Report into market ancillary service prices above $5000/MW

South Australia, 18 October 2016

21 March 2017

AUSTRALIAN ENERGY REGULATOR

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1 Introduction

The AER is required to monitor significant variations between forecast and actual prices and publish a report where:

- prices for a market ancillary service over a period significantly exceed the relevant spot price for energy; and
- prices for a market ancillary service exceed $5000 for a number of trading intervals within that period.

In accordance with the clause 3.13.7(e) of the National Electricity Rules, the report must:

- describe the significant factors that contributed to the ancillary service prices exceeding $5000/MWh;
- identify any linkages between spot prices in the energy market and ancillary service prices contributing to the occurrence; and
- assess whether rebidding pursuant to clause 3.8.22 contributed to prices exceeding $5000/MWh.

On 18 October 2016, the price of two Frequency Control Ancillary Services (FCAS) in South Australia exceeded $5000/MW for an extended period, in excess of energy spot prices. This report presents our analysis of the events in accordance with this obligation.

2 Summary

On 18 October 2016, the price for regulation frequency control ancillary services (FCAS[1]) in South Australia exceeded $5000/MW for more than 5 hours spanning two periods – from 7.05 am to 8.20 am and from 7.05 pm to 11.30 pm. The high prices aligned with a need to source 35MW of these services from within South Australia, despite forecasts prepared by AEMO earlier indicating there would be sufficient low-priced capacity available to meet the local requirement.

Regulation FCAS is used to keep the frequency of the power system constant at 50 Hertz in response to small changes in demand and supply. The cost of regulation services on 18 October exceeded $4.5 million – these costs are borne by generators and consumers in South Australia. In comparison, FCAS costs across all mainland National Electricity Market (NEM) regions combined are typically around $200 000 per day.[2]

The main reasons for the high prices were:

- A planned outage on the Heywood interconnector (which began at 7 am on 18 October) created a risk of islanding South Australia from the NEM. Under these conditions, the Australian Energy Market Operator (AEMO) requires 35 MW of raise and lower regulation FCAS to be sourced locally in South Australia.[3]
- Two of the generators registered to provide regulation FCAS in South Australia experienced technical difficulties, which led to a reduction in low-priced services being available.
    - Delays in the return to service for Engie's Pelican Point Power Station materially reduced its capacity and led to a reduction of low-priced regulation FCAS in the morning.
    - A gas valve trip at Origin Energy's Quarantine Power Station led to a reduction of low-priced regulation FCAS in the evening.
- As a result, high-priced regulation FCAS was enabled to meet the 35 MW requirement.

AEMO first introduced the 35 MW local requirement in October 2015 to ensure that there are adequate sources of regulation FCAS immediately available to manage frequency in South Australia in the event of the region being separated from the rest of the NEM. In other words, generators which provide these services need to be on and running to be capable of providing the services before the need exists - this is effectively a security mechanism introduced by AEMO to protect South Australia in the event of separation .

1 Frequency control ancillary services (FCAS) is explained in Appendix A.

2 Average costs for the 2015/2016 FY.

3 See Appendix A for a description of the local regulation requirement.

The 35 MW local regulation requirement imposed by AEMO has cost South Australian consumers and generators around $48 million since the constraint was first introduced in October 2015.

3 Analysis

Prices for local regulation FCAS exceeded $11 000/MW from 7.05 am to 8.20 am, and exceeded $12 000/MW from 7.05 pm to 10.45 pm (in total, 62, 5-minute dispatch intervals above $5000/MW). The reasons for the high prices are explained below.

3.1 Planned network outage

South Australia is electrically connected to Victoria by the Heywood and Murraylink interconnectors. The Heywood Interconnector is an alternating current (AC) high voltage transmission link, while Murraylink is a direct current (DC) interconnector. The Heywood interconnector provides a synchronous connection between South Australia and the rest of the NEM.

The Heywood interconnector was being augmented to increase its nominal capacity (from 460 MW to 650 MW). From time to time there are planned outages to allow work to be undertaken. When there is a network outage that risks islanding South Australia, AEMO invokes constraints requiring 35 MW of local regulation FCAS. This ensures there are adequate sources of regulation FCAS within South Australia, immediately available in the event of separation, to manage the frequency within the islanded region.

Commencing 7 am on 18 October, a planned network outage commenced on the Heywood to South East No. 2 275 kV line running between South Australia and Victoria. The outage remained in place until 10.50 am on 22 October. As this outage put South Australia on a single contingency (meaning the region could be islanded if the remaining Heywood to South East line failed), AEMO invoked the 35 MW local regulation FCAS constraints for the duration of the outage. The market notices relating to the outage (MN 54934 and 55353) are replicated at Appendix C.

3.2 Regulation FCAS availability and price

This section describes regulation services in South Australia, forecast conditions and rebidding of those services on 18 October.

3.2.1 Registered maximum regulation FCAS capacity

Table 1 shows the power stations registered to provide raise and lower regulation FCAS in South Australia on the day and the maximum capacity. It highlights that each registered power station, if fully available, is capable of providing the local requirement in its entirety.

Table 1: Registered maximum regulation FCAS capacity by station

Power Station	Max Capacity	
	Lower Regulation	Raise Regulation
Osborne (Origin Energy)	36	36
Quarantine (Origin Energy)	50	50
Pelican Point (Engie)	100	100
Torrens Island (AGL)	200	260
Total	**386**	**446**

3.2.2 Forecast effective available capacity and price

The National Electricity Market Dispatch Engine (NEMDE) co-optimises FCAS and energy offers to arrive at the least cost security constrained solution every 5 minutes. Effective available FCAS capacity is calculated during the dispatch process and represents the offered FCAS capacity adjusted for the energy output of the generator. It follows, therefore, that the effective available FCAS capacity will be lower than or equal to the maximum capacity. In analysing markets, the effective available FCAS capacity is a more accurate measure of the FCAS physically available to satisfy requirements.

Table 2 shows that forecasts prepared four hours ahead showed sufficient low-price effective lower and raise regulation FCAS to meet the 35 MW requirement - resultant prices were forecast to be below $100/MW for most dispatch intervals in which high prices eventuated.

Table 2: four hour ahead forecasts of effective raise and lower regulation FCAS

Period	Effective Lower Regulation FCAS		Effective Raise Regulation FCAS	
	Available (MW)	<$100/MW	Available (MW)	<$100/MW
7.05 am - 8.20 am	60	36	111	36
7.05 pm - 10.45 pm	143	36	179	36

3.2.3 Rebidding

Plant failures at Engie's Pelican Point power station in the morning and Origin Energy's Quarantine Power station in the evening led to these stations being unable to provide regulation FCAS.

Rebidding for the period 7 am to 8.30 am

At 4.32 am, Engie reduced the available capacity at Pelican Point Power Station by 165 MW (from 235 MW to 70 MW) all of which was priced below $200/MW. The reason given was "0431P Update RTS Profile, unit flame issues" which related to difficulties in stabilising the combustion in the turbine that consequently delayed its returning to service. As a result of the plant failure, only 33 MW of lower and raise

FCAS capacity priced below $5000/MW remained. Higher cost FCAS from other sources at AGL's Torrens Island power station was used to meet the 35 MW requirement and the dispatch price for both services reached $11 499.99/MW from 7.05 am to 8.20 am.

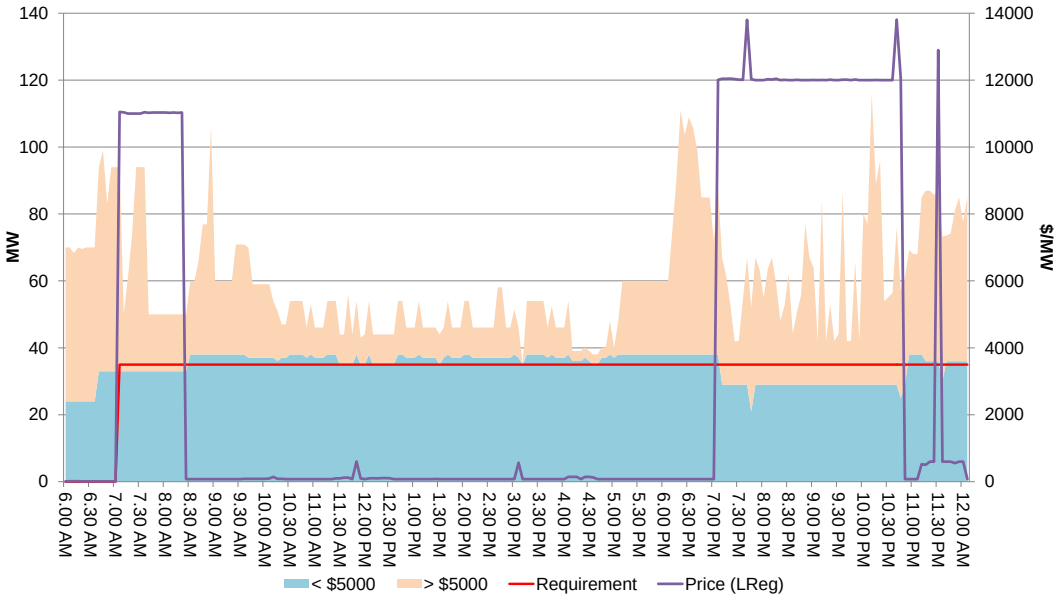
Rebidding for 7.05 pm to 10.45 pm

At around 7 pm Origin Energy's Quarantine Power Station tripped (from 122 MW). The majority of its capacity was priced at the price floor. The reason given was "1858P Change in avail – gas valve trip – SL". As a result of the plant failure, only 29 MW of lower and raise FCAS capacity priced below $5000/MW remained. Higher cost FCAS from sources at AGL's Torrens Island power station was used to meet the 35 MW requirement and the dispatch price for both services exceeded $12 000/MW for most dispatch intervals from 7.05 pm to 11.30 pm.

Appendix D outlines the generators involved in setting prices during these periods.

Figure 1 and Figure 2 show actual price (purple line) and effective available capacity over the high price periods.[4] The (constant) 35 MW requirement is shown by the red line. The blue shaded areas indicate effective available capacity below $5000/MW, while the light orange shaded areas indicate effective available capacity above $5000/MW.

Figure 1: Lower regulation effective offers and price



4 Individual prices are contained in the Price Setter at Appendix D.

Figure 2: Raise regulation effective offers and price

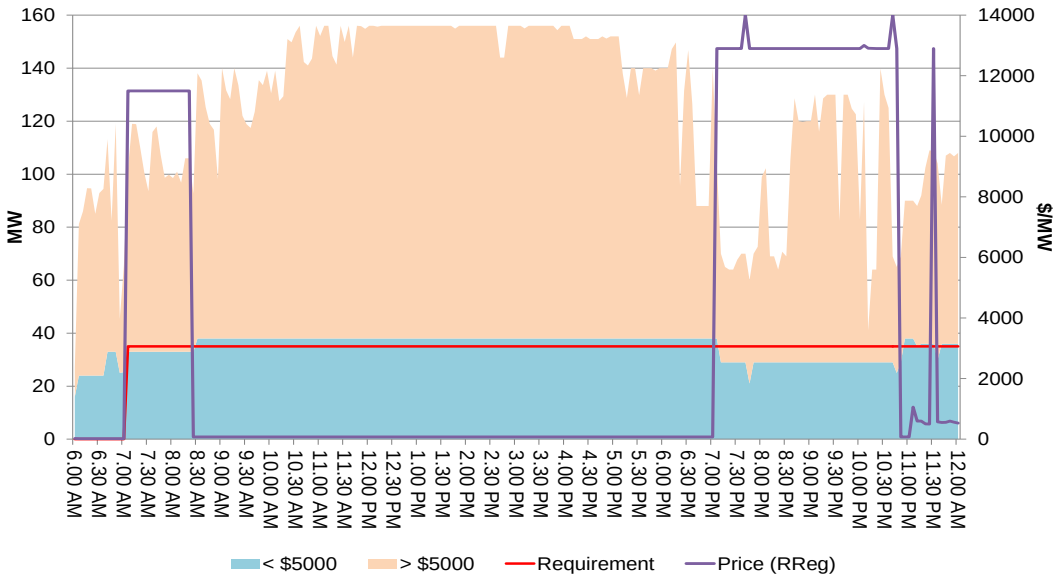


Figure 1 and Figure 2 show how the reduction in low-price (blue shaded area) effective available lower and raise regulation FCAS led to the need for high-price regulation FCAS (indicated by the presence of the red line in the orange shaded area) which ultimately led to high dispatch price outcomes.

