Report into market ancillary service prices above $5000

South Australia, 1 November 2015

11 February 2016

AUSTRALIAN ENERGY REGULATOR

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Amendment Record

Version	Date	Pages
1 For publication	11/02/2016	70

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1 Obligation

In accordance with the clause 3.13.7(e) of the National Electricity Rules, the AER is required to monitor significant variation 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.

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.

On 1 November 2015, South Australia was separated from the rest of the NEM when the Heywood interconnector tripped. All Frequency Control Ancillary Service (FCAS) prices in South Australia exceeded $5000/MW. This report presents our analysis of the events in accordance with this obligation.

2 Summary

Following the loss of the Heywood interconnector between Victoria and South Australia on the night of 1 November 2015, the price for all eight frequency control ancillary services in South Australia exceeded $5000/MW for eight consecutive 5 minute dispatch intervals affecting three trading intervals.

Table 1: Energy and FCAS prices

Period ending	Energy price	Frequency control ancillary service price ($/MW)							
	($/MWh)	lower 5 min	lower 60 sec	lower 6 sec	lower reg	raise 5 min	raise 60 sec	raise 6 sec	raise reg
10.00 pm	2174	13 800	9000	13 800	13 800	13 800	13 800	13 800	13 800
10.05 pm	26	13 800	9000	13 800	13 800	13 800	13 800	13 800	13 800
10.10 pm	32	13 800	9000	13 800	13 800	13 800	13 800	13 800	13 800
10.15 pm	28	13 800	13 800	13 800	13 800	13 800	13 800	13 800	13 800
10.20 pm	10 760	9000	13 800	13 800	9000	13 800	13 800	13 800	13 800
10.25 pm	55	9000	13 800	13 800	13 800	13 800	13 800	13 800	13 800
10.30 pm	25	13 800	13 800	13 800	13 800	13 800	13 800	13 800	13 800
10.35 pm	30	13 800	13 800	13 800	13 800	13 800	13 800	13 800	13 800

The Cumulative Price Threshold (CPT) for regulation services was breached several hours after the incident when regulation prices were sustained at $4991/MW for an extended period.[1] This resulted in an administered price cap of $300/MW being applied to all FCAS prices for seven days. The total cost for FCAS between 10 pm on 1 November 2015 and 4 am on 9 November 2015 was around $6 million.[2]

The Heywood interconnector is the AC transmission network that connects South Australia to Victoria and the rest of the National Electricity Market (NEM). On 1 November 2015, the South East – Heywood No.2 275 kV transmission line, which forms part of the Heywood interconnector, was out of service as part of the interconnector upgrade. At 9.51 pm, a new relay at the South East Sub-Station (SESS) misinterpreted a routine test signal tripping the South East – Heywood No.1 275 kV transmission line. This relay has since been reprogrammed to avoid a recurrence. As a result, South Australia synchronously separated from the rest of the NEM.[3]

1 Section 3.3 of this report describes the formulation and operation of the CPT.

2 Section 3.11 of the Rules defines ancillary services, their requirement, components, structure and cost allocation to generators and customers. A summary is provided in the FCAS settlement notes in Appendix A

3 The direct current (DC) Murraylink interconnector remained in service, the alternating current (AC) synchronous link via Heywood was lost. Only the Heywood interconnector can transfer ancillary services. Under NER clause 4.8.15 – AEMO has investigated this incident. See AEMO website http://www.aemo.com.au/Electricity/Resources/Reports-and-Documents/~/media/9CF5C0817341494492D065A3B5DC4569.ashx

Since South Australia was importing energy at the time, the reduction in supply from the loss of the Heywood interconnector led to under frequency load shedding (UFLS) in South Australia[4].

After the separation, energy and FCAS needed to be sourced locally which elevated FCAS dispatch prices in South Australia to above $9000/MW from 10 pm.[5]

Our analysis concludes that rebidding did not contribute to the high FCAS prices and they were not forecast by the market systems.

Rebidding, just prior to the Heywood interconnector being re-established, did however contribute to the energy spot price reaching $1820/MWh at 10.30 pm.

Synchronous connection was re-established at 10.26 pm following the return to service of the SESS-HYTS No 1 275kV line. AEMO has stated that South Australia could have been synchronised 26 minutes earlier had the local frequency been stable.

The AER is separately considering the compliance of participants, including AEMO, with the Rules.

4 Appendix A contains an explanation of frequency control ancillary services (FCAS).

5 Dispatch prices and targets are calculated to meet the instantaneous forecast of demand for the end of each 5 minute dispatch interval. Since the separation occurred at 9.51 pm, during the dispatch interval ending 9.55 pm, the separation was only reflected from the dispatch interval ending 10 pm.

3 Analysis

This section sets out the factors which contributed to the price outcomes and observations about relevant participant behaviour.

Prior to the Heywood Interconnector trip, six conventional generators and seventeen wind farms were operating in South Australia. Approximately 220 MW and 80 MW of power was flowing from Victoria into South Australia over the Heywood and Murraylink interconnectors respectively. Local regulation FCAS prices were around $600/MW with contingency FCAS prices less than $2/MW and the energy price around $30/MWh in South Australia.

Prior to the separation event, demand and available capacity were close to forecast. With the Heywood interconnector providing energy into South Australia, its loss reduced supply and consequently prices were higher than forecast. The high prices that followed the separation event were not directly as a result of rebidding.

3.1 Network issues

The failure of the Heywood interconnector was the dominant factor that drove high FCAS prices on 1 November. The separation of South Australia from the rest of the NEM which resulted in UFLS qualifies as a "reviewable operating incident" and AEMO has prepared a report discussing the detailed operation of the power system during the event[6].

Two interconnectors link South Australia to Victoria: The Heywood interconnector: an AC link with a nominal capacity around 460 MW and Murraylink: a DC interconnector with a nominal capacity around 200 MW. Currently only Heywood provides a synchronous link to the rest of the NEM and can transfer FCAS between the regions.

In June 2015 ElectraNet submitted requests for a series of outages related to the upgrade of the Heywood interconnector. The last of these started at 7.05 am on 29 October 2015 when the South East – Heywood No.2 275 kV transmission line was planned to be out of service until 5.30 pm on 10 November 2015. To manage system security during such outages, AEMO requires 35 MW of regulation FCAS to be sourced locally in South Australia whenever a single contingency, such as the failure of the remaining Heywood circuit, could result in South Australia becoming an island.[7]

At 9.51.08 pm the Heywood interconnector tripped while transferring around 220 MW into South Australia. The frequency in South Australia dropped to 48.96Hz due to the supply/demand imbalance created by the loss of the interconnector.[8] UFLS operated correctly at 49Hz, interrupting around 105 MW of customer load. AEMO reported a further 55 MW of demand appeared to have tripped as a result of the frequency

6 See AEMO website http://www.aemo.com.au/Electricity/Resources/Reports-and-Documents/~/media/9CF5C0817341494492D065A3B5DC4569.ashx

7 Section 4 draws on information published by AEMO and ElectraNet that describes AEMO's reasons for the change in approach. For additional information see *Prices above $5000/MW - 11, 12 and 25 October 2015 (SA)* Published by the AER on 22 December 2015.

8 Load restoration commenced at 10.30 pm and was completed by 10.37 pm.

variation.[9] The frequency excursion immediately after the trip did not exceed the limits allowed for in these circumstances however, FCAS prices increased to the market price cap.

Cathedral Rocks Wind Farm also tripped from 11 MW when its rate of change of frequency protection operated. While this trip did not materially impact on the incident a review will be completed regarding the wind farms compliance with its generator performance standards.

ElectraNet is responsible for the transmission network in South Australia and the AER has been provided with the following summary of ElectraNet's assessment of the cause of the trip.

> *ElectraNet found that Line 1 tripped due to an incompatible protection relay configuration. The protection relay had been recently installed as part of the works associated with the SESS upgrade. The line tripped when an automated test signal was unexpectedly interpreted by the new relay as a trip signal. The routine test signal was transmitted from Heywood Terminal Station (HYTS) to verify the integrity of a protection telecommunication channel between HYTS and SESS.*[10] *As a result, the relay opened CBs 6603 and 8029 at SESS, which in turn off-loaded Line 1.*
>
> *ElectraNet has reprogrammed the newly installed protection relays to prevent a reoccurrence of the trip.*[11]

3.1.1 Implications of the interruption on frequency

Figure 1 shows the system frequency in South Australia for the period from 9.35 pm to 10.45 pm (black line and inset). The green and blue vertical lines show the time that the Heywood interconnector tripped and was reinstated.

The grey area of the chart shows the acceptable operating frequency range for South Australia under normal conditions and during and after a separation event (Table 3 in Section 4 describes this in more detail). The red line shows the output from the non-scheduled thermal generators in South Australia (a total of 130 MW at Lonsdale, Port Stanvac and Angaston), highlighting the times that they started and stopped generation.[12]

The figure also shows that the output of the wind farms (yellow line) during the event was relatively stable except for the trip of the Cathedral Rocks Wind Farm immediately following the Heywood trip.

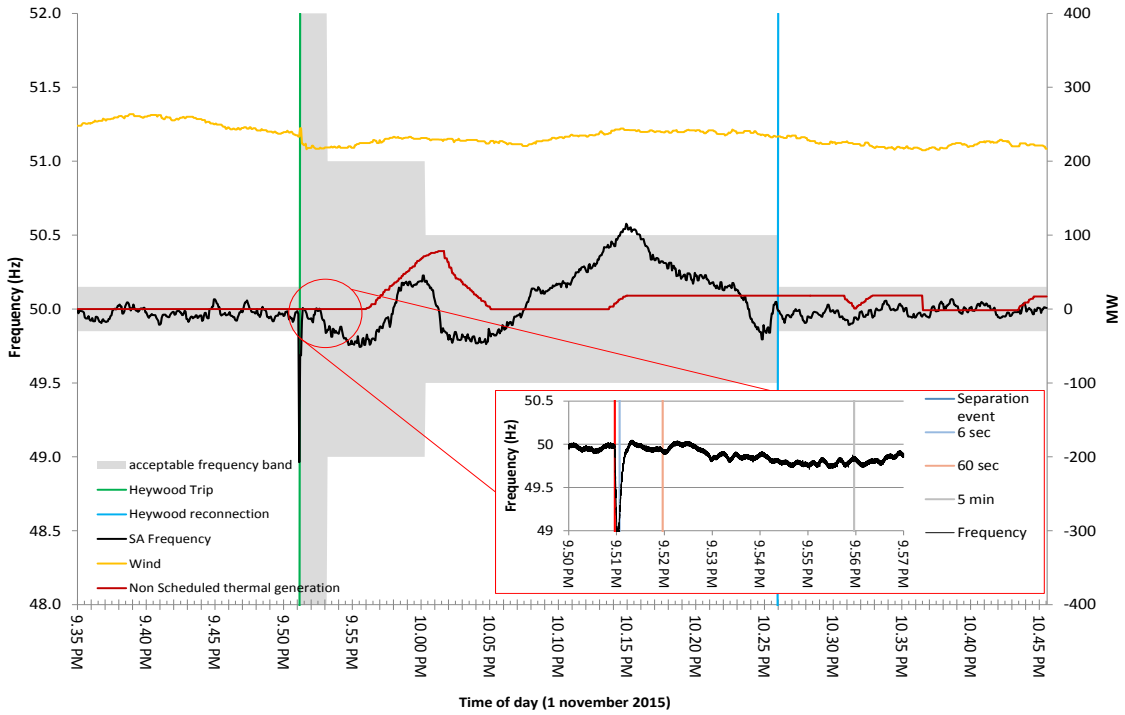
9 Demand in South Australia reduced from 1306 MW at 9.55 pm to 1149 MW at 10 pm from the load reductions.

10 The test is an automated function that is sent periodically (in this case weekly).

11 Sourced from http://www.aemo.com.au/Electricity/Resources/Reports-and-Documents/~/media/9CF5C0817341494492D065A3B5DC4569.ashx

12 Lonsdale and Port Stanvac became scheduled on 13 January 2016.

Figure 1: South Australian frequency



The figure shows that at around 9.56 pm, the non-scheduled generators at Lonsdale and Port Stanvac started, corresponding to the high dispatch price, increasing the frequency. These units stopped operating at 10.05 pm.

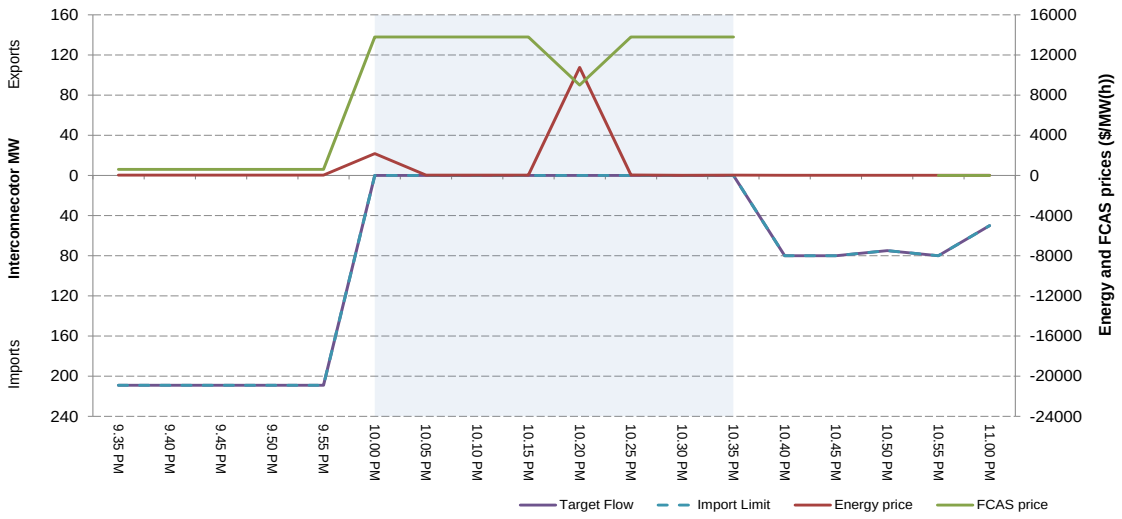
At about 10.15 pm the figure highlights a period of 92 seconds where the frequency is outside the normal operating frequency range reaching 50.58 Hz at 10.14.36 pm. The situation that caused this started at 9.56 pm when in response to the frequency deviation at that time, the TIPS B units started providing raise contingency services. However, this response did not stop when the frequency returned to normal and continued until around 10.14 pm when AEMO requested that the units be put into manual control and follow their targets to reduce their output. At 10.13 pm Lonsdale started again, compounding the frequency deviation.

The frequency returned to around 50 Hz by 10.23 pm allowing AEMO to resynchronise South Australia with the rest of the NEM at 10.26 pm. AEMO has indicated the frequency deviations after 10 pm delayed the reconnection of the Heywood interconnector by around 26 minutes.

Figure 2 shows the import limit and target flows on the Heywood interconnector as well as the energy dispatch price and the lower regulation price (used as a proxy for FCAS).[13] After separation, energy and FCAS prices in South Australia increased as shown by the green and red lines. The shaded area represents the period in market systems when South Australia was islanded.

13 While the line tripped at 9.51 pm, during the dispatch interval ending 9.55 pm, market systems first reflect the change in the dispatch interval ending 10 pm

Figure 2: Heywood limits and flows and FCAS and Energy prices



3.2 Generator offers, FCAS and Energy Prices

On 1 November from 10 pm to 10.35 pm all FCAS prices exceeded $9000/MW as a result of the increased requirements for frequency services that after the separation event could only be met by local high-priced providers. While a number of generators rebid after the separation, these rebids increased the amount of low-priced FCAS capacity, ultimately reducing the FCAS price. Rebidding did not contribute to the high FCAS prices in South Australia.

At the time the event occurred, only three South Australian power stations were registered to provide FCAS:

- Northern Power Station (owned by Alinta Energy);
- Torrens Island A and B (owned by AGL); and
- Pelican Point Power Station (owned by GDF Suez).

Table 2 shows the maximum FCAS capacity available by station; Torrens Island is the largest registered provider of FCAS in South Australia.

Table 2: Maximum capacity available by station and regulation service

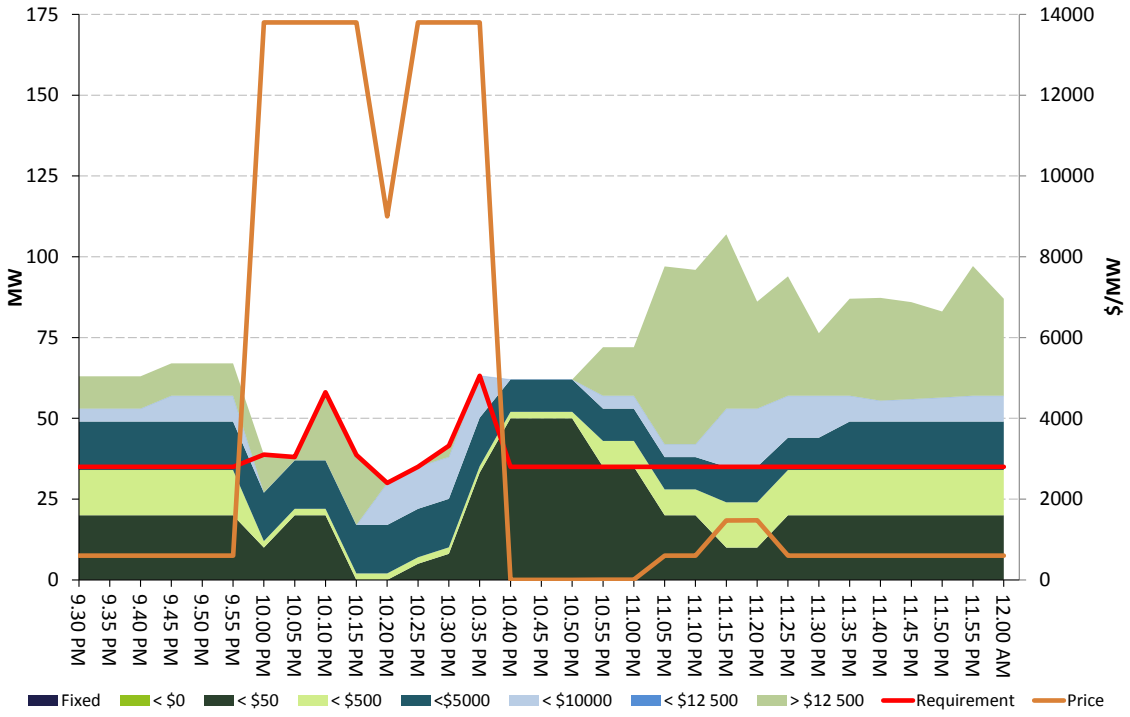
Power Station	Max Capacity							
	lower reg	lower 6 sec	lower 60 sec	lower 5 min	raise reg	raise 6 sec	raise 60 sec	raise 5 min
Northern	20	14	72	56	20	12	64	52
Pelican Point	100	35	30	0	100	35	30	0
Torrens Island	200	115	288	200	260	115	288	200

The market dispatch engine co-optimises energy and FCAS offers to meet forecast requirements and provide the most cost effective pricing solution. Similar to energy offers, participants may spread the capacity offered in each FCAS market into 10 price bands. Co-optimisation in the dispatch process accounts for the forecast energy dispatch level, FCAS requirements and generator bids for all services.

High FCAS prices were effectively driven by the co-optimisation of the generator offers and the limited number of available sources for energy and FCAS. Appendix D lists the price setter information for each dispatch interval and FCAS for the period of the separation.

For the eight FCAS markets, Figure 3 to Figure 10 show the price, requirement and the combined effective capacity being offered in price bands for each local service sourced in South Australia.[14] The red line in these figures shows the local requirement for that service, the coloured areas show the effective volumes while the light brown line shows the price of that service.

