Report into market ancillary service prices above $5000/MW

South Australia, 21 March 2017

1 September 2017

AUSTRALIAN ENERGY REGULATOR

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1 Obligation

The Australian Energy Regulator regulates energy markets and networks under national legislation and rules in eastern and southern Australia, as well as networks in the Northern Territory. Its functions include:

- monitoring wholesale electricity and gas markets to ensure energy businesses comply with the legislation and rules, and taking enforcement action where necessary;
- setting the amount of revenue that network businesses can recover from customers for using networks (electricity poles and wires and gas pipelines) that transport energy;
- regulating retail energy markets in Queensland, New South Wales, South Australia, Tasmania (electricity only), and the ACT;
- operating the Energy Made Easy website, which provides a retail price comparator and other information for energy consumers;
- publishing information on energy markets, including the annual State of the energy market report, to assist participants and the wider community.

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/MW 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/MW;
- 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/MW.

These reports examine the reasons for the high price outcomes—they are not compliance reports. We deal separately with compliance issues that come to our attention during the preparation of these reports.

2 Summary

Lower and raise regulation frequency control ancillary services (FCAS, also referred to in this report as regulation services) are used to manage small fluctuations in supply or demand.

On 21 March 2017 the price for local regulation services in South Australia exceeded $8990/MW for 65 consecutive dispatch intervals, from 11.05 am to 4.25 pm. The wholesale (or spot) price for electricity in South Australia reached a maximum of $2402/MWh during this period.

At 6 am there was a planned network outage on the Moorabool to Tarrone 500 kV line in Victoria. This outage put South Australia on a single contingency, which created the risk of South Australia becoming electrically isolated from the National Electricity Market (NEM). To manage this risk, and in line with its procedures, the market operator (AEMO) notified the market that South Australia would be required to source 35 MW of raise and lower regulation services from within the region for the duration of the outage.

From 11.05 am AGL rebid 6 MW of lower and raise regulation services from prices less than $300/MW to $9000/MW, and as a result capacity priced above $5000/MW was needed to meet the 35 MW requirement. There were price spikes above $9000/MW during this period due to co-optimisation of the energy and FCAS markets and a reduction in effective availability of regulation services.

The high regulation service prices ended when the outage was finished at 4.25 pm and AEMO no longer required 35 MW of local regulation services.

3 Analysis

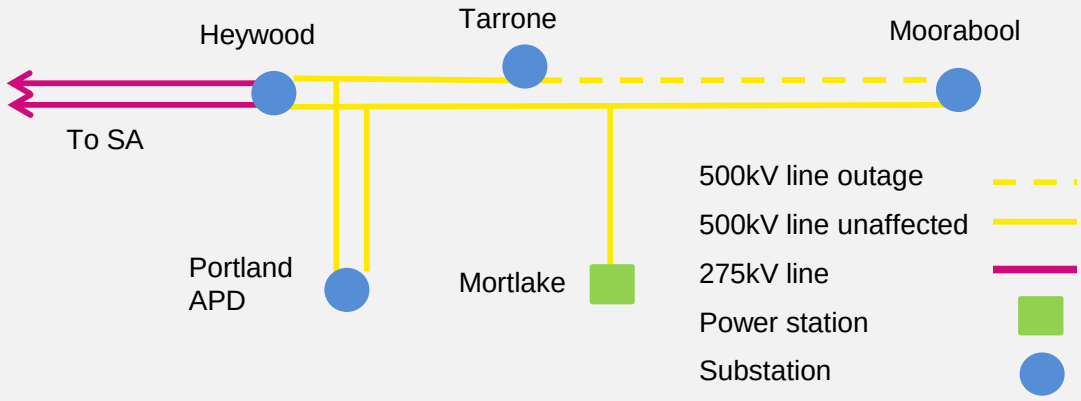
The following sections explain the reasons for the high regulation services prices. To summarise, in response to a planned network outage over several days in Victoria, AEMO imposed the requirement that 35 MW of regulation services be sourced locally in South Australia. A rebid by AGL, effective from 11.05 am, which shifted 6 MW of lower and raise regulation services from prices below $300/MW to $9000/MW reduced the amount of effective capacity priced less than $5000/MW to 34 MW, 1 MW less than the 35 MW requirement. As a result prices for both services reached around $9000/MW from 11.05 am until the outage ended at 4.25 pm.

3.1 Planned network outage

Market notice 58084 (published on 17 March 2017 and replicated at Appendix E) announced to the market that there would be an outage on the Moorabool to Tarrone 500 kV line in Victoria from 6 am to 5 pm on 21 March 2017, putting South Australia on a single contingency. Under such conditions AEMO requires South Australia to source 35 MW of regulation services locally. Box 1 explains how AEMO manages outages on the Heywood interconnector.

Box 1: Heywood Interconnector and line outage management

South Australia is electrically connected to Victoria by the Heywood and Murraylink interconnectors. Murraylink is a direct current interconnector that cannot provide FCAS. The Heywood Interconnector is an alternating current high voltage transmission link which can transfer FCAS from the rest of the NEM. The figure below is a simplified representation of the network around the interconnector.



When any one of the four lines going through the Heywood substation is on an outage, the South Australian region is on a single contingency. This means that South Australia is at risk of being electrically isolated from the rest of the NEM as only one line is connecting South Australia to Victoria. When this occurs AEMO invokes constraints requiring 35 MW of local regulation services. This ensures adequate regulation services are immediately available to manage the frequency (around 50Hz) within South Australia if the remaining line trips.

Further details on the 35 MW requirement can be found in Appendix B.

3.2 Regulation FCAS availability, offer prices and price outcomes

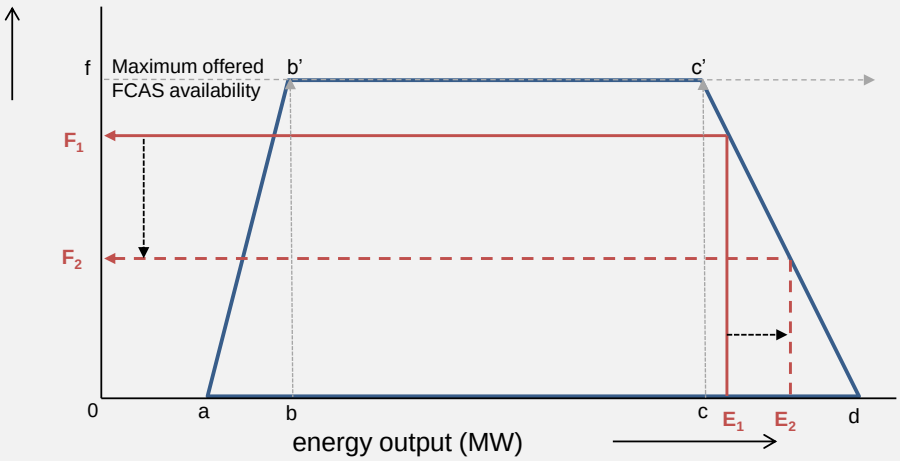
This section discusses participants' offers and resultant prices.

Box 2: Trade-off between generator FCAS and energy offers

Generators must register with AEMO to provide FCAS and offer FCAS capacity in a similar manner to energy into the market.

Participants offer the maximum amount of FCAS and energy, in mega-watts (MW), they are willing to supply across ten price bands, ranging between -$1000 and $14 000 for a trading day. A trading day starts at 4 am each day. A participants FCAS "effective offer" can be reduced by the amount of energy they are currently providing. For example, if a generator is operating at its maximum capacity in energy, then it cannot increase its generation to provide raise regulation services. As a result, its effective availability of FCAS raise offers is reduced to 0 MW.

For every dispatch interval the National Electricity Market Dispatch Engine (NEMDE) co-optimises market participants FCAS and energy offers to arrive at the least cost outcome while maintaining system security.



3.2.1 Registered maximum regulation FCAS capacity

Of the 26 power stations (including wind farms in South Australia only four are registered to provide FCAS. Table 1 shows the power stations that were registered to provide raise and lower regulation FCAS in South Australia on the day and their maximum registered capacity. Table 1 shows each power station, if fully operational, was individually capable of providing the local requirement.

Table 1: Registered maximum regulation FCAS capacity (MW) by station

Power Station	Registered Capacity (MW)	
	Lower regulation	Raise regulation
Osborne (Origin Energy)	36	36
Quarantine (Origin Energy)	50	50

Power Station	Registered Capacity (MW)	
	Lower regulation	Raise regulation
Pelican Point (Engie)	100	100
Torrens Island (AGL)	200	260
Total	**386**	**446**

On the day Osborne power station, half of Pelican Point power station and five units at Torrens Island power station were unavailable. So, although the registered capacity is as shown in Table 1, only around 150 MW of lower regulation and around 200 MW of raise regulation was offered by participants.

3.2.2 Maximum and actual effective available capacity

The first forecast for 21 March (published at 12.30 pm on 20 March) showed there was 40 MW of capacity priced below $5000/MW available in South Australia for the duration of the planned outage. In other words, forecasts showed there was more than enough low-priced capacity to meet the 35 MW requirement.

The price for raise and lower regulation services was $276/MW from the beginning of the outage at 6 am until 10.35 am and then the price for raise regulation services spiked to $9913/MW at 10.40 am (prior to the sustained high price period), coinciding with a price spike of $10 579/MWh in the energy market. The coincident price spikes were caused by the co-optimisation of the energy and FCAS markets. Box 2 explains the concept of co-optimisation.

At 10.56 am, effective from 11.05 am, AGL rebid 6 MW of lower and raise regulation services from prices below $300/MW to $9000/MW. The rebid (shown in Appendix C) was in response to the 10.40 am price spikes. These rebids reduced the amount of maximum and effective regulation services capacity priced below $5000/MW to 34 MW, 1 MW less than the 35 MW requirement.