Australian Energy Regulator

March 2017

Appendix A Explanation of FCAS

Frequency control ancillary services (FCAS) are required to maintain the frequency of the power system within the frequency operating standards. There are two general categories of FCAS:

- Regulation services, which continuously adjust to small changes in demand or supply (changes that cause the frequency to move by only a small amount away from 50 Hz). There are regulation services to increase the frequency (raise regulation or RREG) and services to decrease the frequency (lower regulation or LREG).
- Contingency services, which manage large changes in demand or supply that occur relatively rarely and move the frequency by a large amount. There are three contingency services to increase the frequency and three contingency services to decrease the frequency.

Raise Contingency FCAS are required to be available to correct the frequency excursions that have arisen from a credible contingency event that leads to a decrease in frequency. As these contingency events usually involve step reductions in supply side, the Electricity Rules stipulate that generators pay for these services.

Lower Contingency FCAS are the services required to be available to correct the frequency excursions that arise from a credible contingency event that leads to an increase in frequency. As these contingency events usually involve step reductions in customer demand, the Electricity Rules stipulate that customers pay for these services.

Participants providing regulation services will receive adjusted dispatch targets every 5 minutes via their automatic generation control (AGC) signals from AEMO. Participants are paid through the FCAS markets in accordance with their offered volumes. Their energy production, that may be higher or lower depending on the AGC signals they receive, are settled in accordance with energy market prices.

There are three lower and three raise contingency services:

- fast services, which arrest a frequency deviation within the first six seconds of a contingent event (L6 and R6);
- slow services, which stabilise frequency deviations within sixty seconds of the event (L60/R60); and
- delayed services, which stabilise frequency deviations within five minutes of the event (L5/R5).

Participants offering to provide contingency services are enabled in accordance with the “trapezium” supplied in their offers. While participants will not necessarily be supplying these services until a contingency occurs they are paid in accordance with their enablement.

Local Frequency Control Ancillary Services

AEMO sets the requirement for FCAS to ensure that the frequency standard (as set by the Reliability Panel) is maintained in the event of step changes in supply or demand that results from credible contingencies. Where a credible contingency results in the loss of an interconnector it is termed a “separation event”.

The standard states that in the event of a “separation event” the frequency must be contained within 49 to 51 Hz or a wider band notified to AEMO by a relevant Jurisdictional System Security Co-ordinator (JSSC). In the case of South Australia the JSSC notified AEMO that the frequency band for separation of the South Australian power system is 47 to 52 Hz and that under frequency relays will operate at frequency levels in the low end of this range.

When there is a potential separation event caused by the loss of an interconnector “local frequency control ancillary services” are usually required.

If the region was exporting at the time the interconnector fails, then as a consequence of the immediate over supply situation local contingency “lower” services are required in the islanded region to lower the frequency (typically generators offer to quickly reduce output to lower frequency). In other words, the loss of the Heywood interconnector when power is flowing from South Australia, results in an oversupply of generation, increasing the frequency in South Australia. Contingency lower services are sourced from registered suppliers in South Australia (typically generators) in proportion to the flow across the interconnector from South Australia to Victoria to quickly reduce that over frequency.

A similar situation exists for contingency “raise” services for all other regions except South Australia where, in accordance with the advice from the JSSC, the raise requirement is covered by under frequency load shedding. In other words, the loss of the Heywood interconnector when power is flowing into South Australia, results in an undersupply of generation decreasing the frequency in South Australia. Under frequency load shedding reduces demand in blocks to arrest the falling frequency until supply matches demand and the frequency is restored.

In either event, in the past, in the period immediately following the separation event AEMO would invoke local regulation services and establish a local regulation reference source to manage frequency until the region can be reconnected to the rest of the NEM. It is this aspect that has been recently changed by AEMO. AEMO will now impose a requirement for local lower and raise regulation services in South Australia prior to the failure of the interconnector so that frequency after an island is formed, and after the contingency services have operated, can be smoothly maintained.

Frequency Control Ancillary Service Settlement and who pays

AEMO settles the FCAS markets on a weekly basis, as follows[5].

- Contingency FCAS: Generators pay for Raise Services and customers pay for Lower Services.
- Regulation FCAS: Cost recovery on a "causer pays" basis using the Causer Pays Procedure[6] developed by AEMO in accordance with the appropriate NER procedures.

The 'Causer Pays' Procedure allocates regulation FCAS costs to those market generators, customers and small generation aggregators with facilities that have the metering capable of determining their contribution to frequency deviations at any time.

Every four weeks based on historical data AEMO calculates a single causer pays contribution factor that represents each market participants aggregate contribution to the need for Regulation FCAS on a portfolio basis across the NEM. This contribution factor is not dependent on the amount of energy purchased/consumed by the participant – consequently a generator with a non-zero factor in a particular period will still pay a share of FCAS costs irrespective of how much of its generation is running. Any market generator, with a non-zero contribution factor with generating units in South Australia, will incur regulation FCAS costs.

Since not all of the costs will be recovered from generators, the residual costs are recovered from market customers (including retailers) in the relevant region, based on the amount of energy each market customer is purchasing. Over the week inclusive of 18 October, 60% of the regulation cost in South Australia was recovered from generators and the remaining 40% from market customers.

5 For a full description go to http://www.aemo.com.au/Electricity/Data/Ancillary-Services/Ancillary-Services-Payments-and-Recovery

6 For a full description go to http://www.aemo.com.au/Electricity/Market-Operations/Ancillary-Services/Process-Documentation/Ancillary-Services-Causer-Pays-Contribution-Factors

Appendix B Closing bids

Figures B1a to B6b highlight for each dispatch interval, the lower and raise regulation services closing bids for Origin, AGL and Engie (the only participants in South Australia with ancillary service capability. It also shows the dispatch level of the respective services at each station and the dispatch price.

Regulation services, like all other FCAS services, are co-optimised with energy offers. For example a generator that is operating at its maximum capacity cannot provide raise services so its effective available capacity for raise services would be zero.

Figures denoted with an “a” refer to the quantities offered while those with a “b” refer to the effective quantities available to the market after accounting for the interaction between energy and FCAS.

Figure B1a: Torrens Island (AGL) lower regulation service closing bid prices, dispatch and dispatch price – maximum offers

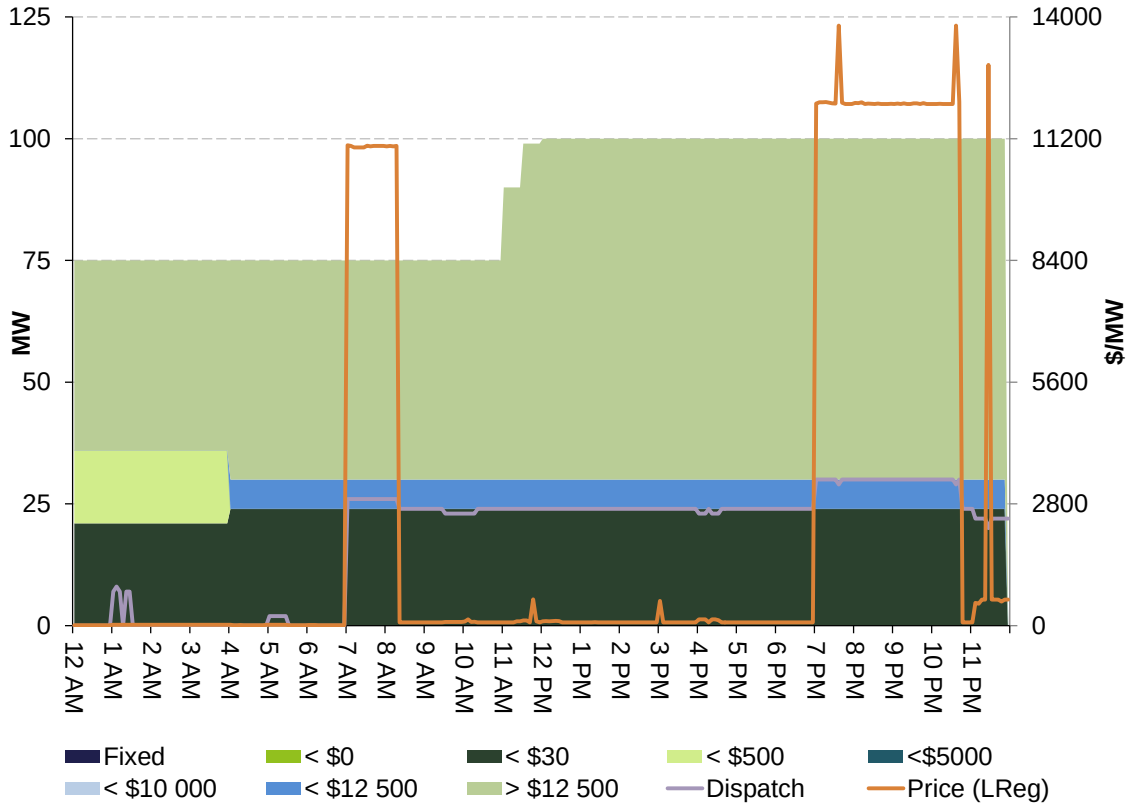


Figure B1b: Torrens Island (AGL) lower regulation service closing bid prices, dispatch and dispatch price – effective offers