Figure 3: Lower regulation services price, requirement and effective capacity by price band



14 Effective FCAS capacity takes into account the co-optimisation process with energy offers

Figure 4: Raise regulation services price, requirement and effective capacity by price band

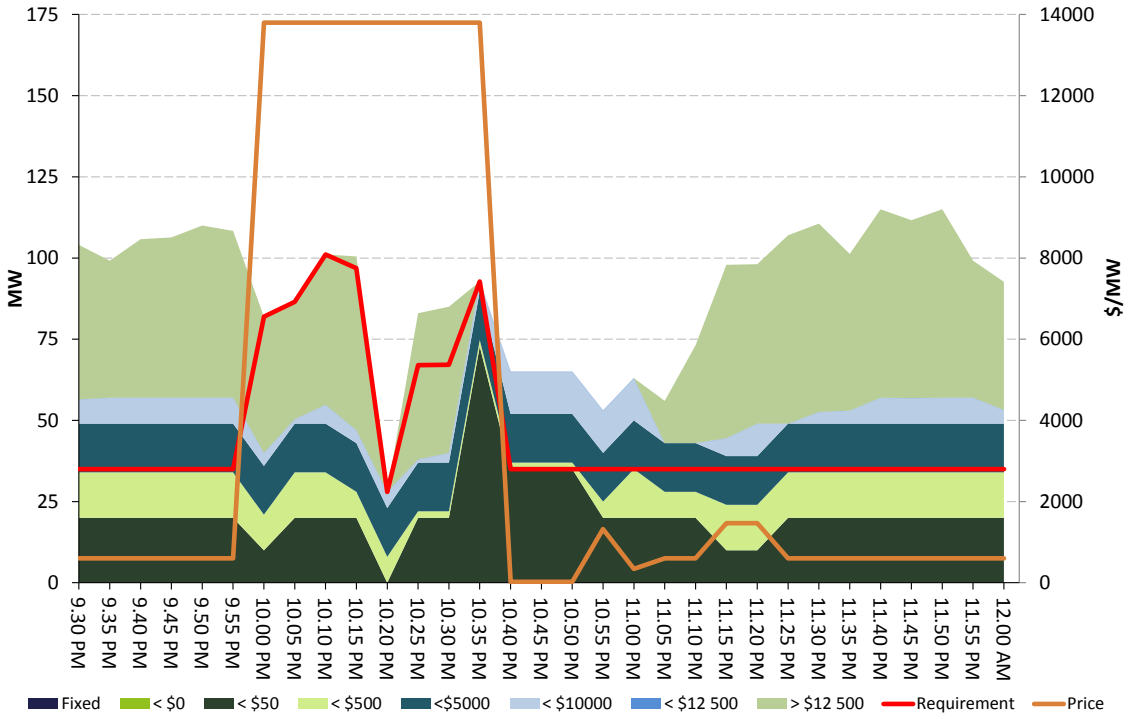


Figure 5: Lower 6 second services price, requirement and effective capacity by price band

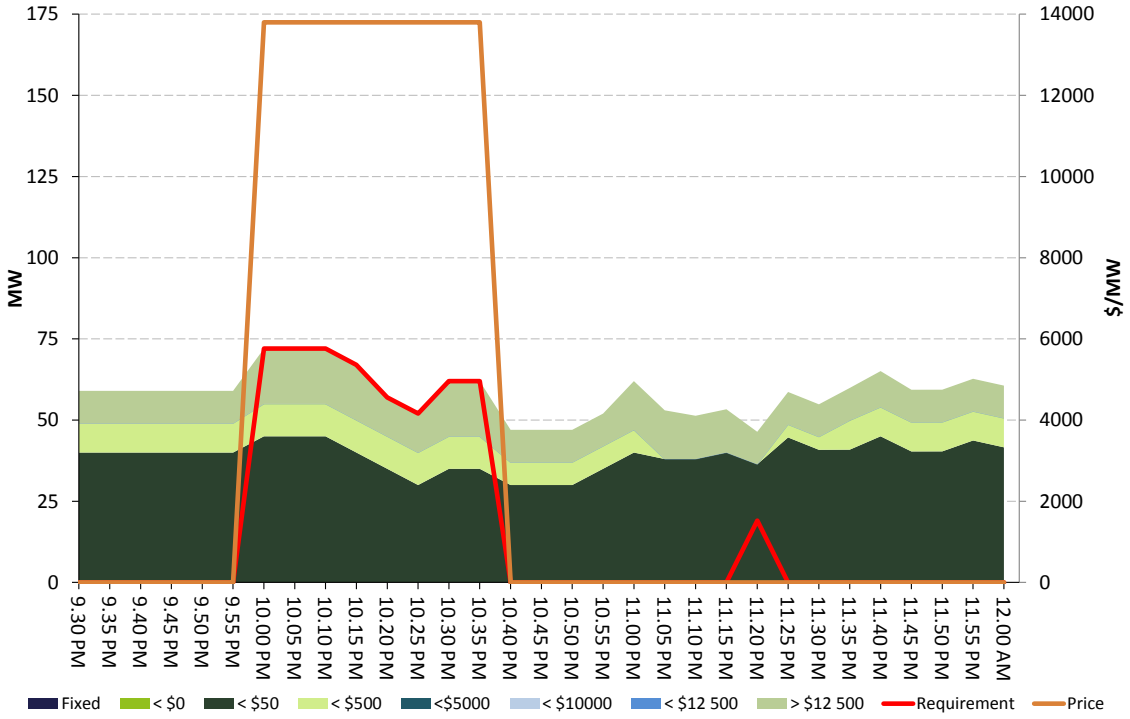


Figure 6: Raise 6 second services price, requirement and effective capacity by price band

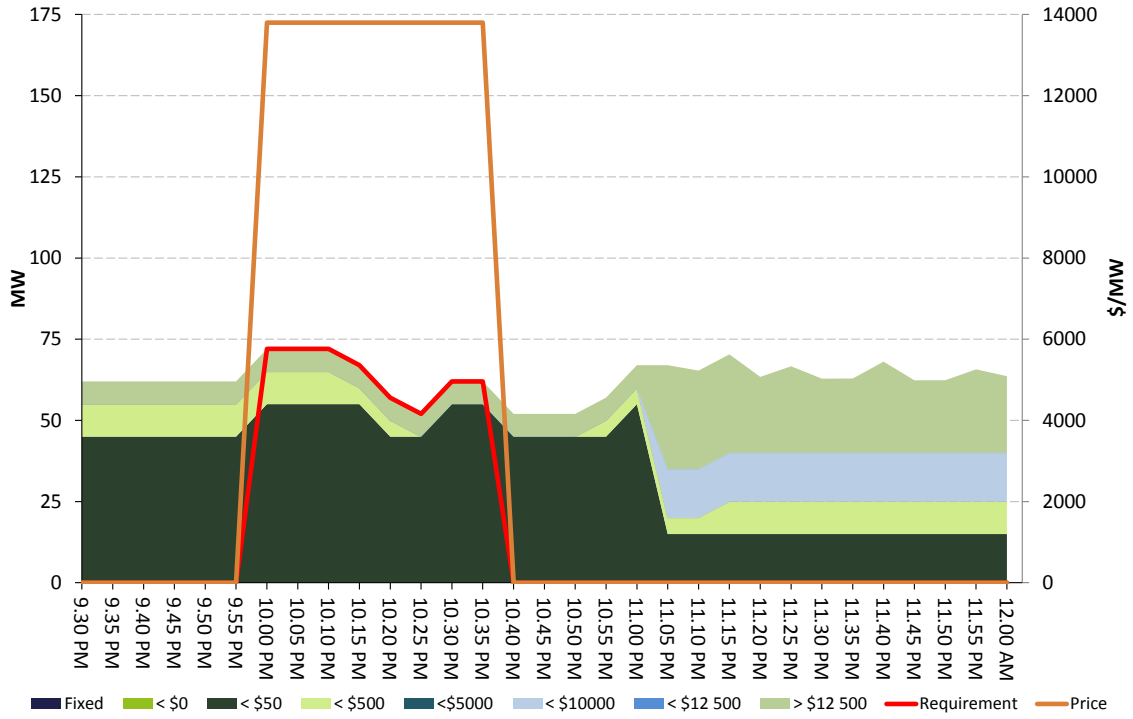


Figure 7: Lower 60 second services price, requirement and effective capacity by price band

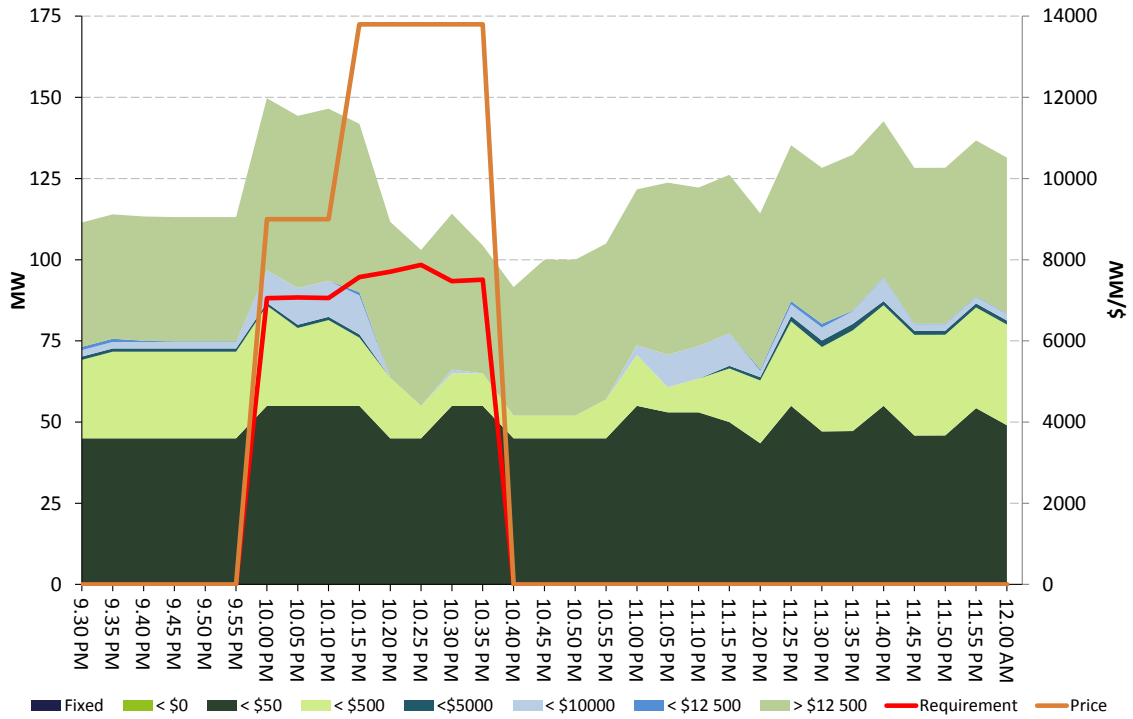


Figure 8: Raise 60 second services price, requirement and effective capacity by price band

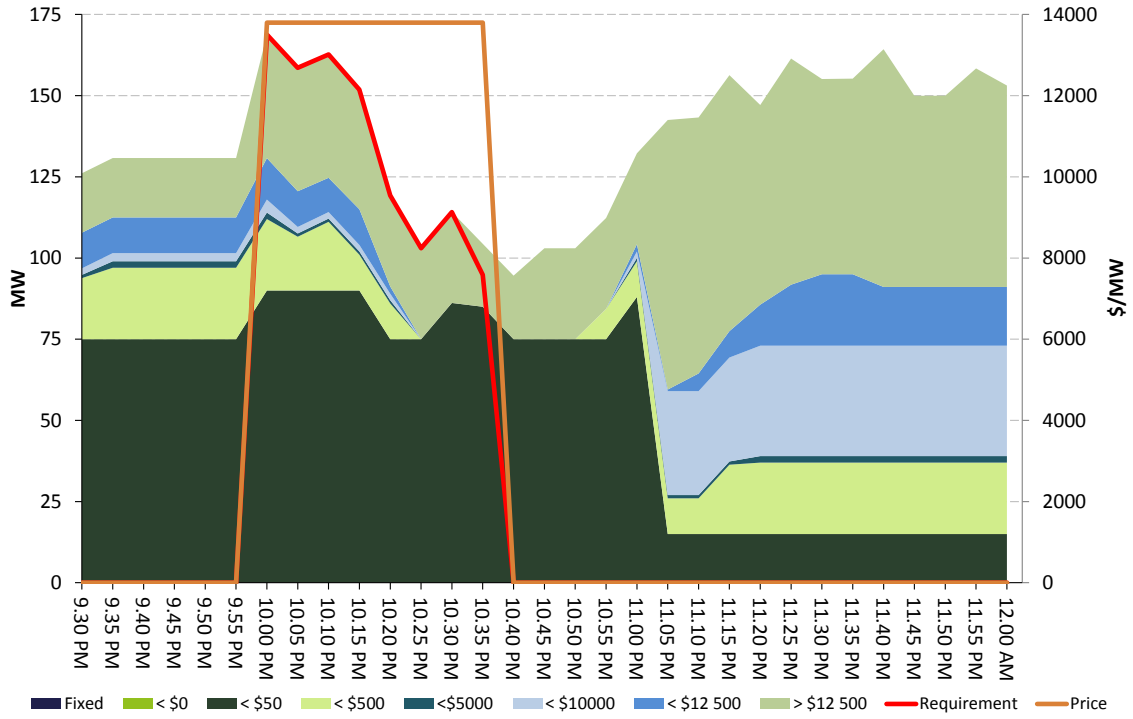


Figure 9: Lower 5 minute services price, requirement and effective capacity by price band

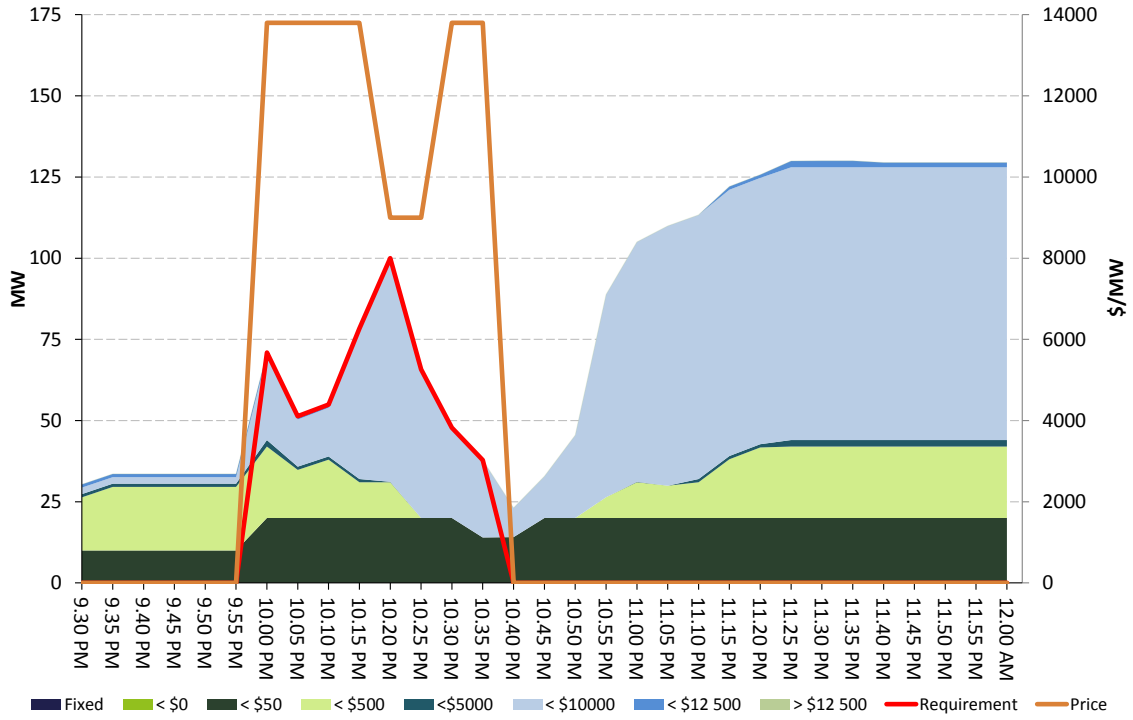
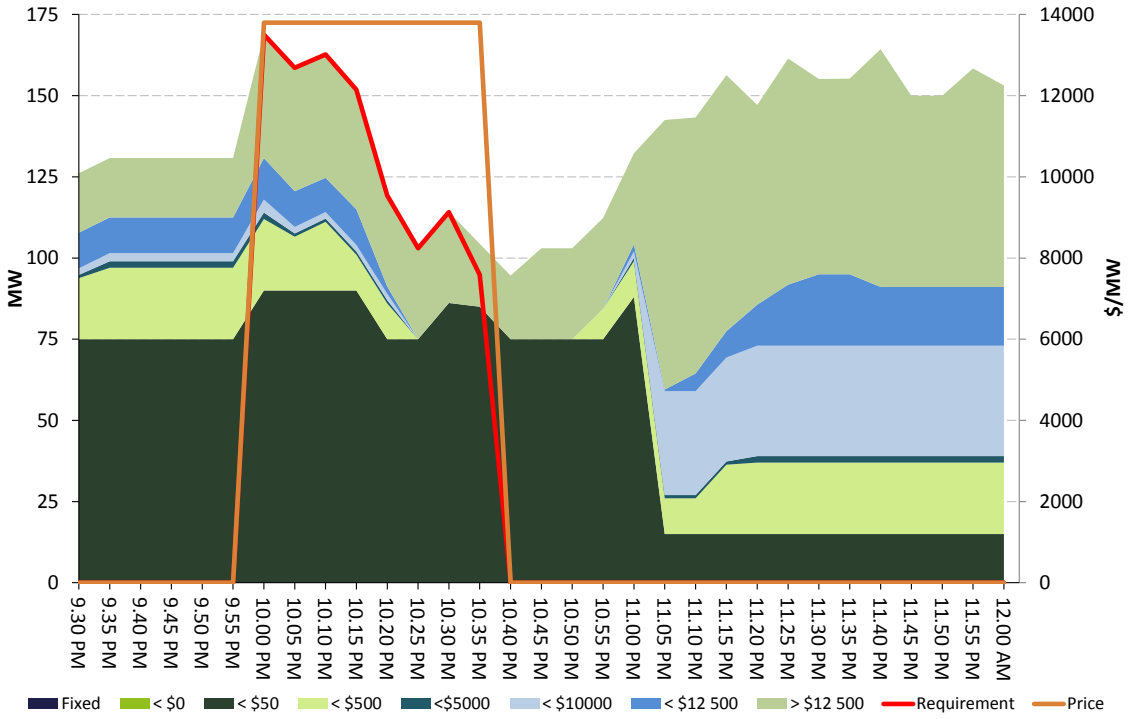


Figure 10: Raise 5 minute services price, requirement and effective capacity by price band



The closing bids for each participant for FCAS are shown in Appendix B.

3.3 The cumulative price threshold

Under the National Electricity Rules, if the accumulation of the previous 2016 prices for a frequency control service exceeds six times the Cumulative Price Threshold (CPT) of $207 000 then an administered price cap of $300/MW[15] is applied to all services where the price would exceed the administered price cap. While FCAS prices were high for the period of the separation, the accumulation of these high prices was insufficient to trigger the cumulative price threshold at that time. Following the reconnection of the Heywood interconnector, FCAS regulation prices dropped. At 12.35 am on 2 November regulation prices increased to $4991/MW in accordance with participant offers and remained at that level until the CPT was triggered at 9 am that morning. Administered prices remained in place until 9 November 2015.[16]

Figure 11 shows the accumulated price of regulation, the dispatch price and six times the CPT value.

15 See Power System Operating Procedure – Dispatch So_Op3705 Version: 80 Date: 23 October 2014 , Section 18.5.2 http://www.aemo.com.au/Electricity/Policies-and-Procedures/System-Operating-Procedures/Dispatch-SO_OP3705

16 See Market notices 50270 and 50446 in Appendix C. AEMO issued a total of 14 market notices starting and ending the administrative price cap for each day from 1 November 2015 until the 9 November 2015.

Figure 11: South Australian local regulation services price, cumulative price and CPT

In Figure 11, the solid red and blue lines show the actual five minute prices for the raise and lower regulation services, while the dashed red and blue lines show the accumulated price of those services.[17] The FCAS CPT is shown as the solid green horizontal line. During an Administered price period the CPT is calculated using the uncapped price based on the market participant offers. The dashed red and blue lines continue above the CPT line in this instance because generators' regulation offers remained high despite the CPT being triggered and the $300/MW administrative price cap being imposed.

17 While the price and requirement for both services are shown on the figure their prices and requirement are effectively the same.

4 Frequency Standards and FCAS requirements for South Australia

Network arrangements in south eastern South Australia and south western Victoria are complex but reliable. The Heywood Interconnector is an alternating current high voltage transmission link that connects South East Substation in South Australia to the Heywood Terminal Station in south-west Victoria. While Murraylink also transmits energy between South Australia and Victoria, Heywood provides synchronous connection between South Australia and the rest of the NEM.[18]

Since the start of the market in December 1998, the Heywood interconnector has failed on only eight occasions, leaving South Australia as an island. In 2001 the South Australian jurisdictional system security coordinator (JSSC) advised the market operator that a wider frequency range would operate for events that would cause separation. In accordance with the Rules, UFLS operates in manageable blocks spread over a number of steps within under-frequency bands from 49 Hz down to 47 Hz as nominated by AEMO.[19] The wider frequency range for separation events in South Australia allows UFLS to replace contingency raise services.

Previously, AEMO would procure local FCAS after a separation event to maintain the South Australian frequency in accordance with the standard.

The frequency Standard for South Australia is shown in Table 3.[20]

Table 3: Acceptable frequency bands for South Australia following a separation event

Condition	Containment	Stabilisation	Recovery
Generation event, load event, network event or separation event during load restoration following a contingency event.	47 to 52 Hz	49 to 51 Hz within 2 minutes	49.5 to 50.5 Hz within 10 minutes

Joint work by AEMO and ElectraNet in 2014, led AEMO to form the view that FCAS is required for all situations when South Australia is at risk of separation to ensure that generators registered for FCAS are operating and able to provide these services. AEMO's local requirement of 35 MW for raise and lower regulation FCAS is not designed to avoid or mitigate the possibility of a contingency resulting in load shedding. Its purpose is to maintain system security in the region in the period after a credible contingency event separates South Australia from the rest of the NEM.

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18 Murraylink is a 200 MW Direct Current interconnector between Berri in South Australia and Red Cliffs in Victoria.

19 Rules Clause 4.3.5 (b)

20 http://www.aemc.gov.au/Australias-Energy-Market/Market-Legislation/Electricity-Guidelines-and-Standards/Frequency-Operating-Standards-(Mainland)

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 islanding a region 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 load shedding 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, if not already enabled contingency services. AEMO would also 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 regulation services in South Australia whenever the region is on a single contingency so that the frequency, after an island is formed and after the contingency services have operated, can be smoothly maintained.

Frequency Control Ancillary Service Settlement

AEMO settles the FCAS markets on a weekly basis, as follows[21].

- 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[22] 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 SA, 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.

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

22 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 B10a highlight for each dispatch interval the lower and raise regulation services closing bids for AGL, Alinta Energy and GDF Suez (the only participants in South Australia at the time with ancillary service capability). It also shows the dispatch level of the respective services at each station and the dispatch price.