3.2.3 Price outcomes

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

The inset graphs are designed to show the reduction in low priced capacity from 11.05 am due to AGL's rebid at Torrens Island. The inset graphs show the red line just inside the orange shaded area, meaning that high priced capacity was needed to meet the requirement. As a result, prices for regulation services increased from around $300/MW to $9000/MW and above from 11.05 am to 4.25 pm. The wholesale (or spot) price for electricity reached a maximum of $2402/MWh during the period of the outage.

[1] Individual prices are contained in the Price Setter at Appendix F

Figure 1 Lower regulation effective offers, requirement and price

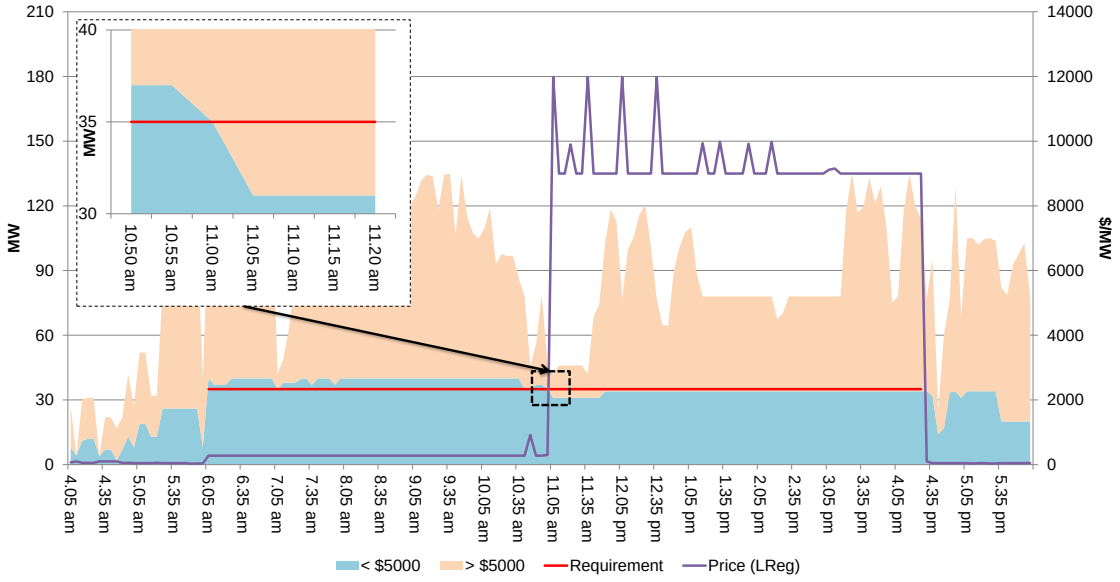


Figure 2 Raise regulation effective offers, requirement and price

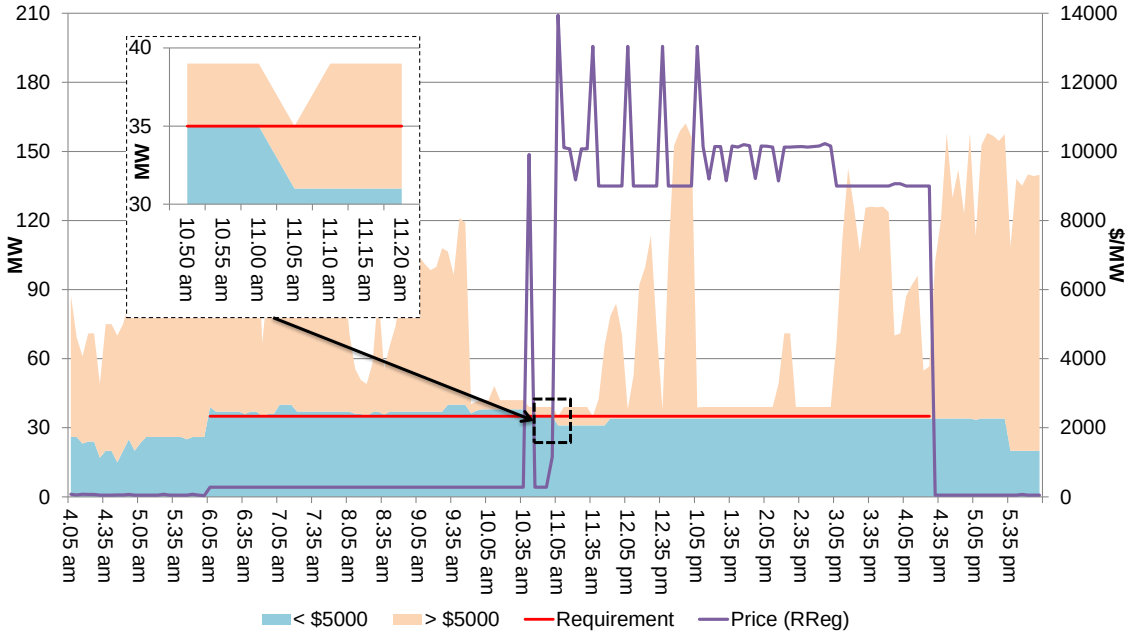


Figure 1 and Figure 2 also show a series of price spikes to $12 000/MW and above from 11.05 am to 1.05 pm, caused by a reduction in effective availability of regulation services. This was a result of an increase in generators' energy output (see Box 3) in line with an increase in energy prices in South Australia. The energy price spikes were caused by imports from Victoria being limited and low levels of available capacity in South Australia.

The figures also show price spikes from around 1.15 pm to 3 pm to around $10 000/MW. These were caused by co-optimisation of the energy and FCAS markets.

See Box 2 for an explanation of co-optimisation and the relationship between energy and FCAS.

The high regulation service prices ended when the outage was finished at 4.25 pm and AEMO no longer required 35 MW of local regulation services.

Australian Energy Regulator

September 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. The two general categories of FCAS are:

- 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 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 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, which 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.

Frequency Control Ancillary Service Settlement

AEMO settles the FCAS markets on a weekly basis, as follows[2].

- Regulation FCAS: Cost recovery on a "causer pays" basis using the Causer Pays Procedure[3] developed by AEMO in accordance with the appropriate NER procedures.
- Contingency FCAS: Generators pay for Raise Services and customers pay for Lower Services.

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 causer pays contribution factor for each generator. Broadly, the contribution factor is determined from historical 4 second generator output and frequency information and is a measure of how each generator contributed to managing changes in the system frequency. If a generators' output changes such that it supports maintaining the system frequency its contribution factor is positive. Conversely, if a generators' output changes such that it exacerbates a frequency deviation, its contribution factor will be negative. The causer pays contribution factors for a portfolio of generators effectively represent the aggregation of the individual performance of the generators in that portfolio.

Settlement is determined by allocating the FCAS costs incurred in the current period in accordance with the causer pays contribution factor for that portfolio from the preceding period. Thus cost allocation to a participant is not dependent on the amount of energy purchased or consumed in that period but by the performance of that participant in managing system frequency in the previous period.

Consequently a portfolio of generators with a negative factor in a particular period will still pay a share of FCAS costs irrespective of how much it generates in the current period.

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.

2 For a full description go to https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Data/Ancillary-Services/Ancillary-Services-Payments-and-Recovery

3 For a full description go to https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Security-and-reliability/Ancillary-services/Ancillary-services-causer-pays-contribution-factors

Appendix B 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 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.

Appendix C Significant Rebids

The rebidding tables highlight the relevant rebids submitted by generators that impacted on market outcomes during the time of high prices. It details the time the rebid was submitted and used by the dispatch process, the capacity involved, the change in the price of the capacity was being offered and the rebid reason.

Table C 1: Significant rebids for 21 March – lower regulation

Submit time	Time effective	Participant	Station	Capacity rebid (MW)	Price from ($/MW)	Price to ($/MW)	Rebid reason
10.56 am	11.05 am	AGL Energy	Torrens Island	6	<$300	$9000	1035~A~040 CHG IN AEMO DISP~45 PRICE INCREASE VS PD SA RREG $9913.19

Table C 2: Significant rebids for 21 March – raise regulation

Submit time	Time effective	Participant	Station	Capacity rebid (MW)	Price from ($/MW)	Price to ($/MW)	Rebid reason
10.56 am	11.05 am	AGL Energy	Torrens Island	6	<$300	$9000	1035~A~040 CHG IN AEMO DISP~45 PRICE INCREASE VS PD SA RREG $9913.19

Appendix D Closing bids

Figures D1a to D6b highlight for each dispatch interval the lower and raise regulation services closing bids for Origin, AGL and Engie (the 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.

FCAS services are co-optimised with energy offers. For example a generator that is operating at its maximum capacity cannot provide raise services so their 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 ("effective available capacity").