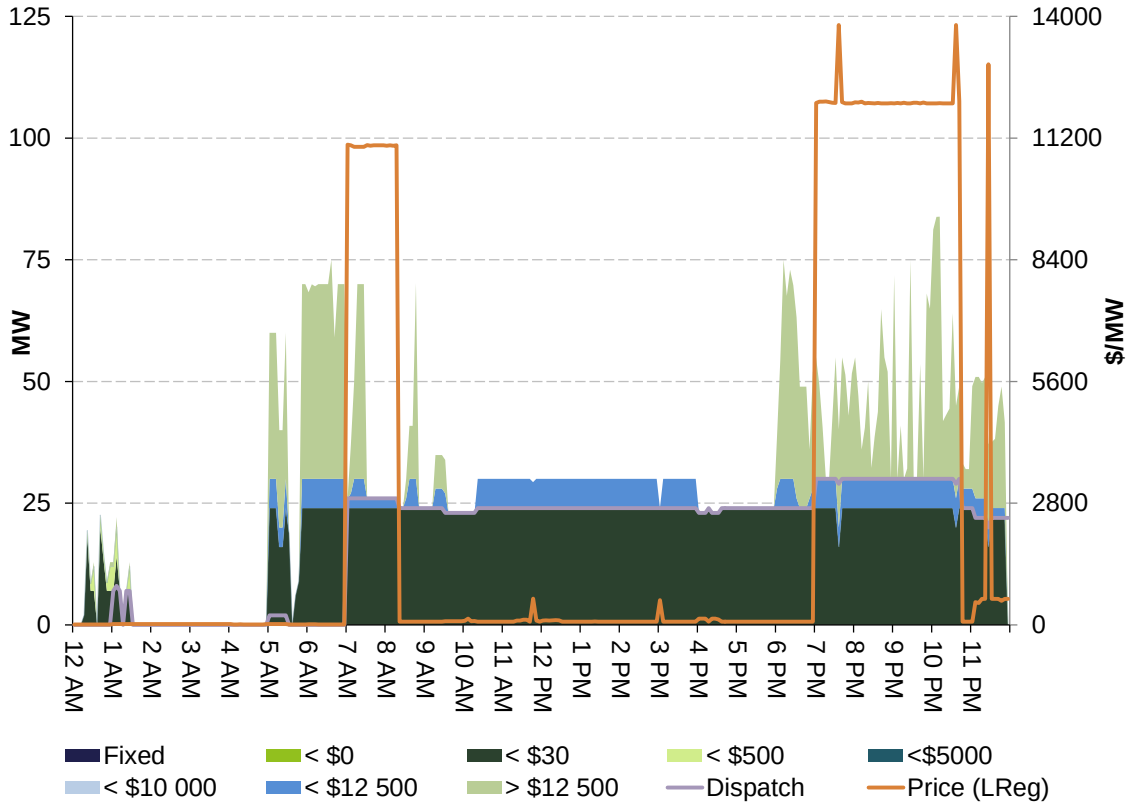


Figure B2a: Quarantine (Origin) lower regulation service closing bid prices, dispatch and dispatch price - maximum offers

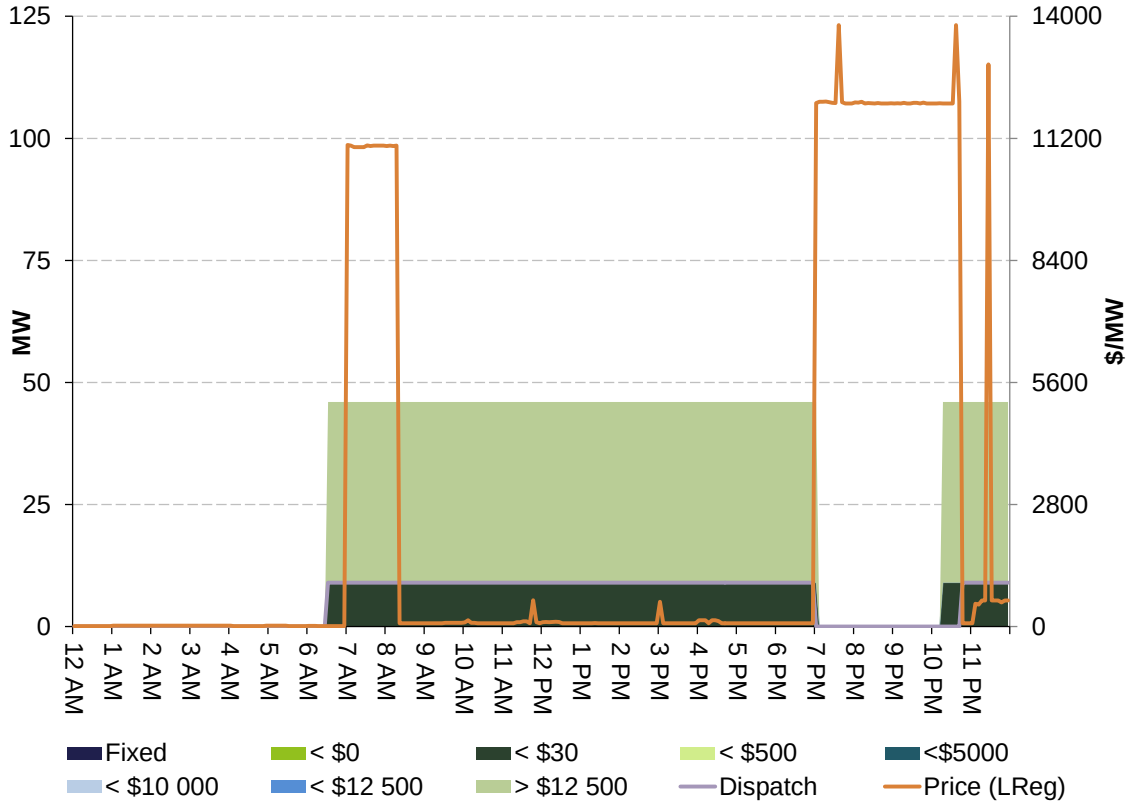


Figure B2b: Quarantine (Origin) lower regulation service closing bid prices, dispatch and dispatch price – effective offers

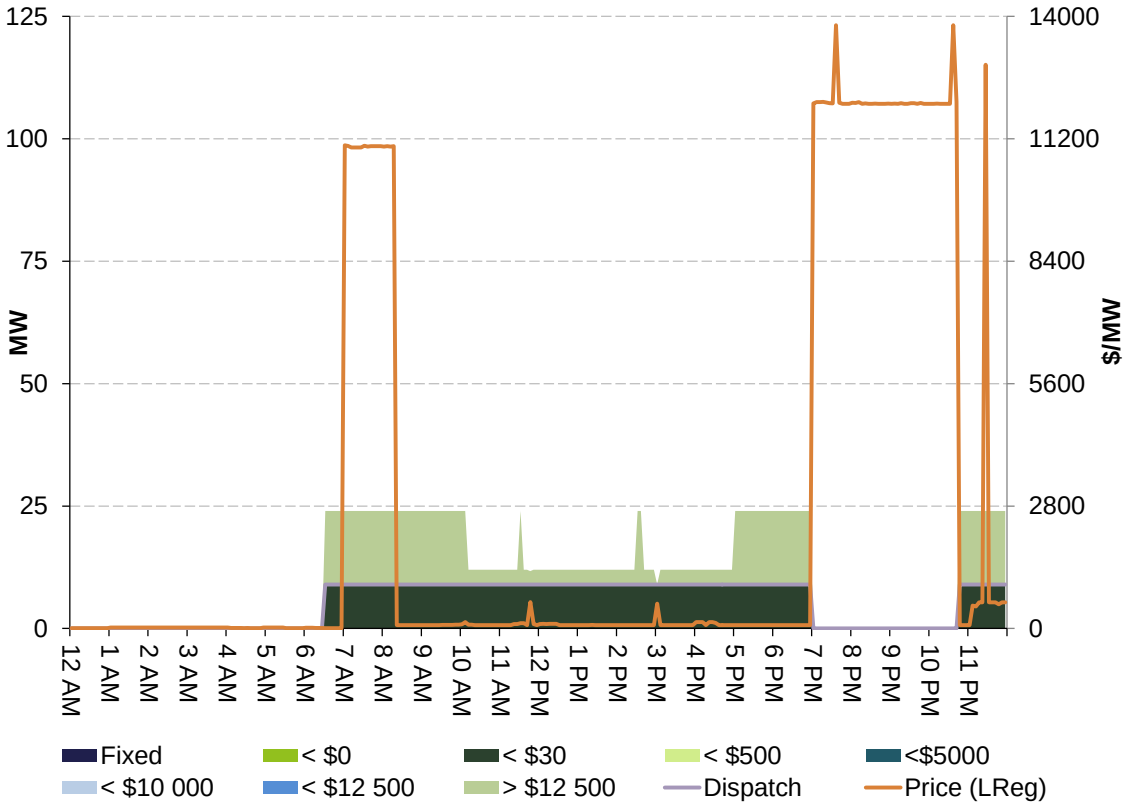


Figure B3a: Pelican Point (Engie) lower regulation service closing bid prices, dispatch and dispatch price – maximum offers

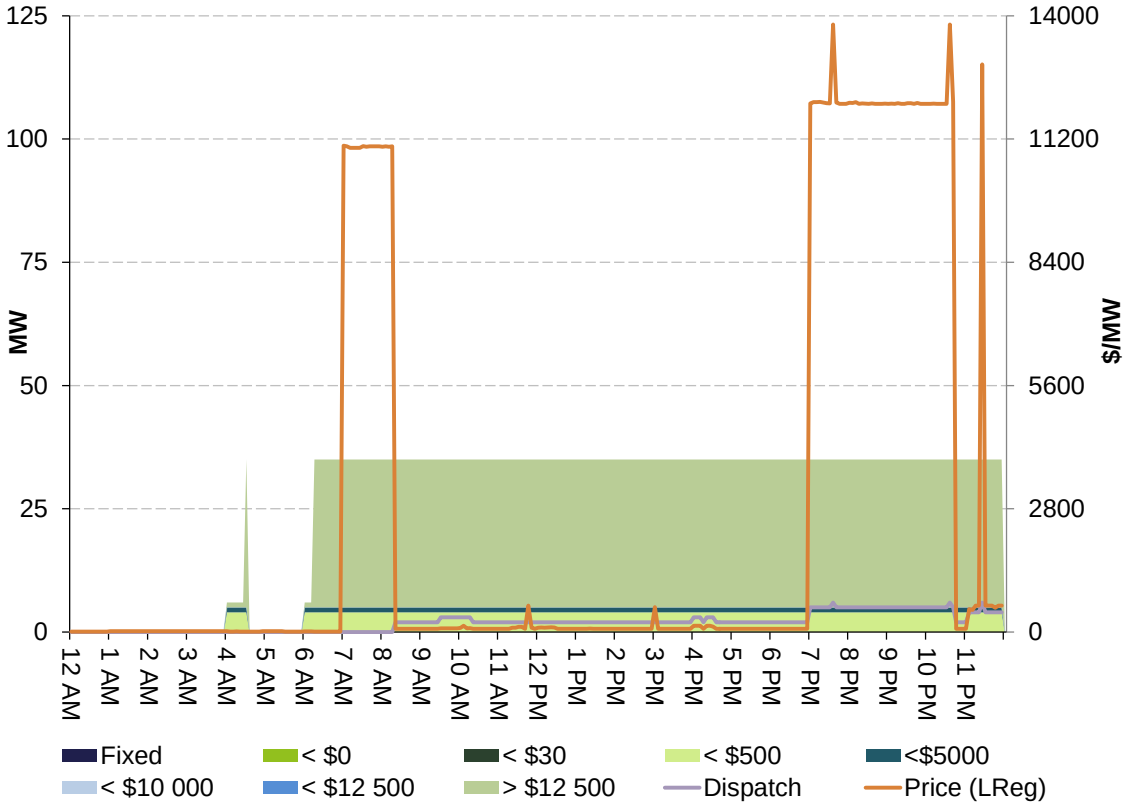


Figure B3b: Pelican Point (Engie) lower regulation service closing bid prices, dispatch and dispatch price – effective offers

