

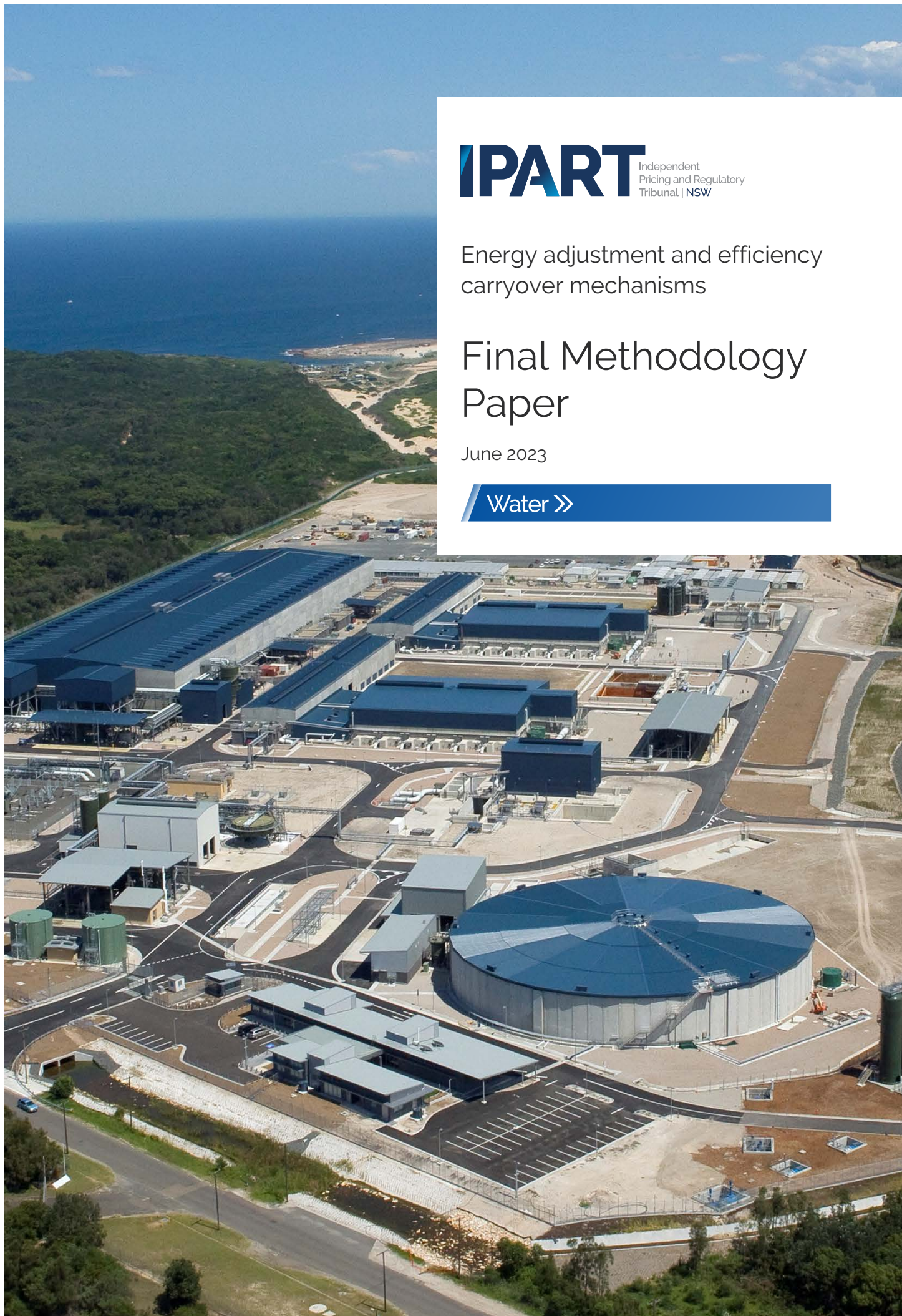


Energy adjustment and efficiency
carryover mechanisms

Final Methodology Paper

June 2023

Water >>



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The Independent Pricing and Regulatory Tribunal

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Acknowledgment of Country

IPART acknowledges the Traditional Custodians of the lands where we work and live. We pay respect to Elders both past and present.

We recognise the unique cultural and spiritual relationship and celebrate the contributions of First Nations peoples.

Contents

Chapter 1

Introduction	5
1.1 Our Methodology Paper	6
1.2 Our review process	7
1.3 Structure of this Methodology Paper	8
1.4 Our decisions	8

Chapter 2

Energy Adjustment Mechanism Methodology	10
2.1 Terms of Reference	11
2.2 Purpose of the EAM	11
2.3 Scope of the EAM	12
2.4 EAM timeframes	14
2.5 EAM calculation of gains and losses	14
2.6 How the EAM shares gains and losses between SDP and its customers	18
2.7 We will calculate EAM allowances that include financing costs	20
2.8 EAM process	21
2.9 Information requirements	22

Chapter 3

Worked examples of the Energy Adjustment Mechanism	23
3.1 Example 1 – gains and losses within the core band	24
3.2 Example 2 – gains and losses outside the core band	25
3.3 Example 3 – banking of LGCs between years	26

Chapter 4

Efficiency Carryover Mechanism Methodology	27
4.1 Terms of Reference	28
4.2 Purpose of the Efficiency Carryover Mechanism	28
4.3 What costs are included in the ECM	29
4.4 ECM timeframes	30
4.5 Identifying and carrying over efficiency savings	31
4.6 ECM allowances	33
4.7 ECM process	33
4.8 Information requirements	33

Chapter 5

Worked examples of the Efficiency Carryover Mechanism	34
5.1 Example 1 – Fixed cost efficiency saving	35
5.2 Example 2 – Variable cost efficiency saving	36
5.3 Example 3 – Efficiency savings retained for up to five years	37
5.4 Example 4 – Temporary underspends and overspends	38

Appendix A

Terms of Reference

40

Appendix B

Glossary

45

Chapter 1 >>

Introduction

01

We determine Sydney Desalination Plant Pty Ltd's (SDP) prices in accordance with a standing Ministerial reference under section 52 of the *Water Industry Competition Act 2006* (WIC Act). Under the Terms of Reference (see Appendix A), we are required to apply the following two revenue adjustment mechanisms at each SDP price review:

- **Energy Adjustment Mechanism (EAM)** - to transfer a portion of gains and losses, outside a core band, that result from the sale of SDP's surplus energy (electricity and large-scale generation certificates (LGCs)) when SDP is in shutdown or restart mode.
- **Efficiency Carryover Mechanism (ECM)** - to allow SDP to carryover demonstrated efficiency savings, net of efficiency losses, in operating expenditure for a period of four years following the year in which the efficiency saving was achieved (i.e. a total of five years).

In 2012 we published our first Methodology Paper¹ which set out the EAM and ECM methodologies that applied during the 2012 determination period and which resulted in adjustments that were factored into prices over the 2017 determination period.

In 2017 we published our second Methodology Paper² which set out the EAM and ECM methodologies that applied during the 2017 determination period and which we are currently factoring into prices to apply over the 2023 determination period. Our [Final Report](#) for the 2023 SDP price review outlines how we applied the 2017 methodologies to calculate allowances to include in prices to apply over the 2023 determination period.

This 2023 Methodology Paper sets out the EAM and ECM methodologies that will apply over the 2023 determination period and will be factored into prices at the next price review. For the avoidance of doubt, the 2017 Methodology will continue to apply to the EAM and ECM methodologies up to 30 June 2023.

1.1 Our Methodology Paper

Our Issues Paper³ identified key issues relating to how the existing EAM and ECM operate and asked what changes, if any, should be made to these mechanisms. Key issues identified for stakeholder consultation included:



The purpose of this review is to update, improve, and clarify how these mechanisms operate and how we intend to apply them at the next price review.

The **EAM** re-allocates risk relating to SDP's surplus energy and large-scale generation certificates (LGCs) from SDP to customers. Re-allocating risk from SDP to customers changes SDP's incentive to manage these risks efficiently. Given that SDP (rather than customers) is best placed to manage the market price risk of its surplus energy, we consider it is important that SDP retains a sufficient incentive to manage this risk efficiently.

We are supporting this objective by:

- maintaining SDP's share of gains or losses outside the core band
- reviewing the size and appropriateness of the core band, in light of SDP's new flexible full-time role, and
- setting the core band relative to the contract value of surplus energy sold in the year.

We have also refined and clarified how we intend to calculate gains and losses on the sale of surplus energy and LGCs.

The purpose of the **ECM** is to allow SDP to retain permanent efficiency savings for a period of time before these savings are passed on to customers through lower prices. To reflect SDP's new service levels under its new Network Operator's licence,^a we have refined the ECM to:

- remove the mode-specific components of the ECM
- calculate two separate ECM components to estimate permanent efficiency savings for:
 - fixed operating costs
 - variable operating costs, and
- ensure permanent efficiency savings are retained by SDP for up to five years (i.e. the year the permanent efficiency saving is made plus another four years).