Lower Regulation

Figure D1a: Torrens Island (AGL) lower regulation service closing bid prices, dispatch and dispatch price – maximum offers

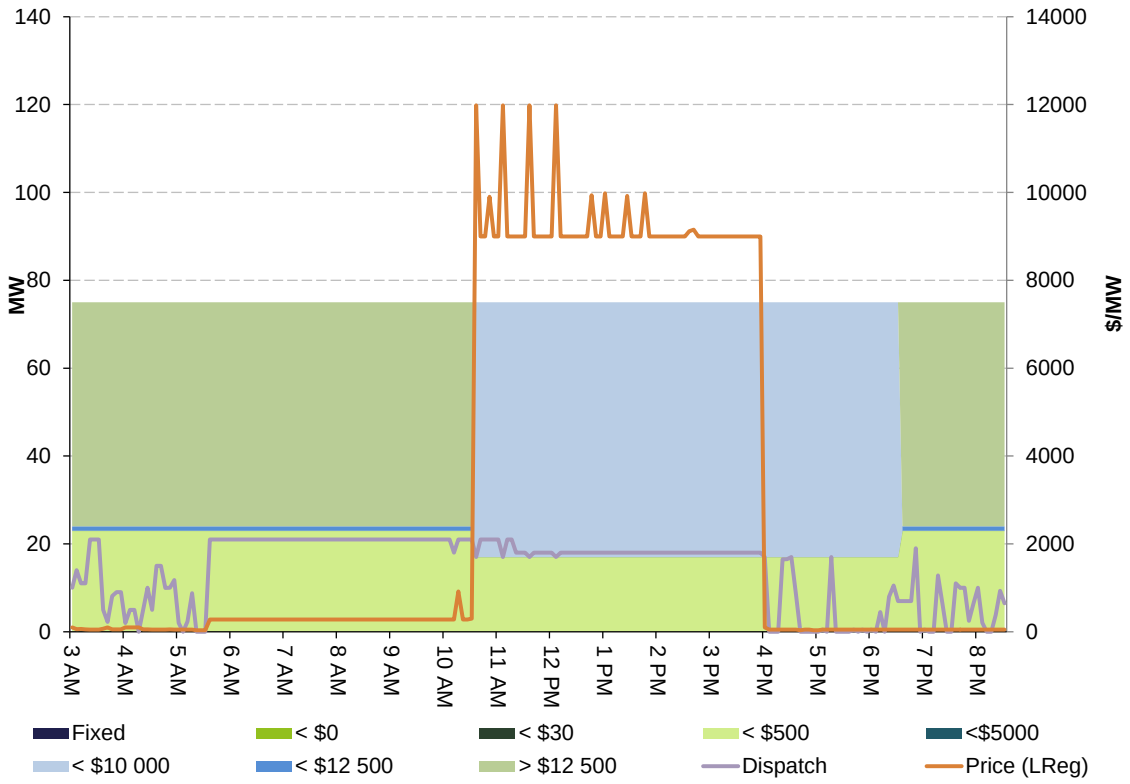


Figure D1b: Torrens Island (AGL) lower regulation service closing bid prices, dispatch and dispatch price – effective offers

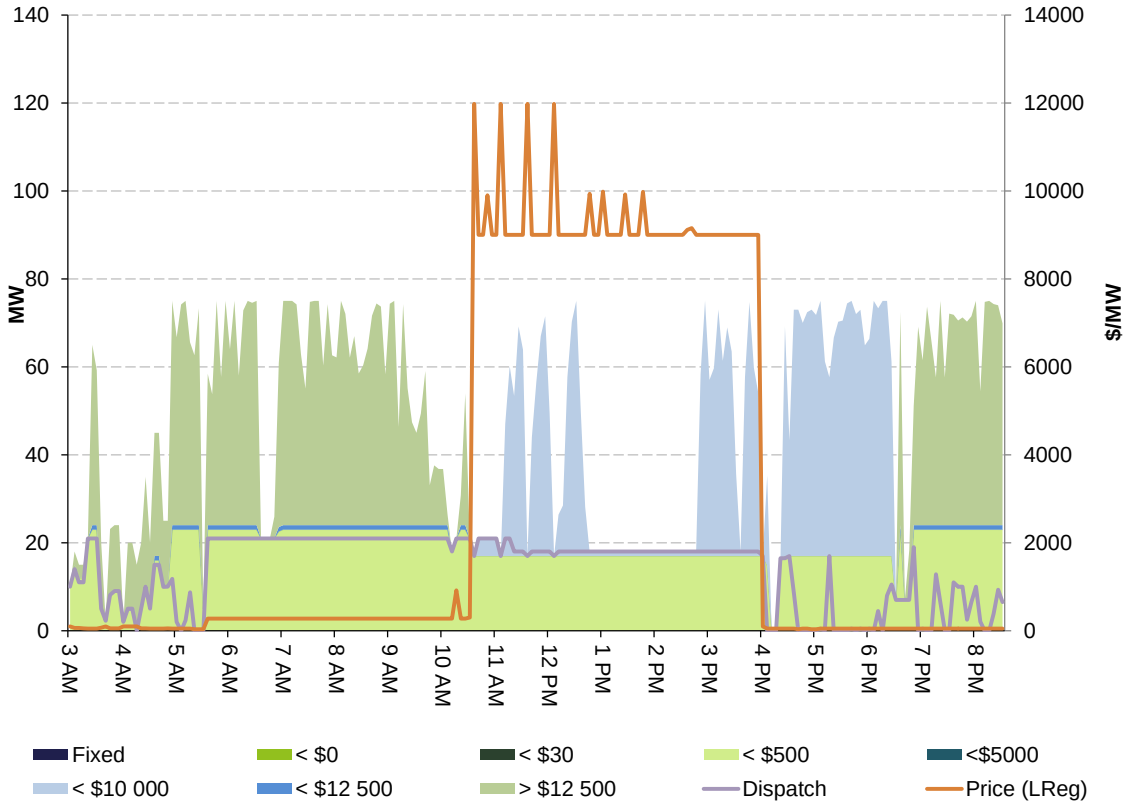


Figure D2a: Quarantine (Origin) lower regulation service closing bid prices, dispatch and dispatch price - maximum offers

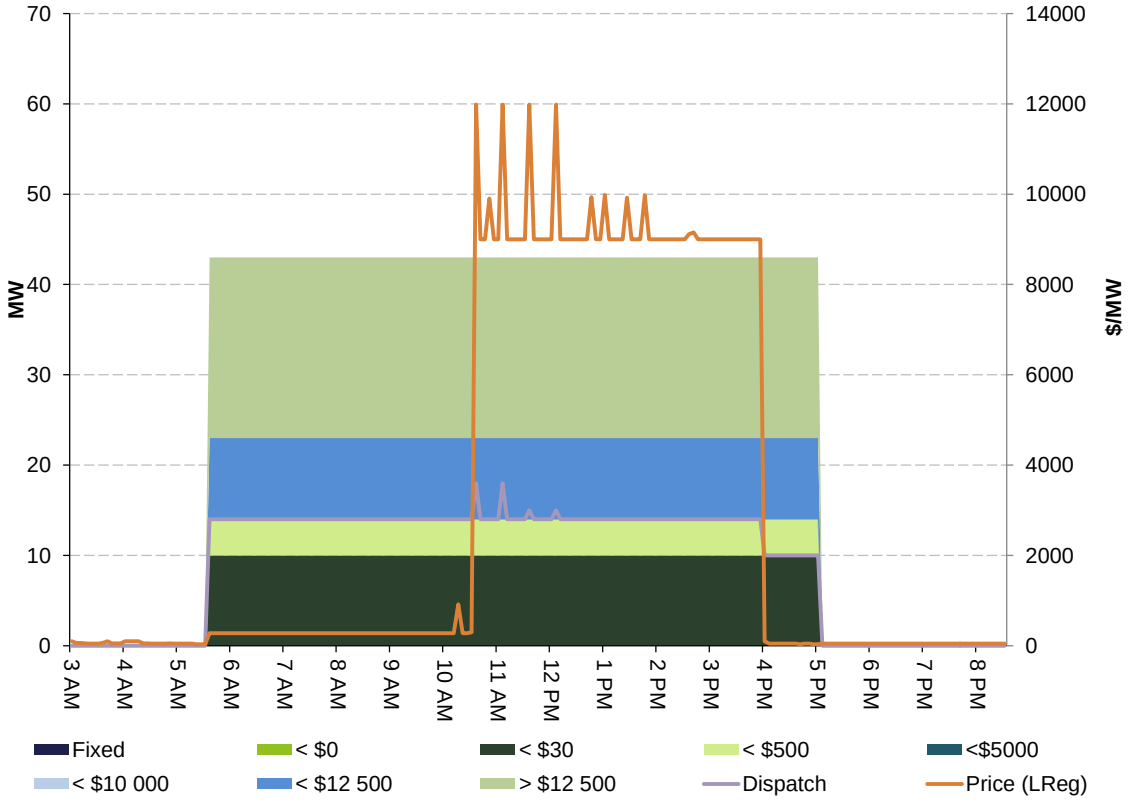


Figure D2b: Quarantine (Origin) lower regulation service closing bid prices, dispatch and dispatch price – effective offers

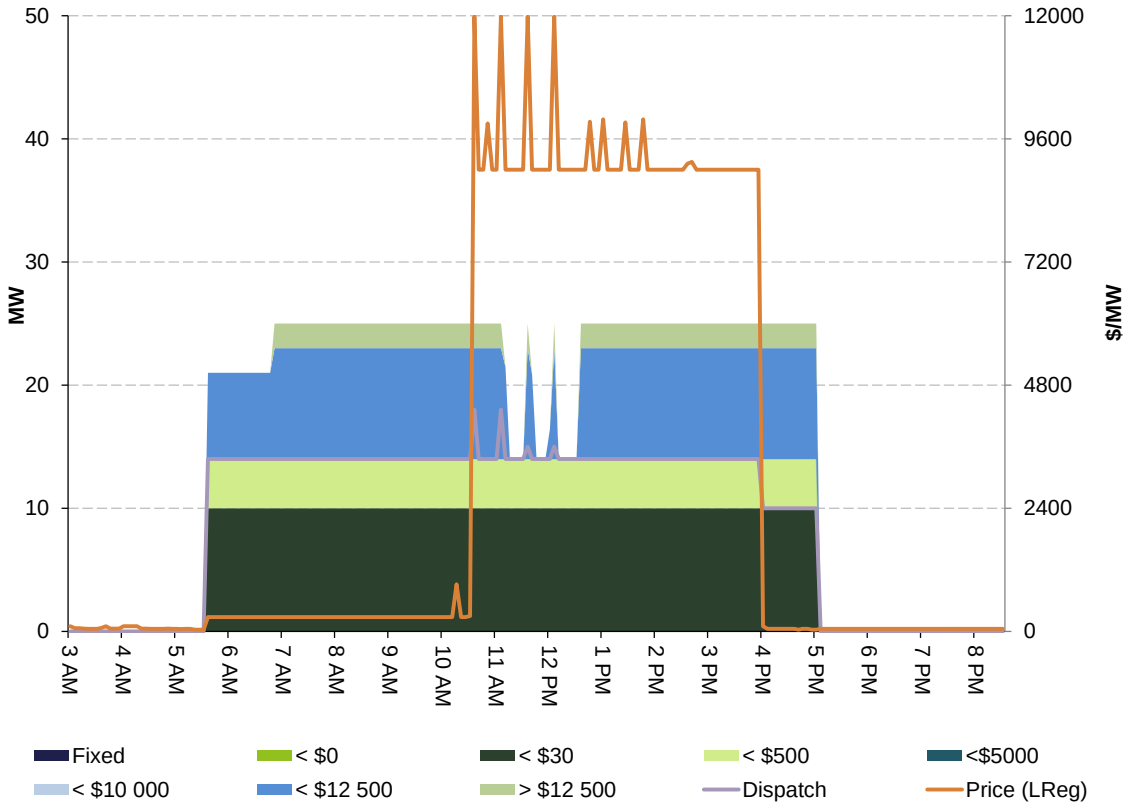


Figure D3a: Pelican Point (Engie) lower regulation service closing bid prices, dispatch and dispatch price – maximum offers