FCAS is 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 that service 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 Power Station (AGL) lower regulation service closing bid prices, dispatch and dispatch price

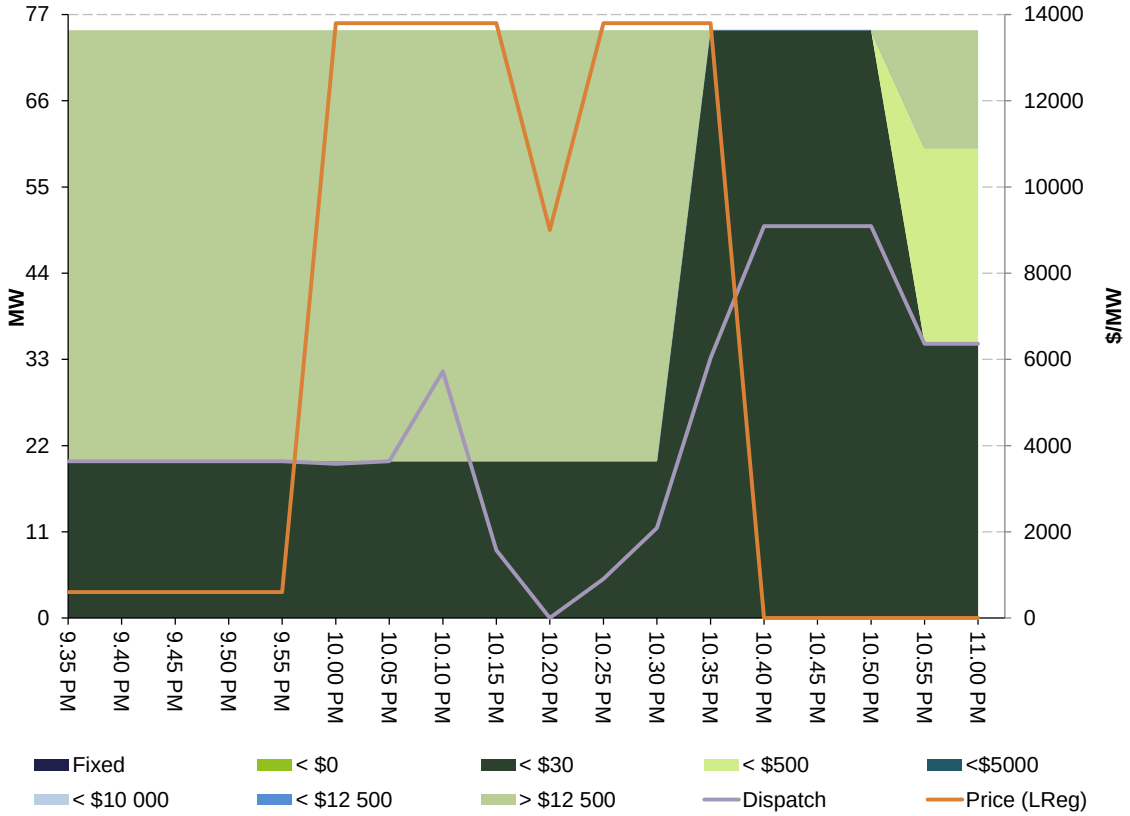


Figure B1b: Torrens Island Power Station (AGL) lower regulation service closing bid prices, dispatch and dispatch price – effective offers

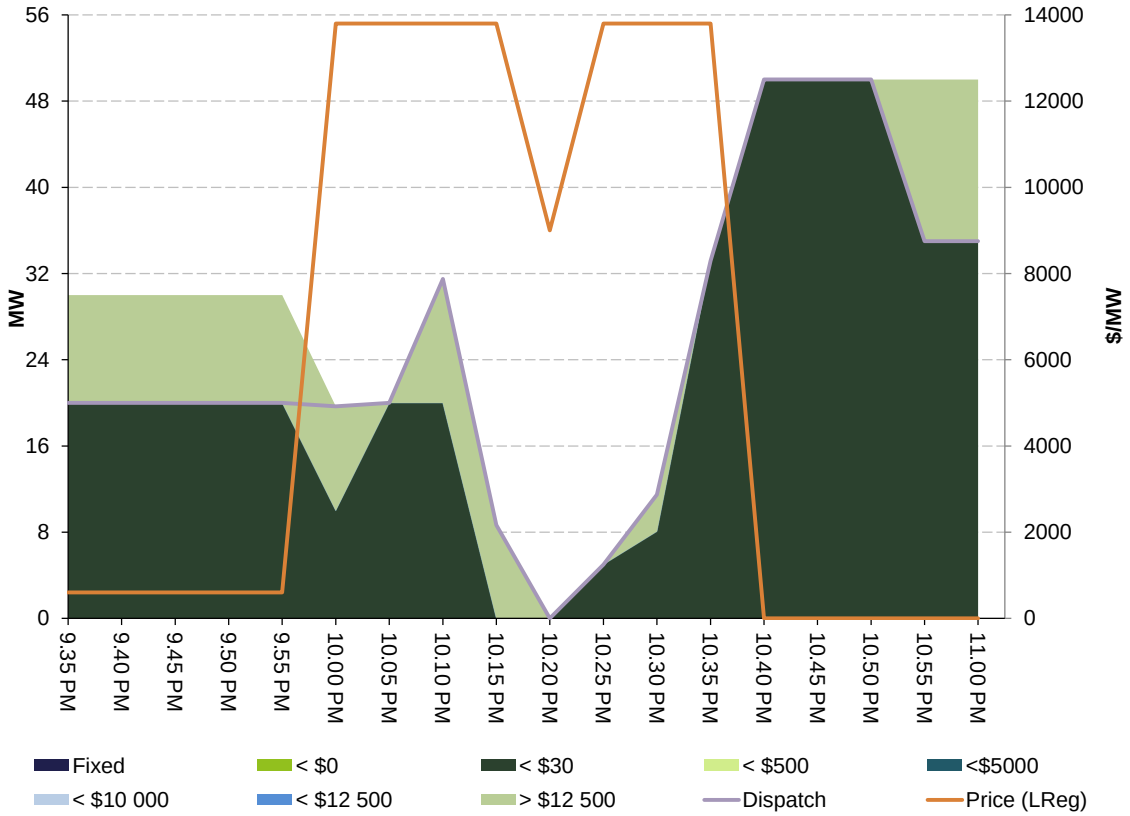


Figure B2a: Northern Power Station (Alinta Energy) lower regulation service closing bid prices, dispatch and dispatch

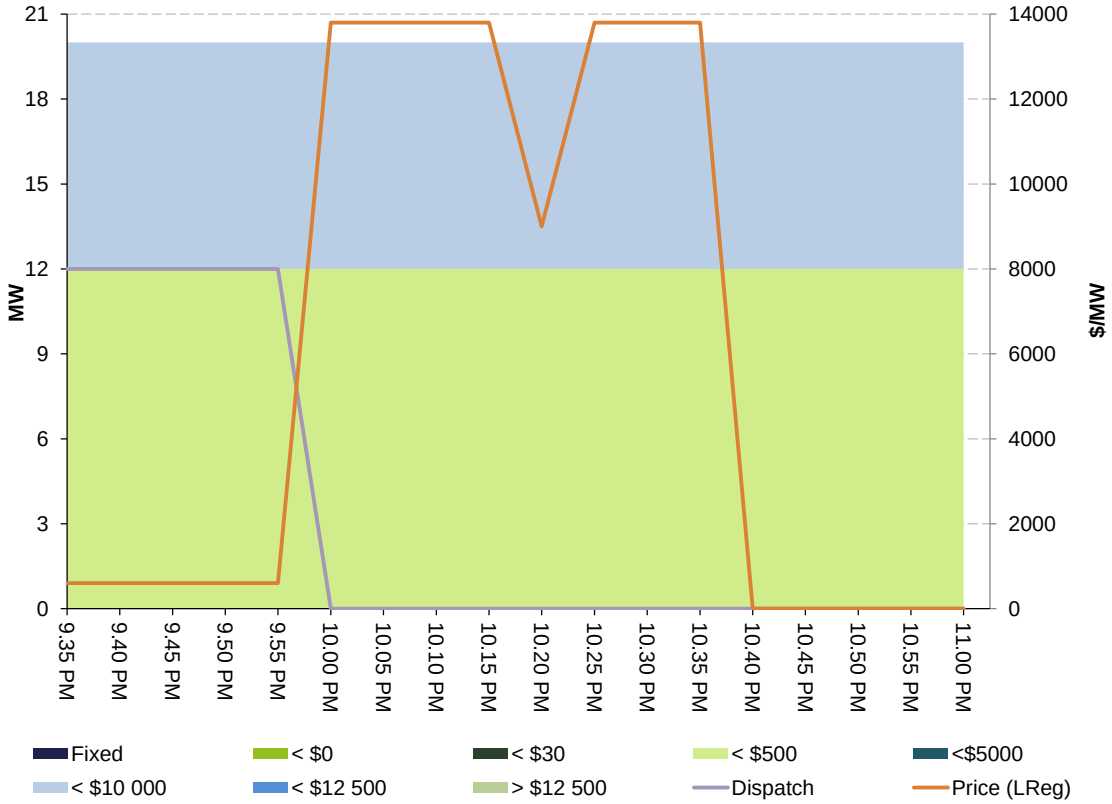


Figure B2b: Northern Power Station (Alinta Energy) lower regulation service closing bid prices, dispatch and dispatch price – effective offers

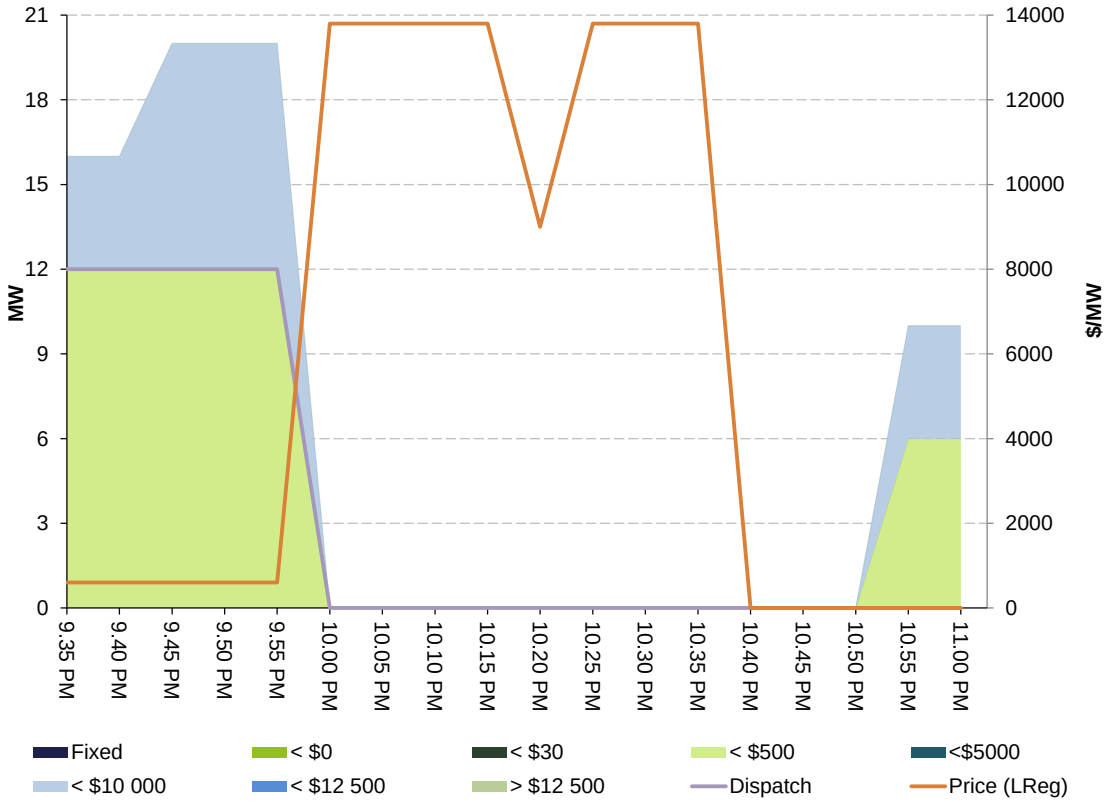


Figure B3a: Pelican Point Power Station (GDF Suez) lower regulation service closing bid prices, dispatch and dispatch

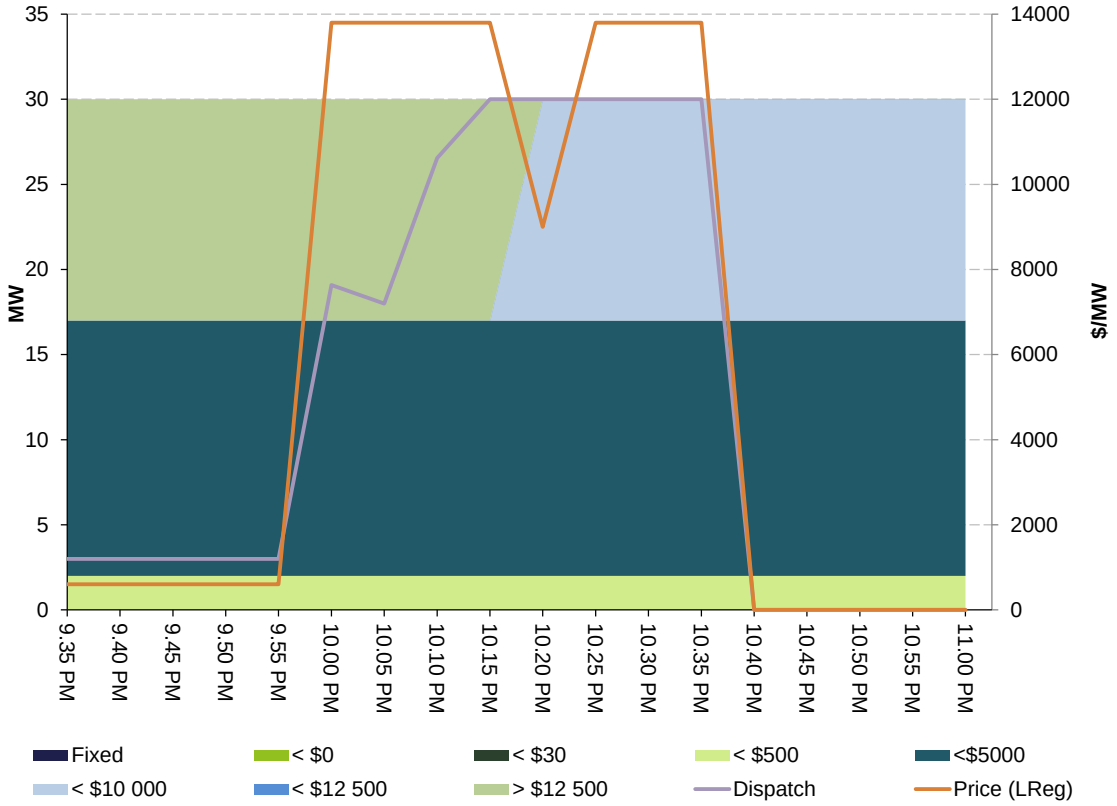


Figure B3b: Pelican Point Power Station (GDF Suez) lower regulation service closing bid prices, dispatch and dispatch price – effective offers

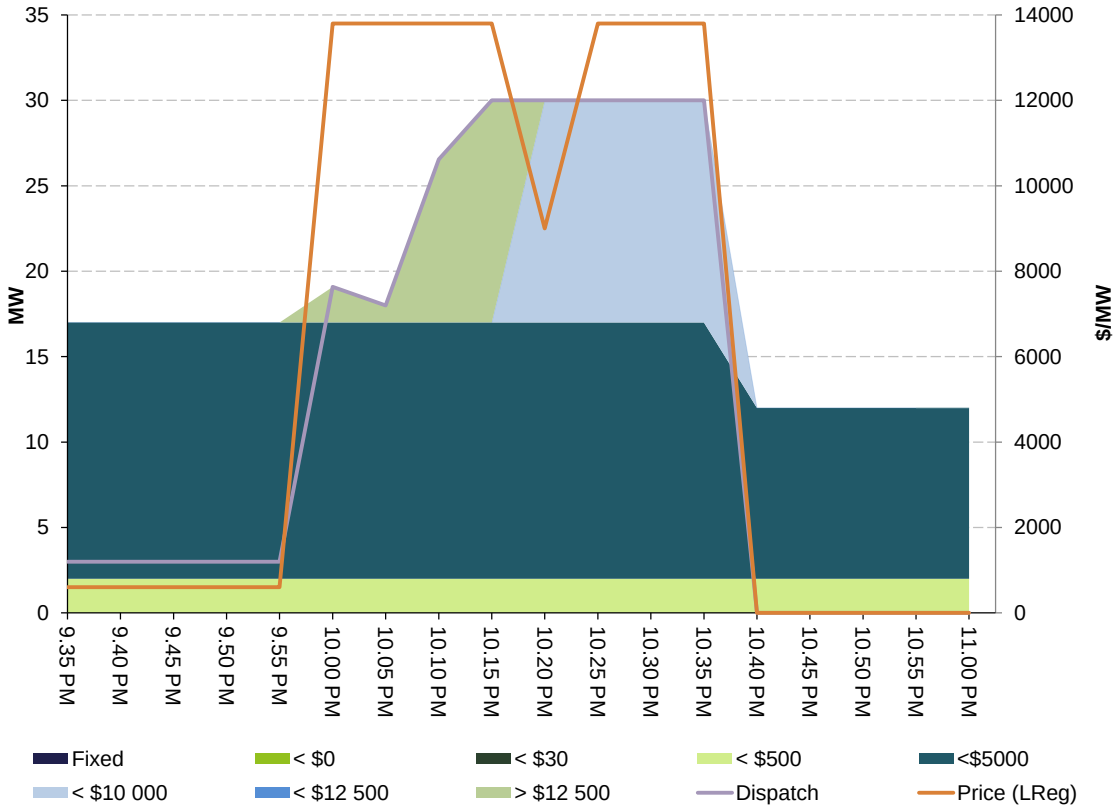


Figure B4a: Torrens Island Power Station (AGL) lower 6 second service closing bid prices, dispatch and dispatch price

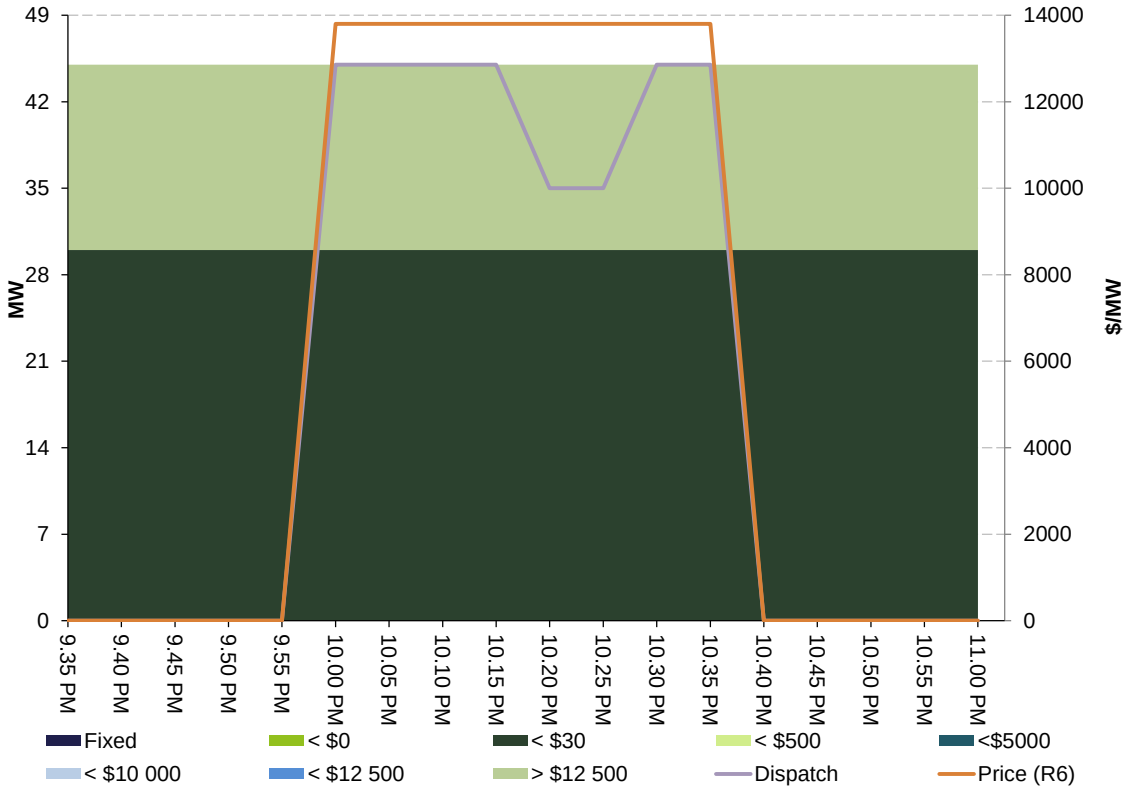


Figure B4b: Torrens Island Power Station (AGL) lower 6 second service closing bid prices, dispatch and dispatch price – effective offers

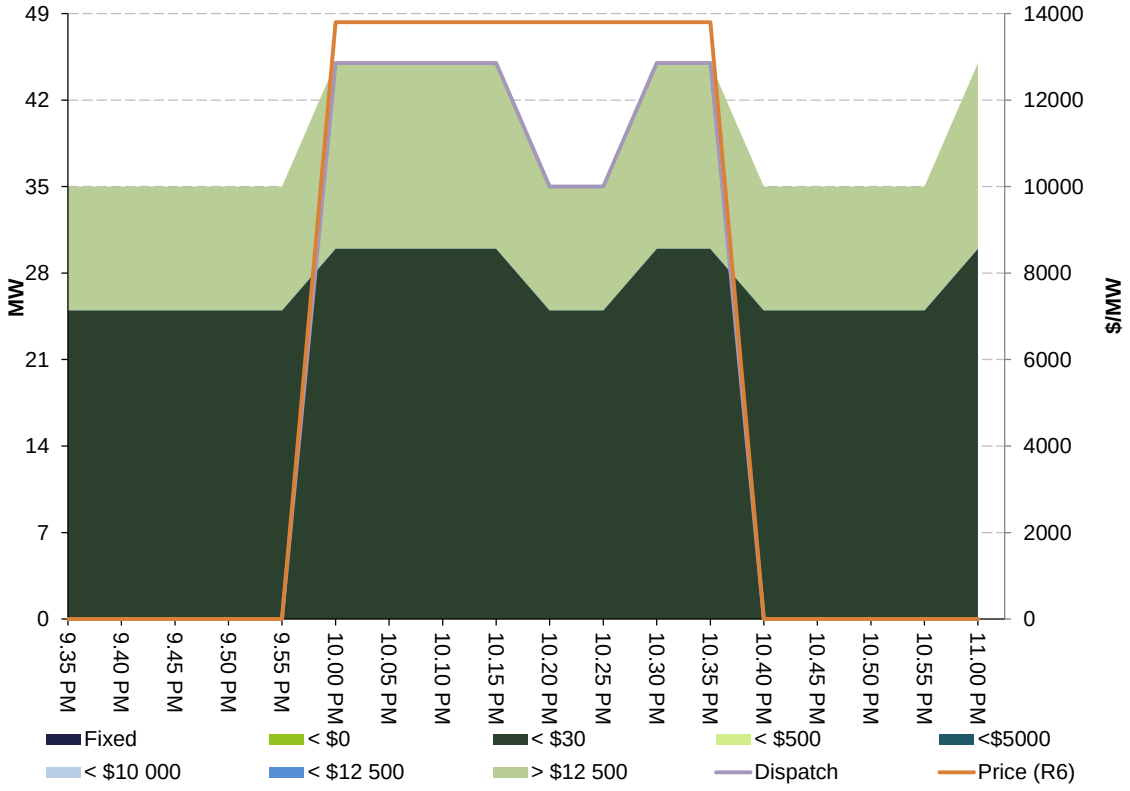


Figure B5a: Northern Power Station (Alinta Energy) lower 6 second service closing bid prices, dispatch and dispatch price

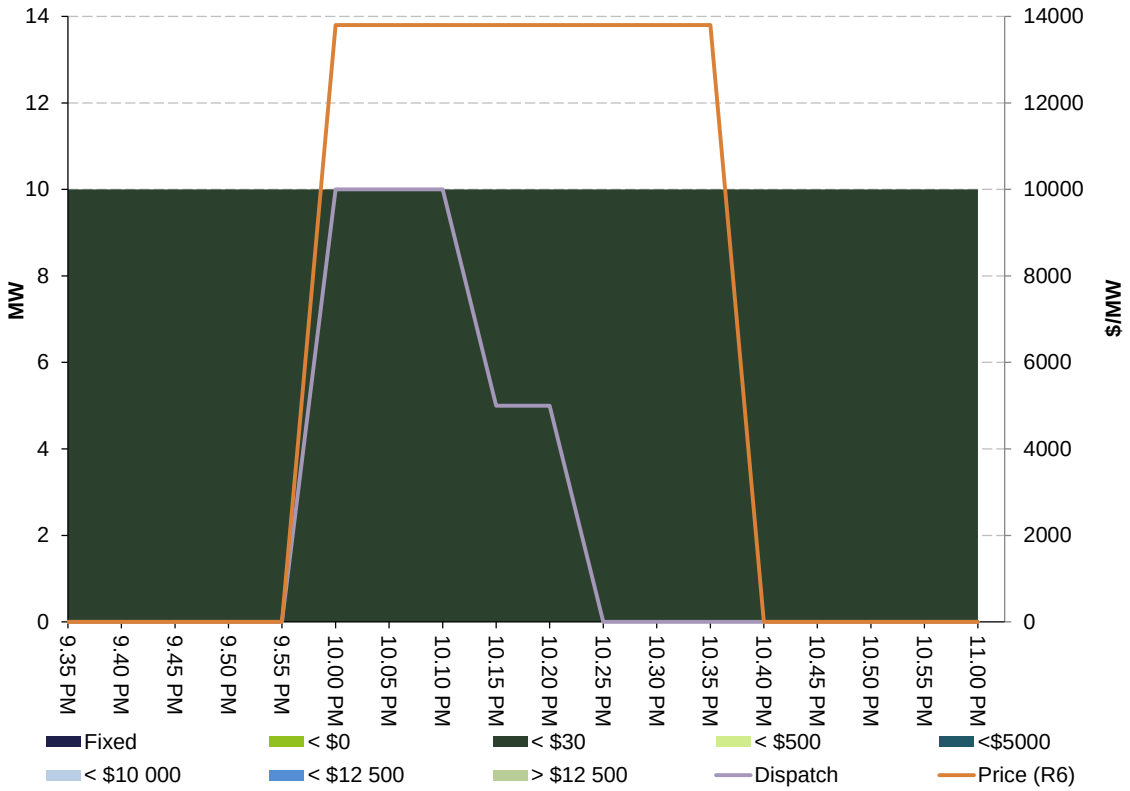


Figure B5b: Northern Power Station (Alinta Energy) lower 6 second service closing bid prices, dispatch and dispatch price – effective offers