1.2 Our review process

In developing our 2023 Methodology Paper, we considered all feedback received from stakeholders on SDP's pricing proposal and our Issues Paper, Draft Report and Draft Methodology Guide. We also considered stakeholder views expressed at the February 2023 Public Hearing.

The overall review process, how we assessed SDP's pricing proposal role and stakeholder engagement are detailed in the [Final Report](#). It also detailed how we complied with our Terms of Reference (see Appendix A).

Our reports, stakeholder submissions, the transcript from the public hearing, and consultants' reports are available on our [website](#).

^a Clause A2 in Schedule A of the previous network operator's licence continues to have affect. That is, SDP is required to maintain and operate the desalination plant under clause A2 of the network operator's licence granted under the WIC Act originally on 9 August 2010. Its new licence is available at [IPART's website](#).

1.3 Structure of this Methodology Paper

We separated the 2023 EAM and ECM methodologies (covered in chapters 2 to 5) from our review of the 2017 Methodology Paper.

The remainder of this Methodology Paper is structured as follows:

Chapters

01	Introduction
02	EAM methodology
03	Worked examples of the EAM
04	ECM methodology
05	Worked examples of the ECM

Appendices




A	Terms of Reference
B	Glossary

1.4 Our decisions





Our decisions for the EAM and ECM, and rationale for these decisions are outlined in Chapter 12 of the Final Report. For convenience, they are also listed below.

Our decisions for the Energy Adjustment Mechanism are:

1. To accept the proposal from SDP to remove the mode distinction in the energy adjustment mechanism.
2. To accept the proposal from SDP to reduce the core band for the energy adjustment mechanism from 5% to 2.5%. This will mean SDP will retain all gains and losses within the core band.

-  3. To maintain the existing sharing ratio of gains or losses for the energy adjustment mechanism. This will mean SDP will retain 20% and pass the other 80% of gains and losses outside the core band to customers through the energy adjustment mechanism.
-  4. To not assess whether SDP's management of its surplus energy is efficient because we can rely of the financial incentive SDP has to manage its surplus energy efficiently under the energy adjustment mechanism.
-  5. To commence the 2023 EAM application period from 2022-23.

Our decisions for the Efficiency Carryover Mechanism are:

-  6. To accept the proposal from SDP to remove the mode-specific distinction in the efficiency carryover mechanism.
-  7. To not accept the proposal from SDP to calculate efficiency savings as the difference between forecast and actual costs.
-  8. To amend the efficiency carryover mechanism to calculate efficiency savings in two components for fixed and variable costs separately. This is to address SDP's concerns about the operation of this mechanism under differing levels of water production.
-  9. To apply a financial incentives cap of 2.5% of fixed plant charges, noting that it is now only applied to the efficiency carryover mechanism.

Chapter 2 »

Energy Adjustment Mechanism Methodology

02

2.1 Terms of Reference

The Terms of Reference state:⁴

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 LGCs under its contracts with Infigen (now Iberdrola Australia) and revenues from the sale of surplus electricity and LGCs. The mechanism would only operate at times when SDP complied with its requirements to maintain and operate the desalination plant under clause A2 of its network operator licence.

The Minister further advised that the intention of the proposed EAM is that:⁵

1. For electricity, the mechanism would mirror the 'Calculation of Shortfall Adjustment' in SDP's Electricity Supply Agreement with Infigen (now Iberdrola Australia), with the 'market price' defined as the half-hourly spot price and/or the price of a contracted 'available block'.
2. For renewable energy certificates (RECs), the 'market price' would be the price shown in the Nextgen Greenroom Report, or another equivalent report.

2.2 Purpose of the EAM

The Sydney Desalination Plant is a potable drinking water desalination plant located on the coast of Kurnell, 25 kilometres from Sydney's CBD. The plant can produce on average 250 ML of drinking water per day, which is equivalent to about 15% of Sydney's total drinking water supplies.⁶ The desalination process involves moving sea water through membranes at high pressure to remove the salt, which requires a considerable amount of energy.

SDP has long-term fixed price contracts for the full amount of electricity and LGCs required to operate the plant at full capacity.^b These contracts require SDP to take, at a minimum, 100% of the contracted electricity and around 50% of the contracted LGCs. This requirement means that SDP will be required to purchase surplus electricity and may be required to purchase surplus LGCs (if production is less than 50% of capacity) when it is producing at less than its full capacity. When market prices are less than contract prices, SDP incurs losses on the resale of its surplus electricity and LGCs. When market prices exceed contract prices, SDP generates gains on the resale of its surplus electricity and LGCs.

Under its new Network Operator's Licence, SDP will receive an Annual Production Request (APR) from Sydney Water for the supply of desalinated water for the next financial year (with the request provided to SDP by 1 May each year). Going forward, the EAM would incentivise SDP to seek operational efficiencies and optimise the sale of its surplus energy position where it has flexibility over its operating profile.

^b The project approval for SDP, granted under the *Environmental Planning and Assessment Act 1979*, included a requirement that the plant use 100% renewable energy. The [SDP website](#) provides more information about this approval.

We anticipate that SDP could consider a range of operational efficiencies that would maximise the sale of its surplus energy position. These are:

- scheduling maintenance during periods of high forecast electricity prices, i.e. due to notice of lack of reserve from AEMO.
- ramping water production over the course of the day (or night) to limit production during peak pricing periods and maximise the sale of its surplus energy position.
- ramping production over the course of a year to correspond with "shoulder" season periods where electricity prices in NSW are lower than average. This arrangement is expected to work effectively under Sydney Water's APR process, where production requests are averaged over a 12-month period, to allow SDP a higher degree of operational flexibility.

The EAM ensures that any gains and losses on surplus energy are shared between SDP and customers.

2.3 Scope of the EAM

The EAM shares any gains or losses, which are outside a core band from the sale of surplus electricity and LGCs, with SDP's customers.

The EAM applies to gains and losses on the sale of SDP's surplus energy contracts when SDP is in compliance with the relevant provisions of its Network Operator's Licence. If SDP is in non-compliance with its Network Operator's Licence, we will consider whether the EAM should still apply on a case-by-case basis and with consideration of the EAM requirements under the Terms of Reference.

The EAM only applies to SDP's current energy (electricity and LGCs) contracts with Infigen Energy Limited (now Iberdrola Australia).

2.3.1 SDP's current energy contracts with Iberdrola Australia

Electricity for the desalination plant is provided under a contract between SDP and Iberdrola Australia. In its submission to the 2012 price review, SDP described the conditions of the Electricity Supply Agreement:⁷

- 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, and
- the ability to sell load back to the market if electricity demand is lower than forecast.

SDP also has agreements with Renewable Power Ventures Pty Ltd, another subsidiary of Iberdrola Australia, for the supply of LGCs to offset the power used by the desalination plant.⁸

SDP reports that the LGCs are sold to SDP under a 20-year REC Agreement, which provides for the supply of LGCs at fixed real prices.⁹ The agreement includes a minimum annual number of LGCs that SDP must purchase. SDP may sell any surplus LGCs in the market.

2.3.2 Changes to SDP's energy contracts

The EAM is premised on the continued operation of SDP's Electricity Supply Agreement with Infigen Energy Limited (now Iberdrola Australia) dated 28 July 2008 (as amended and restated on 31 March 2010) and its LGCs Supply Agreement with Renewable Power Ventures Pty Limited dated 28 July 2008 (as amended and restated on 31 March 2010).

We will exclude from the EAM any amendments to the contracts that increase the duration, risk, or cost of these contracts. We will include in the EAM any amendments to the contracts that decrease the duration, risk, or cost of these contracts. This approach is consistent with the standard regulatory principle that customers should be able to share in efficient gains while not being exposed to inefficient losses incurred by the regulated business.

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

- the term of the contract expires
- either party terminates the Infigen (now Iberdrola Australia) contracts, or
- SDP assigns or novates the Infigen (now Iberdrola Australia) 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 EAM.

Any net loss or gain accruing to SDP as a result of the assignment or termination of one of the Infigen (now Iberdrola Australia) contracts — including any payment received or made by SDP — will be subject to the EAM. We will allow for financing costs on any such amount subject to the EAM at the financing interest rate specified in this 2023 Methodology Paper.

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 EAM.

2.3.3 Changes to renewable energy schemes

If there is a 'Change in Scheme' and SDP is required to purchase another type of Environmental Credit, the EAM will apply to the other type of Environmental Credit in the same way it had previously applied to LGCs.

