surplus RECs depending on the market price at the time relative to the contract price irrespective of whether or not the surplus RECs are sold at the time the RECs become surplus. We consider that the inclusion of any unrealised gains or losses in the energy adjustment mechanism to be consistent with the intent of and principle of symmetry in the Terms of Reference.

We will calculate the overall annual gain or loss on surplus RECs as the net amount of 2 components:

Firstly, we will calculate a hypothetical gain or loss on the assumption that all surplus RECs acquired in the year are sold at the time of receipt at the spot price<sup>36</sup> at the time SDP receives the surplus RECs.

Secondly, we will adjust the hypothetical gain or loss to take account of realised gains or losses for RECS during the year that are not sold at the spot as assumed in the hypothetical calculation. These realised gains or losses will be calculated relative to the spot price assumed in the hypothetical calculation.

### **5.3.2 Threshold and pass-through formula**

The energy adjustment threshold and pass-through formula determines the allocation of gains and losses on surplus energy between SDP and its customers. The formula will determine the Excess Energy Resale Gain or the Excess Energy Resale Loss as the case may be at the end of each year for pass-through to SDP's customers.

We consider it important that the formula provides an incentive for SDP to efficiently manage energy risk, consistent with the principle that risk should be allocated to the party best placed to manage that risk, while at the same time reducing significant energy risk to SDP as required by the amended Terms of Reference.

For the purpose of determining the carryover and pass-through of gains and losses associated with surplus energy, we will set a threshold as a set percentage of the sum of:

- ▼ the contract cost of the minimum contract volume for electricity and
- ▼ the contract cost of the minimum contract volume for RECs.

The energy adjustment will pass-through 90% of gains or losses above a 5% threshold of minimum contract cost, applied on an annual basis in the price determination period.

A worked example of the energy adjustment threshold and pass-through formula is shown in Appendix C. For simplicity only, the worked example does not make allowance for financing costs. The methodology allows for financing costs (see section 5.3.3).

---

<sup>36</sup> The spot price of RECs is defined as the time weighted average of the "last / mkt" prices specified in A\$/MWh for "all spot T+3" transactions of "LGCs (LRETs)" occurring in the final month of each calendar quarter, as published in the Greenroom report (or equivalent).

### 5.3.3 Financing costs

We will allow for the time value of money by applying an interest rate to increase the amounts eligible for pass-through at the end of each year. We will use the average of the corporate bond yield (with 1 to 5 years to maturity; BBB bond credit rating) at the each of each quarter of the year as published by the Reserve Bank of Australia.<sup>37</sup>

After allowing for financing costs, we will calculate the Accumulated Excess Energy Resale Loss or Gain as at the end of each price determination period.<sup>38</sup>

### 5.3.4 Carryover amounts

We will adjust SDP's notional revenue requirement and prices for the next determination period such that the net present value (discounted at the financing interest rate) of the revenue adjustment equals the Accumulated Excess Energy Resale Loss or Gain at the end of the previous price determination period.

Adjustments will be applied to the fixed cost component of prices to be independent of mode and scale of operation.

### 5.3.5 Shutdown mode

The energy adjustment mechanism applies only when:

- ▼ SDP is in a Shutdown or Restart Period, and
- ▼ SDP has complied with its requirements to maintain and operate the desalination plant under clause A2 of its network operator licence.

### 5.3.6 Commencement

We will calculate gains and losses on a financial year basis, commencing 1 July 2012 to align the commencement of the energy adjustment mechanism with the 2012 price determination period.

---

<sup>37</sup> Reserve Bank of Australia, *Table F3 Capital Market Yields and Spreads - Non-Government Instruments*.

<sup>38</sup> 4 years for the first price determination period. See section 5 below.