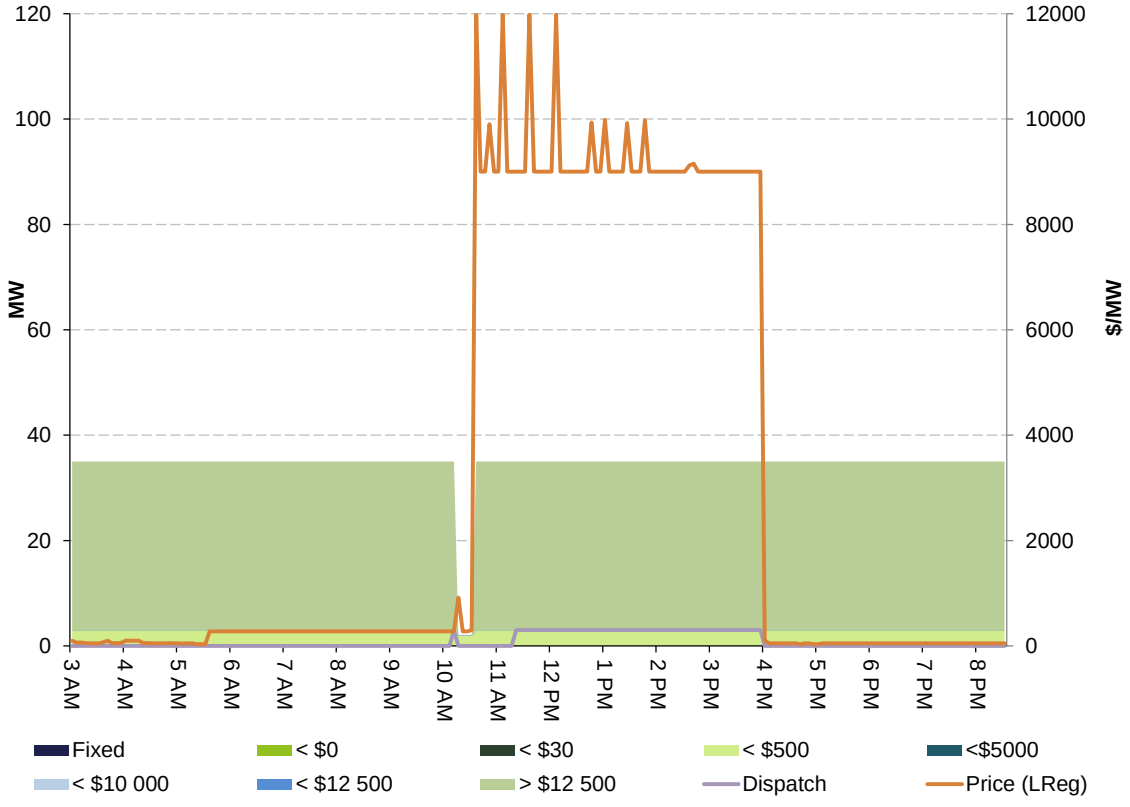


Figure D3b: Pelican Point (Engie) lower regulation service closing bid prices, dispatch and dispatch price – effective offers

Raise Regulation

Figure D4a: Torrens Island (AGL) raise regulation service closing bid prices, dispatch and dispatch price – maximum offers

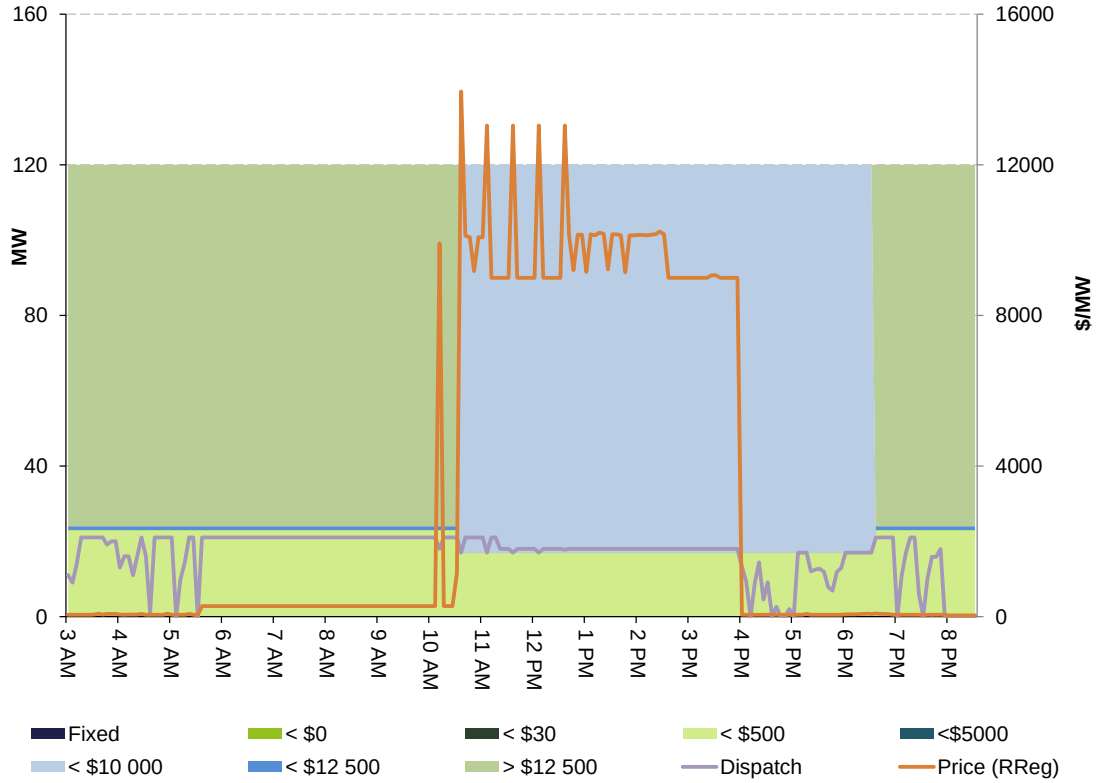


Figure D4b: Torrens Island (AGL) raise regulation service closing bid prices, dispatch and dispatch price – effective offers

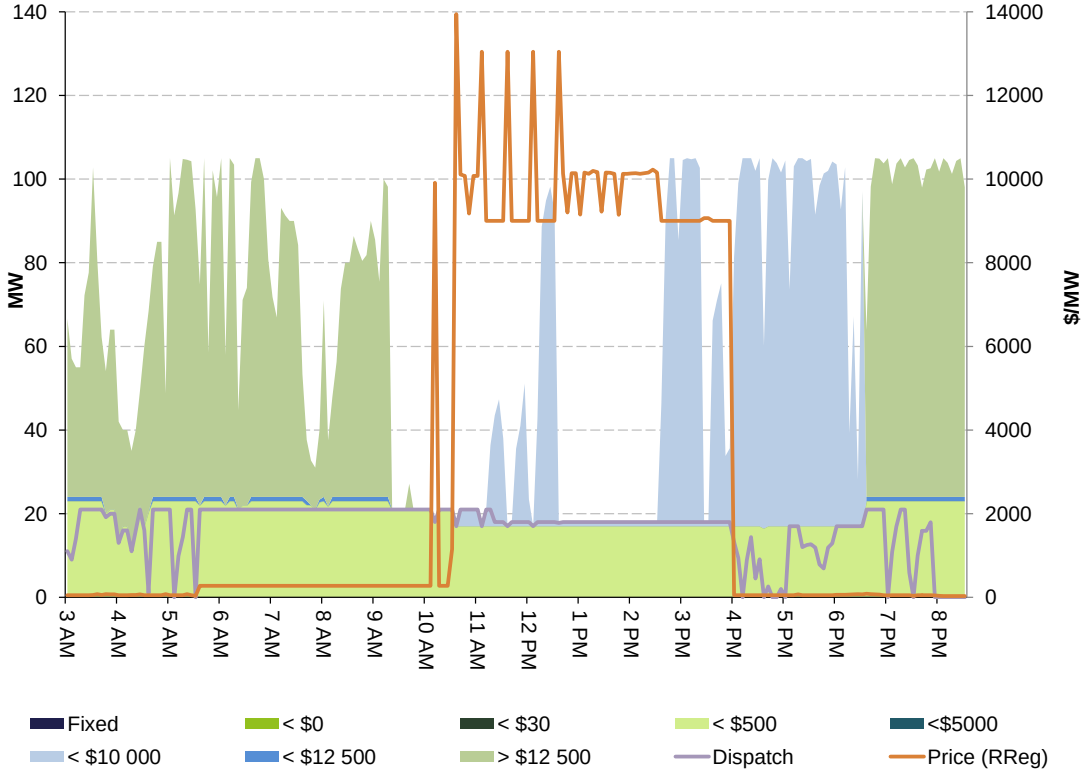


Figure D5a: Quarantine (Origin) raise regulation service closing bid prices, dispatch and dispatch price - maximum offers