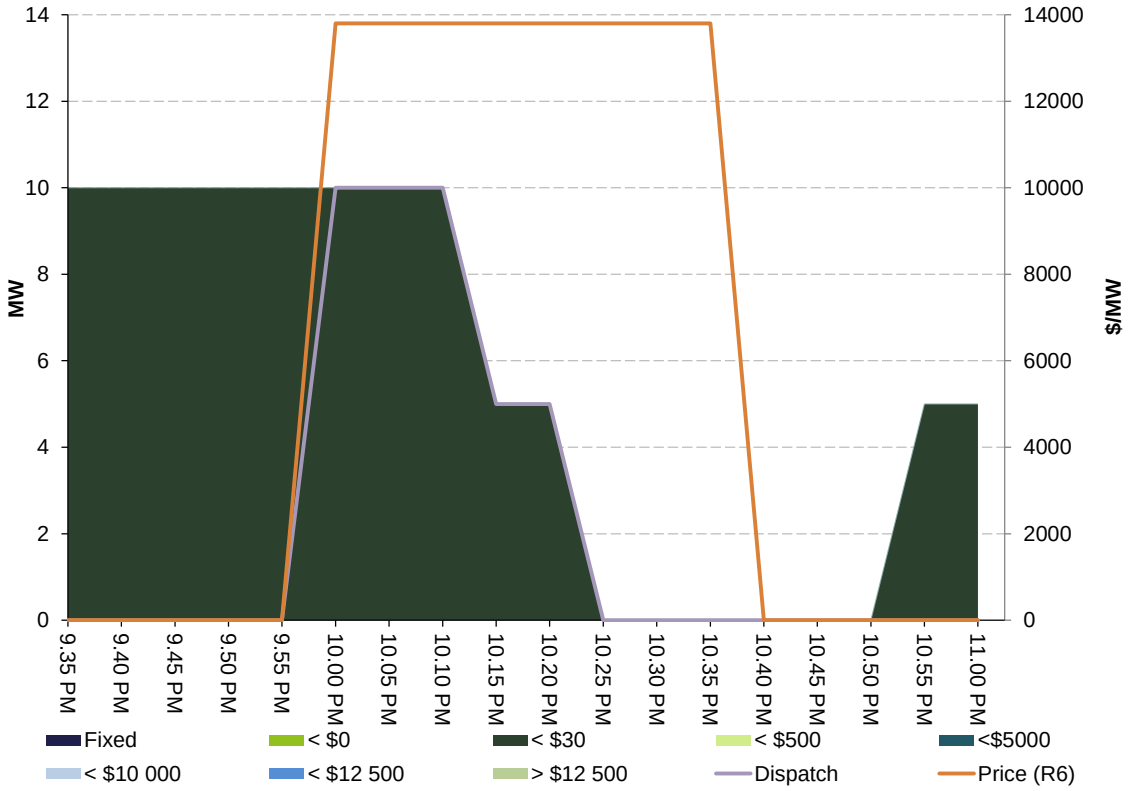


Figure B6a: Pelican Point Power Station (GDF Suez) lower 6 second service closing bid prices, dispatch and dispatch price

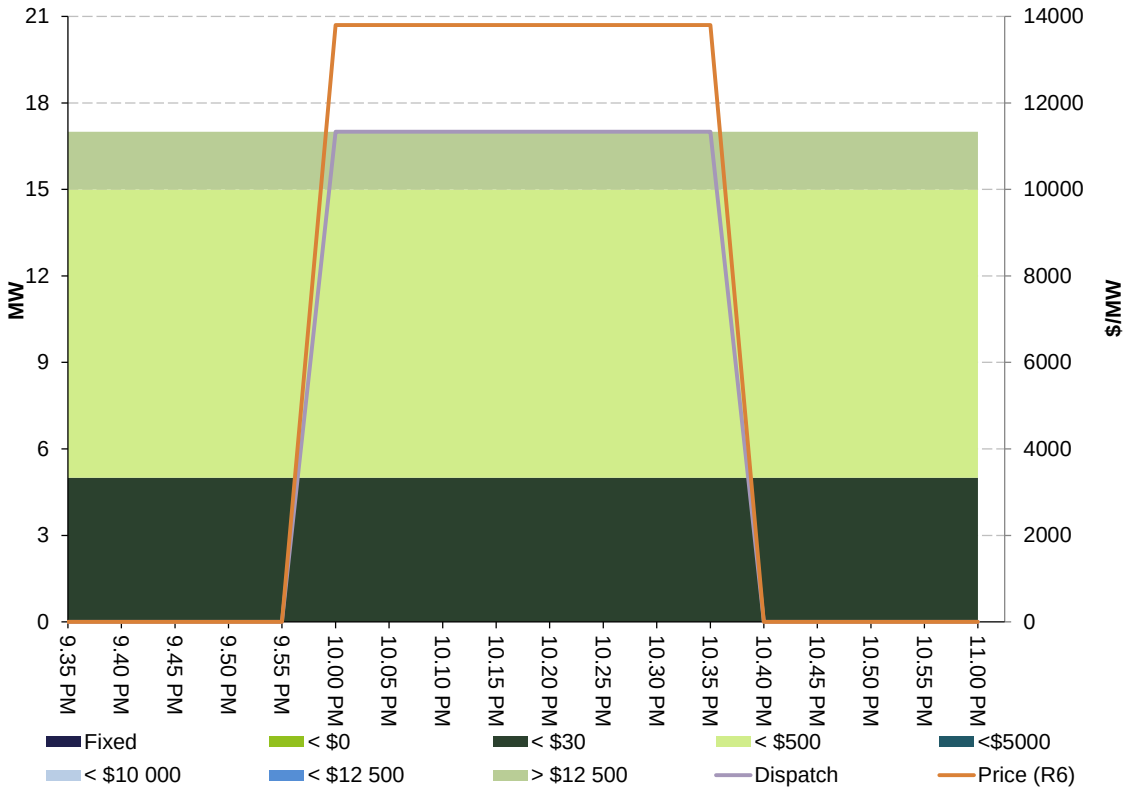


Figure B6b: Pelican Point Power Station (GDF Suez) lower 6 second service closing bid prices, dispatch and dispatch price – effective offers

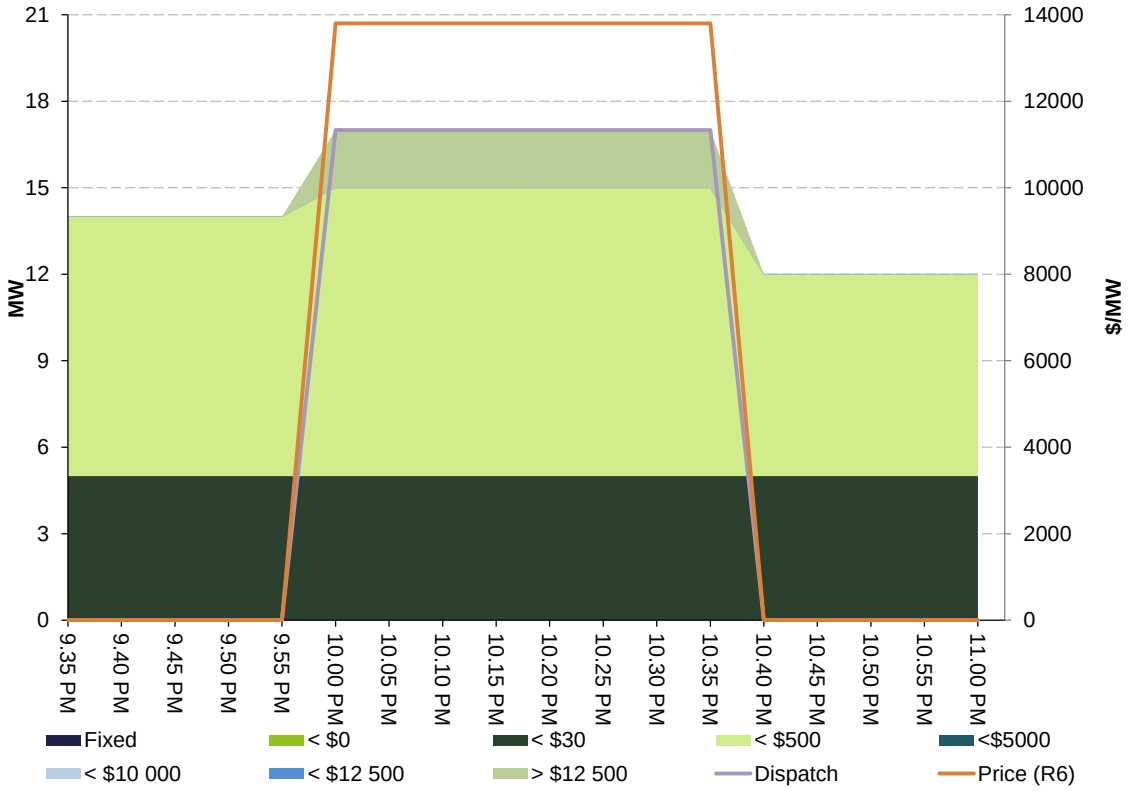


Figure B7a: Torrens Island Power Station (AGL) lower 60 second service closing bid prices, dispatch and dispatch price

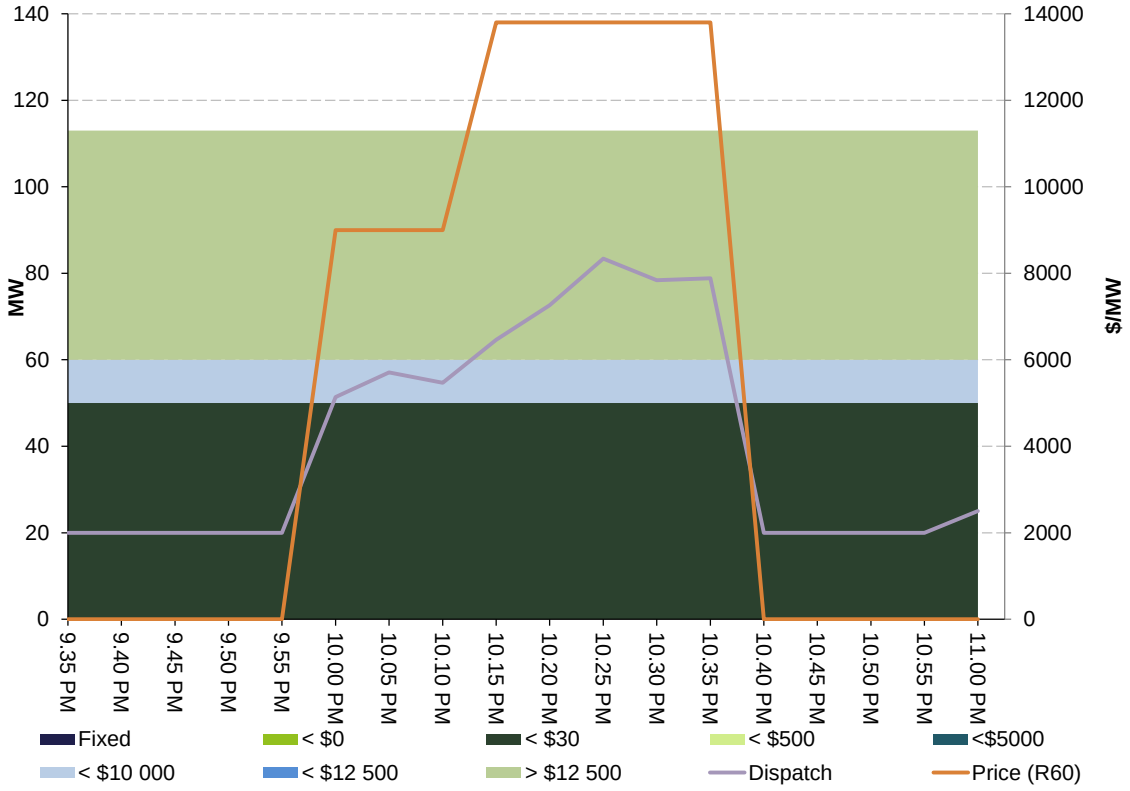


Figure B7b: Torrens Island Power Station (AGL) lower 60 second service closing bid prices, dispatch and dispatch price – effective offers

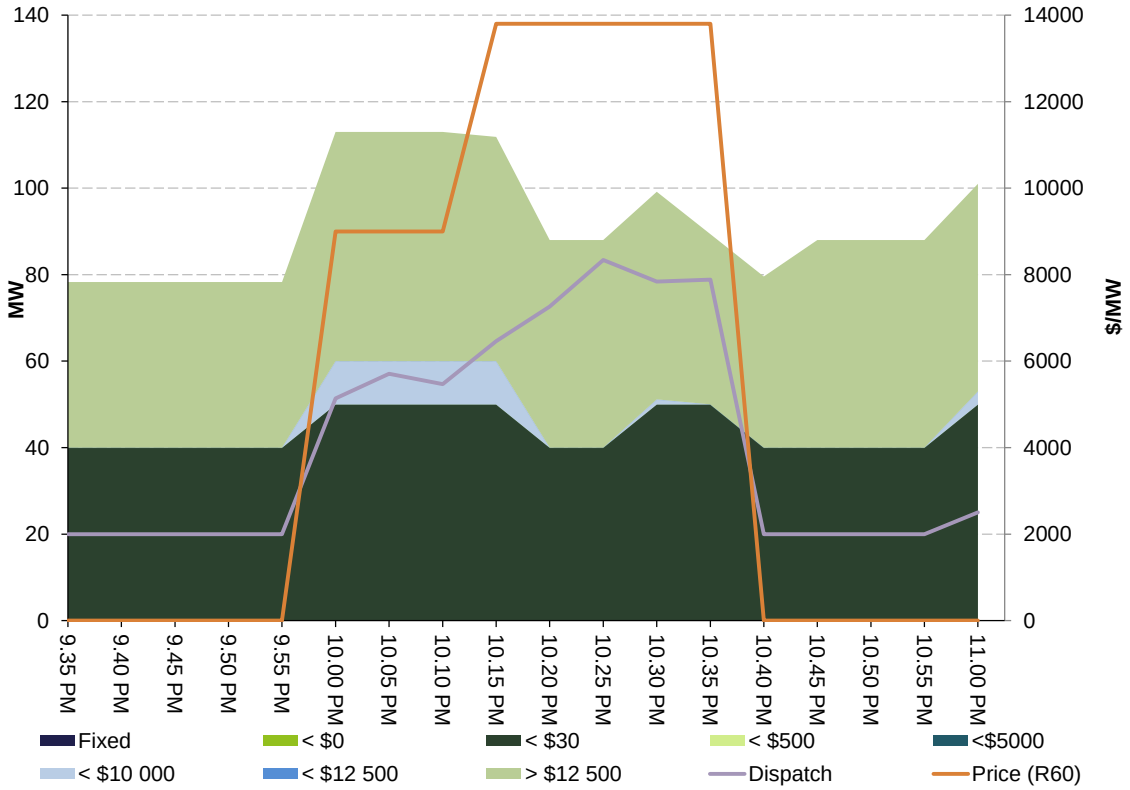


Figure B8a: Northern Power Station (Alinta Energy) lower 60 second service closing bid prices, dispatch and dispatch price

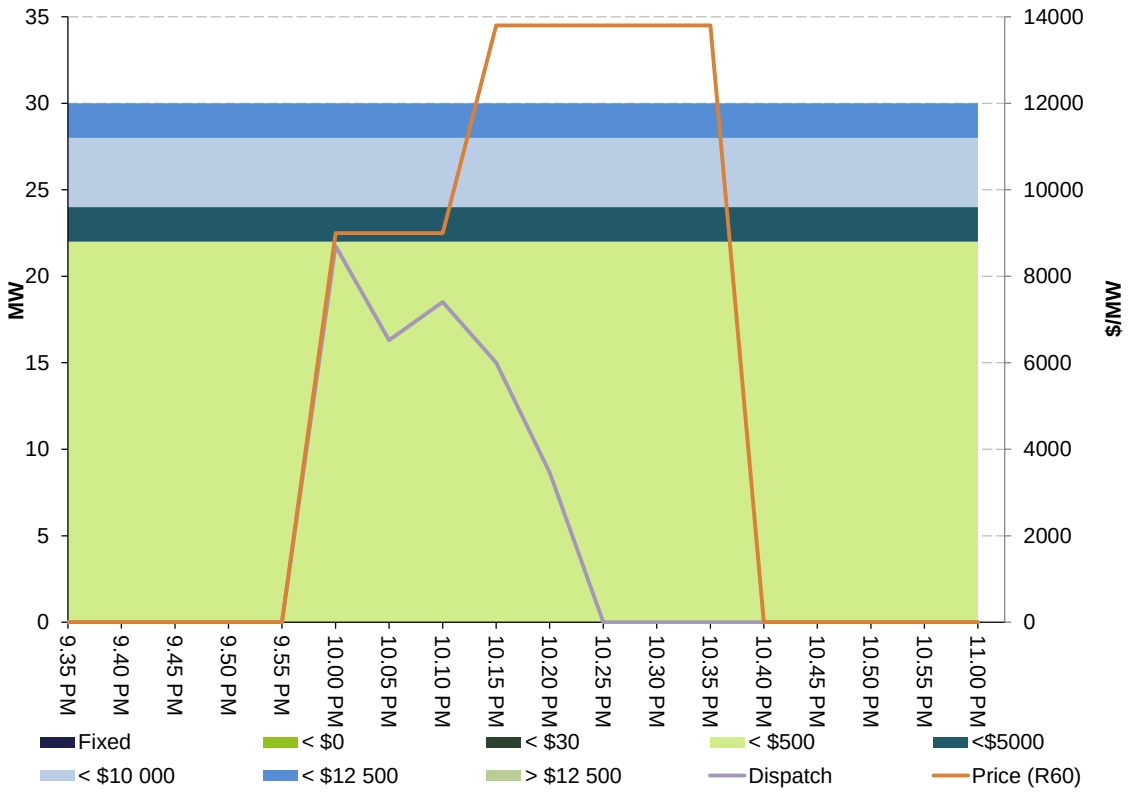


Figure B8b: Northern Power Station (Alinta Energy) lower 60 second service closing bid prices, dispatch and dispatch price – effective offers

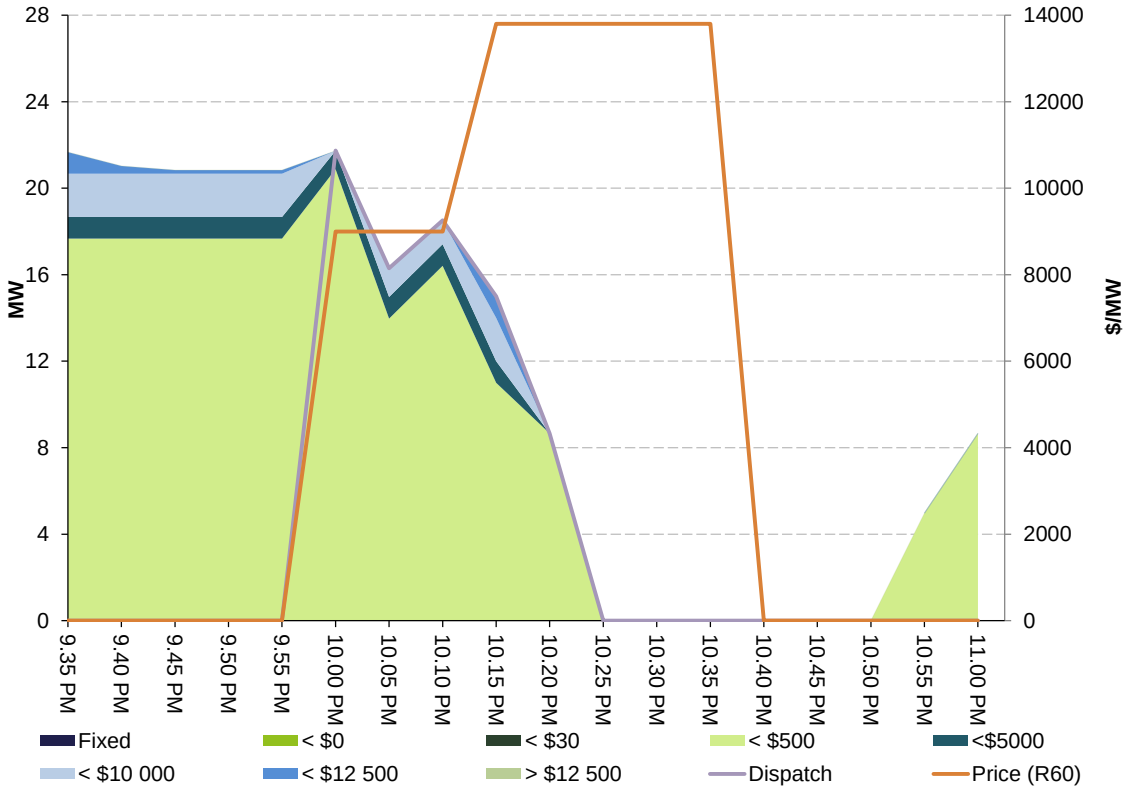


Figure B9a: Pelican Point Power Station (GDF Suez) lower 60 second service closing bid prices, dispatch and dispatch price