### 5.3.7 Existing energy contracts

The energy adjustment mechanism is premised on the continued operation of SDP's Electricity Supply Agreement with Infigen Energy Limited dated 28 July 2008 (as amended and restated on 31 March 2010) and its RECs Supply Agreement with Renewable Power Ventures Pty Limited dated 28 July 2008 (as amended and restated on 31 March 2010). These are collectively known as the Infigen Contracts.

The energy adjustment mechanism will cease to apply from the date of the termination, assignment or novation (as the case may be) in the event that:

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

Notwithstanding the above, any loss or gain accruing to SDP as a result of assignment, termination or novation will be subject to the mechanism.

If any of the terms of the Infigen Contracts is amended, the energy adjustment mechanism will be based on the terms of the Infigen Contracts as at 31 March 2010. For the avoidance of doubt, if the contracts are amended to extend the term of those contracts, the energy adjustment mechanism will not apply beyond the current contract term. If the contracts are amended to change the minimum contract volumes, increase contract prices or change the calculation of the Shortfall Adjustment the energy adjustment mechanism will apply as if those provisions had not been changed.

Any net loss or gain accruing to SDP as a result of the assignment or termination of one of the Infigen Contracts – including any payment received or made by SDP – will be subject to the energy adjustment mechanism. We will allow for financing costs on any such amount eligible for pass-through at the financing interest rate specified at Section 5.3.3.

In the event that SDP makes or receives a payment as a result of the assignment or termination of a contract, IPART may, at its discretion and having regard to the materiality of the payment, apportion the loss or gain over the remaining term of the current contract for purposes of the energy adjustment mechanism.

### 5.3.8 Obligation to act prudently

SDP must act prudently to minimise its exposure to losses on the resale of surplus electricity and RECs, including in negotiating any consideration for the assignment of the Infigen Contracts. In the case of any manifest imprudence that may arise on the part of SDP, IPART may exclude the affected transactions (in whole or in part) from the energy adjustment mechanism.



### 5.3.9 RECs - possible successor schemes

If there is a change in scheme and SDP is required to purchase another type of environmental credit, the energy adjustment mechanism will apply to the other type of environmental credit in the same way it had previously applied to RECs.

'Change in Scheme' and 'Environmental Credit' have the meaning given to each of those terms in the RECs Supply Agreement with Renewable Power Ventures Pty Limited dated 28 July 2008 (as amended and restated on 31 March 2010).

## 6 Incomplete final year data

The Terms of Reference require IPART to make a price determination for each successive price determination period before the expiry of the current determination period.

As a result of this requirement, data for the whole of the final year of a price determination period will not be available at the time the next price determination is made.

In the case of the efficiency adjustment mechanism, we propose to estimate the final year's data based on the most recent information available at the time.

In the case of the energy adjustment mechanism, we propose that:

- ▼ for the next price determination, the energy adjustment mechanism incorporate only adjustments in respect of the first 4 financial years
- ▼ for following price determinations, the energy adjustment mechanism incorporate adjustments based on the final year of the previous determination period and first 4 financial years of the current determination period.

Although this lagged arrangement will delay the adjustments to or from SDP, the application of the financing interest rate will compensate for the time value of money.

## 7 SDP reporting requirements

Under the *Water Industry Competition Act 2006* (NSW), licence holders are required to provide information requested by IPART. In our 2012 determination of SDP's prices we listed certain information required from SDP.<sup>39</sup> We have developed a reporting framework for that determination. We will write to SDP in each year to confirm our requirements for providing information.

We will need to collect additional information to implement the efficiency adjustment mechanism and the energy adjustment mechanism. IPART will develop an appropriate framework in the future and include it in our written advice to SDP.

---

<sup>39</sup> IPART, *Review of water prices for Sydney Desalination Plant Pty Limited, from 1 July 2012 – Determination and Final Report*, December 2011, p 33.