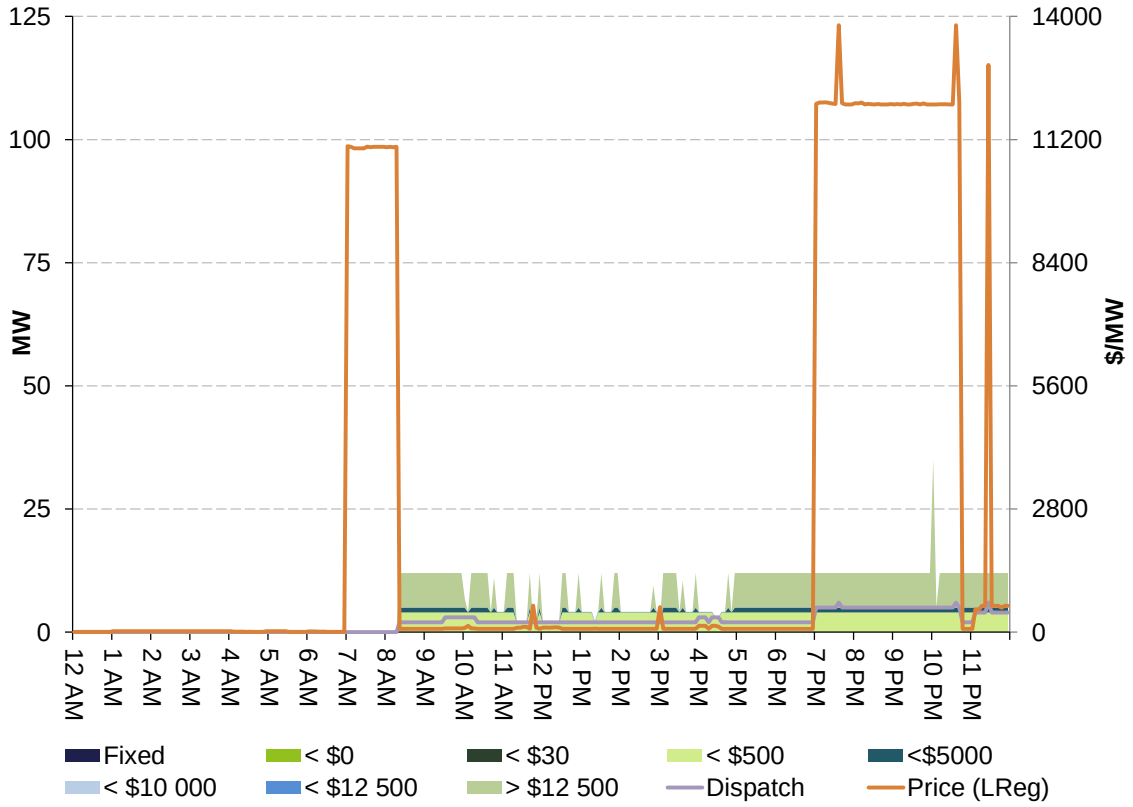


Figure B4a: Torrens Island (AGL) raise regulation service closing bid prices, dispatch and dispatch price – maximum offers

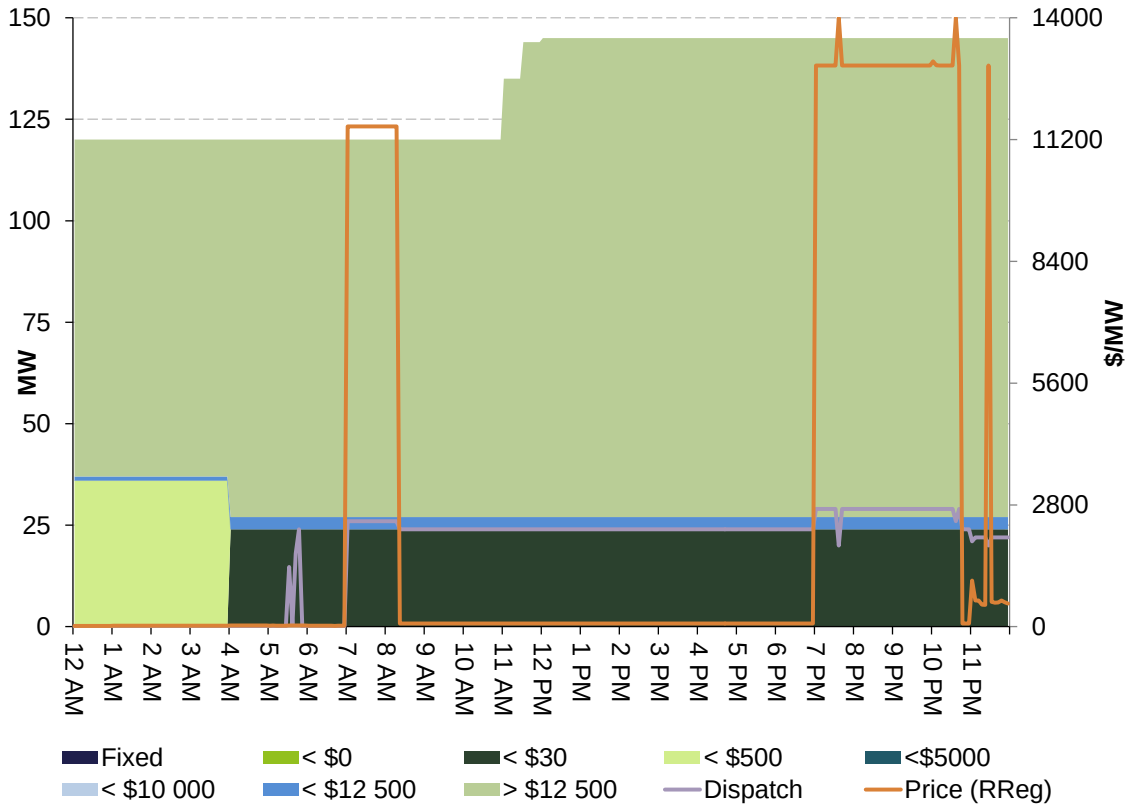


Figure B4b: Torrens Island (AGL) raise regulation service closing bid prices, dispatch and dispatch price – effective offers

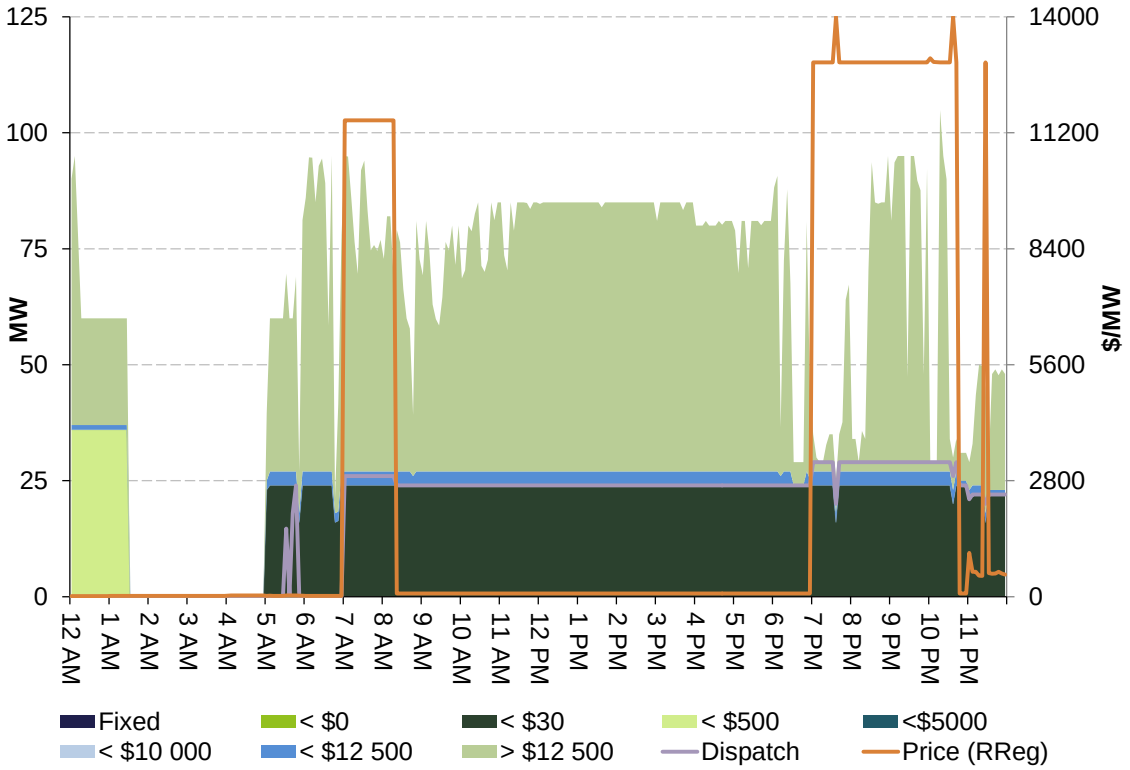


Figure B5a: Quarantine (Origin) raise regulation service closing bid prices, dispatch and dispatch price - maximum offers

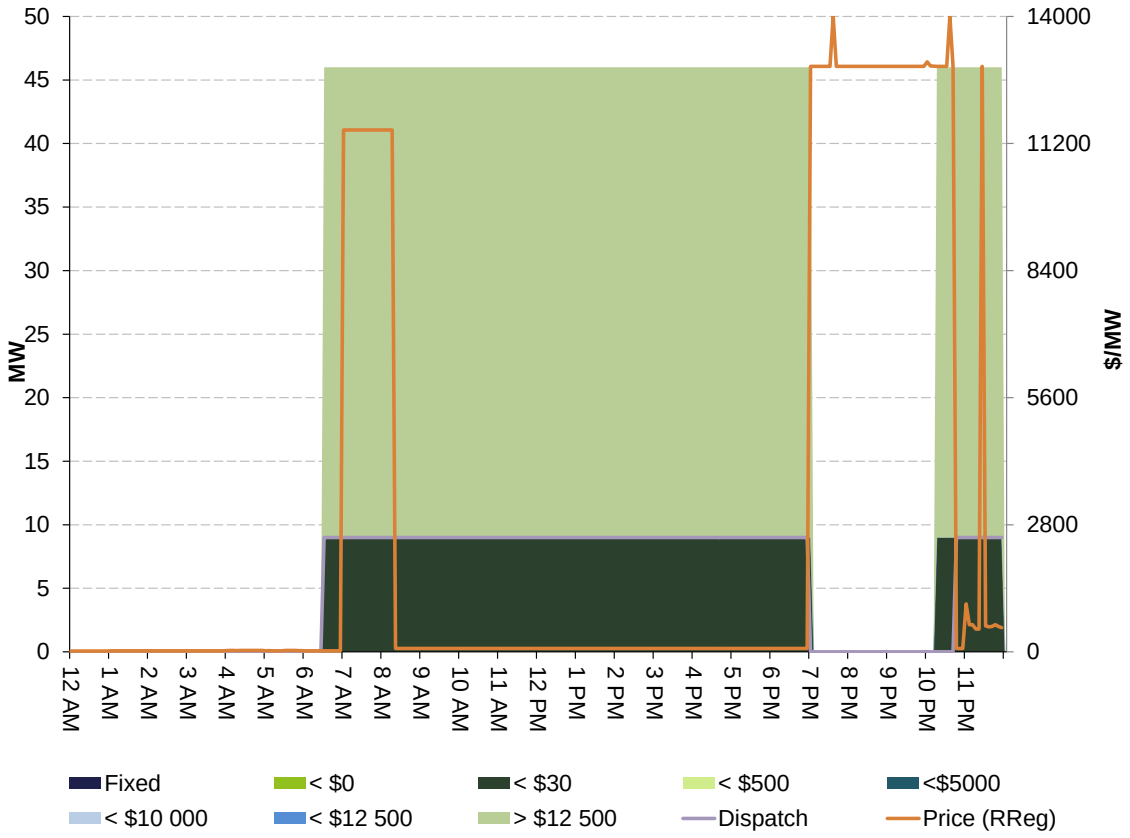


Figure B5b: Quarantine (Origin) raise regulation service closing bid prices, dispatch and dispatch price - effective offers