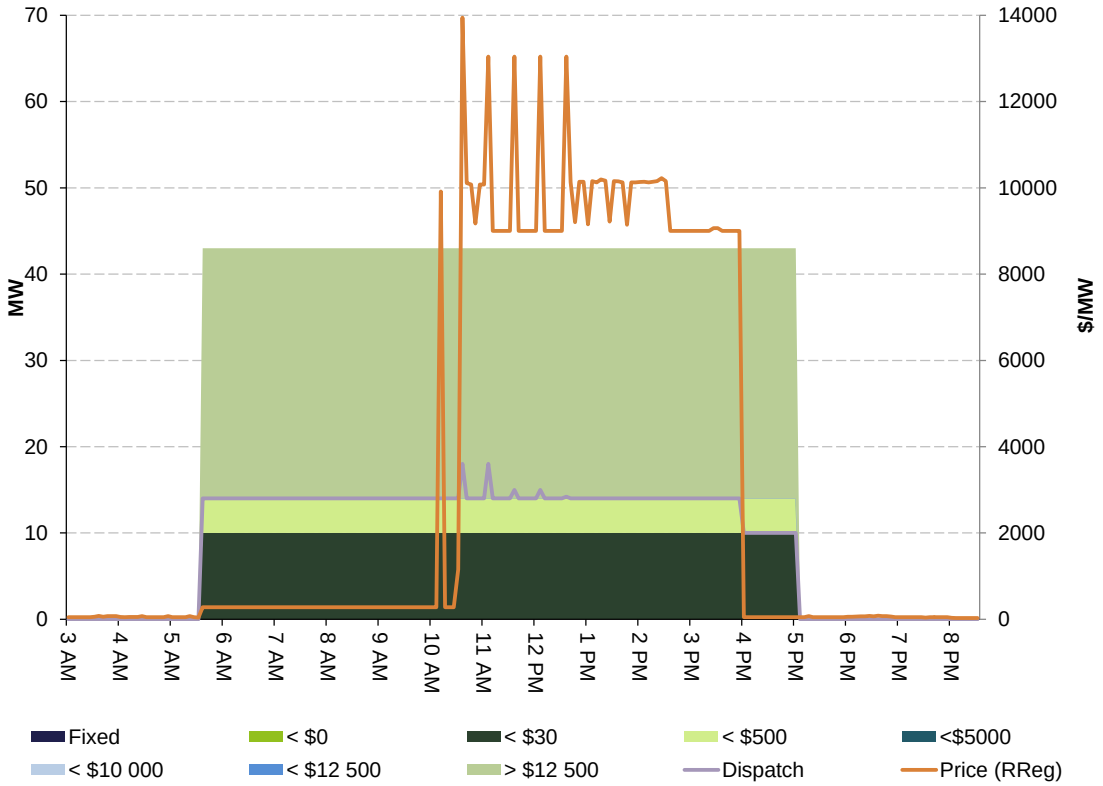


Figure D5b: Quarantine (Origin) raise regulation service closing bid prices, dispatch and dispatch price - effective offers

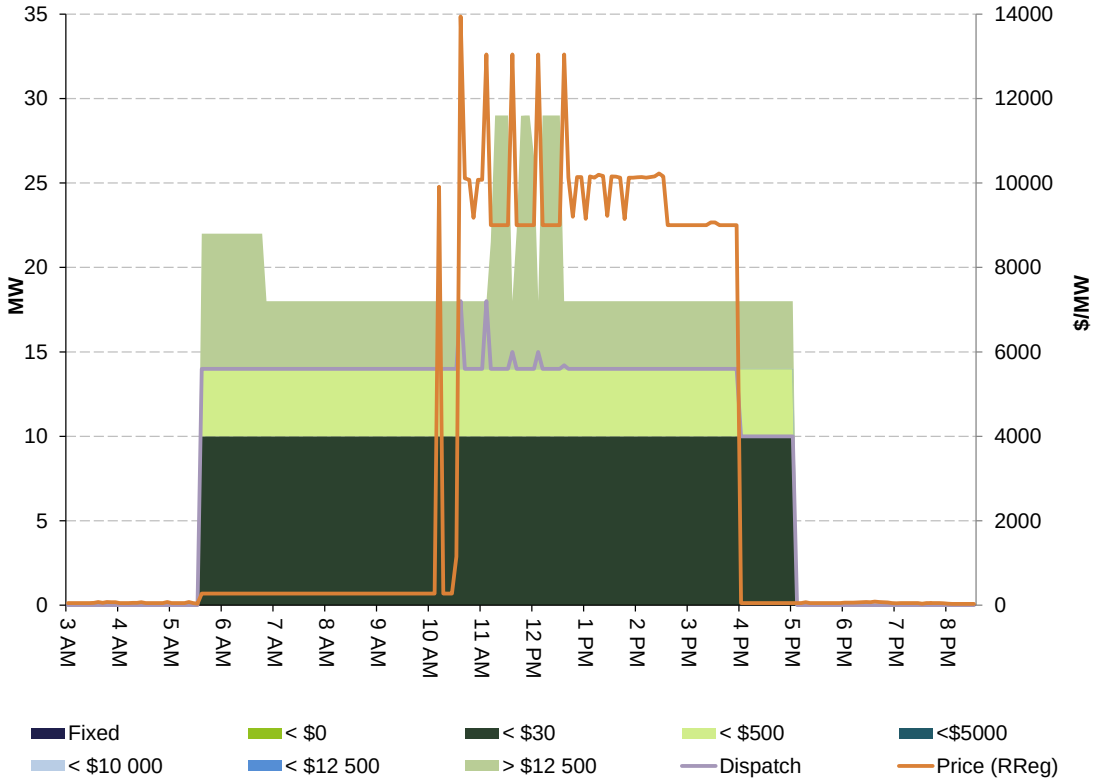


Figure D6a: Pelican Point (Engie) raise regulation service closing bid prices, dispatch and dispatch price – maximum offers

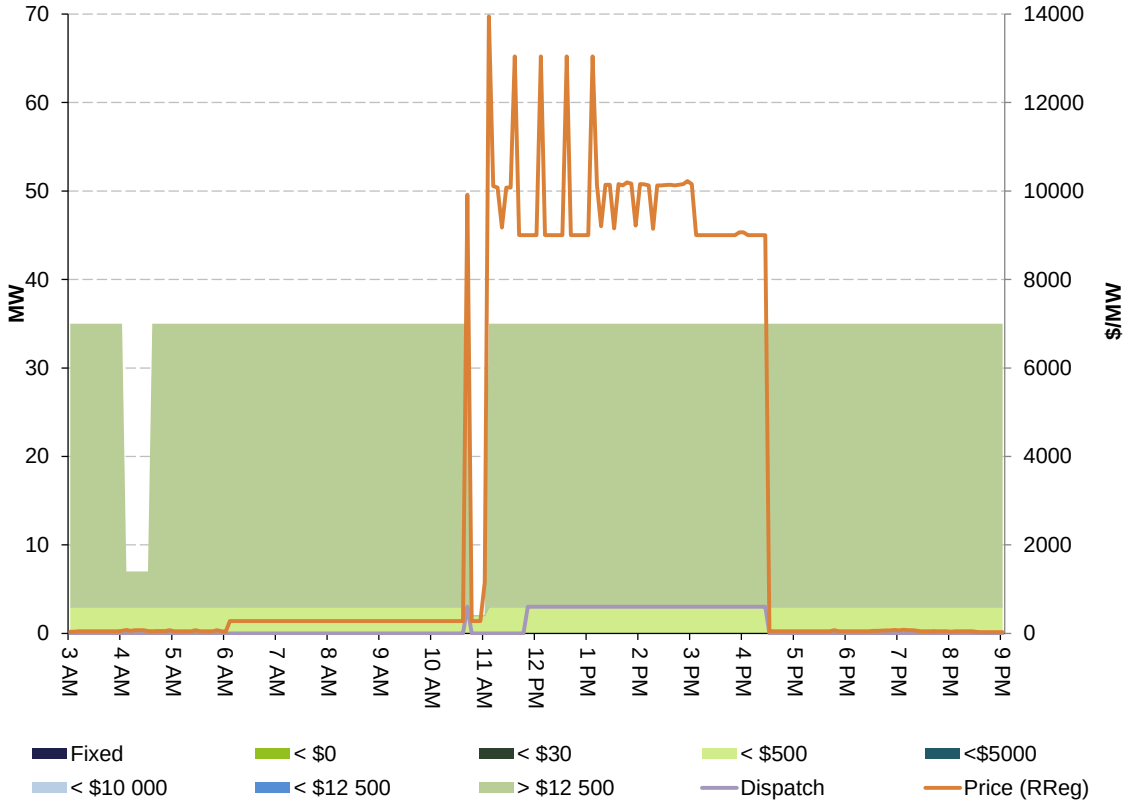


Figure D6b: Pelican Point (Engie) raise regulation service closing bid prices, dispatch and dispatch price – effective offers

Appendix E Relevant Market Notices

AEMO issued the following market notice to advise of the outage.

Market Notice	Type	Date of issue	Last Changed
58084	GENERAL NOTICE	17/03/2017 15:09: 49	17/03/2017 15:09: 49

Reason

AEMO ELECTRICITY MARKET NOTICE

The Moorabool - Tarrone 500 kV line in Victoria region is planned out of service from 0600 hrs to 1700 hrs on 21 March 2017.