'Change in Scheme' and 'Environmental Credit' have the meaning given to each of those terms in the LGCs Supply Agreement with Renewable Power Ventures Pty Limited dated 28 July 2008 (in place as of 1 July 2012).

2.4 EAM timeframes

For the 2023 determination period the EAM will be structured around the following three periods:

- **Application period:** the years between the end of the previous application period and the start of the review year. The EAM will apply to actual realised gains and losses over the application period.
- **Review year:** the year immediately following the last year of the application period where the surplus energy gains and losses over the application period are considered and where the EAM adjustment is calculated.
- **Adjustment period:** the determination period immediately following the review year where any EAM adjustment calculated in the review year is factored into prices.

Table 2.1 illustrates these time periods for the 2017 and 2023 EAMs. This table presents indicative time periods for the 2023 EAM. The application and adjustment periods are subject to change if, for example, the next SDP price review is brought forward or delayed from 2026-27.

Table 2.1 EAM application period, review year, and adjustment period

	16-17	2017 determination period					Deferral 22-23	2023 determination period				2027 determination period				
		17-18	18-19	19-20	20-21	21-22		23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31	31-32
2017 EAM	2017 EAM Application period						Review year	2017 EAM Adjustment period								
	1	2	3	4	5	6		1	2	3	4					
2023 EAM							2023 EAM Application period				Review year	2023 EAM Adjustment period				
							1	2	3	4		1	2	3	4	5

Note: The 2023 EAM application period would be subject to change if the next price review is brought forward or pushed back from 2026-27. The 2023 EAM adjustment period would be subject to change if the next determination period is shorter or longer than five years. Year 1 of the 2023 EAM application period will apply the 2017 EAM methodology (because the 2023 EAM methodology was published at the end of 2022-23 and should not apply retrospectively).
Source: IPART analysis

2.5 EAM calculation of gains and losses

2.5.1 Gains and losses are evaluated within a financial year

We will calculate gains and losses on a financial year basis. If SDP is non-compliant with its Network Operator's Licence for part of a financial year during the application period, any energy relating to that period may be excluded from the EAM. In such instances, we will consider whether the EAM should still apply on a case-by-case basis, and with consideration of the EAM requirements under the Terms of Reference.

The EAM will apply to gains and losses that are realised in each financial year.

- For electricity, the EAM gain or loss calculation applies to surplus electricity contracted and sold in that particular financial year. If electricity for next year is forward sold this year, any gain or loss on that electricity will be included in next year's EAM gain or loss calculation. In this case, although the price is locked in this year, the electricity is traded next year and the gain or loss is not realised until next year.

- For LGCs, the EAM gain or loss calculation applies to surplus LGCs sold in that particular financial year. If LGCs accrued this year are banked and sold next year, any gain or loss on those LGCs will be included in next year's EAM gain or loss calculation. In this case, although the LGCs are accrued this year, they are not sold until next year and the gain or loss is not realised until next year.

2.5.2 Calculating gains and losses on surplus electricity contracts

For the 2017 determination period, the EAM outcomes were subject to a review of prudence, which involved calculating both an actual gain or loss (based on actual sale price which may be the spot market or a forward market price) and a hypothetical gain or loss (based on the spot market price).

However, our decision is to place greater reliance on the incentives created by the EAM to ensure that SDP maximises the potential gains, or minimises any potential losses, from the sale of surplus energy. Accordingly, we have decided to remove the review of the prudence of energy sales occurring over the 2023 EAM application period.

The only measure that will be calculated in the EAM is:

$$\text{Actual gain or loss} = (\text{volume of surplus electricity}) \times (\text{actual sale price less contract price})$$

The process of calculating gains and losses on electricity

The following outlines the steps for calculating the actual gains and losses on surplus electricity:

- Calculate the actual revenue for each month (i.e. volume of surplus electricity in each month multiplied by the volume weighted average sale price for that month using actual surplus electricity volumes recorded by SDP and market price data published by AEMO).^c The frequency of energy volumes and market prices used to calculate the revenue is to be consistent with the calculation of the shortfall adjustment as per agreement between SDP and Iberdrola Australia.
- Sum the monthly revenues to generate totals for each financial year over the application period.
- Calculate the actual gain or loss (i.e. total actual revenues less contract value for surplus electricity in each financial year over the application period).

^c Consistent with the calculation of shortfall adjustment in SDP's Electricity Supply Agreement with Infigen.

2.5.3 Calculating gains and losses on surplus LGC contracts

For the 2017 EAM, we calculated both an actual gain or loss (based on the actual sale price when the surplus LGCs were sold) and a hypothetical gain or loss (based on the average spot market price in the quarter the surplus LGCs were accrued).

The actual gain or loss calculation was used to calculate EAM allowances. The difference between hypothetical and actual gain or loss illustrated the value gained or lost, as the LGCs are received at the end of the quarter in which they are accrued and then banked to be sold in subsequent quarter/s.

However, our decision for the 2023 EAM is to place greater reliance on the incentives created by the EAM to ensure that SDP maximises the potential gains, or minimises any potential losses, from the sale of surplus LGCs. Accordingly, we have decided to remove the review of the prudence of LGC sales over the 2023 EAM application period.

The only measure that will be calculated in the EAM is:

$$\text{Actual gain or loss} = (\text{volume of surplus LGCs sold in quarter}) \times (\text{actual sale price less contract price})$$

The process of calculating gains and losses on LGCs

The following outlines how each of the formulas above will be calculated.

1. To calculate the contract value of surplus LGCs sold:
 - Identify the transactions of surplus LGCs sold in each quarter over the application period.
 - Identify the contract cost of surplus LGCs sold in each quarter over the application period.
 - Calculate the sum of the cost of LGC contracts sold in each financial year of the application period.
2. To calculate the actual gain or loss:
 - Calculate the total actual revenue for each quarter as the sum of the revenue from each surplus LGC sold in that quarter.
 - Calculate the actual gain or loss for each quarter. This is calculated as the actual revenue minus the contract value of the surplus LGCs for each quarter.
 - Calculate the actual gain or loss for each financial year. This is the sum of the quarterly actual gains or losses over each financial year of the application period.

An example of how gains and losses are calculated for LGCs is presented in Box 2.1.

Box 2.1 Clarifying the calculation of actual gains and losses on LGCs

For this example, assume a LGC is accrued in the second quarter of 2023-24 and is received following that quarter on 1 January 2024. The LGC is banked and sold by SDP one year later on 1 January 2025.

Under this 2023 EAM methodology, the actual gain or loss would be recorded as occurring in 2024-25 and would be based on the difference between SDP's contract price (December 2024 quarter) and the actual sale price on 1 January 2025.

This is consistent with the approach we took when applying the 2017 EAM methodology.

2.5.4 Combining gains and losses on electricity and LGCs

For each financial year over the application period, we will sum the actual gains and losses on electricity and LGCs to a single combined actual gain or loss on energy before we apply the core band (discussed below). By combining electricity and LGCs into a single energy gain or loss, gains in one component will be able to offset losses in the other component. This means that customers will be exposed to gains and losses outside a core band on the resale of SDP's surplus energy (rather than being exposed to separate risks for electricity and LGCs depending on where each component is trading relative to separate core bands).

2.5.5 Relationship to Shortfall Adjustment in SDP's electricity contract

In calculating the gain or loss on surplus electricity, we will follow the definitions and procedures specified in the 'Calculation of Shortfall Adjustment' in SDP's Electricity Supply Agreement with Infigen (now Iberdrola Australia) to the extent consistent with the methodology specified in this paper.

However, the combined actual gain or loss on energy may differ from the Shortfall Adjustment on the SDP contract as a result of any/all of the following factors:

- the inclusion of LGCs
- the allowance for financing costs (see below)
- any timing differences (financial year vs. calendar year and the treatment of the final year of each determination period), and
- the calculation of the volume weighted average sale price.

2.6 How the EAM shares gains and losses between SDP and its customers

As required by the Terms of Reference, actual gains or losses beyond a core band are shared between SDP and its customers.

2.6.1 Defining the core band

Consistent with SDP's pricing proposal, we have defined a core band of plus or minus 2.5% of the contract value of SDP's **surplus energy sold** (i.e. electricity and LGCs combined) for which gains and losses are realised in that financial year.

Therefore, instead of total volume of energy contracted in the year, the core band is now based on the same volume of energy that is used in the calculation of gains and losses (i.e. the volume of energy sold within the year). This means that the core band will vary to reflect the volume of energy sold that year. Basing the core band on surplus energy sold in the financial year accommodates the potential 'banking' of LGCs and ensures that gains and losses are treated symmetrically in the event that LGCs are accrued and sold in different years.

This is consistent to the approach adopted in the 2017 determination period.