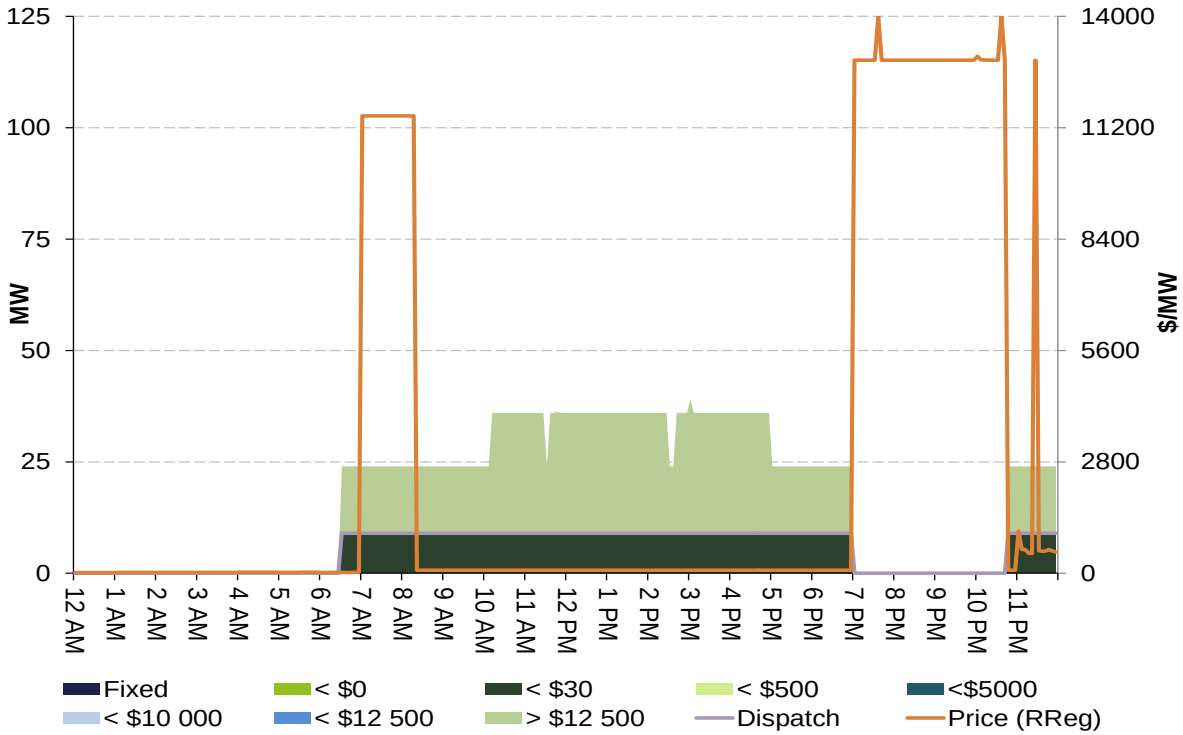


Figure B6a: Pelican Point (Engie) raise regulation service closing bid prices, dispatch and dispatch price for – maximum offers

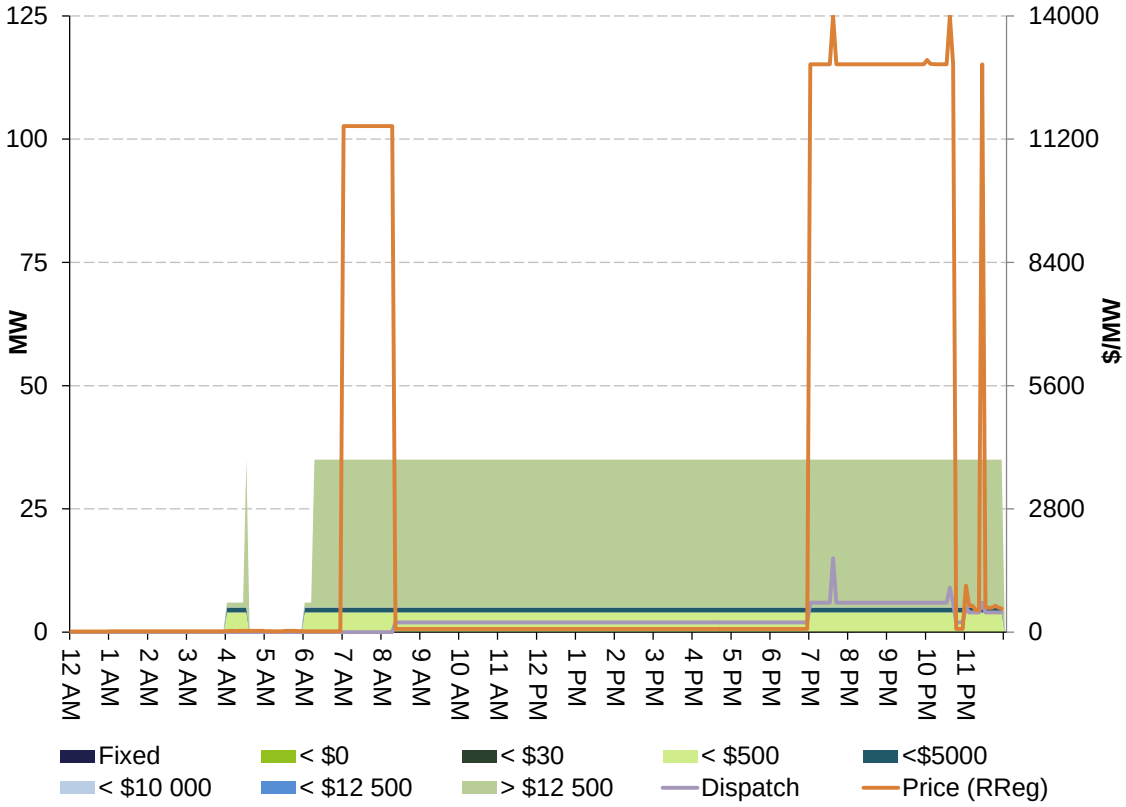
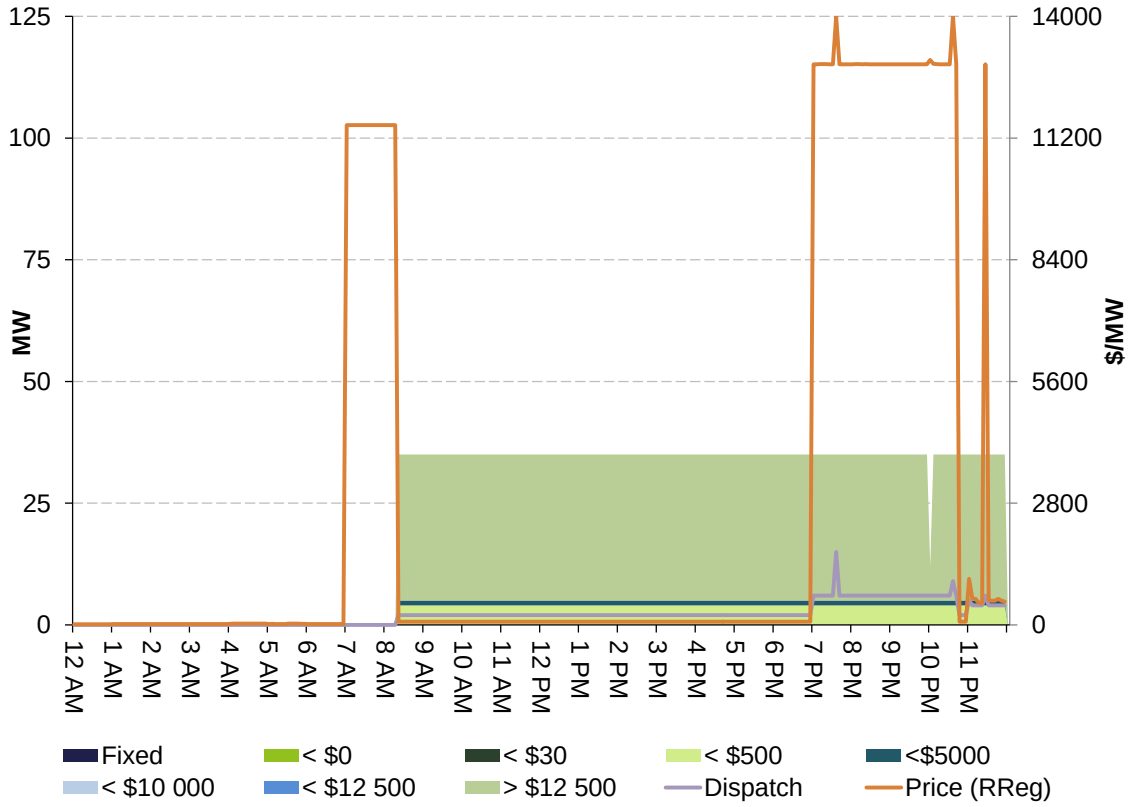


Figure B6b: Pelican Point (Engie) raise regulation service closing bid prices, dispatch and dispatch price – effective offers



Appendix C Relevant Market Notices

The following market notices notified the market of the regulation requirement for South Australia.

Market notice 54934

Market Notice	Type	Date of issue	Last Changed
55353	General Notice	19/09/2016 9:24:38	19/09/2016 9:24:38

Reason

AEMO ELECTRICITY MARKET NOTICE.

This market notice is FOR INFORMATION ONLY.

The Heywood to South East No.2 275 kV line in South Australia and Victoria regions is planned out of service from 0700 hrs on 18 October 2016 to 1700 hrs on 20 October 2016. During this outage, Heywood 500/275 kV M2 transformer will be off-loaded

During this outage, a credible contingency can separate South Australia region from the rest of the NEM.

Under these circumstances, 35 MW of Raise and Lower regulation FCAS will be sourced from South Australia for the duration of this outage. In addition, consistent with AEMO existing procedures, adequate contingency FCAS lower requirements will also be sourced from South Australia at times when power transfer is from South Australia to Victoria.

The following constraint sets have been invoked for this outage:

F-I-HYSE (includes F-S_LREG_0035 and F-S_RREG_0035)
I-HYSE
S-X_BC_CP
V-HYTX_M12

Refer AEMO Network Outage Schedule (NOS) for further details.

AEMO will continue monitoring this proposed outage and will update the Market accordingly.

Terry Liu
AEMO Operations

Market notice 55353

Market Notice	Type	Date of issue	Last Changed
55353	General Notice	13/10/2016 14:20:33	13/10/2016 14:20:33

Reason

AEMO ELECTRICITY MARKET NOTICE.

Update to Market Notice 54934

This market notice is FOR INFORMATION ONLY.

An outage of Heywood to South East No.2 275 kV line in South Australia and Victoria regions was previously planned from 0700 hrs on 18 October 2016 to 1700 hrs on 20 October 2016. The planned end time of this outage has been revised to 1700hrs on 22/10/2016.
During this outage, Heywood 500/275 kV M2 transformer will be off-loaded.

During this outage, a credible contingency can separate South Australia region from the rest of the NEM.

Under these circumstances, 35 MW of Raise and Lower regulation FCAS will be sourced from South Australia for the duration of this outage. In addition, consistent with AEMO existing procedures, adequate contingency FCAS lower requirements will also be sourced from South Australia at times when power transfer is from South Australia to Victoria.