A credible contingency event during this planned outage could cause synchronous separation of the South Australia (SA) region from the rest of the NEM. To minimise the possibility of load interruption due to the operation of the Automatic Under Frequency Load Shedding (AUFLS) scheme in SA, the power transfer from VIC to SA on Heywood interconnector is limited to 50 MW.

The credible separation contingency is managed as follows:

- 35 MW of raise and lower regulation FCAS will be sourced from SA.
- When power transfer is from SA to Victoria, contingency lower FCAS will be sourced from SA.

The following constraint sets has been invoked for this outage:

I-VS_050

F-V-MLTR

S-X_BC_CP

V-MLTR

V-MACARTHUR_ZERO

Forecast capacity reserves in the South Australia region are currently sufficient to meet electricity demand during the planned outage.

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

Ying Xu

AEMO Operations

Appendix F 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.[4] 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 21 March

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
11:05	$11 982.00	Origin Energy	QPS5	Lower reg	$11 982.00	-1.00	-$11 982.00
11:10	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
11:15	$8999.99	AGL (SA)	TORRB1	Lower reg	$8999.99	-1.00	-$8999.99
11:20	$9900.07	AGL (SA)	TORRB1	Lower reg	$8999.99	-0.50	-$4500.00
		AGL (SA)	TORRB1	Raise reg	$8999.99	0.50	$4500.00
		AGL (SA)	TORRB4	Lower reg	$8999.99	-0.50	-$4500.00
		AGL (SA)	TORRB4	Raise reg	$8999.99	-0.50	-$4500.00
		AGL Energy	BW02	Energy	$105.96	0.00	$0.00
		Origin Energy	MORTLK12	Energy	$75.04	-1.00	-$75.04
		EnergyAustralia	YWPS4	Raise 60 sec	$39.00	3.33	$129.87
		EnergyAustralia	YWPS4	Raise 6 sec	$20.70	1.50	$31.05
		CS Energy	W/HOE#1	Raise 5 min	$14.95	1.00	$14.95
		AGL Energy	BW02	Raise 60 sec	$0.80	0.00	$0.00
		AGL Energy	BW02	Raise 6 sec	$0.80	0.00	$0.00
		AGL (SA)	TORRB1	Raise 6 sec	$0.50	-1.50	-$0.75
		AGL (SA)	TORRB1	Raise 60 sec	$0.04	-3.33	-$0.13
		AGL (SA)	TORRB1	Energy	-$1000.00	0.50	-$500.00
		AGL (SA)	TORRB4	Energy	-$1000.00	0.50	-$500.00
11:25	$8999.99	AGL (SA)	TORRB3	Lower reg	$8999.99	-1.00	-$8999.99
11:30	$8999.99	AGL (SA)	TORRB1	Lower reg	$8999.99	-1.00	-$8999.99
11:35	$11 982.00	Origin Energy	QPS5	Lower reg	$11 982.00	-1.00	-$11 982.00
11:40	$8999.99	AGL (SA)	TORRB3	Lower reg	$8999.99	-1.00	-$8999.99
11:45	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
11:50	$8999.99	AGL (SA)	TORRB3	Lower reg	$8999.99	-1.00	-$8999.99
11:55	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99

[4] 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
12:00	$8999.99	AGL (SA)	TORRB1	Lower reg	$8999.99	-1.00	-$8999.99
12:05	$11 982.00	Origin Energy	QPS5	Lower reg	$11 982.00	-1.00	-$11 982.00
12:10	$8999.99	AGL (SA)	TORRB1	Lower reg	$8999.99	-1.00	-$8999.99
12:15	$8999.99	AGL (SA)	TORRB1	Lower reg	$8999.99	-1.00	-$8999.99
12:20	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
12:25	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
12:30	$8999.99	AGL (SA)	TORRB1	Lower reg	$8999.99	-1.00	-$8999.99
12:35	$11 982.00	Origin Energy	QPS5	Lower reg	$11 982.00	-1.00	-$11 982.00
12:40	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
12:45	$8999.99	AGL (SA)	TORRB3	Lower reg	$8999.99	-1.00	-$8999.99
12:50	$8999.99	AGL (SA)	TORRB1	Lower reg	$8999.99	-1.00	-$8999.99
12:55	$8999.99	AGL (SA)	TORRB1	Lower reg	$8999.99	-1.00	-$8999.99
13:00	$8999.99	AGL (SA)	TORRB3	Lower reg	$8999.99	-1.00	-$8999.99
13:05	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
13:10	$8999.99	AGL (SA)	TORRB1	Lower reg	$8999.99	-1.00	-$8999.99
13:15	$9934.09	AGL (SA)	TORRB1	Lower reg	$8999.99	-1.00	-$8999.99
		Snowy Hydro	MURRAY	Energy	$135.01	-1.01	-$136.36
		Ecogen Energy	NPS	Raise 60 sec	$49.50	3.33	$164.84
		Delta Electricity	VP6	Raise 6 sec	$15.00	1.50	$22.50
		CS Energy	W/HOE#1	Raise 5 min	$14.95	1.00	$14.95
		AGL (SA)	TORRB1	Energy	-$1000.00	1.00	-$1000.00
13:20	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
13:25	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
13:30	$9982.48	AGL (SA)	TORRB1	Lower reg	$8999.99	-1.00	-$8999.99
		Snowy Hydro	MURRAY	Energy	$135.01	1.53	$206.57
		AGL Energy	BW01	Energy	$105.96	-1.24	-$131.39
		AGL Energy	BW02	Energy	$105.96	-1.24	-$131.39
		EnergyAustralia	YWPS4	Raise 60 sec	$39.00	1.83	$71.37
		AGL Energy	BW01	Raise reg	$7.40	-1.24	-$9.18
		AGL Energy	BW02	Raise reg	$7.40	1.24	$9.18
		AGL Energy	BW01	Raise 60 sec	$0.80	1.50	$1.20
		AGL Energy	BW01	Raise 6 sec	$0.80	1.50	$1.20
		AGL (SA)	TORRB1	Raise 60 sec	$0.04	-3.33	-$0.13
		AGL (SA)	TORRB1	Energy	-$1000.00	1.00	-$1000.00
13:35	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
13:40	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
13:45	$8999.99	AGL (SA)	TORRB3	Lower reg	$8999.99	-1.00	-$8999.99
13:50	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
13:55	$9920.83	AGL (SA)	TORRB3	Lower reg	$8999.99	-1.00	-$8999.99
		AGL Energy	BW01	Energy	$105.96	-0.86	-$91.13
		EnergyAustralia	YWPS4	Raise 60 sec	$52.00	2.81	$146.12
		CS Energy	GSTONE5	Raise 6 sec	$20.79	0.98	$20.37
		CS Energy	W/HOE#1	Raise 5 min	$14.95	0.14	$2.09
		AGL Energy	BW01	Raise 5 min	$2.80	0.86	$2.41
		AGL (SA)	TORRB3	Raise 60 sec	$0.04	-3.33	-$0.13
		AGL Energy	BW01	Raise 60 sec	$0.01	0.52	$0.01
		AGL Energy	BW01	Raise 6 sec	$0.01	0.52	$0.01
		AGL (SA)	TORRB3	Energy	-$1000.00	1.00	-$1000.00
14:00	$8999.99	AGL (SA)	TORRB1	Lower reg	$8999.99	-1.00	-$8999.99
14:05	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
14:10	$8999.99	AGL (SA)	TORRB1	Lower reg	$8999.99	-1.00	-$8999.99
14:15	$9979.21	AGL (SA)	TORRB3	Raise reg	$8999.99	1.00	$8999.99
		AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
		AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		Engie	PPCCGT	Energy	$124.69	-1.00	-$124.69
		AGL Energy	BW02	Energy	$105.96	-2.75	-$291.39
		AGL Energy	BW04	Energy	$105.96	-2.75	-$291.39
		ERMPower and	BRAEMAR5	Energy	$97.14	5.85	$568.27
		CS Energy	GSTONE4	Lower reg	$47.00	5.68	$266.96
		CS Energy	GSTONE4	Raise 6 sec	$20.79	-1.83	-$38.05
		CS Energy	W/HOE#1	Raise 5 min	$14.95	-4.51	-$67.42
		AGL Energy	BW02	Lower reg	$0.80	-5.68	-$4.54
		AGL Energy	BW02	Raise 5 min	$0.80	2.75	$2.20
		AGL Energy	BW04	Raise 5 min	$0.80	2.75	$2.20
		AGL (SA)	TORRB3	Raise 6 sec	$0.50	-1.50	-$0.75
		AGL (SA)	TORRB3	Raise 60 sec	$0.04	-3.33	-$0.13
		CS Energy	CALL_B_1	Lower 60 sec	$0.01	5.68	$0.06
		CS Energy	CALL_B_2	Lower 6 sec	$0.01	5.68	$0.06
		AGL Energy	BW02	Raise 60 sec	$0.01	1.67	$0.02
		AGL Energy	BW02	Raise 6 sec	$0.01	1.67	$0.02
		AGL Energy	BW04	Raise 60 sec	$0.01	1.67	$0.02
		AGL Energy	BW04	Raise 6 sec	$0.01	1.67	$0.02
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00
14:20	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
14:25	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
14:30	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
14:35	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
14:40	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
14:45	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
14:50	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
14:55	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
15:00	$8999.99	AGL (SA)	TORRB3	Lower reg	$8999.99	-1.00	-$8999.99
15:05	$9115.97	AGL (SA)	TORRB3	Lower reg	$8999.99	-0.50	-$4500.00
		AGL (SA)	TORRB4	Lower reg	$8999.99	-0.50	-$4500.00
		AGL (SA)	TORRB3	Energy	$484.99	-0.50	-$242.50
		AGL (SA)	TORRB4	Energy	$484.99	-0.50	-$242.50
		Engie	MINTARO	Energy	$369.01	1.00	$369.01
15:10	$9153.04	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
		AGL (SA)	TORRB4	Energy	$299.99	-1.00	-$299.99
		Delta Electricity	VP5	Energy	$149.00	0.99	$147.51
15:15	$9000.29	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
		AGL (SA)	TORRB4	Energy	$124.99	-1.00	-$124.99
		Engie	PPCCGT	Energy	$124.69	1.00	$124.69
15:20	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
15:25	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
15:30	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
15:35	$8999.99	AGL (SA)	TORRB3	Lower reg	$8999.99	-1.00	-$8999.99
15:40	$8999.99	AGL (SA)	TORRB1	Lower reg	$8999.99	-1.00	-$8999.99
15:45	$8999.99	AGL (SA)	TORRB3	Lower reg	$8999.99	-1.00	-$8999.99
15:50	$8999.99	AGL (SA)	TORRB3	Lower reg	$8999.99	-1.00	-$8999.99
15:55	$8999.99	AGL (SA)	TORRB3	Lower reg	$8999.99	-1.00	-$8999.99
16:00	$8999.99	AGL (SA)	TORRB3	Lower reg	$8999.99	-1.00	-$8999.99
16:05	$9000.01	AGL (SA)	TORRB1	Lower reg	$8999.99	-1.00	-$8999.99
		AGL (SA)	TORRB1	Energy	$124.99	-1.00	-$124.99
		Origin Energy	OSB-AG	Energy	$124.97	1.00	$124.97
16:10	$8999.99	AGL (SA)	TORRB1	Lower reg	$8999.99	-1.00	-$8999.99
16:15	$8999.99	AGL (SA)	TORRB1	Lower reg	$8999.99	-1.00	-$8999.99
16:20	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
16:25	$8999.99	AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99