Table 2.2 Example of the core band calculation

Year of application period	1	2	3	4	5
2023 core band – contract value					
- Surplus contracted electricity (\$)	99	99	99	99	99
- Surplus contracted LGCs (\$)	99	99	99	99	99
- Surplus sold electricity (\$)	99	99	99	99	99
- Surplus sold LGCs (\$)	90	95	99	102	109
- Total surplus sold energy (\$)	189	194	198	201	208
- Core band (2.5% of surplus sold) (\$)	4.73	4.85	4.95	5.03	5.20

Note: Figures used in this example are for illustration only.
Source: IPART analysis.

2.6.2 Defining the sharing ratios outside the core band

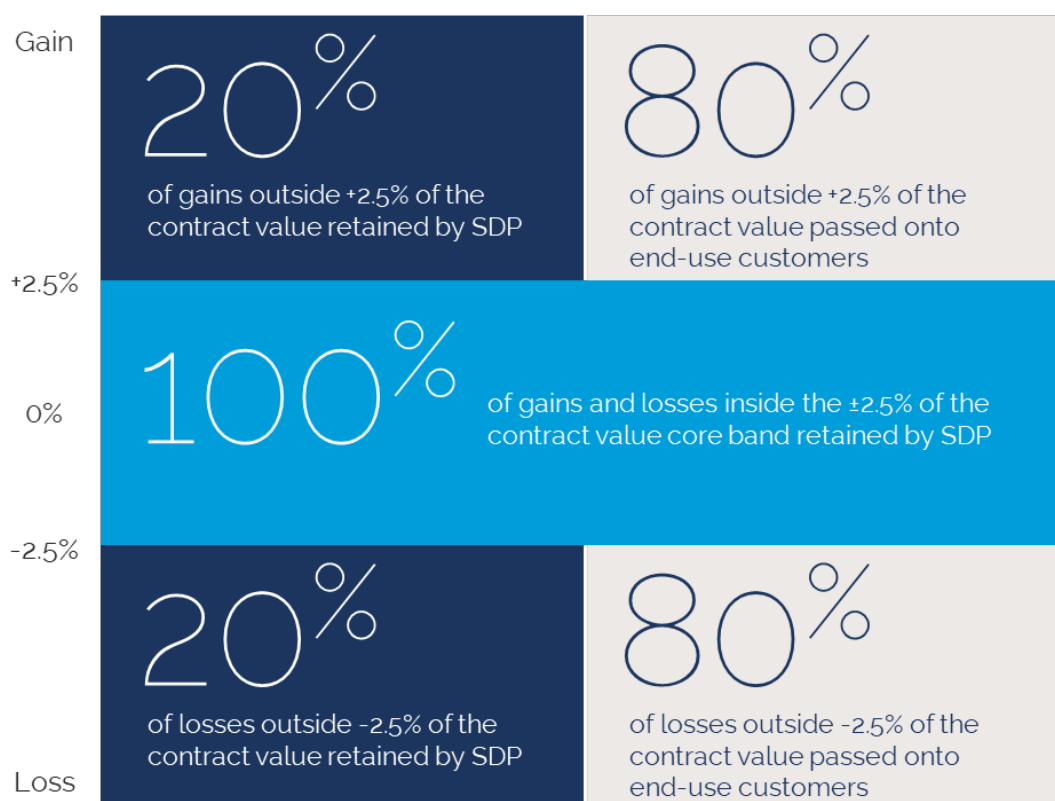
Consistent with the Terms of Reference, SDP retains 100% of gains and losses within the plus or minus 2.5% core band. Relative to this core band:

- SDP retains 20% of incremental gains and losses outside the plus or minus 2.5% core band.
- The remaining 80% of incremental gains and losses outside the plus or minus 2.5% core band are passed through to customers.

We have not accepted SDP's proposal to change the sharing ratio such that SDP would retain 5% of incremental gains and losses outside the core band. Therefore, SDP will continue to retain 20% of gains and losses outside the 2.5% core band over the 2023 EAM application period. We note the exception to these sharing rules is that in 2022-23, the core band will be equivalent to plus or minus 5%, consistent with the 2017 EAM methodology. This is because we will release the final 2023 Methodology Paper at the close of 2022-23 and we are of the view that this change to SDP's incentives should apply prospectively (i.e. from 2023-24) and not retrospectively (i.e. it should not apply to 2022-23). Figure 2.1 illustrates the key design elements of the EAM.

While the 2023 EAM application period includes 2022-23, the treatment of EAM gains and losses within this year will be in accordance with the 2017 EAM methodology. The 2023 EAM methodology will commence from 1 July 2023.

Figure 2.1 EAM sharing of gains and losses on resale of contracted surplus energy



Source: IPART analysis

Note: In this figure, "contract value" refers to the contract value of surplus energy

2.7 We will calculate EAM allowances that include financing costs

The EAM includes financing costs to compensate SDP for the delay in passing on losses and/or to compensate customers for the delay in receiving gains through the EAM.

EAM allowances are generated by calculating an annuity over the adjustment period (this would be a 5-year annuity in the case of a 5-year determination/adjustment period), with a present value equal to the present value of the gains and losses over the application period to be passed on to customers under the EAM. There are two steps to this process:

- 01 The gains and losses for each year of the application period (assumed to be mid-year values) are escalated to a present value in the review year (assumed to be mid-year value for the review year). For example, a gain or loss in 2022-23 (mid-year) will be escalated forward four years to 2026-27 (mid-year).
- 02 An annuity is calculated over the adjustment period (this would be a 5-year annuity in the case of a 5-year determination/adjustment period). The cash flows of this annuity (calculated as mid-year values) are set such that the present value of the annuity as of 2026-27 (mid-year) is equal to the present value of gains and losses as of 2026-27 (mid-year).

We intend to use the 3-year BBB Corporate Bond Rate series currently published by the RBA.¹⁰ If this series is discontinued in the future, we will use a suitable alternative series. The RBA series is a monthly nominal series. If the RBA series is available, the EAM will convert this to real terms by using:

- For the application period: simple averages of 12 monthly observations for the relevant years of the application period.
- For the review year: the simple average of the available months for the review year.
- For the adjustment period: the simple average of the available months for the review year, converted to real terms using the Fisher equation and a geometric mean of the following inflation forecast inputs:
 - The RBA's latest available 1-year inflation forecast for the review year.
 - The consensus June-June mean CPI forecast for the year following the review year (i.e. for year 1 of the adjustment period).
 - 2.5% for the second year following the review year (i.e. for year 2 of the adjustment period).

Table 2.3 illustrates how EAM allowances are calculated.

Table 2.3 How EAM allowances are generated

	2023 determination period					2027 determination period				
	22-23	23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31	31-32
	Application period (\$nominal)					Adjustment Period (\$2026-27)				
Customer Share	\$10	-\$8	\$6	\$0	Review year					
Nominal discount rate		5.50%	6.10%	5.45%	4.50%					
Present value					\$9.59					
Real discount rate						2.00%				
Real Annuity (\$2026-27)						\$2.04	\$2.04	\$2.04	\$2.04	\$2.04

Source: IPART analysis.

2.8 EAM process

The following points step through how we intend to apply the EAM at future price reviews:^d

- Calculate actual gains and losses for electricity and LGCs in each financial year of the application period.
- Sum the actual gains and losses for electricity and LGCs into combined energy gains and losses for each year of the application period. This gives the total energy gain or loss in each year of the application period to potentially be shared between SDP and customers.
- Calculate the core band for each year of the application period as plus or minus 2.5% of the combined contract value of surplus electricity and LGCs sold in each year of the application period (using the same volumes used to calculate the gains and losses above).^e
- Apply the core bands and sharing ratios to combined energy gains and losses for each year of the application period. This gives the allocation of gains and losses between SDP and customers for each year of the application period.
- Account for the financing costs associated with the EAM gains or losses by:
 - Using the RBA 3-year BBB corporate bond series^f to obtain an annual nominal financing rate by averaging the monthly observations within a financial year over the relevant years of the application period
- Convert the nominal interest rate for the review year to a real rate as outline in section 2.7.
- Using the real interest rate, calculate an annual annuity over the adjustment period (i.e. equal annual payments in constant real dollars) with a present value equal to the present value of customers' share of gains and losses on an annual basis over the application period.

^d We note that this process assumes all the qualifications set out in this paper have been met and therefore that gains and losses over the application period are subject to the EAM.

^e With the exception of EAM gains and losses in 2022-23, which will be calculated per the 2017 EAM Methodology.

^f Or a substitute series if the RBA series is discontinued.

2.9 Information requirements

We will collect information to implement the EAM at future price reviews. IPART will develop an appropriate framework to collect this information and include it in our written advice to SDP prior to future reviews.

We already have an annual reporting framework in place with SDP.⁹ We will work with SDP over the 2023 determination period to ensure this reporting framework continues to meet our requirements.