The following constraint sets have been invoked for this outage:

F-I-HYSE (includes F-S_LREG_0035 and F-S_RREG_0035)
I-HYSE
S-X_BC_CP
V-HYTX_M12

Refer AEMO Network Outage Schedule (NOS) for further details.

AEMO will continue monitoring this proposed outage and will update the Market accordingly.

Kin Onn Wong
AEMO Operations

Appendix D Price setter

The following tables identify for each five-minute dispatch interval where regulation dispatch prices were above $5000/MW, the price and the generating units involved in setting the price for each of the lower and raise regulation services in South Australia. This information is published by AEMO.[7] Also shown are the offer prices involved in determining the dispatch price, together with the quantity of that service and the contribution to the total price. AEMO reports an increase as a negative marginal change in FCAS price setter. Generator offers which contributed zero to the price have been removed for clarity.

Lower regulation 18 October 7.05 am to 8.20 am

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
07:05	$11 049.68	AGL (SA)	TORRB1	Lower reg	$11 000.00	-0.50	-$5500.00
		AGL (SA)	TORRB4	Lower reg	$11 000.00	-0.50	-$5500.00
		AGL (SA)	TORRB1	Energy	$59.99	-0.50	-$30.00
		AGL (SA)	TORRB4	Energy	$59.99	-0.50	-$30.00
		Engie	LOYYB2	Energy	$10.50	0.47	$4.94
		Engie	LOYYB1	Energy	$10.50	0.51	$5.36
07:10	$11 035.09	AGL (SA)	TORRB1	Lower reg	$11 000.00	-0.50	-$5500.00
		AGL (SA)	TORRB4	Lower reg	$11 000.00	-0.50	-$5500.00
		AGL (SA)	TORRB1	Energy	$59.99	-0.50	-$30.00
		AGL (SA)	TORRB4	Energy	$59.99	-0.50	-$30.00
		AGL Energy	LYA3	Energy	$25.20	0.49	$12.35
		AGL Energy	LYA4	Energy	$25.20	0.49	$12.35
07:15	$11 000.00	AGL (SA)	TORRB4	Lower reg	$11 000.00	-1.00	-$11 000.00
07:20	$11 000.00	AGL (SA)	TORRB4	Lower reg	$11 000.00	-1.00	-$11 000.00
07:25	$11 000.00	AGL (SA)	TORRB2	Lower reg	$11 000.00	-1.00	-$11 000.00
07:30	$11 000.00	AGL (SA)	TORRB4	Lower reg	$11 000.00	-1.00	-$11 000.00
07:35	$11 039.65	AGL (SA)	TORRB4	Lower reg	$11 000.00	-0.50	-$5500.00
		AGL (SA)	TORRB1	Lower reg	$11 000.00	-0.50	-$5500.00
		AGL (SA)	TORRB1	Energy	$59.99	-0.50	-$30.00
		AGL (SA)	TORRB4	Energy	$59.99	-0.50	-$30.00
		EnergyAustralia	YWPS3	Energy	$20.19	1.01	$20.39
07:40	$11 024.33	AGL (SA)	TORRB2	Lower reg	$11 000.00	-1.00	-$11 000.00
		AGL (SA)	TORRB2	Energy	$59.99	-1.00	-$59.99
		EnergyAustralia	TALWA1	Energy	$50.00	0.18	$9.00
		Snowy Hydro	MURRAY	Energy	$34.00	0.79	$26.86

[7] Details on how the price is determined can be found at www.aemo.com.au

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
07:45	$11 034.52	AGL (SA)	TORRB1	Lower reg	$11 000.00	-1.00	-$11 000.00
		AGL (SA)	TORRB1	Energy	$59.99	-1.00	-$59.99
		AGL Energy	LYA3	Energy	$25.20	0.50	$12.60
		AGL Energy	LYA4	Energy	$25.20	0.50	$12.60
		AGL Energy	BW03	Raise reg	$7.40	1.00	$7.40
		AGL Energy	LYA3	Raise reg	$7.20	-0.50	-$3.60
		AGL Energy	LYA4	Raise reg	$7.20	-0.50	-$3.60
07:50	$11 034.57	AGL (SA)	TORRB1	Lower reg	$11 000.00	-0.50	-$5500.00
		AGL (SA)	TORRB4	Lower reg	$11 000.00	-0.50	-$5500.00
		AGL (SA)	TORRB4	Energy	$59.99	-0.50	-$30.00
		AGL (SA)	TORRB1	Energy	$59.99	-0.50	-$30.00
		AGL Energy	LYA4	Energy	$25.20	0.50	$12.60
		AGL Energy	LYA3	Energy	$25.20	0.50	$12.60
07:55	$11 034.57	AGL (SA)	TORRB4	Lower reg	$11 000.00	-0.50	-$5500.00
		AGL (SA)	TORRB1	Lower reg	$11 000.00	-0.50	-$5500.00
		AGL (SA)	TORRB1	Energy	$59.99	-0.50	-$30.00
		AGL (SA)	TORRB4	Energy	$59.99	-0.50	-$30.00
		AGL Energy	LYA3	Energy	$25.20	0.50	$12.60
		AGL Energy	LYA4	Energy	$25.20	0.50	$12.60
08:00	$11 034.22	AGL (SA)	TORRB4	Lower reg	$11 000.00	-1.00	-$11 000.00
		AGL (SA)	TORRB4	Energy	$59.99	-1.00	-$59.99
		EnergyAustralia	TALWA1	Energy	$50.00	0.17	$8.50
		AGL Energy	LYA4	Energy	$25.20	0.35	$8.82
		AGL Energy	LYA3	Energy	$25.20	0.35	$8.82
08:05	$11 024.53	AGL (SA)	TORRB1	Lower reg	$11 000.00	-1.00	-$11 000.00
		AGL (SA)	TORRB1	Energy	$59.99	-1.00	-$59.99
		AGL Energy	BW02	Energy	$49.96	0.04	$2.00
		AGL Energy	BW03	Energy	$49.96	0.04	$2.00
		AGL Energy	BW01	Energy	$49.96	0.04	$2.00
		AGL Energy	BW04	Energy	$49.96	0.04	$2.00
		Snowy Hydro	MURRAY	Energy	$34.00	0.78	$26.52
08:10	$11 034.26	AGL (SA)	TORRB4	Lower reg	$11 000.00	-1.00	-$11 000.00
		AGL (SA)	TORRB4	Energy	$59.99	-1.00	-$59.99
		AGL Energy	LYA2	Energy	$25.20	1.00	$25.20
		Delta Electricity	VP5	Raise 6 sec	$2.00	0.28	$0.56
		Delta Electricity	VP6	Raise 60 sec	$1.00	0.43	$0.43
		AGL Energy	LYA2	Raise 60 sec	$0.80	-0.43	-$0.34
		AGL Energy	LYA2	Raise 6 sec	$0.20	-0.28	-$0.06

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
08:15	$11 024.71	AGL (SA)	TORRB1	Lower reg	$11 000.00	-1.00	-$11 000.00
		AGL (SA)	TORRB1	Energy	$59.99	-1.00	-$59.99
		AGL Energy	BW03	Energy	$49.96	0.04	$2.00
		AGL Energy	BW01	Energy	$49.96	0.04	$2.00
		AGL Energy	BW02	Energy	$49.96	0.04	$2.00
		AGL Energy	BW04	Energy	$49.96	0.04	$2.00
		Snowy Hydro	MURRAY	Energy	$34.00	0.78	$26.52
08:20	$11 033.96	AGL (SA)	TORRB4	Lower reg	$11 000.00	-1.00	-$11 000.00
		AGL (SA)	TORRB4	Energy	$59.99	-1.00	-$59.99
		AGL Energy	LYA4	Energy	$25.20	0.50	$12.60
		AGL Energy	LYA3	Energy	$25.20	0.50	$12.60
		CS Energy	GSTONE4	Raise 6 sec	$2.39	0.66	$1.58
		AGL Energy	LYA4	Raise 6 sec	$0.80	-0.33	-$0.26
		AGL Energy	LYA3	Raise 6 sec	$0.80	-0.33	-$0.26

Lower regulation 18 October 7.05 pm to 11.30 am

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
19:05	$12 010.80	AGL (SA)	TORRB2	Lower reg	$12 000.00	-1.00	-$12 000.00
		Hydro Tasmania	POAT220	Energy	$83.20	-1.11	-$92.35
		AGL (SA)	TORRB2	Energy	$79.99	1.00	$79.99
		Hydro Tasmania	POAT220	Raise 60 sec	$2.39	1.09	$2.61
		AGL Energy	LYA3	Raise 60 sec	$0.80	-1.09	-$0.87
		Engie	LOYYB1	Lower 5 min	$0.19	1.09	$0.21
		Hydro Tasmania	TREVALLN	Lower 5 min	$0.17	-1.09	-$0.19
			T-V-MNSP1,VIC1	Energy	$0.01	-1.09	-$0.01
19:10	$12 040.70	AGL (SA)	TORRB2	Lower reg	$12 000.00	-1.00	-$12 000.00
		AGL (SA)	TORRA4	Energy	$119.99	-1.00	-$119.99
		AGL (SA)	TORRB2	Energy	$79.99	1.00	$79.99
		AGL (SA)	TORRB4	Raise 6 sec	$2.60	-0.33	-$0.86
		AGL (SA)	TORRA4	Raise 6 sec	$0.50	0.33	$0.17
19:15	$12 040.77	AGL (SA)	TORRB4	Lower reg	$12 000.00	-1.00	-$12 000.00
		AGL (SA)	TORRA4	Energy	$119.99	-1.00	-$119.99
		AGL (SA)	TORRB4	Energy	$79.99	1.00	$79.99
		AGL Energy	BW04	Raise 6 sec	$2.80	-0.33	-$0.92
		AGL (SA)	TORRA4	Raise 6 sec	$0.50	0.33	$0.17
19:20	$12 045.33	AGL (SA)	TORRB2	Lower reg	$12 000.00	-1.00	-$12 000.00
		Snowy Hydro	UPPTUMUT	Energy	$99.60	-1.26	-$125.50