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DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
11:05	$13 943.89	EnergyAustralia	AGLHAL	Energy	$13 998.99	-1.00	-$13 998.99
		Origin Energy	QPS5	Energy	$13 099.10	1.00	$13 099.10
		Origin Energy	QPS5	Raise reg	$13 044.00	-1.00	-$13 044.00
11:10	$10 112.07	AGL (SA)	TORRB1	Lower reg	$8999.99	-0.50	-$4500.00
		AGL (SA)	TORRB1	Raise reg	$8999.99	-0.50	-$4500.00
		AGL (SA)	TORRB4	Lower reg	$8999.99	0.50	$4500.00
		AGL (SA)	TORRB4	Raise reg	$8999.99	-0.50	-$4500.00
		AGL Energy	BW01	Energy	$105.96	-0.79	-$83.71
		EnergyAustralia	YWPS1	Raise 60 sec	$39.00	-0.48	-$18.72
		AGL Energy	BW03	Raise 6 sec	$20.80	-0.48	-$9.98
		AGL Energy	BW01	Raise 60 sec	$0.80	0.48	$0.38
		AGL Energy	BW01	Raise 6 sec	$0.80	0.48	$0.38
		AGL (SA)	TORRB1	Energy	-$1000.00	0.50	-$500.00
		AGL (SA)	TORRB4	Energy	-$1000.00	0.50	-$500.00
11:15	$10 075.98	AGL (SA)	TORRB1	Lower reg	$8999.99	0.50	$4500.00
		AGL (SA)	TORRB1	Raise reg	$8999.99	-0.50	-$4500.00
		AGL (SA)	TORRB4	Lower reg	$8999.99	-0.50	-$4500.00
		AGL (SA)	TORRB4	Raise reg	$8999.99	-0.50	-$4500.00
		AGL Energy	BW02	Energy	$105.96	-0.01	-$1.06
		Origin Energy	MORTLK12	Energy	$75.04	-1.00	-$75.04
		AGL Energy	LD03	Raise 60 sec	$38.00	0.00	$0.00
		EnergyAustralia	YWPS1	Raise 6 sec	$20.70	0.00	$0.00
		AGL Energy	BW02	Raise 60 sec	$3.04	0.00	$0.00
		AGL Energy	BW02	Raise 6 sec	$2.80	0.00	$0.00
		AGL (SA)	TORRB1	Energy	-$1000.00	0.50	-$500.00
		AGL (SA)	TORRB4	Energy	-$1000.00	0.50	-$500.00
11:20	$9175.11	AGL (SA)	TORRB1	Raise reg	$8999.99	-1.00	-$8999.99
		EnergyAustralia	YWPS4	Raise 60 sec	$39.00	-3.33	-$129.87
		EnergyAustralia	YWPS4	Raise 6 sec	$20.70	-1.50	-$31.05
		CS Energy	W/HOE#1	Raise 5 min	$14.95	-1.00	-$14.95
		AGL (SA)	TORRB1	Raise 6 sec	$0.50	1.50	$0.75
		AGL (SA)	TORRB1	Raise 60 sec	$0.04	3.33	$0.13
11:25	$10 075.14	AGL (SA)	TORRB1	Lower reg	$8999.99	-0.50	-$4500.00
		AGL (SA)	TORRB1	Raise reg	$8999.99	-0.50	-$4500.00
		AGL (SA)	TORRB3	Lower reg	$8999.99	0.50	$4500.00
		AGL (SA)	TORRB3	Raise reg	$8999.99	-0.50	-$4500.00

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
		AGL Energy	BW01	Energy	$105.96	0.00	$0.00
		Origin Energy	MORTLK12	Energy	$75.04	-1.00	-$75.04
		EnergyAustralia	YWPS4	Raise 60 sec	$39.00	0.00	$0.00
		EnergyAustralia	YWPS4	Raise 6 sec	$20.70	0.00	$0.00
		AGL Energy	BW01	Raise 60 sec	$3.04	0.00	$0.00
		AGL Energy	BW01	Raise 6 sec	$2.80	0.00	$0.00
		AGL (SA)	TORRB1	Energy	-$1000.00	0.50	-$500.00
		AGL (SA)	TORRB3	Energy	-$1000.00	0.50	-$500.00
11:30	$10 075.18	AGL (SA)	TORRB1	Lower reg	$8999.99	0.50	$4500.00
		AGL (SA)	TORRB1	Raise reg	$8999.99	-0.50	-$4500.00
		AGL (SA)	TORRB4	Lower reg	$8999.99	-0.50	-$4500.00
		AGL (SA)	TORRB4	Raise reg	$8999.99	-0.50	-$4500.00
		Snowy Hydro	MURRAY	Energy	$135.01	0.00	$0.00
		Origin Energy	MORTLK12	Energy	$75.04	-1.00	-$75.04
		AGL (SA)	TORRB1	Energy	-$1000.00	0.50	-$500.00
		AGL (SA)	TORRB4	Energy	-$1000.00	0.50	-$500.00
11:35	$13 044.00	Origin Energy	QPS5	Raise reg	$13 044.00	-1.00	-$13 044.00
11:40	$8999.99	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		Origin Energy	QPS5	Energy	-$1000.00	-0.17	$170.00
		Engie	PPCCGT	Energy	-$1000.00	-0.43	$430.00
		Engie	DRYCGT1	Energy	-$1000.00	-0.07	$70.00
		Engie	DRYCGT2	Energy	-$1000.00	-0.07	$70.00
		Engie	DRYCGT3	Energy	-$1000.00	-0.08	$80.00
		Engie	SNUG1	Energy	-$1000.00	-0.07	$70.00
		Snowy Hydro	PTSTAN1	Energy	-$1000.00	-0.11	$110.00
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00
11:45	$8999.99	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
11:50	$8999.99	AGL (SA)	TORRB1	Raise reg	$8999.99	-1.00	-$8999.99
11:55	$8999.99	AGL (SA)	TORRB3	Raise reg	$8999.99	-1.00	-$8999.99
12:00	$8999.99	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
12:05	$13 044.00	Origin Energy	QPS5	Raise reg	$13 044.00	-1.00	-$13 044.00
12:10	$8999.99	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		Origin Energy	QPS5	Energy	-$1000.00	-0.16	$160.00
		EnergyAustralia	AGLHAL	Energy	-$1000.00	-0.20	$200.00
		Engie	PPCCGT	Energy	-$1000.00	-0.35	$350.00
		Engie	DRYCGT1	Energy	-$1000.00	-0.06	$60.00
		Engie	DRYCGT2	Energy	-$1000.00	-0.06	$60.00
		Engie	DRYCGT3	Energy	-$1000.00	-0.07	$70.00