⁹ Under the *Water Industry Competition Act 2006* (NSW), licence holders are required to provide information requested by IPART.

Chapter 3 »

Worked examples of the Energy
Adjustment Mechanism

03

The following examples illustrate how we intend to implement the EAM at future price reviews.

3.1 Example 1 – gains and losses within the core band

Table 3.1 shows how the EAM allocates gains and losses when they are within the core band. Because the gains and losses are within the core band in each of the financial years, SDP retains 100% of the gains and losses. The EAM passes 0% of the gains and losses on to customers.

Table 3.1 Gains and losses within the core band

	2023 determination period					2027 determination period				
	22-23	23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31	31-32
	Application period (\$nominal)					Adjustment period (\$2026-27)				
Year of period	1	2	3	4	Review year	1	2	3	4	5
Cost ^a										
- Electricity	100	100	100	100						
- LGCs	100	100	100	100						
- Total	200	200	200	200						
Revenue - surplus energy sold										
- Electricity	101	102	100	98						
- LGCs	104	102	100	98						
- Total	205	204	200	196						
Gain or loss										
- Total gain (loss)	5	4	-	(4)						
- EAM core band	10 ^b	5	5	(5)						
EAM shares										
- SDP within band	5	4	-	(4)						
- SDP outside band	-	-	-	-						
- Customer share	-	-	-	-						
- PV customer share										
EAM										
- EAM allowance										
- PV EAM allowance										

a. For 2022-23, the costs in this example refer to the total energy contracted within the year. For all other years in the 2023 application period, the costs refer to the value of surplus energy contracted in those years

b. The core band in 2022-23 is based on the 2017 EAM methodology of 5%. Sharing outside the core band in all years is based on the 2017 and 2023 EAM methodologies of 20% SDP and 80% customers.

Note: The figures used in this example are for illustration only.
Source: IPART analysis.

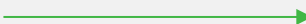
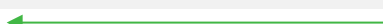
3.2 Example 2 – gains and losses outside the core band

Table 3.2 shows how the EAM allocates gains and losses when they are outside the core band.

SDP retains 100% of the gain or loss up to the core band and 20% of the gain or loss outside the core band. The EAM adds financing costs to the Customer share (i.e. 80% of gains and losses outside the core band) and passes this through to customers over the adjustment period.

In this example, the present value of the Customer share of gains and losses over the application period is (\$30.50). This is equal to the present value of an annual annuity of (\$6.60) over the adjustment period.

Table 3.2 Gains and losses outside the core band

	2023 determination period					2027 determination period				
	22-23	23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31	31-32
	Application period (\$nominal)					Adjustment period (\$2026-27)				
Year of period	1	2	3	4	Review year	1	2	3	4	5
Cost a										
- Electricity	100	100	100	100						
- LGCs	100	100	100	100						
- Total	200	200	200	200						
Revenue - surplus energy sold										
- Electricity	80	90	100	110						
- LGCs	80	90	100	110						
- Total	160	180	200	220						
Gain or loss										
- Total gain (loss)	(40)	(20)	-	20						
- EAM core band	(10) b	(5)	5	5						
EAM shares										
- SDP within band	(10)	(5)	-	5						
- SDP outside band	(6)	(3)	-	3						
- Customer share	(24)	(12)		12						
- PV customer share					(30.50)					
EAM										
- EAM allowance						(6.60)	(6.60)	(6.60)	(6.60)	(6.60)
- PV EAM allowance					(30.50)					

a. For 2022-23, the costs in this example refer to the total energy contracted within the year. For all other years in the 2023 application period, the costs refer to the value of surplus energy contracted in those years

b. The core band in 2022-23 is based on the 2017 EAM methodology of 5%. Sharing outside the core band in all years is based on the 2017 and 2023 EAM methodologies of 20% SDP and 80% customers.

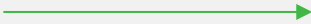

Note: the figures used in this example are for illustration only and may not add due to rounding. This analysis assumes a nominal financing rate of 5% and a real discount rate of 2.5%.

Source: IPART analysis.

3.3 Example 3 – banking of LGCs between years

This example illustrates how the core band adjusts when LGCs are banked between years. For example, in year 1, SDP sells \$150 of surplus energy (5% core band = \$9.50) and in year 4 SDP sells \$235 of surplus energy (2.5% core band = \$5.40).

Table 3.3 Banking of LGCs between years

	2023 determination period					2027 determination period				
	22-23	23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31	31-32
	Application period (\$nominal)					Adjustment period (\$2026-27)				
Year of period	1	2	3	4	Review year	1	2	3	4	5
Costs ^a										
- Electricity	100	100	100	100						
- LGCs	90	95	100	115						
- Total	190	195	200	215						
Revenue - surplus energy sold										
- Electricity	80	90	100	110						
- LGCs	70	80	100	125						
- Total	150	170	200	235						
Gain or loss										
- Total gain (loss)	(40)	(25)	-	20						
- EAM core band	(9.5) ^b	(4.9)	5	5.4						
EAM shares										
- SDP within band	(9.5)	(4.9)	-	5.4						
- SDP outside band	(6.1)	(4.0)	-	2.9						
- Customer share	(24.4)	(16.1)		11.7						
- PV customer share					(36)					
EAM										
- EAM allowance						(7.80)	(7.80)	(7.80)	(7.80)	(7.80)
- PV EAM allowance					(36)					

a. For 2022-23, the costs in this example refer to the total energy contracted within the year. For all other years in the 2023 application period, the costs refer to the value of surplus energy contracted in those years.

b. The core band in 2022-23 is based on the 2017 EAM methodology of 5%. Sharing outside the core band in all years is based on the 2017 and 2023 EAM methodologies of 20% SDP and 80% customers.

Note: the figures used in this example are for illustration only and may not add due to rounding. This analysis assumes a nominal financing rate of 5% and a real discount rate of 2.5%.

Source: IPART analysis.

Chapter 4 »

Efficiency Carryover Mechanism Methodology

04

4.1 Terms of Reference

The Terms of Reference states:¹¹

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.

4.2 Purpose of the Efficiency Carryover Mechanism

Our approach to regulating prices for monopoly services, which is referred to as our 'form of regulation', provides:

- incentives for the businesses we regulate to manage their costs prudently and efficiently, and
- incentives for the businesses we regulate to search for and deliver permanent cost savings that can benefit customers through lower prices.

Without an ECM, if the business makes a permanent efficiency saving in the first year of a four year determination period, it is able to retain the saving for four years. However, if it makes a permanent efficiency saving in the third year of a four year determination period, it is able to retain the saving for just two years. This is because the timing of the next price review would account for efficiency savings within expenditure allowances. Therefore, without an ECM, businesses can have an incentive to delay permanent efficiency savings from the end of one determination period to the beginning of the next determination period. Although the saving is still made, its benefit to customers is delayed.

Our form of regulation includes an efficiency sharing mechanism to explicitly allow businesses to retain efficiency savings for a specified period in order to provide an incentive to achieve savings in any year of a determination period, on the condition that customers will benefit through lower prices in subsequent determination periods.

The ECM removes the incentive to delay efficiency savings, by allowing the business to retain a permanent savings for the same number of years regardless of when the saving is achieved within a determination period, while maintaining all other aspects of the form of regulation. One way to think of the ECM is that it takes the incentives for permanent efficiency savings that apply in the first year of the determination period, and applies these incentives consistently across the remaining years of the determination period. With an ECM in place:

- The business has an incentive to achieve efficiency savings as soon as they are identified.
- The business retains the efficiency saving for a fixed number of years, regardless of when during the determination period the efficiency saving is made.
- In the case of savings that might otherwise be delayed until the next determination period, customers will benefit through lower prices sooner if the business responds to the incentive to achieve efficiency savings as soon as they are identified.

4.3 What costs are included in the ECM

The scope of the ECM is limited to operating costs (i.e. capital expenditure is excluded, as it is beyond the scope of the Terms of Reference).

There are some elements of SDP's operating costs, however, that are not relevant when it comes to setting regulated prices and are therefore excluded from the ECM. Specifically:

- SDP's actual energy prices are excluded from the ECM because we set prices based on benchmark energy prices that may be different to SDP's actual energy prices.
 - If SDP were to negotiate lower actual energy prices, this would not affect SDP's regulated prices because we would continue to set energy prices relative to a benchmark energy price (not SDP's actual price). Therefore, SDP's actual energy prices are excluded from the ECM.
 - Energy volumes are however included in the ECM. If SDP is able to achieve efficiency savings that reduce its demand for energy, we will take this into account when setting prices and customers will benefit through lower prices in the future. Therefore, energy volumes are included in the ECM.
- Any operating costs that are outside the scope of SDP's regulated prices are excluded from the ECM. For example:
 - If SDP engaged in any unregulated activities, any costs associated with these activities would be excluded from the ECM.
 - In the absence of the EAM, any gains or losses from the sale of SDP's surplus energy contracts would be fully retained by SDP and would be outside the scope of SDP's regulated prices. Therefore, gains and losses on the sale of SDP's surplus energy are excluded from the ECM.