---

## **Appendices**



## A Terms of Reference



**The Hon. Greg Pearce MLC**  
Minister for Finance and Services  
Minister for the Illawarra

Dr Peter J Boxall AO  
Chairman  
Independent Pricing and Regulatory Tribunal  
PO Box Q290  
QVB Post Office NSW 1230



Dear Dr Boxall

I write regarding the Terms of Reference for Referral of Sydney Desalination Plant Pty Ltd (SDP) to IPART under Section 52 of the *Water Industry Competition Act 2006*.

I note your previous request that the Terms of Reference be amended to provide for IPART to establish an efficiency gains and losses carryover mechanism for SDP. I understand that implementation of this mechanism would involve the preparation of a methodology paper, which would be subject to public consultation prior to finalisation and publication.

I am pleased to support this proposal subject to the methodology paper also including a mechanism to adjust SDP's revenue to accommodate significant gains and losses associated with the sale of surplus electricity and Renewable Energy Certificates (RECs).

Amended Terms of Reference, which refer to this mechanism as well as IPART's proposed efficiency carryover mechanism, are attached to this letter. For clarity, the intention of the proposed energy adjustment mechanism is that:

1. It would only apply to electricity and RECs that are not required by SDP when the desalination plant is not in full operation mode when complying with the plant's operating rules, as established by the Metropolitan Water Plan and subsequently included in SDP's Network Operator Licence under the Water Industry Competition Act.
2. It would ensure that SDP customers for water (in Sydney Water's Area of Operations) receive the benefit of significant gains and bear significant losses incurred as a result of the difference between the cost of electricity and RECs under SDP's contracts with Infigen and the market price for electricity and RECs arising from the sale of SDP's surplus electricity and RECs (in the circumstances described in point 1).

3. For electricity, the mechanism would mirror the 'Calculation of Shortfall Adjustment' in SDP's Electricity Supply Agreement with Infigen, with the 'market price' defined as the half-hourly spot price and/or the price of a contracted 'available block'.
4. For RECs, the 'market price' would be the price shown in the Nextgen Greenroom Report, or another equivalent report.

I understand that IPART's intention is to publish its draft methodology paper in the near future, with the final paper due to be published by May 2012.

Yours sincerely



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

*16 February 2012*

## Terms of Reference for Referral of Sydney Desalination Plant Pty Limited to IPART under Section

### 52 of the Water Industry Competition Act

#### Background

On 29 June 2010 Sydney Desalination Plant Pty Limited (SDP) was granted a network operator licence in relation to the *desalination plant*. The Minister for Finance and Services has, under section 51 of the Water Industry Competition Act 2006, declared that SDP is a monopoly supplier in relation to the *water supply services* it provides under its network operator licence.

SDP is the only supplier of non-rainfall dependant drinking water in New South Wales. Currently, the primary purchaser of drinking water supplied from the desalination plant is Sydney Water Corporation. Sydney Water Corporation purchases bulk water from two main sources, the Sydney Catchment Authority and, since its commissioning, the *desalination plant*.

The *desalination plant* is a key element in Sydney's water security plan. Under its network operator licence, the *desalination plant* is required to maximise water production when dam storage levels in Sydney are below a prescribed threshold. Prices set by the Independent Pricing and Regulatory Tribunal (IPART) should therefore reflect the water supply services provided by SDP set out below:

- (a) the supply of non-rainfall dependant drinking water to purchasers; and
- (b) the making available of the *desalination plant* to supply non-rainfall dependant drinking water.

#### Matters for consideration - pricing principles

Unless indicated otherwise each *price determination* is to be consistent with the following pricing principles:

1. Maximum prices should be set so that expected revenue generated will recover the efficient costs of providing the services described at (a) and (b) above over the life of the assets. Costs include operating costs, a return on the assets and return of assets (depreciation).
2. In calculating the return on invested assets:
  - i. The rate of return (or Weighted Average Cost of Capital) should reflect the commercial risks faced by the asset owner in providing the services.
  - ii. IPART should determine an appropriate opening asset value.
3. Return of assets (depreciation) is to reflect the economic lives of the assets.
4. The structure of prices should encourage SDP to be financially indifferent as to whether or not it supplies water. As such the structure of prices should comprise separate charges for the different water supply services described at (a) and (b) above.
5. The amount of any adjustments under the mechanisms in principle 8 should each be separately quantified and published by IPART.