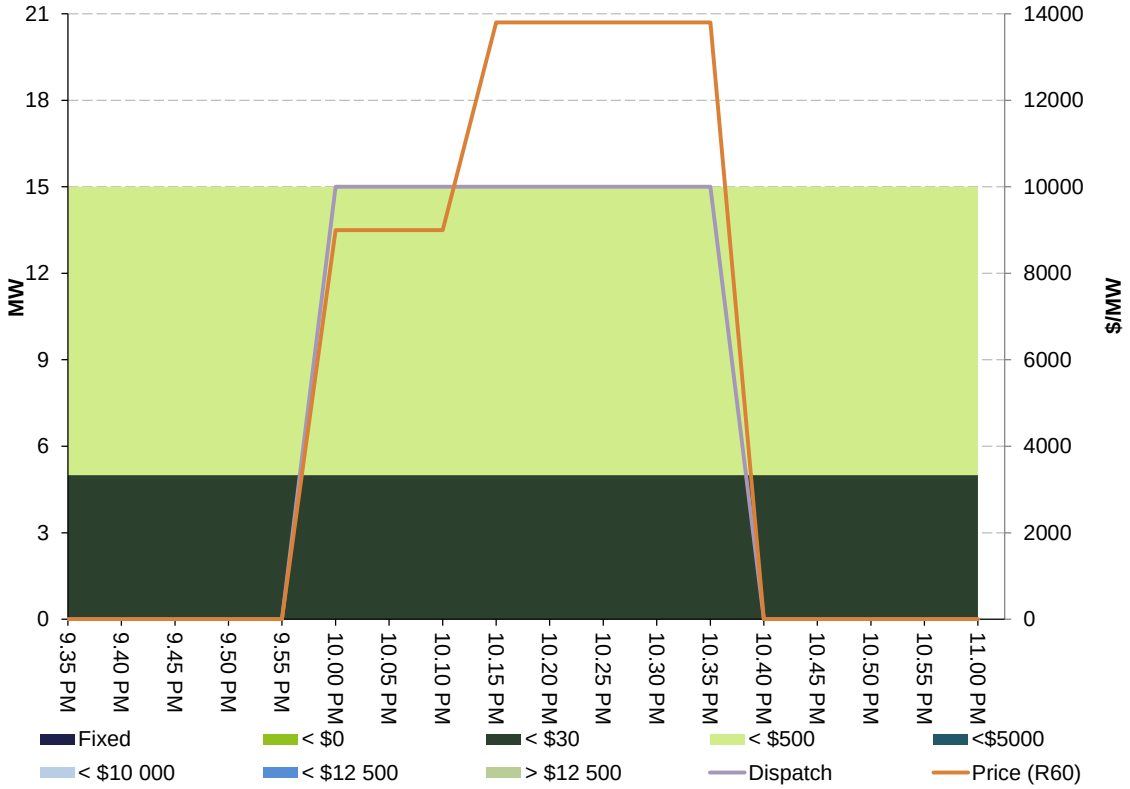


Figure B9b: Pelican Point Power Station (GDF Suez) lower 60 second service closing bid prices, dispatch and dispatch price – effective offers

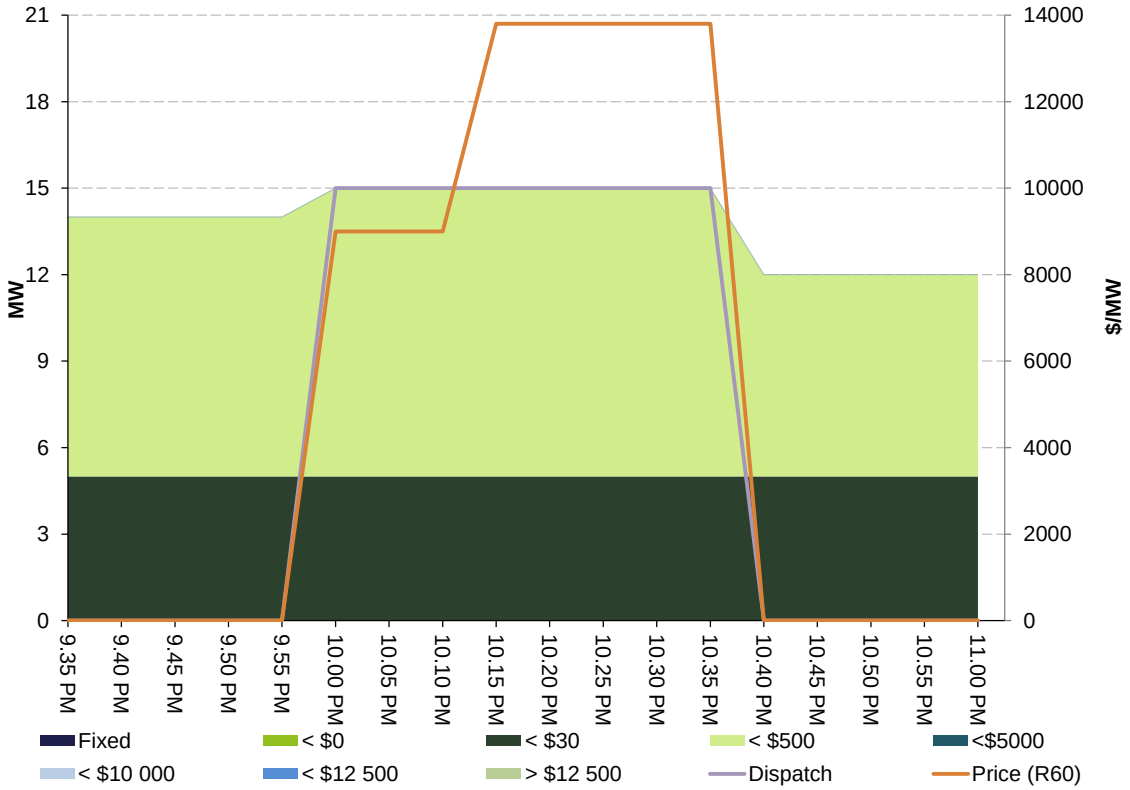


Figure B10a: Torrens Island Power Station (AGL) lower 5 minute service closing bid prices, dispatch and dispatch price

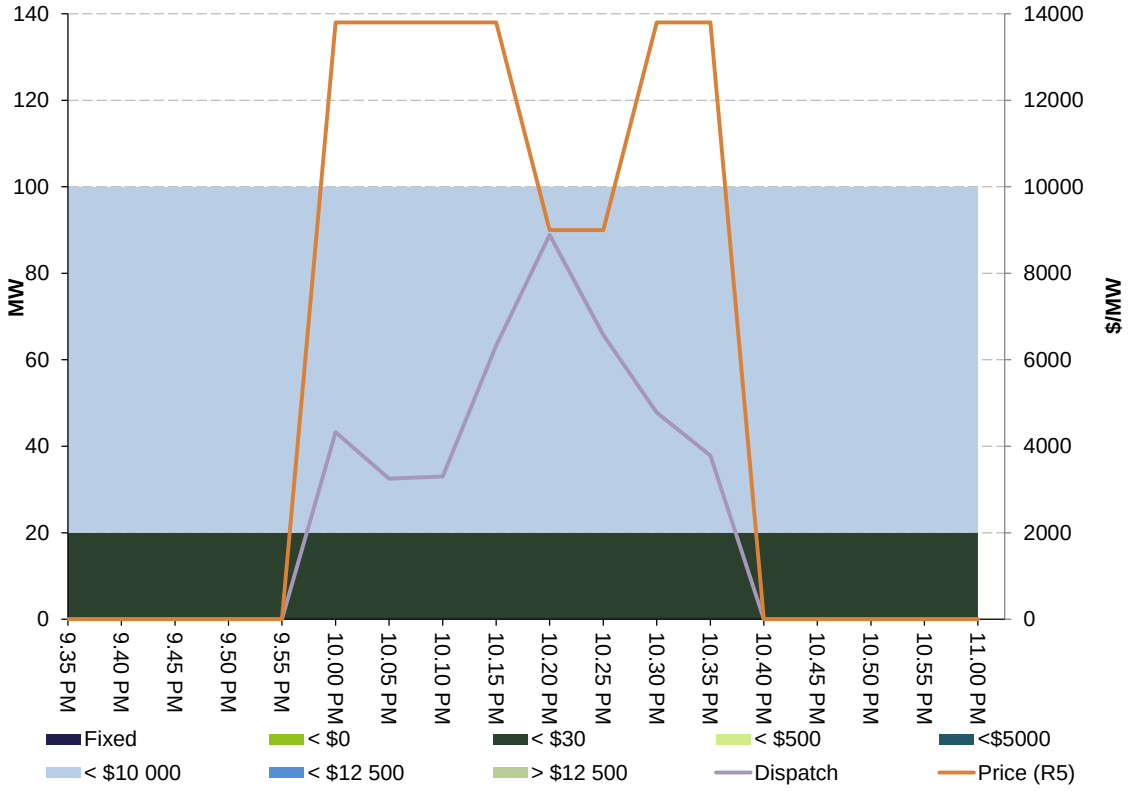


Figure B10b: Torrens Island Power Station (AGL) lower 5 minute service closing bid prices, dispatch and dispatch price – effective offers

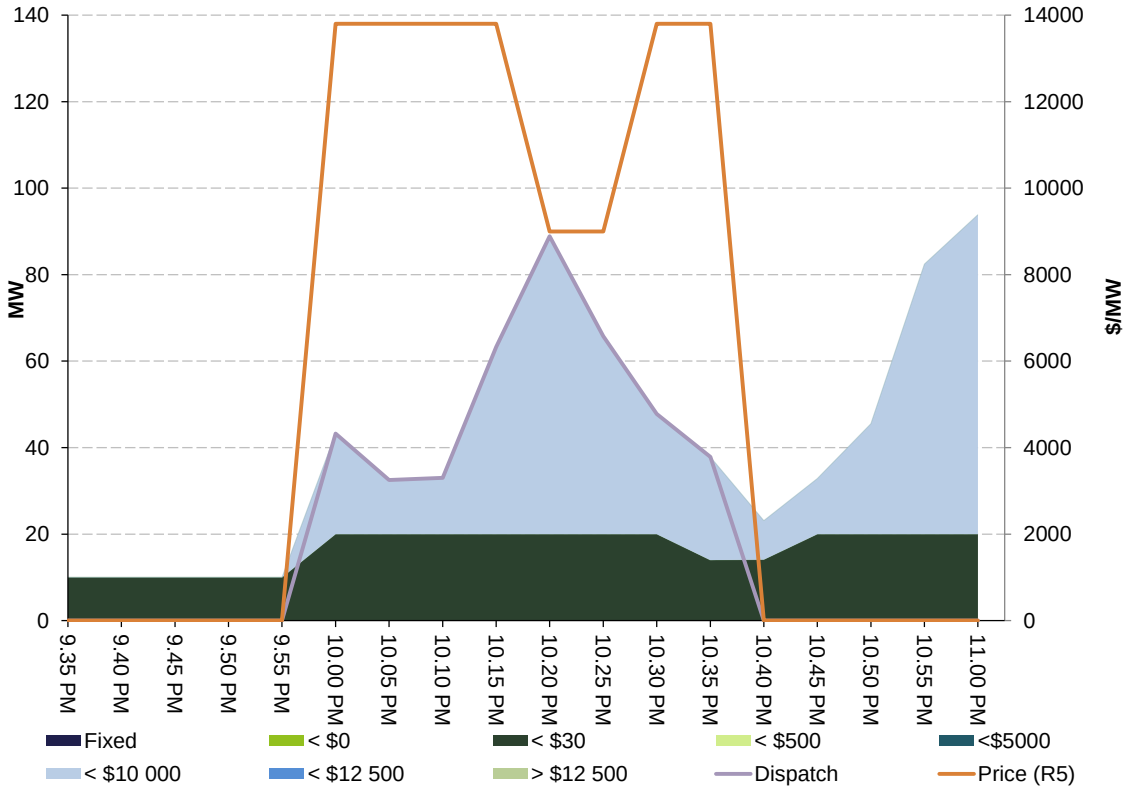


Figure B11a: Northern Power Station (Alinta Energy) lower 5 minute service closing bid prices, dispatch and dispatch price

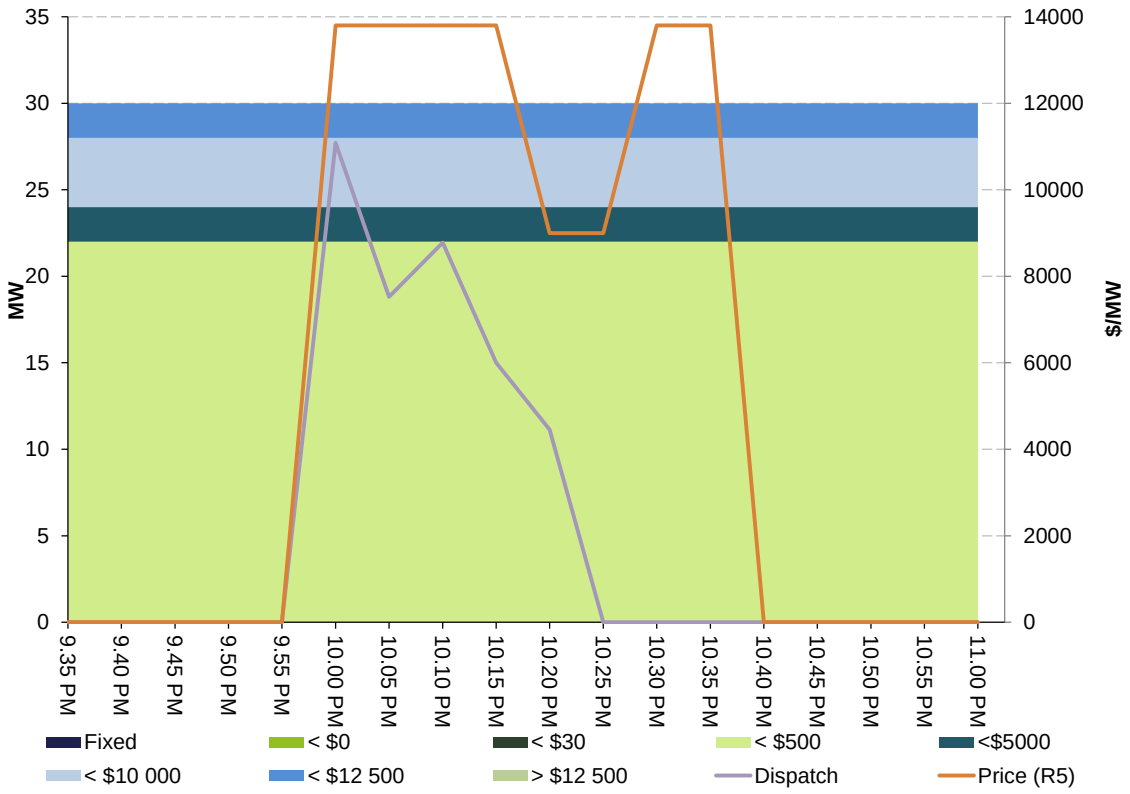


Figure B11b: Northern Power Station (Alinta Energy) lower 5 minute service closing bid prices, dispatch and dispatch price – effective offers

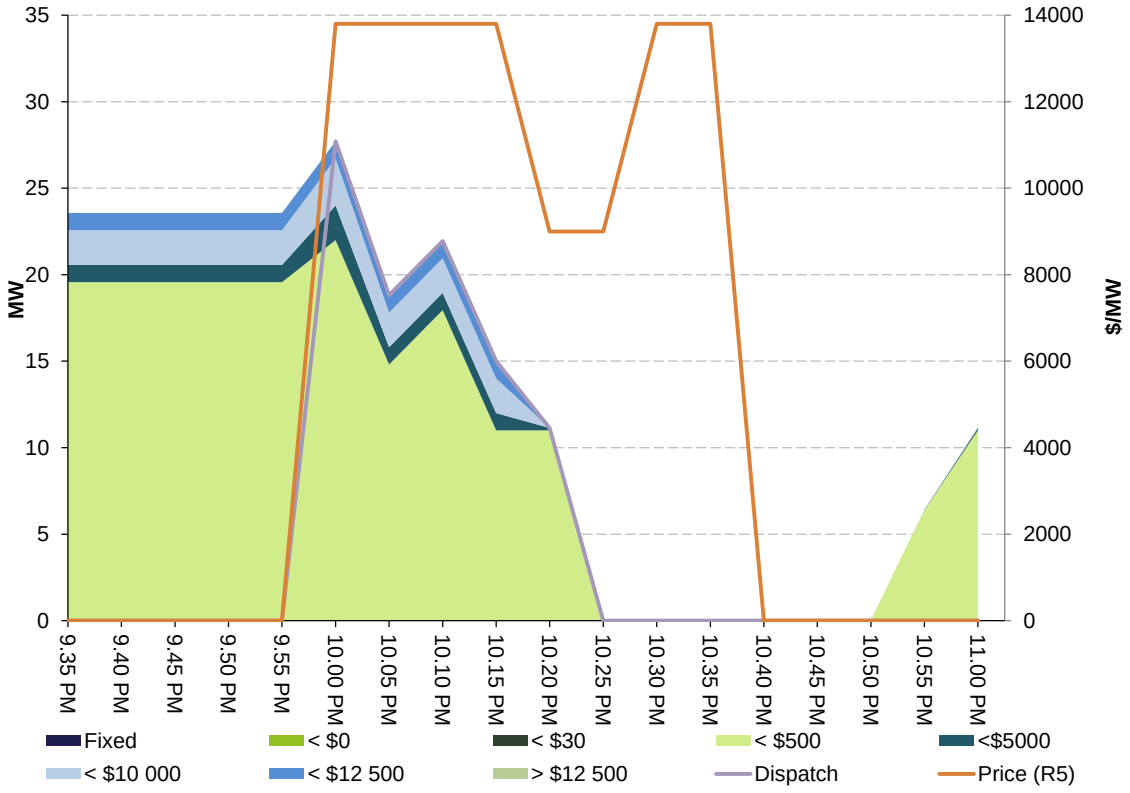


Figure B12a: Pelican Point Power Station (GDF Suez) lower 5 minute service closing bid prices, dispatch and dispatch price

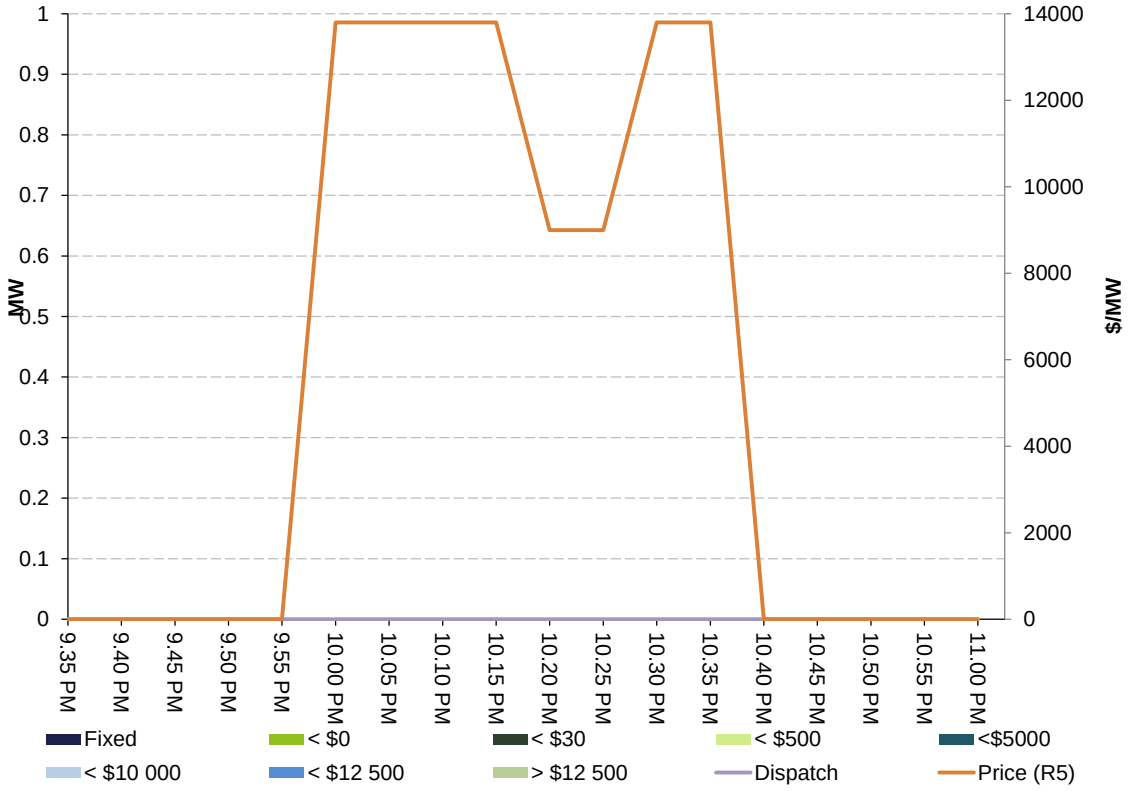


Figure B12b: Pelican Point Power Station (GDF Suez) lower 5 minute service closing bid prices, dispatch and dispatch price – effective offers

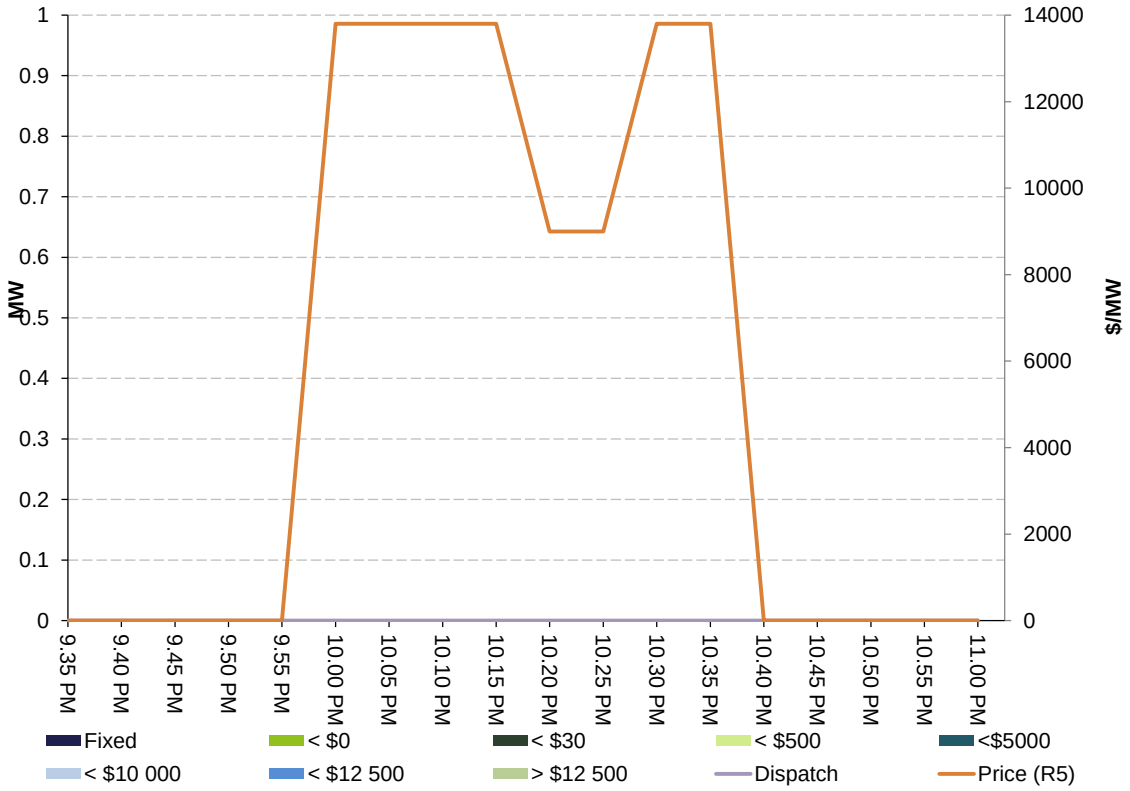


Figure B13a: Torrens Island Power Station (AGL) raise regulation service closing bid prices, dispatch and dispatch price