In its submission to our Draft Methodology Paper, SDP proposed that the ECM apply only to controllable cost items. We have considered SDP's submission on this matter, and have responded to these comments within our Final Report.

4.4 ECM timeframes

The ECM is structured around the following three periods:

- **Application period:** the period commencing the year immediately following the end of the previous application period until the year immediately preceding the review year.^h The ECM will apply to permanent efficiency savings over the application period.
- **Review year:** the year that efficiency savings over the application period are considered and any ECM adjustment is calculated.
- **Carryover period:** the determination period (or periods) immediately following the review year.ⁱ If an efficiency saving is made in the final year of the application period, the ECM will allow the saving to carry over for the first three years of the carryover period (i.e. allowing the saving to be retained for a total of five years).

Table 4.1 illustrates these time periods for the next EAM application in 2027.

Table 4.1 ECM application period and carryover period

2023 determination period					2027 determination period				
22-23	23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31	31-32
Application period				Review year	Carryover period				
1	2	3	4		1	2	3	4	5

Note: This example assumes a five-year 2027 determination period.

Source: IPART analysis.

As illustrated in Table 4.1, assuming the next review year occurs in 2026-27, the ECM application period will be from 2022-23 to 2025-26. This means that:

- The ECM will make use of actual expenditure data in every year (i.e. there is no need to rely on forecasts for the review year).
- We can ensure savings are held by SDP up to five years, consistent with the Terms of Reference.

^h Because we do not have actual data for final year of the determination period when we apply the ECM, this year is included in the application period at the next application of the ECM. That is, the application period is lagged one year behind the determination period.

ⁱ The terms of reference requires us to apply a 4-year carryover period following the year in which the efficiency saving was achieved. Given the review year is the final year of a determination period, the last year that SDP can reveal an efficiency saving is in the penultimate year of a determination period. Therefore, the 3-year carryover period consists of the final two years of the current determination period *plus* the first three years of the next determination period. If the next determination period is less than three years, the 3-year carryover period would then need to extend into subsequent determination period/s.

4.5 Identifying and carrying over efficiency savings

4.5.1 Definition of efficiency savings

The ECM applies to permanent reductions in operating costs. If the identified cost reduction is the result of cost shifting or if the saving has been re-absorbed into the business with the effect of there being no surplus to share with customers, the identified cost reduction would not qualify as an efficiency saving for the ECM.

The ECM does not depend on what caused the net reduction in operating cost. What is important is that SDP identifies and commits to maintain the permanent reduction in operating costs. The purpose of the ECM is to allow SDP to retain permanent savings for a period of time before they are passed on to customers through lower prices. The ultimate test is whether an identified efficiency saving will lead to a permanent reduction in prices for customers.

The fixed and variable components of the ECM are calculated independently. Therefore, a permanent efficiency gain in one component would not be affected by the other component. We will review any proposed permanent efficiency saving and ensure it is a genuine permanent efficiency saving and not the result of cost shifting.

4.5.2 Variable and fixed cost components of the ECM

To address the issues of year-to-year variance in total operating expenditure arising from differing levels of water production, our decision is to calculate the incremental operating efficiency saving:

- in SDP's fixed operating costs over the 2023 determination period, and
- in SDP's variable operating costs per GL over the 2023 determination period.

The Terms of Reference state that SDP should be allowed to carry over efficiency savings for four years following the year the efficiency permanent saving is achieved (i.e. a total of five years).

Table 4.2 sets out our ECM adopting the scenario used above, which allows SDP to retain both fixed and variable permanent efficiency savings for up to five years.

Table 4.2 Illustration of ECM carryovers

	Determination period 1				Determination period 2				
	1	2	3	4	1	2	3	4	5
ECM_{fixed}									
Fixed allowance	100	100	100	100	100	100	100	100	100
Fixed actual	100	100	100	100	100	100	100	100	100
Efficiency _{fixed}	-	-	-	-	-	-	-	-	-
ECM _{fixed} allowance	-	-	-	-	-	-	-	-	-
Net allowance _{fixed}	100	100	100	100	100	100	100	100	100
SDP gain _{fixed}	-	-	-	-	-	-	-	-	-
ECM_{variable}									

	Determination period 1				Determination period 2				
	1	2	3	4	1	2	3	4	5
APR (GL)	50	25	75	50	50	75	25	50	50
Variable allowance per GL	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9
Variable actual per GL	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Efficiency _{variable} per GL	-	0.1	-	-	-	-	-	-	-
ECM _{variable} allowance	-	-	-	-	0.1	0.1	-	-	-
Net allowance per GL	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9
SDP gain _{variable}	-	2.5	7.5	5	5	7.5	-	-	-
ECM_{total}									
Total allowance (excl. ECM)	150	125	175	150	145	167.5	122.5	145	145
Total actual	150	122.5	167.5	145	145	167.5	122.5	145	145
ECM allowance	-	-	-	-	5	7.5	-	-	-
Total allowance (incl. ECM)	150	125	175	150	150	175	145	145	145
SDP gain	-	2.5	7.5	5	5	7.5	-	-	-

Source: IPART analysis.

Table 4.2, illustrates that SDP would retain efficiency savings made in year 2 of the first determination for a total of five years.

4.5.3 Ensuring savings are held for a total of five years

We set prices for the next determination period during the last year of the current determination period before actual costs are known for this year.

Therefore, it is possible for SDP to make a permanent efficiency saving in the last year of a determination period and for us to not know about the saving when we set prices for the next determination period. The result is that SDP would be able to retain this saving for a total of six years before we are able to pass it on to customers through lower prices.

The ECM needs to address this situation for two reasons:

- To be consistent with the Terms of Reference, which stipulate SDP should be able to retain savings for four years following the year they are made (i.e., for a total of five years).
- To remove the incentive for SDP to delay savings until the last year of a determination period. Removing the incentive for SDP to delay savings is the sole purpose of the ECM.

If a permanent efficiency saving is made in the first year of the ECM application period (i.e. the last year of the previous determination period), SDP will retain the saving for six years. To correct for this, the ECM applies a negative carryover amount in the first year of the next determination period (ECM adjustment). The ECM adjustment is equal to the efficiency saving retained in the sixth year plus one year of financing costs. This effectively returns the sixth year of benefit retained by SDP in the last year of the current determination period to customers in the first year of the next determination period. Including financing costs is necessary to fully remove any incentive SDP might still have to delay savings until the last year of the determination period.

The financing cost assumption used by the ECM to return the sixth year of the efficiency saving from SDP to customers will be consistent with the financing cost assumption used by the EAM.

The ECM adjustment applies to general savings. Because the ECM adjustment is about returning the sixth year of benefit retained by SDP to customers in the first year of the next determination period, the ECM adjustment will be applied to fixed service charges.

4.6 ECM allowances

The ECM adjustment will be applied to SDP's charges in future price reviews. In addition, to ensure that savings held for more than five years are immediately returned to customers, these savings will be factored entirely into service charges.

SDP's pricing proposal should clearly state whether an identified efficiency saving has been inflated from the dollars of the year the saving was achieved to dollars of the review year. IPART's CPI index should be used for any such inflation indexation.

4.7 ECM process

The following points step through the ECM calculation process:

- Identify whether SDP permanently reduced total in-scope fixed or variable operating costs below the regulatory allowance used by IPART in setting maximum prices. If so, quantify the size of the incremental efficiency saving (i.e. ECM_{fixed} is \$X and $ECM_{variable}$ is \$Y per GL).
- Identify the financial year of the application period in which the saving was achieved (n).
- Ensure SDP retains the efficiency saving for a total of five years and its expenditure allowance in subsequent determination periods is reduced by the amount of the incremental efficiency saving (i.e. ECM_{fixed} is \$X and $ECM_{variable}$ is \$Y per GL).
- If a permanent efficiency saving is achieved in year 1 of the application period, SDP will retain the saving for a total of five years and, as intended, the ECM will have no effect.
- If an efficiency saving is achieved in years 2 to 4 of the application period, apply a positive ECM_{fixed} allowance of \$X per year and $ECM_{variable}$ allowance of \$Y per GL per year for the first n-1 years of the next determination period.
- If in the future we have a five-year ECM application period, we will ensure that permanent efficiency savings are kept for a maximum of five years (see example 3 in Chapter 5).

4.8 Information requirements

We will need to collect additional information to implement the ECM at future price reviews. IPART will develop an appropriate framework to collect this information and include it in our written advice to SDP prior to future price reviews.