6. The charges for water supply services in (b) above should be a periodic payment and should reflect fixed costs including, return on assets, return of assets, and the fixed component of operating costs. SDP is to be entitled to charge for providing the water supply services in (b) above irrespective of levels of water in dam storages servicing Sydney or availability of water from other sources.
7. The charges for water supply services in (a) above should reflect all efficient costs that vary with output, including variable energy, labour costs, and maintenance costs.
8. For each *price determination* other than the first price determination:
  - i. SDP should be allowed to carryover demonstrated efficiency savings, net of efficiency losses, in operating expenditure in providing the water supply services specified at (a) and (b) above for a period of 4 years following the year in which the efficiency saving was achieved.
  - ii. In calculating the notional revenue requirement, IPART should determine the demonstrated efficiency savings and treatment of energy gains or losses in accordance with the Methodology Paper; and
  - iii. A mechanism(s) is required to allocate the costs or benefits to SDP customers (in Sydney Waters area of operation) of actual gains or losses beyond a core band that result from the difference between SDP's costs of electricity and RECs under its contracts with Infigen and revenues from the sale of surplus electricity and RECs. The mechanism would only operate at times when:
    - the desalination is in Shutdown or in a Restart Period; and
    - SDP complied with its requirements to maintain and operate the desalination plant under clause A2 of its network operator licence.
9. Any other matters that IPART may consider relevant

#### **Methodology Paper**

IPART must publish on its website a methodology paper setting out its approach to implementing pricing principle 8 above (**Methodology Paper**) IPART may update the Methodology Paper from time to time.

#### **Timing**

The determination period is to cover the period to 30 June 2017.

For each successive price determination period, IPART is to make the price determination before the expiry of the current determination period.



## B Worked examples of efficiency adjustment mechanism

Table B.1 illustrates an example of a carryover mechanism in the case of a single mode of production that is in continuous operation. Planned efficient operating expenditure is as specified for the relevant operating mode for each year of the first 5-year price determination period.

**Table B.1 Example of an efficiency carryover mechanism– continuous operation (\$)**

Year	1	2	3	4	5	6	7	8	9	10
Planned expenditure	101	103	101	107	106	91	91	91	91	91
Actual expenditure	99	100	100	102	101					
Gain/loss	2	3	1	5	5					
Incremental gain/loss	2	1	-2	4	0					
<b>Efficiency carryover</b>										
Year1		2	2	2	2					
Year2			1	1	1	1				
Year3				-2	-2	-2	-2			
Year4					4	4	4	4		
Year5						0	0	0	0	
Carry forward amounts						3	2	4	0	0
Expenditure used for pricing purposes	101	103	101	107	106	94	93	95	91	91

**Note:** All figures are in real terms.

**Source:** IPART calculations.

In the first year, the incremental gain or loss is calculated as the difference between the planned efficient operating expenditure and actual operating expenditure in that year. That is:

$$E_1 = (P_1 - A_1)$$

Where:

- ▼  $E_1$  is the incremental efficiency gain or loss for the current period
- ▼  $P_1$  is the planned efficient operating expenditure for the current period
- ▼  $A_1$  is the actual operating expenditure for the current period.

For years 2 to 4 inclusive, the incremental gain or loss is calculated as the difference between the planned efficient operating expenditure and actual operating expenditure in the current year less the difference between the planned efficient operating expenditure and actual operating expenditure in the previous year. That is:

$$E_t = (P_t - A_t) - (P_{t-1} - A_{t-1})$$

Where:

- ▼  $E_t$  is the incremental efficiency gain or loss for the current period
- ▼  $P_t$  is the planned efficient operating expenditure for the current period
- ▼  $A_t$  is the actual operating expenditure for the current period
- ▼  $(P_{t-1} - A_{t-1})$  is the gross efficiency gain or loss for the previous period.