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
		AGL (SA)	TORRB2	Energy	$79.99	1.00	$79.99
19:25	$12 030.06	AGL (SA)	TORRB4	Lower reg	$12 000.00	-1.00	-$12 000.00
		EnergyAustralia	TALWA1	Energy	$84.81	-1.30	-$110.25
		AGL (SA)	TORRB4	Energy	$79.99	1.00	$79.99
19:30	$12 014.99	AGL (SA)	TORRB2	Lower reg	$12 000.00	-1.00	-$12 000.00
		AGL (SA)	TORRB2	Energy	$79.99	1.00	$79.99
		Stanwell	TARONG#2	Energy	$74.90	-0.42	-$31.46
		Stanwell	TARONG#3	Energy	$74.90	-0.42	-$31.46
		Stanwell	TARONG#4	Energy	$74.90	-0.42	-$31.46
19:35	$12 008.74	AGL (SA)	TORRB2	Lower reg	$12 000.00	-1.00	-$12 000.00
		AGL (SA)	TORRB2	Energy	$79.99	1.00	$79.99
		Snowy Hydro	UPPTUMUT	Energy	$69.58	-1.28	-$89.06
19:40	$13 799.99	AGL (SA)	TORRA4	Lower reg	$13 799.99	-1.00	-$13 799.99
19:45	$12 027.27	AGL (SA)	TORRB2	Raise reg	$12 899.99	-1.00	-$12 899.99
		AGL (SA)	TORRB1	Raise reg	$12 899.99	1.00	$12 899.99
		AGL (SA)	TORRB2	Lower reg	$12 000.00	-1.00	-$12 000.00
		Delta Electricity	VP5	Energy	$96.00	-0.74	-$71.04
		Delta Electricity	VP6	Energy	$96.00	-0.37	-$35.52
		AGL (SA)	TORRB2	Energy	$79.99	1.00	$79.99
19:50	$12 000.00	AGL (SA)	TORRB2	Lower reg	$12 000.00	-1.00	-$12 000.00
		AGL (SA)	TORRA4	Energy	$79.99	-1.00	-$79.99
		AGL (SA)	TORRB2	Energy	$79.99	1.00	$79.99
19:55	$12 000.00	AGL (SA)	TORRB4	Lower reg	$12 000.00	-1.00	-$12 000.00
		AGL (SA)	TORRA4	Energy	$79.99	0.40	$32.00
		AGL (SA)	TORRB1	Energy	$79.99	0.60	$47.99
		AGL (SA)	TORRB4	Energy	$79.99	-1.00	-$79.99
20:00	$12 000.00	AGL (SA)	TORRB2	Lower reg	$12 000.00	-1.00	-$12 000.00
		AGL (SA)	TORRB4	Energy	$79.99	-0.39	-$31.20
		AGL (SA)	TORRB2	Energy	$79.99	1.00	$79.99
		AGL (SA)	TORRB1	Energy	$79.99	-0.36	-$28.80
		AGL (SA)	TORRA4	Energy	$79.99	-0.24	-$19.20
20:05	$12 025.85	AGL (SA)	TORRB2	Lower reg	$12 000.00	-1.00	-$12 000.00
		Hydro Tasmania	POAT220	Energy	$83.20	-1.27	-$105.66
		AGL (SA)	TORRB2	Energy	$79.99	1.00	$79.99
			T-V-MNSP1,VIC1	Energy	$0.01	-1.23	-$0.01
20:10	$12 020.29	AGL (SA)	TORRB2	Raise reg	$12 899.99	-1.00	-$12 899.99
		AGL (SA)	TORRB1	Raise reg	$12 899.99	1.00	$12 899.99
		AGL (SA)	TORRB2	Lower reg	$12 000.00	-1.00	-$12 000.00

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
		AGL Energy	BW01	Energy	$96.96	0.32	$31.03
		AGL Energy	BW02	Energy	$96.96	0.32	$31.03
		AGL Energy	BW04	Energy	$96.96	0.32	$31.03
		Delta Electricity	VP6	Energy	$96.00	-2.00	-$192.00
		AGL (SA)	TORRB2	Energy	$79.99	1.00	$79.99
		AGL (SA)	TORRB1	Raise 6 sec	$2.60	-2.00	-$5.20
		Delta Electricity	VP6	Raise 6 sec	$2.00	2.00	$4.00
20:15	$12 040.37	AGL (SA)	TORRB1	Raise reg	$12 899.99	1.00	$12 899.99
		AGL (SA)	TORRB2	Raise reg	$12 899.99	-1.00	-$12 899.99
		AGL (SA)	TORRB2	Lower reg	$12 000.00	-1.00	-$12 000.00
		AGL (SA)	TORRA4	Energy	$119.99	-1.00	-$119.99
		AGL (SA)	TORRB2	Energy	$79.99	1.00	$79.99
		AGL Energy	BW03	Raise 6 sec	$2.80	1.67	$4.68
		AGL (SA)	TORRB1	Raise 6 sec	$2.60	-2.00	-$5.20
		AGL (SA)	TORRA4	Raise 6 sec	$0.50	0.33	$0.17
20:20	$12 000.00	AGL (SA)	TORRB2	Lower reg	$12 000.00	-1.00	-$12 000.00
		AGL (SA)	TORRB2	Energy	$79.99	1.00	$79.99
		AGL (SA)	TORRA4	Energy	$79.99	-1.00	-$79.99
20:25	$12 011.02	AGL (SA)	TORRB2	Lower reg	$12 000.00	-1.00	-$12 000.00
		AGL (SA)	TORRB2	Energy	$79.99	1.00	$79.99
		Stanwell	TARONG#4	Energy	$64.60	-1.06	-$68.48
		Stanwell	TARONG#3	Energy	$64.60	-0.18	-$11.63
		Stanwell	TARONG#2	Energy	$64.60	-0.18	-$11.63
20:30	$12 002.30	AGL (SA)	TORRB4	Lower reg	$12 000.00	-1.00	-$12 000.00
		AGL (SA)	TORRB4	Energy	$79.99	-1.00	-$79.99
		AGL (SA)	TORRA4	Energy	$79.99	1.00	$79.99
		AGL Energy	BW01	Raise 6 sec	$2.80	-1.00	-$2.80
		AGL (SA)	TORRA4	Raise 6 sec	$0.50	1.00	$0.50
20:35	$12 000.00	AGL (SA)	TORRB4	Lower reg	$12 000.00	-1.00	-$12 000.00
		AGL (SA)	TORRB4	Energy	$79.99	-1.00	-$79.99
		AGL (SA)	TORRB2	Energy	$79.99	1.00	$79.99
20:40	$12 007.83	AGL (SA)	TORRB4	Lower reg	$12 000.00	-1.00	-$12 000.00
		AGL (SA)	TORRB4	Energy	$79.99	-1.00	-$79.99
		Snowy Hydro	UPPTUMUT	Energy	$50.01	1.44	$72.01
20:45	$12 000.00	AGL (SA)	TORRB4	Lower reg	$12 000.00	-1.00	-$12 000.00
20:50	$12 000.00	AGL (SA)	TORRB4	Lower reg	$12 000.00	-1.00	-$12 000.00
20:55	$12 000.00	AGL (SA)	TORRB4	Lower reg	$12 000.00	-1.00	-$12 000.00
21:00	$12 005.54	AGL (SA)	TORRB1	Lower reg	$12 000.00	-1.00	-$12 000.00

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
		AGL (SA)	TORRB1	Energy	$59.99	-1.00	-$59.99
		Origin Energy	DDPS1	Energy	$36.97	1.47	$54.35
21:05	$12 000.00	AGL (SA)	TORRB4	Lower reg	$12 000.00	-1.00	-$12 000.00
21:10	$12 007.05	AGL (SA)	TORRB1	Lower reg	$12 000.00	-1.00	-$12 000.00
		AGL (SA)	TORRB1	Energy	$59.99	-1.00	-$59.99
		Snowy Hydro	UPPTUMUT	Energy	$37.01	1.43	$52.92
21:15	$12 000.00	AGL (SA)	TORRB1	Lower reg	$12 000.00	-1.00	-$12 000.00
		AGL (SA)	TORRB1	Energy	$59.99	-1.00	-$59.99
		AGL (SA)	TORRB2	Energy	$59.99	0.36	$21.60
		AGL (SA)	TORRB4	Energy	$59.99	0.64	$38.39
21:20	$12 014.86	AGL (SA)	TORRB1	Lower reg	$12 000.00	-1.00	-$12 000.00
		AGL (SA)	TORRB1	Energy	$59.99	-1.00	-$59.99
		Snowy Hydro	UPPTUMUT	Energy	$37.01	0.41	$15.17
		Snowy Hydro	MURRAY	Energy	$26.00	1.15	$29.90
21:25	$12 000.00	AGL (SA)	TORRB1	Lower reg	$12 000.00	-1.00	-$12 000.00
		AGL (SA)	TORRB2	Energy	$59.99	1.00	$59.99
		AGL (SA)	TORRB1	Energy	$59.99	-1.00	-$59.99
21:30	$12 000.00	AGL (SA)	TORRB2	Lower reg	$12 000.00	-1.00	-$12 000.00
21:35	$12 013.69	AGL (SA)	TORRB1	Lower reg	$12 000.00	-1.00	-$12 000.00
		AGL (SA)	TORRB1	Energy	$59.99	-1.00	-$59.99
		Snowy Hydro	MURRAY	Energy	$26.00	1.78	$46.28
21:40	$12 015.71	AGL (SA)	TORRB1	Lower reg	$12 000.00	-1.00	-$12 000.00
		AGL (SA)	TORRB1	Energy	$59.99	-1.00	-$59.99
		Delta Electricity	VP6	Energy	$30.75	0.72	$22.14
		Delta Electricity	VP5	Energy	$30.75	0.72	$22.14
21:45	$12 000.00	AGL (SA)	TORRB1	Lower reg	$12 000.00	-1.00	-$12 000.00
21:50	$12 020.12	AGL (SA)	TORRB2	Lower reg	$12 000.00	-1.00	-$12 000.00
		AGL (SA)	TORRB2	Energy	$59.99	-1.00	-$59.99
		AGL Energy	LYA3	Energy	$25.20	0.79	$19.91
		AGL Energy	LYA4	Energy	$25.20	0.79	$19.91
21:55	$12 000.00	AGL (SA)	TORRB1	Lower reg	$12 000.00	-1.00	-$12 000.00
22:00	$12 000.00	AGL (SA)	TORRB1	Lower reg	$12 000.00	-1.00	-$12 000.00
22:05	$12 000.00	AGL (SA)	TORRB4	Lower reg	$12 000.00	-1.00	-$12 000.00
22:10	$12 000.00	AGL (SA)	TORRB4	Lower reg	$12 000.00	-1.00	-$12 000.00
22:15	$12 004.68	AGL (SA)	TORRB2	Lower reg	$12 000.00	-1.00	-$12 000.00
		AGL Energy	BW01	Energy	$96.96	-0.29	-$28.12
		AGL Energy	BW02	Energy	$96.96	-0.29	-$28.12
		AGL Energy	BW04	Energy	$96.96	-0.29	-$28.12

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
		AGL (SA)	TORRB2	Energy	$79.99	1.00	$79.99
22:20	$12 000.52	AGL (SA)	TORRB4	Lower reg	$12 000.00	-1.00	-$12 000.00
		AGL (SA)	TORRB4	Energy	$79.99	-1.00	-$79.99
		Snowy Hydro	MURRAY	Energy	$69.57	1.14	$79.31
22:25	$12 000.52	AGL (SA)	TORRB4	Lower reg	$12 000.00	-1.00	-$12 000.00
		AGL (SA)	TORRB4	Energy	$79.99	-1.00	-$79.99
		Snowy Hydro	MURRAY	Energy	$69.57	1.14	$79.31
22:30	$12 000.00	AGL (SA)	TORRB2	Lower reg	$12 000.00	-1.00	-$12 000.00
22:35	$12 000.00	AGL (SA)	TORRB1	Lower reg	$12 000.00	-1.00	-$12 000.00
22:40	$13 799.99	AGL (SA)	TORRB1	Lower reg	$13 799.99	-1.00	-$13 799.99
22:45	$12 046.29	AGL (SA)	TORRB4	Lower reg	$12 000.00	-1.00	-$12 000.00
		Stanwell	TARONG#2	Energy	$64.60	-0.21	-$13.57
		Stanwell	TARONG#3	Energy	$64.60	-0.21	-$13.57
		Stanwell	TARONG#4	Energy	$64.60	-0.21	-$13.57
		AGL Energy	LYA3	Energy	$25.20	-0.11	-$2.77
		AGL Energy	LYA4	Energy	$25.20	-0.11	-$2.77
		Hydro Tasmania	GORDON	Lower reg	$6.00	0.21	$1.26
		AGL Energy	LYA3	Lower reg	$5.00	-0.11	-$0.55
		AGL Energy	LYA4	Lower reg	$5.00	-0.11	-$0.55
		AGL (SA)	TORRB4	Energy	$0.00	1.00	$0.00
23:30	$12 896.69	Engie	PPCCGT	Lower reg	$12 896.69	-1.00	-$12 896.69