We already have an annual reporting framework in place with SDP. We will work with SDP over the 2023 determination period to ensure this reporting framework continues to meet our requirements.

Chapter 5 »

Worked examples of the
Efficiency Carryover Mechanism

05

The following examples illustrate how we intend to implement the ECM at future price reviews.^j For simplicity, we have not included the effects of inflation indexation in these examples.

The fixed and variable components of the ECM are calculated separately. Therefore, a permanent efficiency gain in one component would not be affected by the other component. We will review any proposed permanent efficiency saving and ensure it is genuine and not the result of cost shifting.

5.1 Example 1 – Fixed cost efficiency saving

The ECM allows permanent efficiency savings in fixed and variable operating costs to be retained for up to five years. The following example shows how the ECM allows a fixed operating cost efficiency saving achieved in the third year of determination period 1 to carryover for the first three years of determination period 2. This ensures permanent efficiency savings are retained by SDP for up to five years before being passed on to customers through lower prices.

Table 5.1 Fixed cost efficiency saving

	Determination period 1				Determination period 2					
	1	2	3	4	1	2	3	4	5	1
ECM_{fixed}										
Fixed allowance	100	100	100	100	90	90	90	90	90	90
Fixed actual	100	100	90	90	90	90	90	90	90	90
Efficiency _{fixed}	-	-	10	-	-	-	-	-	-	-
ECM _{fixed} allowance	-	-	-	-	10	10	10	-	-	-
Net allowance _{fixed}	100	100	100	100	100	100	100	90	90	90
SDP gain _{fixed}	-	-	10	10	10	10	10	-	-	-
ECM_{variable}										
APR (GL)	50	25	75	50	50	75	25	50	50	50
Variable allowance per GL	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Variable actual per GL	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Efficiency _{variable} per GL	-	-	-	-	-	-	-	-	-	-
ECM _{variable} allowance	-	-	-	-	-	-	-	-	-	-
Net allowance per GL	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
SDP gain _{variable}	-	-	-	-	-	-	-	-	-	-
ECM_{total}										
Total allowance (excl. ECM)	150	125	175	150	140	165	115	140	140	140
Total actual	150	125	165	140	140	165	115	140	140	140
ECM allowance	-	-	-	-	10	10	10	-	-	-
Total allowance (incl. ECM)	150	125	175	150	150	175	125	140	140	140
SDP gain	-	-	10	10	10	10	10	-	-	-

Note: The figures used in this example are for illustration only.
Source: IPART analysis.

^j The figures used in these examples are for illustration only.

5.2 Example 2 – Variable cost efficiency saving

The ECM allows variable cost efficiency savings to be retained for up to five years, including the year when the efficiency saving is first achieved, as demonstrated in the following example.

The Table 5.2 example shows that in year 2 of determination period 1, SDP makes a 10% permanent efficiency saving in its variable water costs. In this example, SDP retains the benefits of the reduction in variable costs for the remainder of determination period 1 as well as the first two years of determination period 2.

Table 5.2 Variable cost efficiency saving

	Determination period 1				Determination period 2					
	1	2	3	4	1	2	3	4	5	1
ECM_{fixed}										
Fixed allowance	100	100	100	100	100	100	100	100	100	100
Fixed actual	100	100	100	100	100	100	100	100	100	100
Efficiency _{fixed}	-	-	-	-	-	-	-	-	-	-
ECM _{fixed} allowance	-	-	-	-	-	-	-	-	-	-
Net allowance _{fixed}	100	100	100	100	100	100	100	100	100	100
SDP gain _{fixed}	-	-	-	-	-	-	-	-	-	-
ECM_{variable}										
APR (GL)	50	25	75	50	50	75	25	50	50	50
Variable allowance per GL	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9
Variable actual per GL	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Efficiency _{variable} per GL	-	-	-	-	-	-	-	-	-	-
ECM _{variable} allowance	-	-	-	-	0.1	0.1	-	-	-	-
Net allowance per GL	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9
SDP gain _{variable}	-	2.5	7.5	5.0	5.0	7.5	-	-	-	-
ECM_{total}										
Total allowance (excl. ECM)	150	125	175	150	145	167.5	123	145	145	145
Total actual	150	122.5	167.5	145	145	167.5	123	145	145	145
ECM allowance	-	-	-	-	5.0	7.5	-	-	-	-
Total allowance (incl. ECM)	150	125	175	150	150	175	123	145	145	145
SDP gain	-	2.5	7.5	5.0	5.0	7.5	-	-	-	-

Note: The figures used in this example are for illustration only.
Source: IPART analysis.

5.3 Example 3 – Efficiency savings retained for up to five years

The ECM ensures that efficiency savings are held for up to five years, consistent with the Terms of Reference. If a permanent fixed and variable efficiency saving is achieved in the first year of the application period (i.e., year 4 of determination period 1) and we are not aware of it when we set prices, SDP will retain this saving for six years. The ECM corrects for this by taking the sixth year of the retained saving (i.e., the \$15 retained by SDP in year 5 of determination period 2) plus financing costs (in this case assumed to be 5%) and passes this back to customers in year 1 of determination period 3.

Table 5.3 Ensuring savings are held for a maximum of five years

	Determination period 1				Determination period 2					
	1	2	3	4	1	2	3	4	5	1
ECM_{fixed}										
Fixed allowance	100	100	100	100	100	100	100	100	100	90
Fixed actual	100	100	100	90	90	90	90	90	90	90
Efficiency _{fixed}	-	-	-	10	-	-	-	-	-	-
ECM _{fixed} allowance	-	-	-	-	-	-	-	-	-	-
Net allowance _{fixed}	100	100	100	100	100	100	100	100	100	100
SDP gain _{fixed}	-	-	-	10	10	10	10	10	10	-
ECM_{variable}										
APR (GL)	50	25	75	50	50	75	25	50	50	50
Variable allowance per GL	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9
Variable actual per GL	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Efficiency _{variable} per GL	-	-	-	-	-	-	-	-	-	-
ECM _{variable} allowance	-	-	-	-	-	-	-	-	-	-
Net allowance per GL	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9
SDP gain _{variable}	-	-	-	5.0	5.0	7.5	2.5	5.0	5.0	-
ECM_{total}										
Total allowance (excl. ECM)	150	125	175	150	150	175	125	150	150	135
Total actual	150	125	175	135	135	158	113	135	135	135
ECM allowance	-	-	-	-	-	-	-	-	-	(15.75)
Total allowance (incl. ECM)	150	125	175	150	150	175	125	150	150	119.25
SDP gain	-	-	-	15.0	15.0	17.5	12.5	15.0	15.0	(15.75)

Note: The figures used in this example are for illustration only.
Source: IPART analysis.

5.4 Example 4 – Temporary underspends and overspends

The regulatory framework allows the flexibility of temporary underspends in one year to be offset by temporary overspends in another year. The following example shows how the ECM does not affect temporary underspends and overspends, which are both retained by SDP. In this example, SDP underspends \$10 in year 2 of determination period 1 and overspends \$10 in year 3 of determination period 1.

Table 5.4 Temporary underspends and overspends are outside the scope of the ECM

	Determination period 1				Determination period 2					
	1	2	3	4	1	2	3	4	5	1
ECM_{fixed}										
Fixed allowance	100	100	100	100	100	100	100	100	100	100
Fixed actual	100	90	110	100	100	100	100	100	100	100
Efficiency _{fixed}	-	-	-	-	-	-	-	-	-	-
ECM _{fixed} allowance	-	-	-	-	-	-	-	-	-	-
Net allowance _{fixed}	100	100	100	100	100	100	100	100	100	100
SDP gain _{fixed}	-	10	(10)	-	-	-	-	-	-	-
ECM_{variable}										
APR (GL)	50	25	75	50	50	75	25	50	50	50
Variable allowance per GL	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Variable actual per GL	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Efficiency _{variable} per GL	-	-	-	-	-	-	-	-	-	-
ECM _{variable} allowance	-	-	-	-	-	-	-	-	-	-
Net allowance per GL	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
SDP gain _{variable}	-	-	-	-	-	-	-	-	-	-
ECM_{total}										
Total allowance (excl. ECM)	150	125	175	150	150	175	125	150	150	150
Total actual	150	115	185	150	150	175	125	150	150	150
ECM allowance	-	-	-	-	-	-	-	-	-	-
Total allowance (incl. ECM)	150	125	175	150	150	175	125	150	150	150
SDP gain	-	10	(10)	-	-	-	-	-	-	-

Note: The figures used in this example are for illustration only.
Source: IPART analysis.

Appendices

Appendix A »

Terms of Reference





The Hon. Kevin Anderson MP
Minister for Lands and Water
Minister for Hospitality and Racing

Our ref: B22/2430

Ms Carmel Donnelly PSM
Chair
Independent Pricing and Regulatory Tribunal
PO Box K35
Haymarket Post Shop NSW 1240

Dear Ms Donnelly

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*.