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
		Engie	SNUG1	Energy	-$1000.00	-0.07	$70.00
		Snowy Hydro	LONSDALE	Energy	-$1000.00	-0.03	$30.00
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00
12:15	$8999.99	AGL (SA)	TORRB3	Raise reg	$8999.99	-1.00	-$8999.99
12:20	$8999.99	AGL (SA)	TORRB1	Raise reg	$8999.99	-1.00	-$8999.99
12:25	$8999.99	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
12:30	$8999.99	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
12:35	$13 044.00	Origin Energy	QPS5	Raise reg	$13 044.00	-1.00	-$13 044.00
12:40	$8999.99	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
12:45	$8999.99	AGL (SA)	TORRB1	Raise reg	$8999.99	-1.00	-$8999.99
12:50	$8999.99	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
12:55	$8999.99	AGL (SA)	TORRB3	Raise reg	$8999.99	-1.00	-$8999.99
13:00	$8999.99	AGL (SA)	TORRB1	Raise reg	$8999.99	-1.00	-$8999.99
13:05	$13 044.00	Origin Energy	QPS5	Raise reg	$13 044.00	-1.00	-$13 044.00
13:10	$10 130.00	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		Stanwell	TARONG#1	Energy	$67.07	-0.27	-$18.11
		Stanwell	TARONG#2	Energy	$67.07	-0.27	-$18.11
		Stanwell	TARONG#3	Energy	$67.07	-0.27	-$18.11
		Stanwell	TARONG#4	Energy	$67.07	-0.27	-$18.11
		Stanwell	STAN-4	Lower reg	$55.00	-1.05	-$57.75
		Engie	LOYYB2	Lower 5 min	$0.19	1.05	$0.20
		CS Energy	CALL_B_2	Lower 60 sec	$0.01	-1.05	-$0.01
		CS Energy	CALL_B_2	Lower 6 sec	$0.01	-1.05	-$0.01
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00
13:15	$9202.44	AGL (SA)	TORRB1	Lower reg	$8999.99	1.00	$8999.99
		AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
		AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		Ecogen Energy	NPS	Raise 60 sec	$49.50	-3.33	-$164.84
		Delta Electricity	VP6	Raise 6 sec	$15.00	-1.50	-$22.50
		CS Energy	W/HOE#1	Raise 5 min	$14.95	-1.00	-$14.95
		AGL (SA)	TORRB1	Energy	-$1000.00	-1.00	$1000.00
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00
13:20	$10 139.99	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		Snowy Hydro	MURRAY	Energy	$135.01	-1.04	-$140.41
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00
13:25	$10 139.99	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		Snowy Hydro	MURRAY	Energy	$135.01	-1.04	-$140.41
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
13:30	$9153.94	AGL (SA)	TORRB1	Lower reg	$8999.99	1.00	$8999.99
		AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
		AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		Snowy Hydro	MURRAY	Energy	$135.01	-2.54	-$342.93
		AGL Energy	BW01	Energy	$105.96	1.24	$131.39
		AGL Energy	BW02	Energy	$105.96	1.24	$131.39
		EnergyAustralia	YWPS4	Raise 60 sec	$39.00	-1.83	-$71.37
		AGL Energy	BW01	Raise reg	$7.40	1.24	$9.18
		AGL Energy	BW02	Raise reg	$7.40	-1.24	-$9.18
		AGL Energy	BW01	Raise 60 sec	$0.80	-1.50	-$1.20
		AGL Energy	BW01	Raise 6 sec	$0.80	-1.50	-$1.20
		AGL (SA)	TORRB1	Raise 60 sec	$0.04	3.33	$0.13
		AGL (SA)	TORRB1	Energy	-$1000.00	-1.00	$1000.00
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00
13:35	$10 154.21	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		Snowy Hydro	MURRAY	Energy	$135.01	-1.14	-$153.91
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00
13:40	$10 126.38	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		Snowy Hydro	MURRAY	Energy	$135.01	-0.94	-$126.91
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00
13:45	$10 197.11	AGL (SA)	TORRB3	Lower reg	$8999.99	1.00	$8999.99
		AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
		AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		Snowy Hydro	MURRAY	Energy	$181.00	-1.09	-$197.29
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00
13:50	$10 166.59	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		AGL Energy	BW02	Energy	$105.96	-1.03	-$109.14
		EnergyAustralia	YWPS4	Raise 60 sec	$52.00	-0.63	-$32.76
		EnergyAustralia	YWPS1	Raise 6 sec	$20.70	-0.63	-$13.04
		CS Energy	W/HOE#1	Raise 5 min	$14.95	-1.03	-$15.40
		AGL Energy	BW02	Raise 5 min	$2.80	1.03	$2.88
		AGL Energy	BW02	Raise 60 sec	$0.80	0.63	$0.50
		AGL Energy	BW02	Raise 6 sec	$0.80	0.63	$0.50
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00
13:55	$9219.32	AGL (SA)	TORRB3	Lower reg	$8999.99	1.00	$8999.99
		AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
		AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		EnergyAustralia	YWPS4	Raise 60 sec	$52.00	-3.33	-$173.16

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
		CS Energy	GSTONE5	Raise 6 sec	$20.79	-1.50	-$31.19
		CS Energy	W/HOE#1	Raise 5 min	$14.95	-1.00	-$14.95
		AGL (SA)	TORRB3	Raise 60 sec	$0.04	3.33	$0.13
		AGL (SA)	TORRB3	Energy	-$1000.00	-1.00	$1000.00
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00
14:00	$10 154.88	AGL (SA)	TORRB1	Lower reg	$8999.99	1.00	$8999.99
		AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
		AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		AGL Energy	BW01	Energy	$105.96	-0.39	-$41.32
		AGL Energy	BW02	Energy	$105.96	-0.39	-$41.32
		Delta Electricity	VP5	Raise 60 sec	$100.00	-0.47	-$47.00
		AGL Energy	BW03	Raise 6 sec	$20.80	-0.47	-$9.78
		CS Energy	W/HOE#1	Raise 5 min	$20.79	-0.77	-$16.01
		AGL Energy	BW01	Raise 5 min	$0.01	0.39	$0.00
		AGL Energy	BW01	Raise 60 sec	$0.01	0.23	$0.00
		AGL Energy	BW01	Raise 6 sec	$0.01	0.23	$0.00
		AGL Energy	BW02	Raise 5 min	$0.01	0.39	$0.00
		AGL Energy	BW02	Raise 60 sec	$0.01	0.23	$0.00
		AGL Energy	BW02	Raise 6 sec	$0.01	0.23	$0.00
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00
14:05	$10 151.92	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		Snowy Hydro	MURRAY	Energy	$181.00	-0.84	-$152.04
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00
14:10	$10 124.96	AGL (SA)	TORRB1	Lower reg	$8999.99	1.00	$8999.99
		AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
		AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		Origin Energy	OSB-AG	Energy	$124.97	-1.00	-$124.97
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00
14:15	$9145.46	AGL (SA)	TORRB3	Raise reg	$8999.99	-1.00	-$8999.99
		AGL Energy	BW02	Energy	$105.96	2.75	$291.39
		AGL Energy	BW04	Energy	$105.96	2.75	$291.39
		ERMPower	BRAEMAR5	Energy	$97.14	-5.85	-$568.27
		CS Energy	GSTONE4	Lower reg	$47.00	-5.68	-$266.96
		CS Energy	GSTONE4	Raise 6 sec	$20.79	1.83	$38.05
		CS Energy	W/HOE#1	Raise 5 min	$14.95	4.51	$67.42
		AGL Energy	BW02	Lower reg	$0.80	5.68	$4.54
		AGL Energy	BW02	Raise 5 min	$0.80	-2.75	-$2.20
		AGL Energy	BW04	Raise 5 min	$0.80	-2.75	-$2.20

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
		AGL (SA)	TORRB3	Raise 6 sec	$0.50	1.50	$0.75
		AGL (SA)	TORRB3	Raise 60 sec	$0.04	3.33	$0.13
		CS Energy	CALL_B_1	Lower 60 sec	$0.01	-5.68	-$0.06
		CS Energy	CALL_B_2	Lower 6 sec	$0.01	-5.68	-$0.06
		AGL Energy	BW02	Raise 60 sec	$0.01	-1.67	-$0.02
		AGL Energy	BW02	Raise 6 sec	$0.01	-1.67	-$0.02
		AGL Energy	BW04	Raise 60 sec	$0.01	-1.67	-$0.02
		AGL Energy	BW04	Raise 6 sec	$0.01	-1.67	-$0.02
14:20	$10 124.68	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		Engie	PPCCGT	Energy	$124.69	-1.00	-$124.69
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00
14:25	$10 124.68	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		Engie	PPCCGT	Energy	$124.69	-1.00	-$124.69
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00
14:30	$10 135.13	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		Snowy Hydro	MURRAY	Energy	$181.00	-0.75	-$135.75
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00
14:35	$10 139.26	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		Snowy Hydro	MURRAY	Energy	$181.00	-0.77	-$139.37
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00
14:40	$10 124.96	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		Origin Energy	OSB-AG	Energy	$124.97	-1.00	-$124.97
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00
14:45	$10 143.44	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		Snowy Hydro	MURRAY	Energy	$181.00	-0.79	-$142.99
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00
14:50	$10 156.23	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		Snowy Hydro	MURRAY	Energy	$181.00	-0.86	-$155.66
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00
14:55	$10 226.43	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		Delta Electricity	VP5	Energy	$288.00	-0.79	-$227.52
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00
15:00	$10 156.23	AGL (SA)	TORRB3	Lower reg	$8999.99	1.00	$8999.99
		AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
		AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		Snowy Hydro	MURRAY	Energy	$181.00	-0.86	-$155.66
		AGL (SA)	TORRB4	Energy	-$1000.00	1.00	-$1000.00
15:05	$8999.99	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
15:10	$8999.99	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
15:15	$8999.99	AGL (SA)	TORRB1	Raise reg	$8999.99	-1.00	-$8999.99
15:20	$8999.99	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
15:25	$8999.99	AGL (SA)	TORRB3	Raise reg	$8999.99	-1.00	-$8999.99
15:30	$8999.99	AGL (SA)	TORRB1	Raise reg	$8999.99	-1.00	-$8999.99
15:35	$8999.99	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
15:40	$8999.99	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
15:45	$8999.99	AGL (SA)	TORRB3	Raise reg	$8999.99	-1.00	-$8999.99
15:50	$8999.99	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
15:55	$9064.69	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		Engie	PPCCGT	Energy	$124.69	-1.00	-$124.69
		AGL (SA)	TORRB4	Energy	$59.99	1.00	$59.99
16:00	$9064.69	AGL (SA)	TORRB3	Lower reg	$8999.99	1.00	$8999.99
		AGL (SA)	TORRB4	Lower reg	$8999.99	-1.00	-$8999.99
		AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
		Engie	PPCCGT	Energy	$124.69	-1.00	-$124.69
		AGL (SA)	TORRB4	Energy	$59.99	1.00	$59.99
16:05	$8999.99	AGL (SA)	TORRB3	Raise reg	$8999.99	-1.00	-$8999.99
16:10	$8999.99	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
16:15	$8999.99	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
16:20	$8999.99	AGL (SA)	TORRB4	Raise reg	$8999.99	-1.00	-$8999.99
16:25	$8999.99	AGL (SA)	TORRB3	Raise reg	$8999.99	-1.00	-$8999.99