Raise regulation 18 October 7.05 am to 8.20 am

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
07:05	$11 499.99	AGL (SA)	TORRB1	Raise reg	$11 499.99	-1.00	-$11 499.99
07:10	$11 499.99	AGL (SA)	TORRB1	Raise reg	$11 499.99	-1.00	-$11 499.99
07:15	$11 499.99	AGL (SA)	TORRB4	Raise reg	$11 499.99	-1.00	-$11 499.99
07:20	$11 499.99	AGL (SA)	TORRB1	Raise reg	$11 499.99	-1.00	-$11 499.99
07:25	$11 499.99	AGL (SA)	TORRB4	Raise reg	$11 499.99	-1.00	-$11 499.99
07:30	$11 499.99	AGL (SA)	TORRB2	Raise reg	$11 499.99	-1.00	-$11 499.99
07:35	$11 499.99	AGL (SA)	TORRB2	Raise reg	$11 499.99	-1.00	-$11 499.99
07:40	$11 499.99	AGL (SA)	TORRB2	Raise reg	$11 499.99	-1.00	-$11 499.99
07:45	$11 499.99	AGL (SA)	TORRB4	Raise reg	$11 499.99	-1.00	-$11 499.99
07:50	$11 499.99	AGL (SA)	TORRB2	Raise reg	$11 499.99	-1.00	-$11 499.99
07:55	$11 499.99	AGL (SA)	TORRB1	Raise reg	$11 499.99	-1.00	-$11 499.99

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
08:00	$11 499.99	AGL (SA)	TORRB2	Raise reg	$11 499.99	-1.00	-$11 499.99
08:05	$11 499.99	AGL (SA)	TORRB1	Raise reg	$11 499.99	-1.00	-$11 499.99
08:10	$11 499.99	AGL (SA)	TORRB1	Raise reg	$11 499.99	-1.00	-$11 499.99
08:15	$11 499.99	AGL (SA)	TORRB1	Raise reg	$11 499.99	-1.00	-$11 499.99
08:20	$11 499.99	AGL (SA)	TORRB1	Raise reg	$11 499.99	-1.00	-$11 499.99

Lower regulation 18 October 7.05 pm to 11.30 am

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
19:05	$12 899.99	AGL (SA)	TORRB2	Raise reg	$12 899.99	-1.00	-$12 899.99
19:10	$12 899.99	AGL (SA)	TORRB1	Raise reg	$12 899.99	-1.00	-$12 899.99
19:15	$12 900.39	AGL (SA)	TORRB1	Raise reg	$12 899.99	-1.00	-$12 899.99
		AGL Energy	BW04	Raise 6 sec	$2.80	-2.00	-$5.60
		AGL (SA)	TORRB1	Raise 6 sec	$2.60	2.00	$5.20
19:20	$12 900.39	AGL (SA)	TORRB1	Raise reg	$12 899.99	-1.00	-$12 899.99
		AGL Energy	BW02	Raise 6 sec	$2.80	-2.00	-$5.60
		AGL (SA)	TORRB1	Raise 6 sec	$2.60	2.00	$5.20
19:25	$12 900.39	AGL (SA)	TORRB1	Raise reg	$12 899.99	-1.00	-$12 899.99
		AGL Energy	BW03	Raise 6 sec	$2.80	-2.00	-$5.60
		AGL (SA)	TORRB1	Raise 6 sec	$2.60	2.00	$5.20
19:30	$12 899.99	AGL (SA)	TORRB4	Raise reg	$12 899.99	-1.00	-$12 899.99
19:35	$12 899.99	AGL (SA)	TORRB1	Raise reg	$12 899.99	-1.00	-$12 899.99
19:40	$14 000.00	Engie	PPCCGT	Raise reg	$14 000.00	-1.00	-$14 000.00
19:45	$12 899.99	AGL (SA)	TORRB1	Raise reg	$12 899.99	-1.00	-$12 899.99
19:50	$12 899.99	AGL (SA)	TORRB1	Raise reg	$12 899.99	-1.00	-$12 899.99
		AGL (SA)	TORRB1	Raise 6 sec	$2.60	2.00	$5.20
		AGL (SA)	TORRB4	Raise 6 sec	$2.60	-2.00	-$5.20
19:55	$12 899.99	AGL (SA)	TORRB1	Raise reg	$12 899.99	-1.00	-$12 899.99
20:00	$12 899.99	AGL (SA)	TORRB1	Raise reg	$12 899.99	-1.00	-$12 899.99
20:05	$12 900.25	AGL (SA)	TORRB1	Raise reg	$12 899.99	-1.00	-$12 899.99
		Delta Electricity	VP6	Energy	$96.00	2.00	$192.00
		Hydro Tasmania	POAT220	Energy	$83.20	-2.33	-$193.86
		AGL (SA)	TORRB1	Raise 6 sec	$2.60	2.00	$5.20
		Delta Electricity	VP6	Raise 6 sec	$2.00	-2.00	-$4.00
			T-V-MNSP1,VIC1	Energy	$0.01	-2.24	-$0.02
20:10	$12 900.71	AGL (SA)	TORRB1	Raise reg	$12 899.99	-1.00	-$12 899.99
		AGL Energy	BW04	Energy	$96.96	-0.67	-$64.96
		AGL Energy	BW02	Energy	$96.96	-0.67	-$64.96

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
		AGL Energy	BW01	Energy	$96.96	-0.67	-$64.96
		Delta Electricity	VP6	Energy	$96.00	2.00	$192.00
		AGL (SA)	TORRB1	Raise 6 sec	$2.60	2.00	$5.20
		Delta Electricity	VP6	Raise 6 sec	$2.00	-2.00	-$4.00
20:15	$12 900.39	AGL (SA)	TORRB1	Raise reg	$12 899.99	-1.00	-$12 899.99
		AGL Energy	BW03	Raise 6 sec	$2.80	-2.00	-$5.60
		AGL (SA)	TORRB1	Raise 6 sec	$2.60	2.00	$5.20
20:20	$12 899.99	AGL (SA)	TORRB1	Raise reg	$12 899.99	-1.00	-$12 899.99
		AGL (SA)	TORRB1	Raise 6 sec	$2.60	2.00	$5.20
		AGL (SA)	TORRB4	Raise 6 sec	$2.60	-2.00	-$5.20
20:25	$12 900.39	AGL (SA)	TORRB1	Raise reg	$12 899.99	-1.00	-$12 899.99
		AGL Energy	BW02	Raise 6 sec	$2.80	-2.00	-$5.60
		AGL (SA)	TORRB1	Raise 6 sec	$2.60	2.00	$5.20
		AGL (SA)	TORRB2	Raise 5 min	$0.90	-1.00	-$0.90
		AGL (SA)	TORRB1	Raise 5 min	$0.90	1.00	$0.90
20:30	$12 899.99	AGL (SA)	TORRB2	Raise reg	$12 899.99	-1.00	-$12 899.99
20:35	$12 899.99	AGL (SA)	TORRB4	Raise reg	$12 899.99	-1.00	-$12 899.99
20:40	$12 899.99	AGL (SA)	TORRB1	Raise reg	$12 899.99	-1.00	-$12 899.99
20:45	$12 899.99	AGL (SA)	TORRB2	Raise reg	$12 899.99	-1.00	-$12 899.99
20:50	$12 899.99	AGL (SA)	TORRB1	Raise reg	$12 899.99	-1.00	-$12 899.99
20:55	$12 899.99	AGL (SA)	TORRB4	Raise reg	$12 899.99	-1.00	-$12 899.99
21:00	$12 899.99	AGL (SA)	TORRB2	Raise reg	$12 899.99	-1.00	-$12 899.99
21:05	$12 899.99	AGL (SA)	TORRB2	Raise reg	$12 899.99	-1.00	-$12 899.99
21:10	$12 899.99	AGL (SA)	TORRB1	Raise reg	$12 899.99	-1.00	-$12 899.99
21:15	$12 899.99	AGL (SA)	TORRB2	Raise reg	$12 899.99	-1.00	-$12 899.99
21:20	$12 899.99	AGL (SA)	TORRB1	Raise reg	$12 899.99	-1.00	-$12 899.99
21:25	$12 899.99	AGL (SA)	TORRB2	Raise reg	$12 899.99	-1.00	-$12 899.99
21:30	$12 899.99	AGL (SA)	TORRB4	Raise reg	$12 899.99	-1.00	-$12 899.99
21:35	$12 899.99	AGL (SA)	TORRB1	Raise reg	$12 899.99	-1.00	-$12 899.99
21:40	$12 899.99	AGL (SA)	TORRB2	Raise reg	$12 899.99	-1.00	-$12 899.99
21:45	$12 899.99	AGL (SA)	TORRB1	Raise reg	$12 899.99	-1.00	-$12 899.99
21:50	$12 899.99	AGL (SA)	TORRB2	Raise reg	$12 899.99	-1.00	-$12 899.99
21:55	$12 899.99	AGL (SA)	TORRB1	Raise reg	$12 899.99	-1.00	-$12 899.99
		AGL (SA)	TORRB1	Energy	$59.99	1.00	$59.99
		AGL (SA)	TORRB4	Energy	$59.99	-0.64	-$38.39
		AGL (SA)	TORRB2	Energy	$59.99	-0.36	-$21.60
22:00	$12 899.99	AGL (SA)	TORRB2	Raise reg	$12 899.99	-1.00	-$12 899.99
22:05	$12 999.69	AGL (SA)	TORRB1	Raise reg	$12 899.99	-1.00	-$12 899.99

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
		Engie	PPCCGT	Energy	$159.69	-1.00	-$159.69
		AGL (SA)	TORRB1	Energy	$59.99	1.00	$59.99
22:10	$12 909.83	AGL (SA)	TORRB2	Raise reg	$12 899.99	-1.00	-$12 899.99
		Snowy Hydro	MURRAY	Energy	$85.01	-1.06	-$90.11
		AGL (SA)	TORRB2	Energy	$79.99	1.00	$79.99
22:15	$12 904.67	AGL (SA)	TORRB4	Raise reg	$12 899.99	-1.00	-$12 899.99
		AGL Energy	BW01	Energy	$96.96	-0.29	-$28.12
		AGL Energy	BW02	Energy	$96.96	-0.29	-$28.12
		AGL Energy	BW04	Energy	$96.96	-0.29	-$28.12
		AGL (SA)	TORRB4	Energy	$79.99	1.00	$79.99
22:20	$12 899.99	AGL (SA)	TORRB1	Raise reg	$12 899.99	-1.00	-$12 899.99
22:25	$12 899.99	AGL (SA)	TORRB4	Raise reg	$12 899.99	-1.00	-$12 899.99
22:30	$12 899.99	AGL (SA)	TORRB4	Raise reg	$12 899.99	-1.00	-$12 899.99
22:35	$12 899.99	AGL (SA)	TORRB4	Raise reg	$12 899.99	-1.00	-$12 899.99
22:40	$14 000.00	Engie	PPCCGT	Raise reg	$14 000.00	-1.00	-$14 000.00
22:45	$12 899.99	AGL (SA)	TORRB4	Raise reg	$12 899.99	-1.00	-$12 899.99
23:30	$12 899.99	AGL (SA)	TORRB1	Raise reg	$12 899.99	-1.00	-$12 899.99