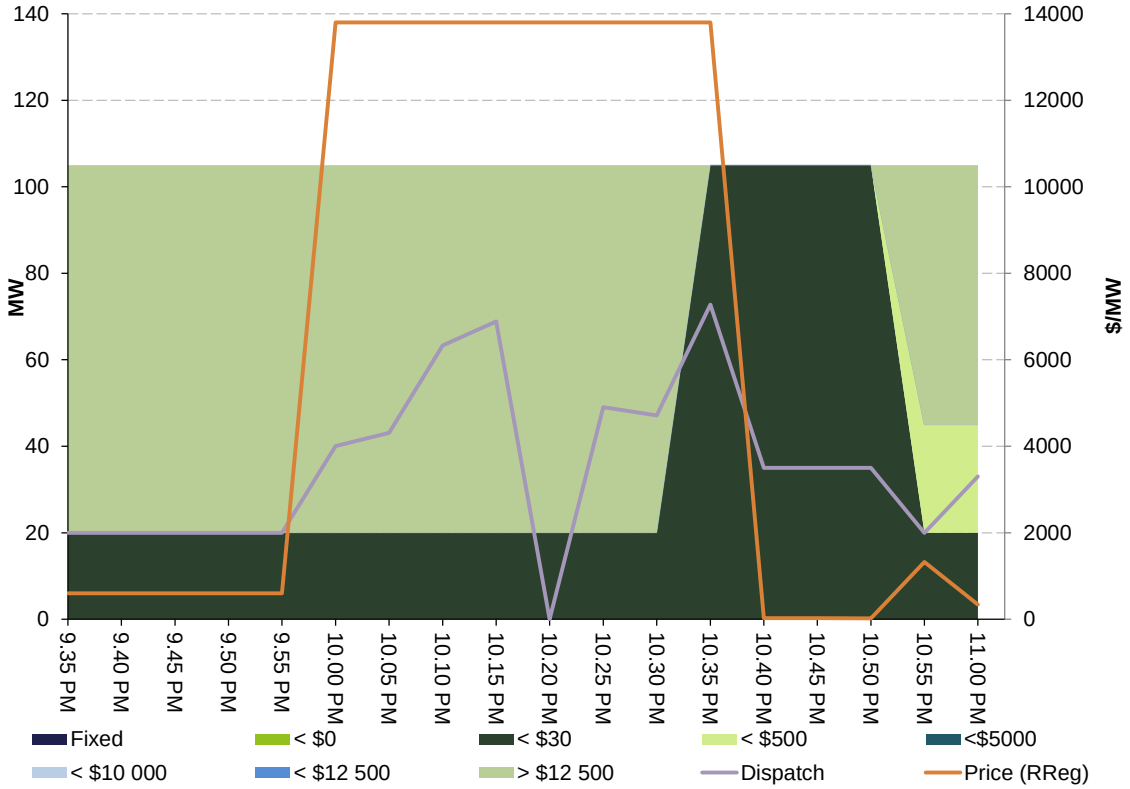


Figure B13b: Torrens Island Power Station (AGL) raise regulation service closing bid prices, dispatch and dispatch price – effective offers

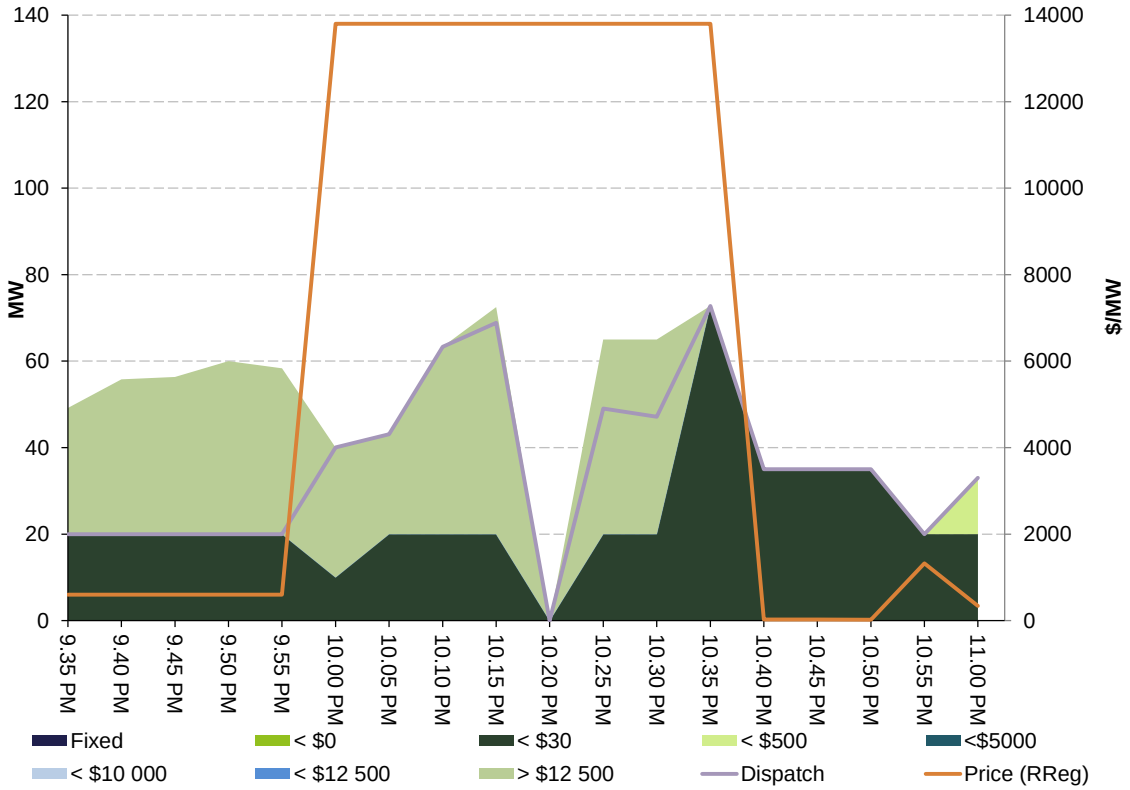


Figure B14a: Northern Power Station (Alinta Energy) raise regulation service closing bid prices, dispatch and dispatch price

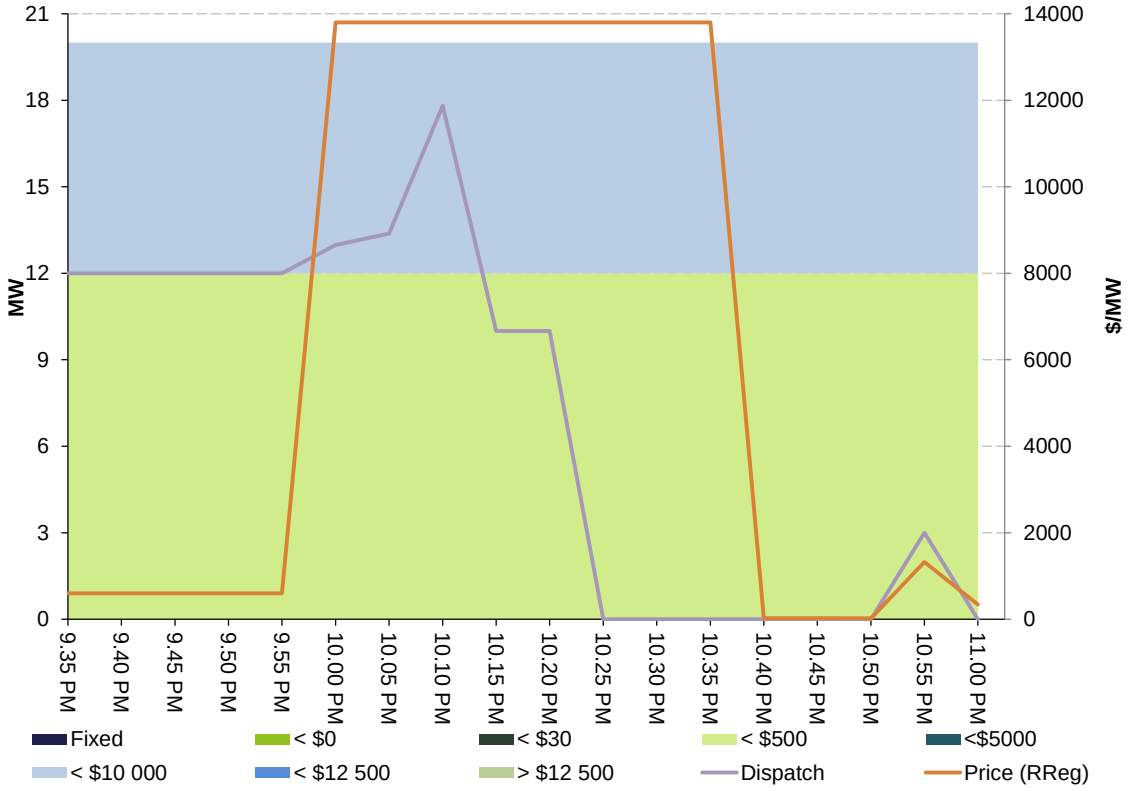


Figure B14b: Northern Power Station (Alinta Energy) raise regulation service closing bid prices, dispatch and dispatch price – effective offers

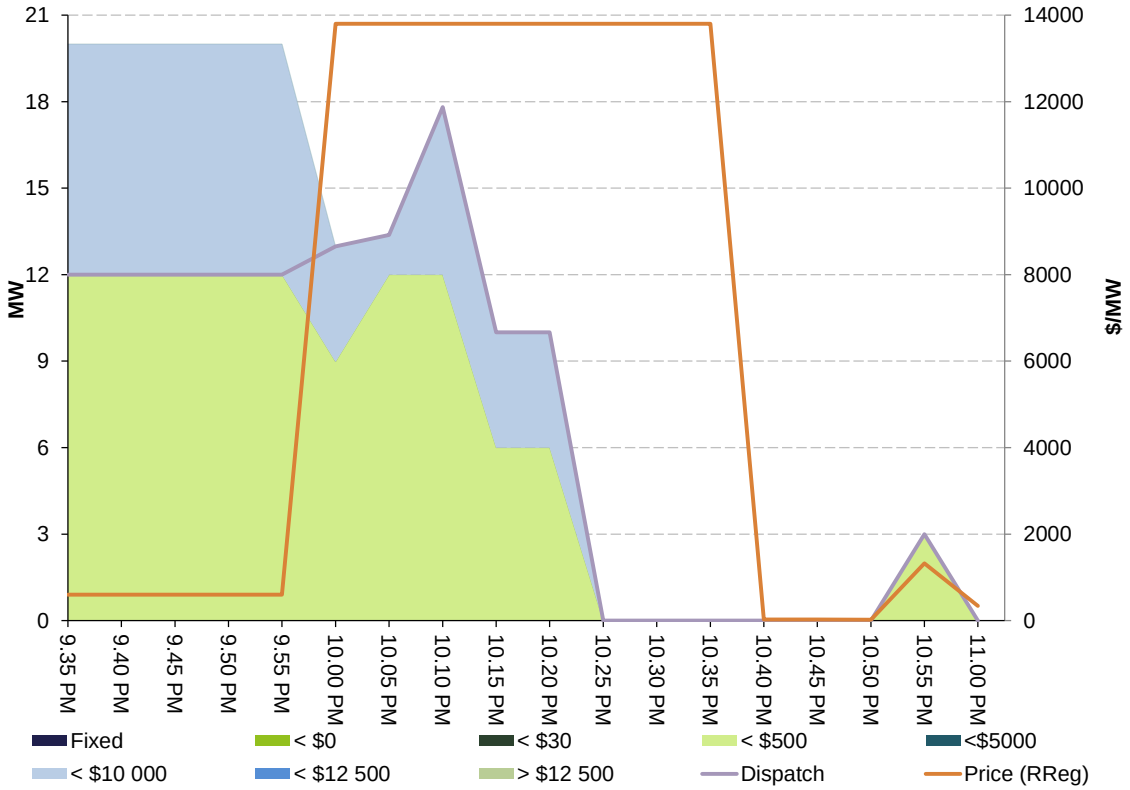


Figure B15a: Pelican Point Power Station (GDF Suez) raise regulation service closing bid prices, dispatch and dispatch price

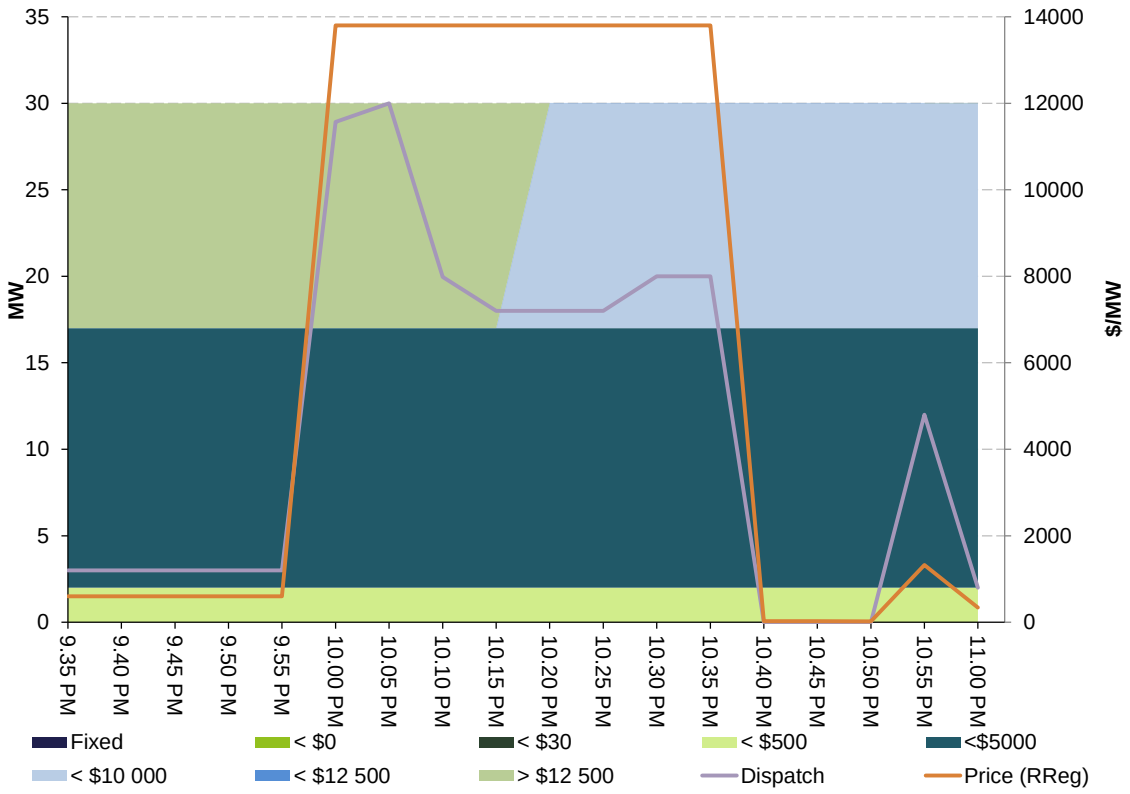


Figure B15b: Pelican Point Power Station (GDF Suez) raise regulation service closing bid prices, dispatch and dispatch price – effective offers

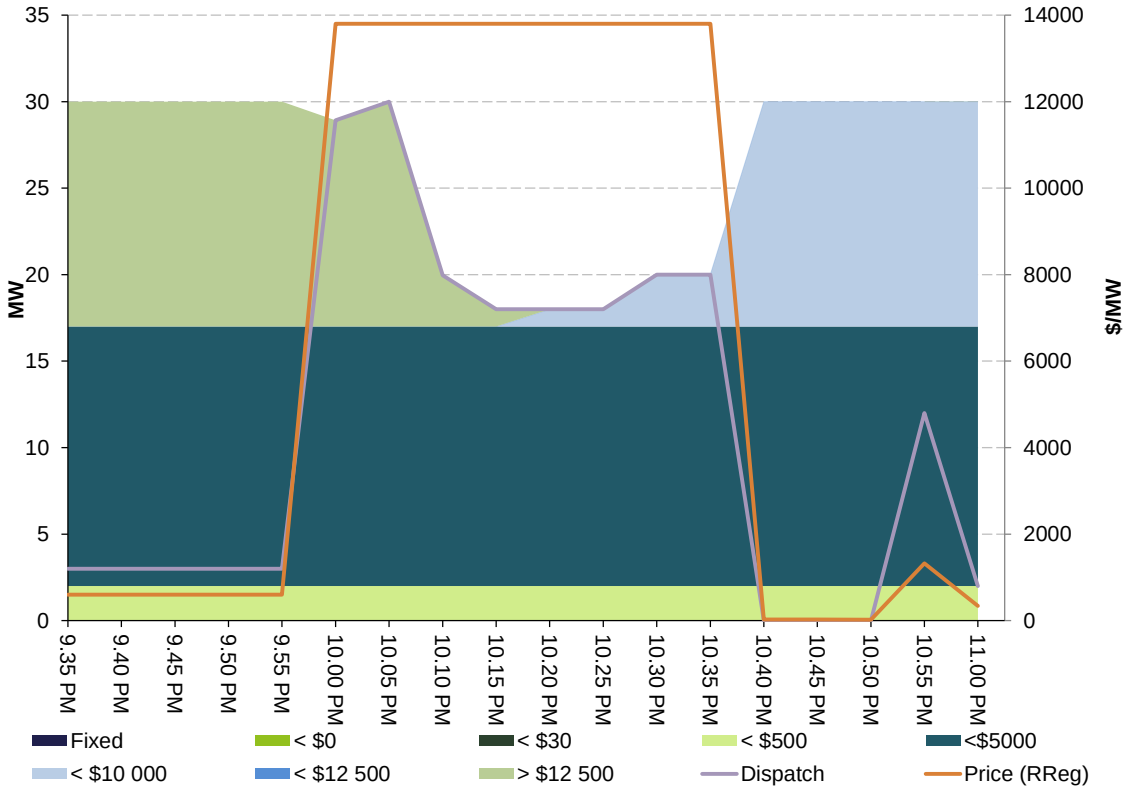


Figure B16a: Torrens Island Power Station (AGL) raise 6 second service closing bid prices, dispatch and dispatch price

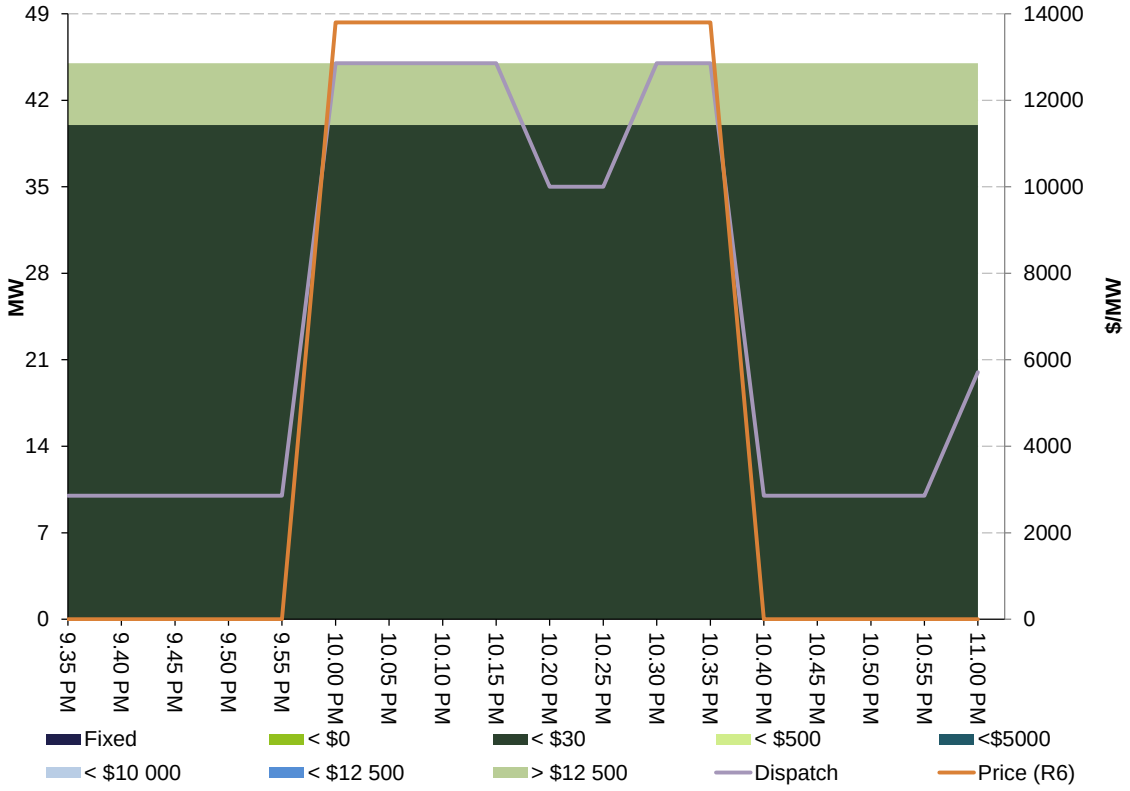


Figure B16b: Torrens Island Power Station (AGL) raise 6 second service closing bid prices, dispatch and dispatch price – effective offers

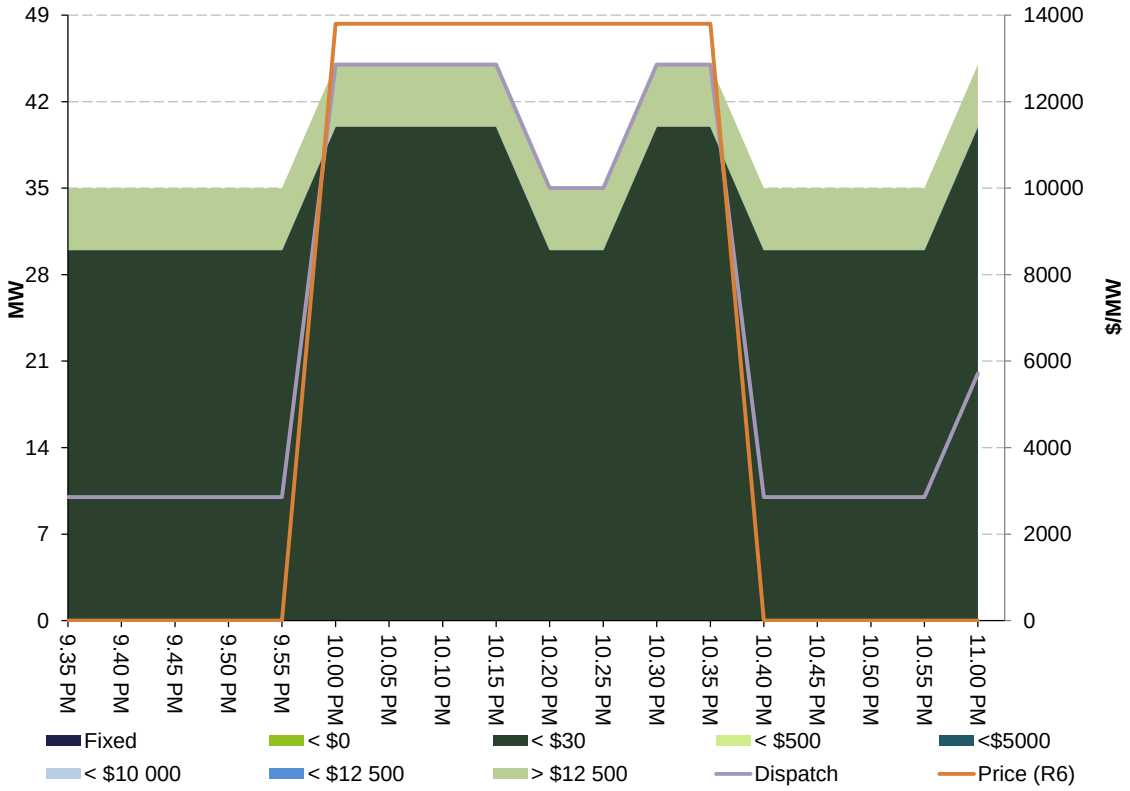


Figure B17a: Northern Power Station (Alinta Energy) raise 6 second service closing bid prices, dispatch and dispatch price