Table B.2 illustrates an example of a carryover mechanism in the case of a single mode of production that is in intermittent operation. We assume that the mode of production is not operating in years 4 and 7 and that gains and losses are unique to that mode of production.

In this case, for years 2 to 5 inclusive, the incremental gain or loss is calculated as the difference between the planned efficient operating expenditure and actual operating expenditure in the current year less the difference between the planned efficient operating expenditure and actual operating expenditure in the previous comparable year, that is, the previous year of operation of that mode.

**Table B.2 Example of an efficiency carryover mechanism – intermittent operation (\$)**

Year	1	2	3	4	5	6	7	8	9	10
Planned expenditure	101	103	101	-	106	91	-	91	91	91
Actual expenditure	99	100	100	-	101					
Gain/loss	2	3	1	-	5					
Incremental gain/loss	2	1	-2	-	4					
<b>Efficiency Carryover</b>										
Year1		2	2	2	2					
Year2			1	1	1	1				
Year3				-2	-2	-2	-			
Year4					-	-	-	-		
Year5						4	-	4	4	
Carry forward amounts						3	-	4	4	0
Expenditure used for pricing purposes	101	103	101	-	106	94	-	95	95	91

**Note:** All figures are in real terms.

**Source:** IPART calculations.

## C Worked example of energy adjustment mechanism

**Table C.1 Energy adjustment mechanism (\$)**

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
<b>Minimum contract cost</b>	<b>400</b>	<b>400</b>	<b>400</b>	<b>400</b>	<b>400</b>	<b>2000</b>
<b>Gain or loss<sup>a</sup></b>	<b>80</b>	<b>60</b>	<b>0</b>	<b>60</b>	<b>80</b>	<b>280</b>
Threshold	20	20	20	20	20	
Gain or loss passed through	54	36	0	36	54	180
Gain or loss retained by SDP	26	24	0	24	26	100

<sup>a</sup> Assumes all numbers are consistently either gains or losses.

**Notes:** All figures are hypothetical for illustrative purposes only.

Threshold is 5% of minimum contract cost. 90% of gains or losses beyond the threshold are passed through.

## Glossary

2012 determination period	The period from July 1 2012 to June 30 2017
Degremont	Degremont Ltd
Full operation mode	Term for the operational mode where the plant is producing water
IPART Act	<i>Independent Pricing and Regulatory Tribunal Act 1992</i>
Long term restart mode	Term for the operational mode where the plant is being restarted from a period of not producing water of between 91 days and 2 years
Long term shutdown mode	Term for the operational mode where the plant is not producing water for between 91 days and 2 years
Medium term restart mode	Term for the operational mode where the plant is being restarted from a period of not producing water of between 11 and 90 days
Medium term shutdown mode	Term for the operational mode where the plant is not producing water for between 11 and 90 days
NPV	Net present value
O&M	Operating and maintenance
RECs	Renewable Energy Certificates
SDP	Sydney Desalination Plant Pty Limited
Short-term restart mode	Term for the operational mode where the plant is being restarted from a period of not producing water of between 2 and 10 days
Short-term shutdown mode	Term for the operational mode where the plant is not producing water for between 2 and 10 days
Sydney Water	Sydney Water Corporation
The Centre	The National Centre of Excellence in Desalination Australia

Water security mode	Term for the operational mode where the plant is not producing water for longer than 2 years
Water security restart mode	Term for the operational mode where the plant is being restarted from a period of not producing water of longer than 2 years
Water Usage Charge	Variable water charge that applies for every megalitre of water supplied to SDP's customers
WICA	<i>Water Industry Competition Act 2006 (NSW)</i>