Amended Terms of Reference are attached to this letter.

Greater Sydney Water Strategy

The final Greater Sydney Water Strategy (GSWS) has been approved by Government and will be published in the coming weeks. The Strategy charts the long-term vision and direction for delivering sustainable and resilient water services to Greater Sydney, including the Illawarra and the Blue Mountains, for the next 20 years.

The Strategy provides for an amended operating regime for the Sydney Desalination Plant (**Plant**) to optimise its contribution to the overall system resilience including water supply security, drought management and operating flexibility. In future, the Plant will operate on a flexible basis (including with respect to the volume of water produced) rather than only at full capacity during periods of drought, in line with a Decision Framework currently being developed by Sydney Water for my endorsement.

I encourage the Tribunal to work with stakeholders to consider the implications of the new operating regime, with a view to creating a pricing framework that is in the long-term interests of customers and consistent with the Decision Framework and need for a more flexible operating regime.

The principles under which SDP is expected to operate include:

- That the Plant provides a minimum baseload volume each year to achieve the desired performance set out below
- That the Plant can respond to shocks in the network, as required by the agreements between SDP and Sydney Water
- That the volume of water produced by the Plant can be varied as needed (in line with the Decision Framework) to support the resilience of the system, including slowing down dam depletion during droughts and keeping dam levels higher when needed, but also to be decreased when dam levels are high in order to minimise the risk of spills and maintain cost effectiveness.

Energy adjustment mechanism

As has been the case for the previous price determinations, I note for clarity that the intention of the proposed energy adjustment mechanism (which includes an efficiency gains and losses carryover mechanism to accommodate significant gains and losses associated with the sale of surplus electricity and Renewable Energy Certificates (**RECs**)) is to 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 (now Iberdrola Australia) and the market price for electricity and RECs arising from the sale of SDP's surplus electricity and RECs.

For electricity, the mechanism would mirror the 'Calculation of Shortfall Adjustment' in SDP's Electricity Supply Agreement with Infigen (now Iberdrola Australia), with the 'market price' defined as the half-hourly spot price and/or the price of a contracted 'available block'.

For RECs, the 'market price' would be the price shown in the Nextgen Greenroom Report, or another equivalent report.

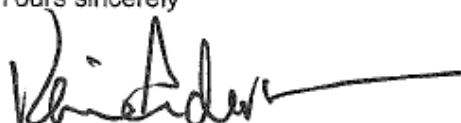
I note also that:

SDP is required by its Project Approval 05_0082 (as modified) to implement a greenhouse gas reduction plan, which incorporates the long term electricity and REC arrangements between SDP and Infigen (now Iberdrola Australia) that were entered into at the time of developing the Plant.

SDP did not know that it would be asked to operate the plant in accordance with the new operating regime when entering into those agreements with Infigen.

I ask that IPART have regard to the points above in making its price determination.

Yours sincerely



The Hon Kevin Anderson MP
Minister for Lands and Water
Minister for Hospitality and Racing

Date: 16.6.2012

Terms of Reference for Referral of Sydney Desalination Plant Pty Limited to IPART under Section 52 of the Water Industry Competition Act

Background

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

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

The Greater Sydney Water Strategy (GSWS) charts the long-term vision and direction for delivering sustainable and resilient water services to Greater Sydney, including the Illawarra and the Blue Mountains, for the next 20 years. The GSWS replaces the 2017 Metropolitan Water Plan. The *desalination plant* is a key element in Sydney's water security plan and the Greater Sydney Water Strategy.

The GSWS provides for an amended operating regime for the Sydney Desalination Plant (Plant) to increase its contribution to water supply security and drought management, and not only as a drought-response service. A Decision Framework is being developed by Sydney Water for my endorsement and will guide the flexible operating approach. It adopts a principle-based approach aimed at enhancing resilience and is intended to remain adaptive to the changing circumstances and needs across Sydney Water's network. As part of IPART's review of SDP's network operator's licence, reference to the Decision Framework in the licence will provide additional information about the intended operation of SDP, and will be consistent with the Government's objectives stated in the GSWS.

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 (noting the potential range and variation of production required under the Decision Framework) 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.
- 7A. The SDP Project Approval under former s 75J of the *Environmental Planning and Assessment Act 1979* (05_0082) required the development of a greenhouse gas reduction plan (**GGRP**), to be approved by the Director-General, prior to the commencement of operation of the plant. The GGRP details a strategic plan for the management, minimisation and off-set of greenhouse gas generation associated with electricity supply for the plant. As part of the approved GGRP, certain contracts were entered into with Infigen (now Iberdrola Australia) to acquire electricity and RECs (**GGRP Contracts**). The price determination should consider SDP's ability to recover all costs it incurs in complying with the GGRP and the GGRP Contracts other than costs related to surplus energy in relation to which the energy adjustment mechanism described in paragraph 8 (iii) applies.
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 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 (now Iberdrola Australia) and revenues from the sale of surplus electricity and RECs. The mechanism would only operate at times when 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 be confirmed as part of the IPART review process. For each successive price determination period, IPART is to make the price determination before the expiry of the current determination period.

Appendix B »

Glossary

B

2012 determination period	The period 1 July 2012 to 30 June 2017.
2012 ECM	The Efficiency Adjustment Mechanism outlined in the 2012 Methodology Paper.
2012 EAM	The Energy Adjustment Mechanism outlined in the 2012 Methodology Paper.
2012 Methodology Paper	The Methodology Paper published by IPART in April 2012.
2017 Determination	Determination of SDP's maximum prices from 1 July 2017.
2017 determination period	The period 1 July 2017 to 30 June 2022.
2017 ECM	The Efficiency Carryover Mechanism outlined in the 2017 Methodology Paper.
2017 EAM	The Energy Adjustment Mechanism outlined in the 2017 Methodology Paper.
2017 Final Report	IPART, Sydney Desalination Plant – Review of prices from 1 July 2017 to June 2022, Final Report , June 2017.
2017 Methodology Paper	The Methodology Paper published by IPART in June 2017.
2023 determination period	The period 1 July 2023 to 30 June 2027.
2023 ECM	The Efficiency Carryover Mechanism outlined in the 2023 Methodology Paper.
2023 EAM	The Energy Adjustment Mechanism outlined in the 2023 Methodology Paper.
2023 Final Report	IPART, Sydney Desalination Plant – Review of prices from 1 July 2023 to June 2027, Final Report , June 2023.
2023 Draft Methodology Paper	The Draft Methodology Paper published by IPART in April 2023.
2023 Methodology Paper	The Final Methodology Paper published by IPART in June 2023 to apply over the 2023 determination period.
Adjustment period	The determination period immediately following the review year

AEMO	Australian Energy Market Operator
Application period	The five-year period immediately preceding the review year
Carryover period	The first three years of a determination period immediately following the review year
Determination period	The period over which IPART sets maximum prices
General saving	Efficiency savings that apply in all modes of operation
Infigen	Infigen Energy Limited
LGC	Large scale generation certificate
LRMC	Long run marginal cost
Review year	The year in which IPART reviews and sets prices for the next determination period
RBA	The Reserve Bank of Australia
REC	Renewable energy certificate
SDP	Sydney Desalination Plant Pty Ltd
Sydney Water	Sydney Water Corporation
WIC Act	<i>Water Industry Competition Act 2006 (NSW)</i>

-
- ¹ IPART, *Sydney Desalination Plant – Energy Adjustment and Efficiency Carryover Mechanisms - Methodology Paper*, June 2012
 - ² IPART, *Sydney Desalination Plant – Energy Adjustment and Efficiency Carryover Mechanisms - Methodology Paper*, June 2017.
 - ³ IPART, *Review of prices for Sydney Desalination Plant Pty Ltd from 1 July 2023 – Issues Paper*, November 2022, Chapter 5.
 - ⁴ SDP Amended Terms of Reference, June 2022.
 - ⁵ SDP Amended Terms of Reference, June 2022, page 2.
 - ⁶ SDP, *Pricing submission to IPART | Prices from 1 July 2023 to June 2027*, 16 September 2022, p 30.
 - ⁷ SDP (Sydney Water) submission to IPART's review of prices, 8 July 2011, p 3.
 - ⁸ SDP (Sydney Water) submission to IPART's review of prices, 8 July 2011, p 3.
 - ⁹ SDP (Sydney Water) submission to IPART's review of prices, 8 July 2011, p 3.
 - ¹⁰ Reserve Bank of Australia, [Statistical Table - Interest Rates](#), Aggregate Measures of Australian Corporate Bond Spreads and Yields – F3, accessed 7 June 2017.
 - ¹¹ SDP Terms of Reference, February 2012, page 2.

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