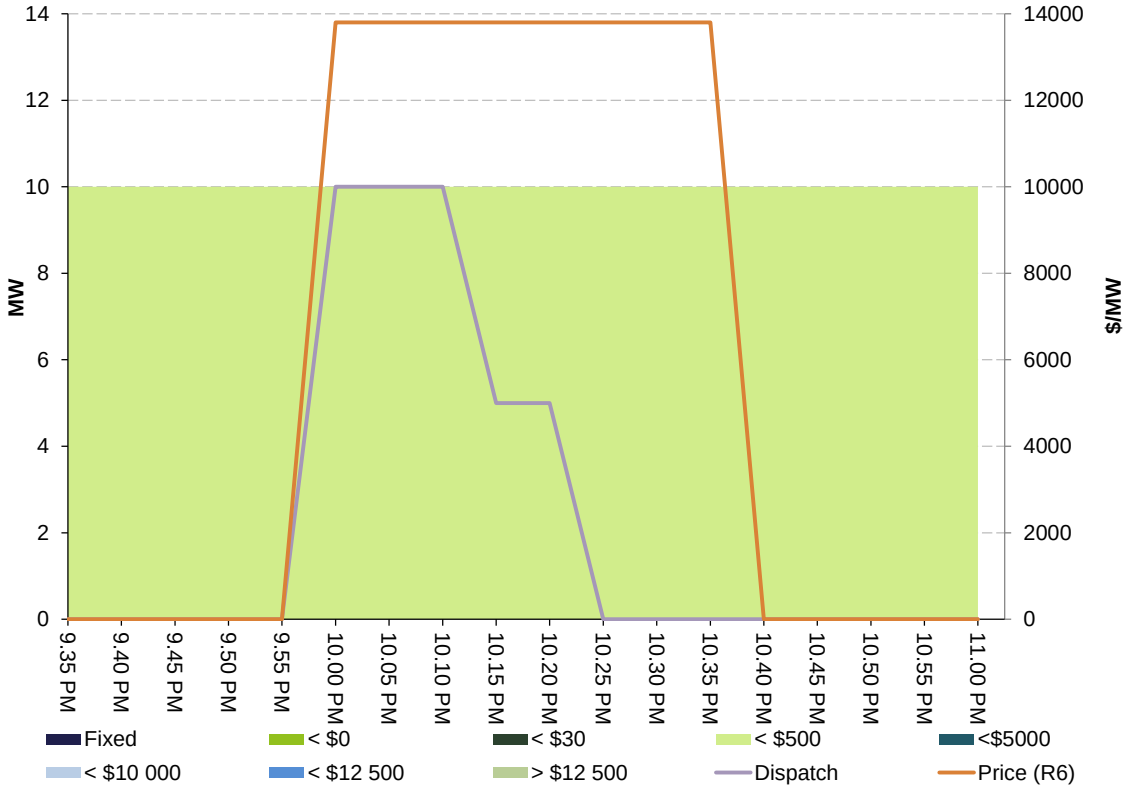


Figure B17b: Northern Power Station (Alinta Energy raise 6 second service closing bid prices, dispatch and dispatch price – effective offers

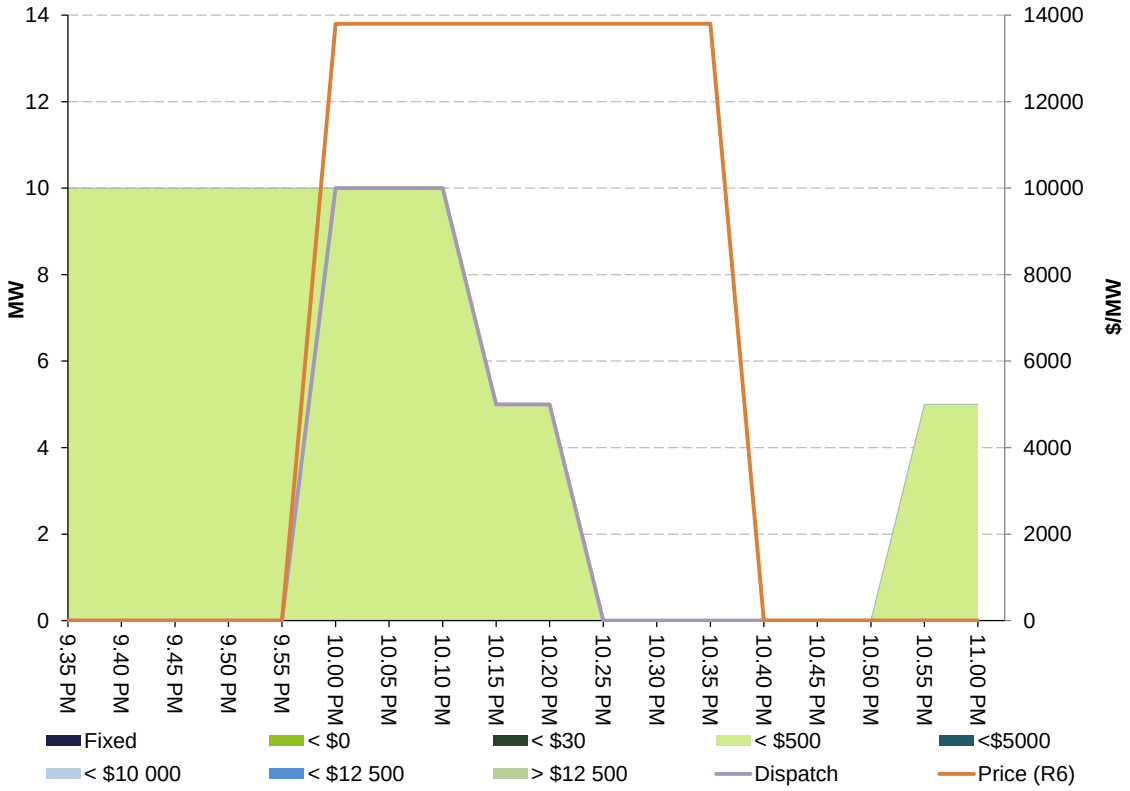


Figure B18a: Pelican Point Power Station (GDF Suez) raise 6 second service closing bid prices, dispatch and dispatch price

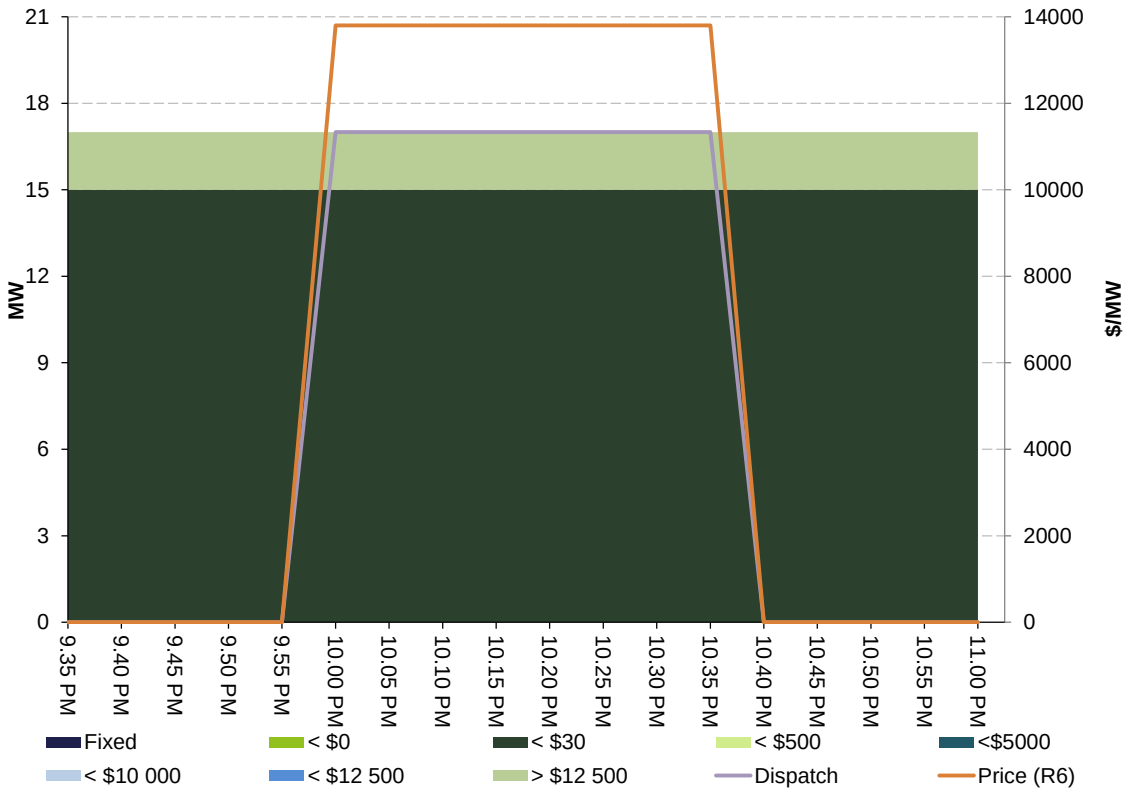


Figure B18b: Pelican Point Power Station (GDF Suez) raise 6 second service closing bid prices, dispatch and dispatch price – effective offers

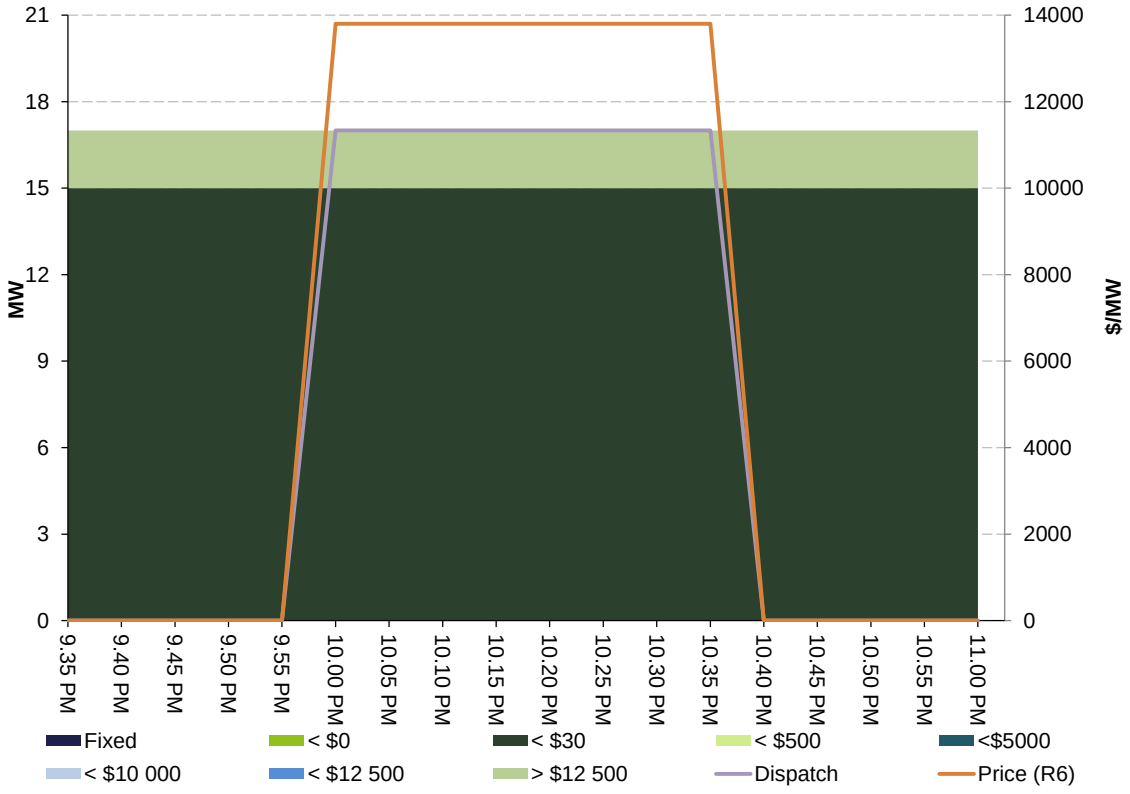


Figure B19a: Torrens Island Power Station (AGL) raise 60 second service closing bid prices, dispatch and dispatch price

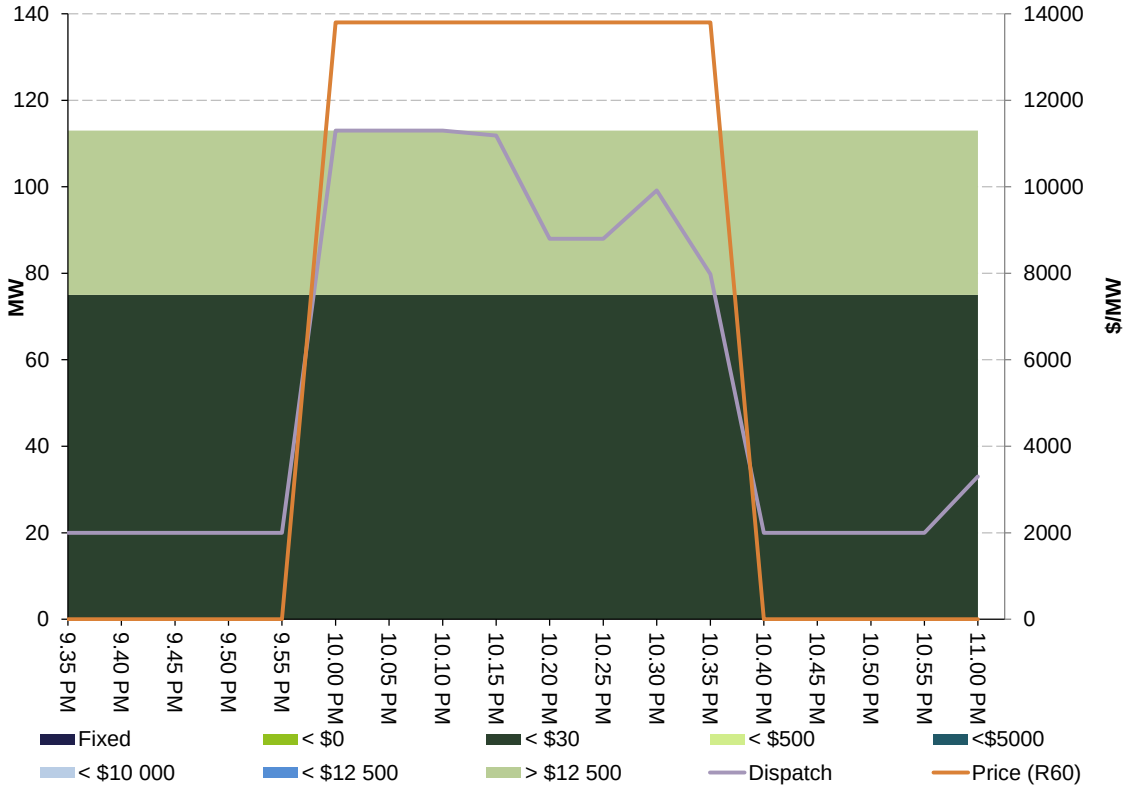


Figure B19b: Torrens Island Power Station (AGL) raise 60 second service closing bid prices, dispatch and dispatch price – effective offers

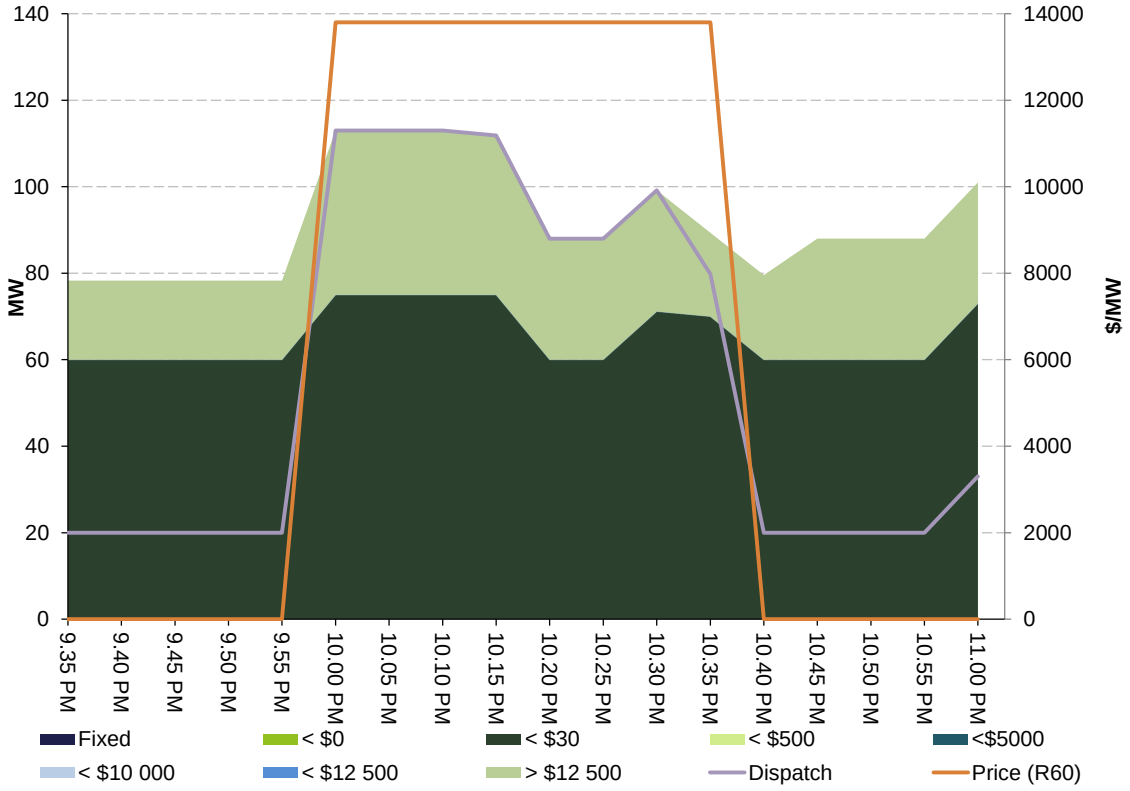


Figure B20a: Northern Power Station (Alinta Energy) raise 60 second service closing bid prices, dispatch and dispatch price

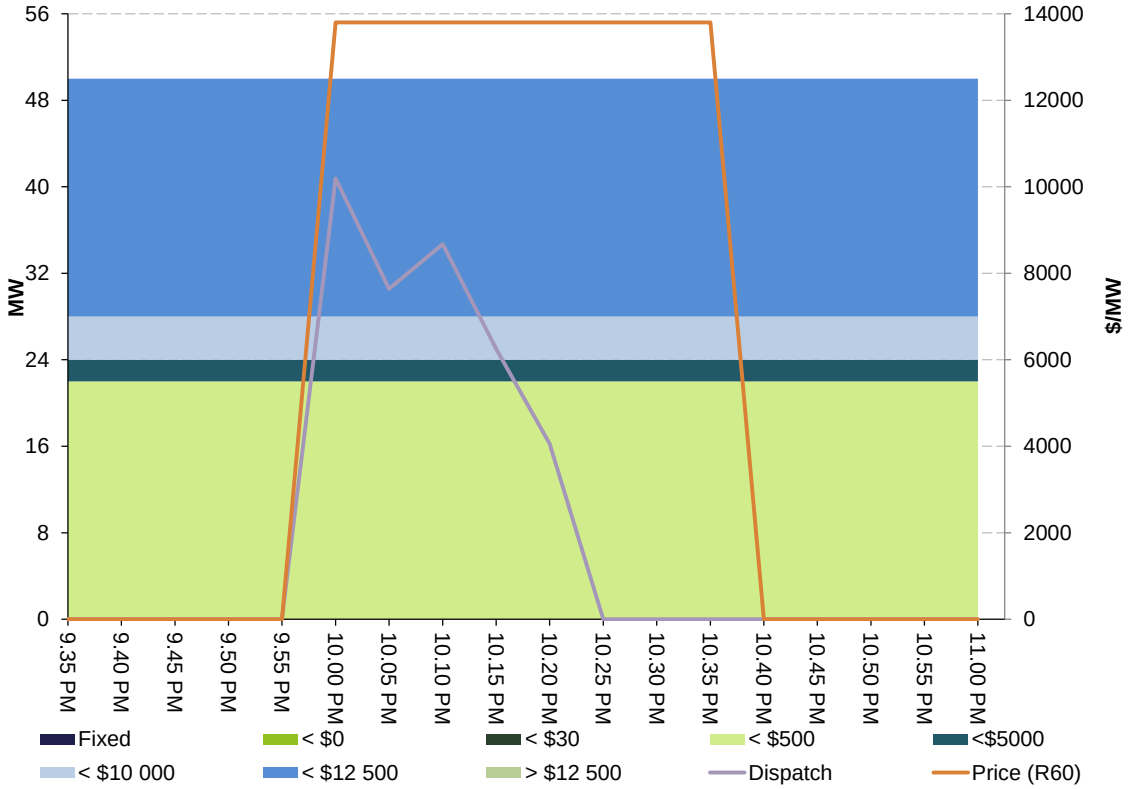


Figure B20b: Northern Power Station (Alinta Energy) raise 60 second service closing bid prices, dispatch and dispatch price – effective offers

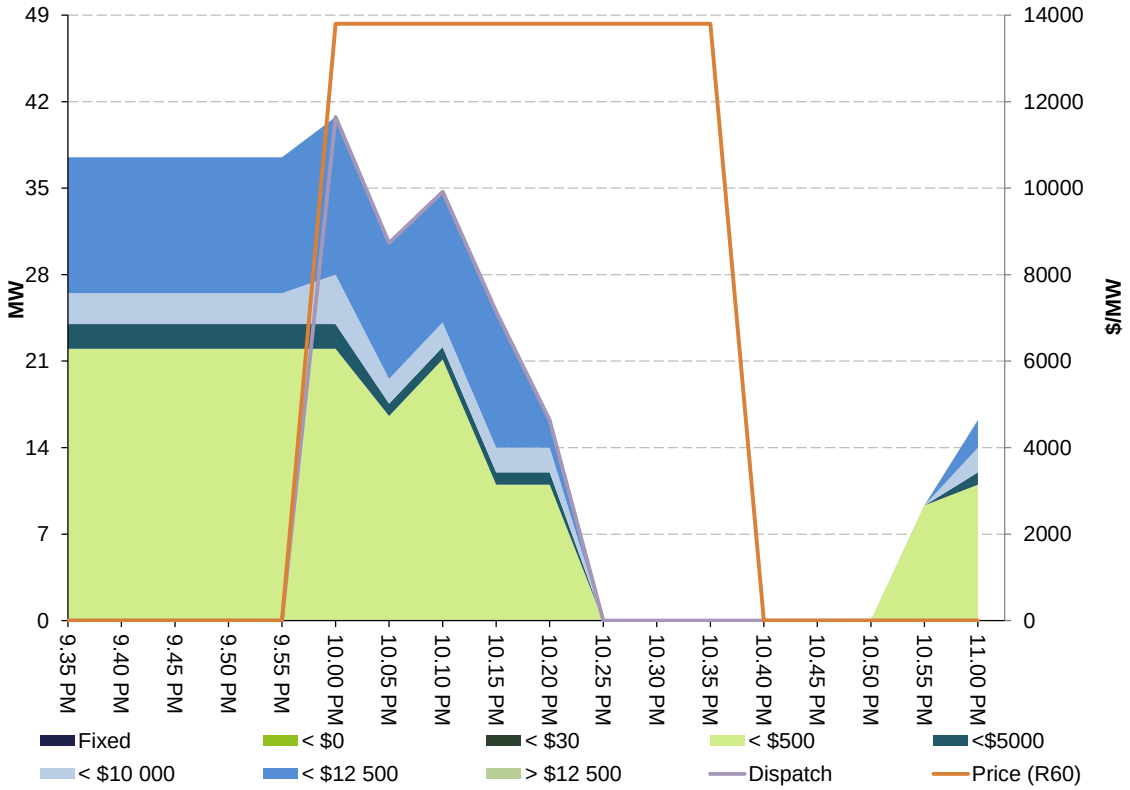


Figure B21a: Pelican Point Power Station (GDF Suez) raise 60 second service closing bid prices, dispatch and dispatch price

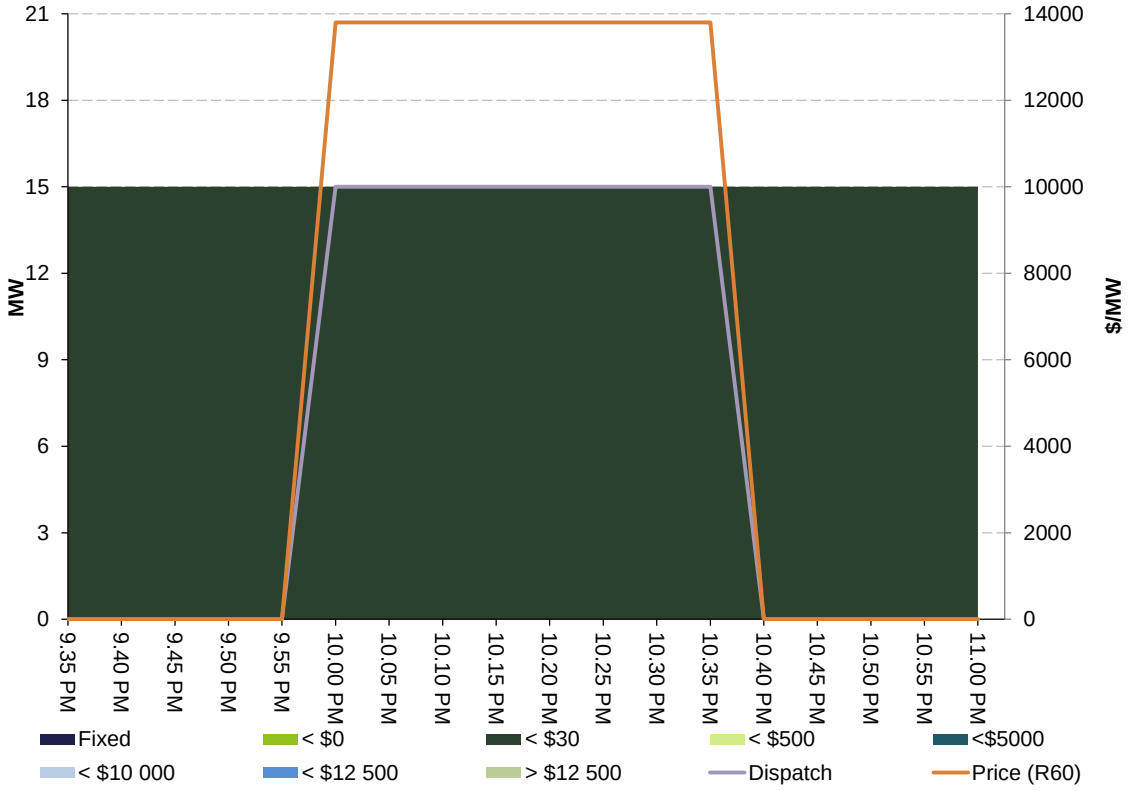


Figure B21b: Pelican Point Power Station (GDF Suez) raise 60 second service closing bid prices, dispatch and dispatch price – effective offers

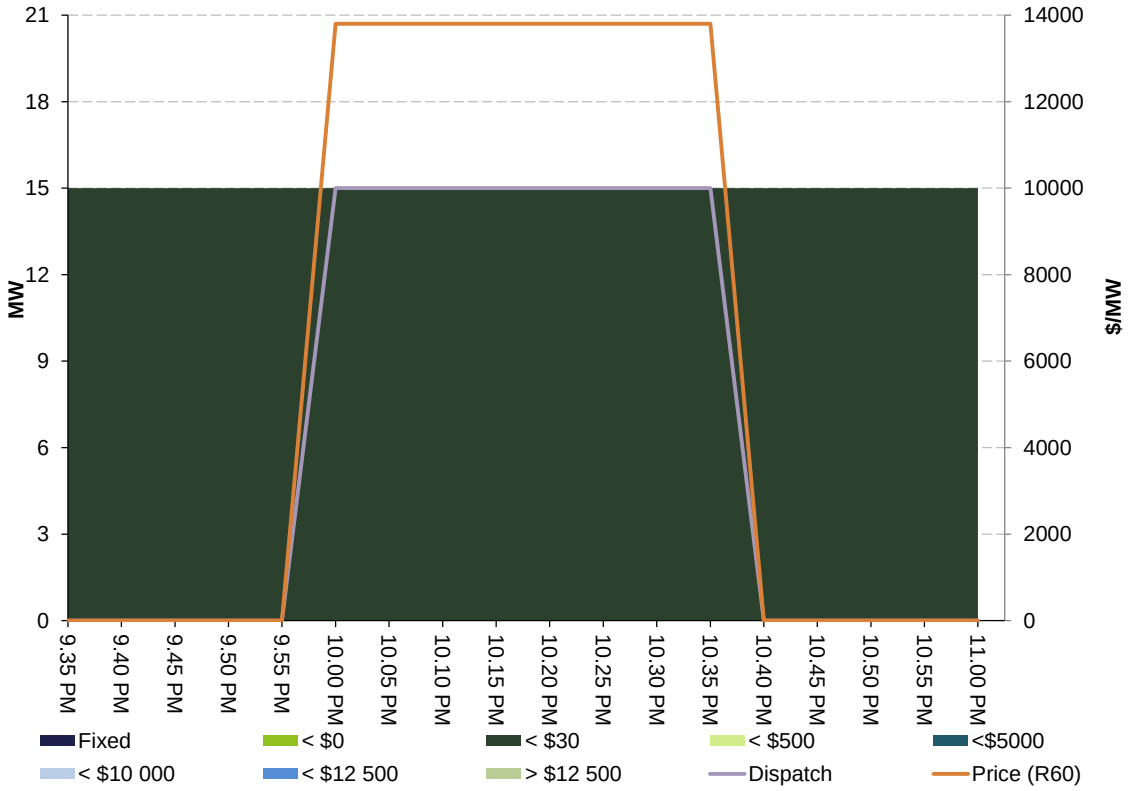


Figure B22a: Torrens Island Power Station (AGL) raise 5 minute service closing bid prices, dispatch and dispatch price

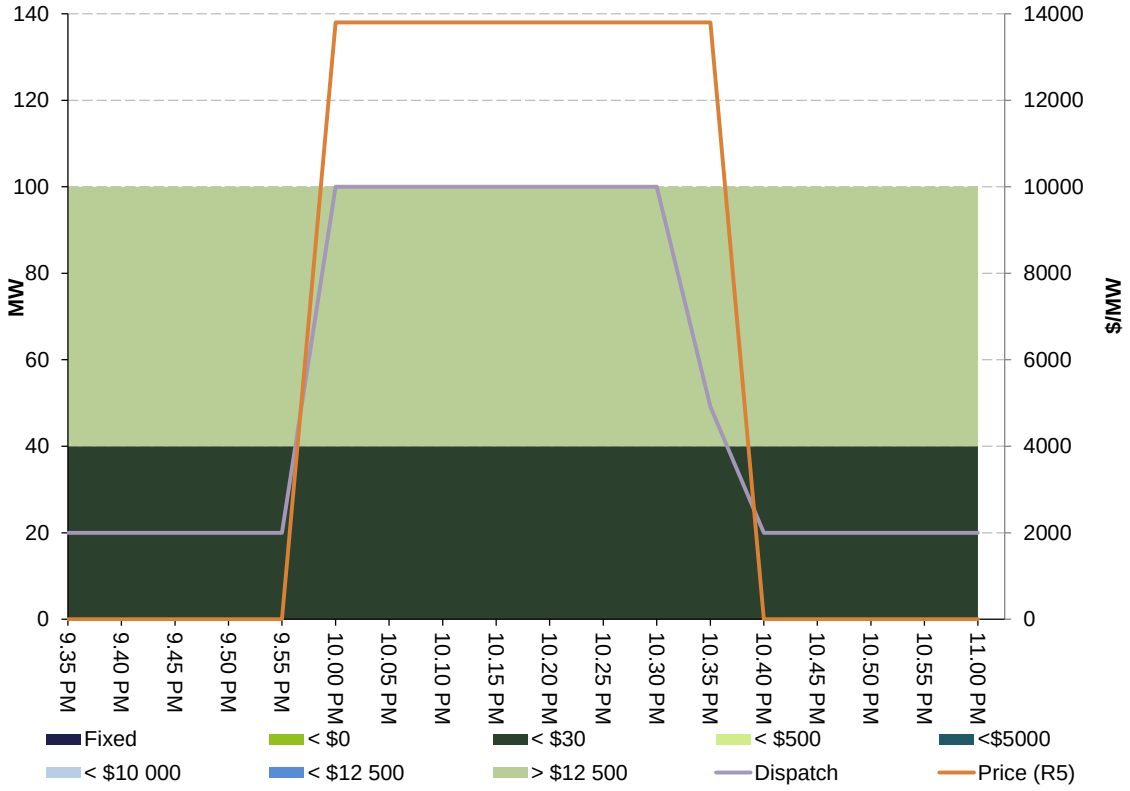


Figure B22b: Torrens Island Power Station (AGL) raise 5 minute service closing bid prices, dispatch and dispatch price – effective offers

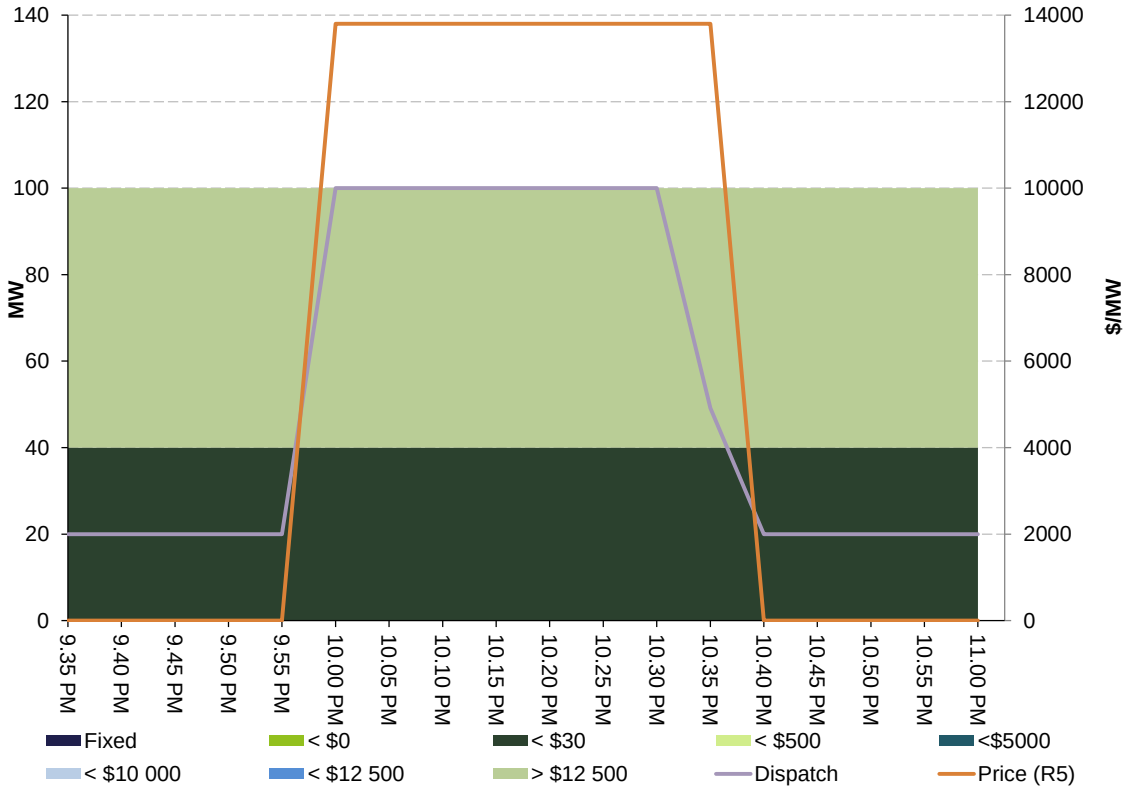


Figure B23a: Northern Power Station (Alinta Energy) raise 5 minute service closing bid prices, dispatch and dispatch price

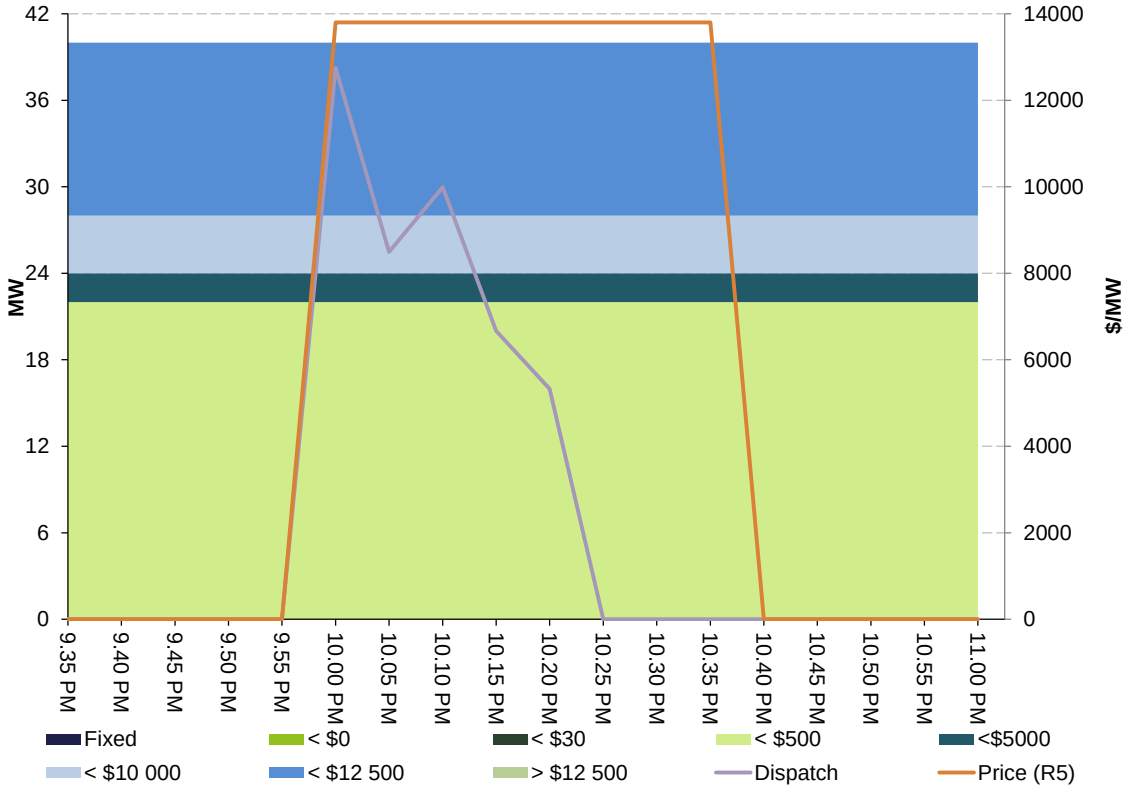


Figure B23b: Northern Power Station (Alinta Energy raise 5 minute service closing bid prices, dispatch and dispatch price – effective offers

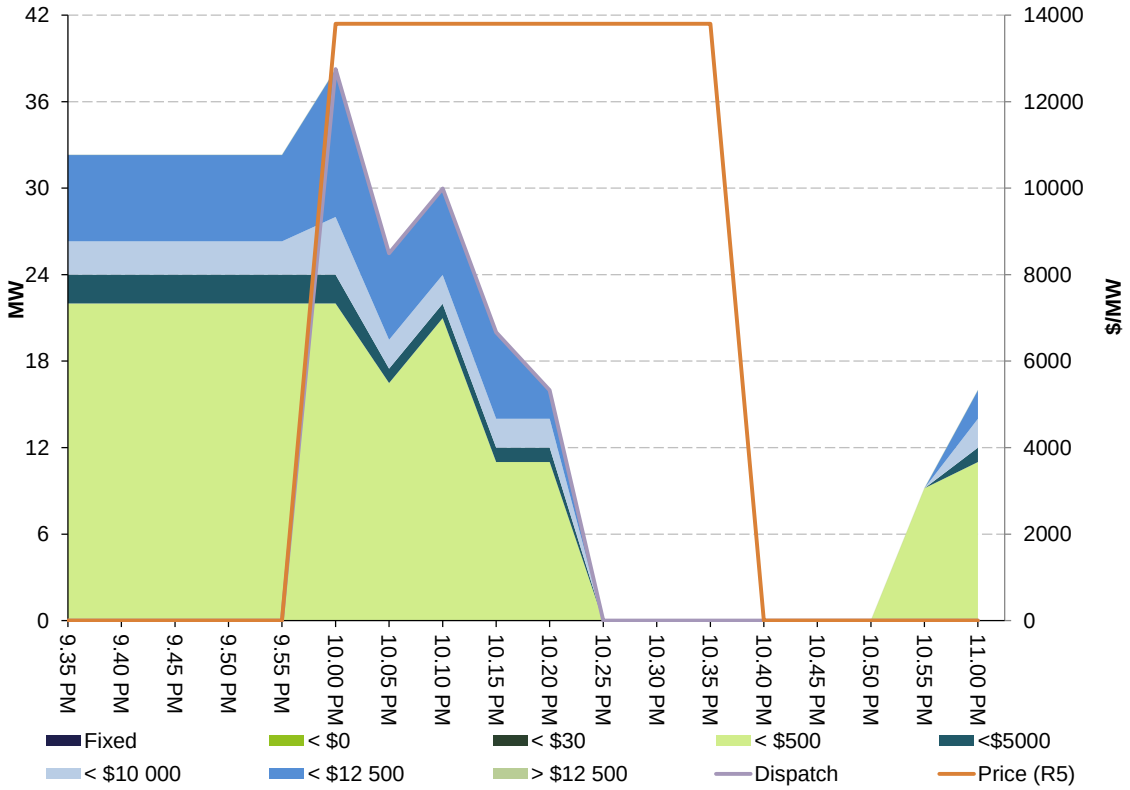


Figure B24a: Pelican Point Power Station (GDF Suez) raise 5 minute service closing bid prices, dispatch and dispatch price

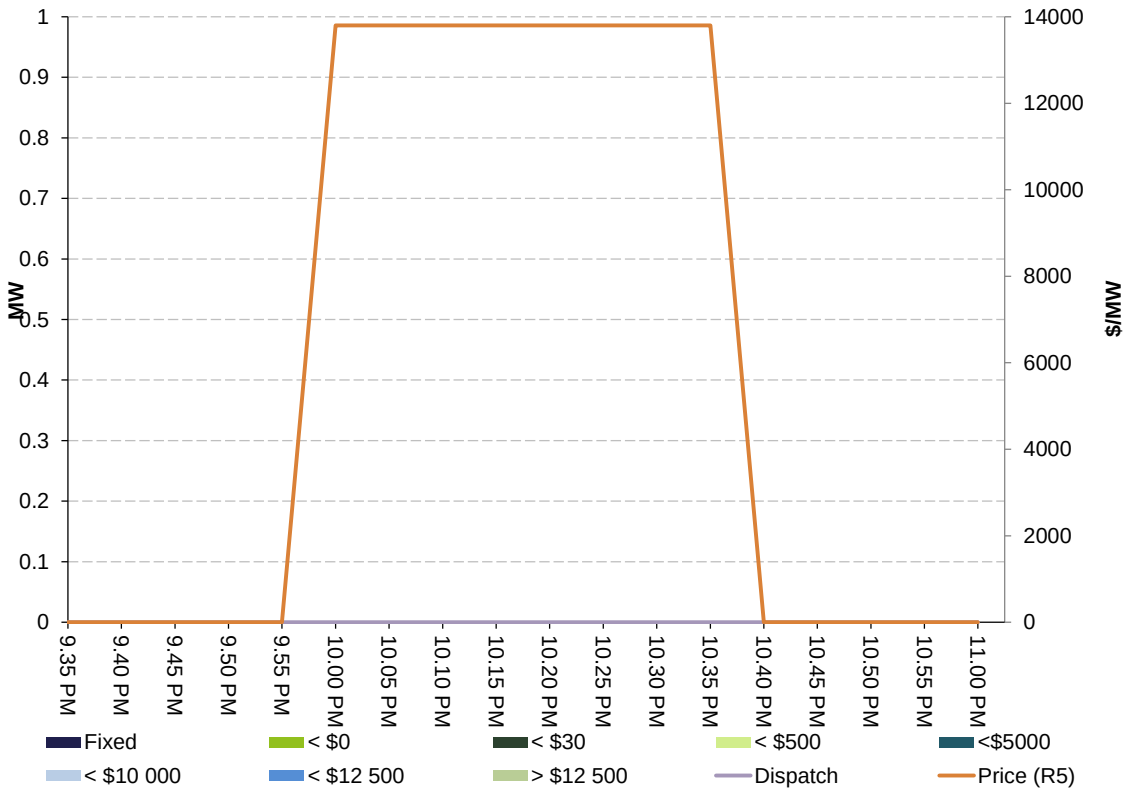
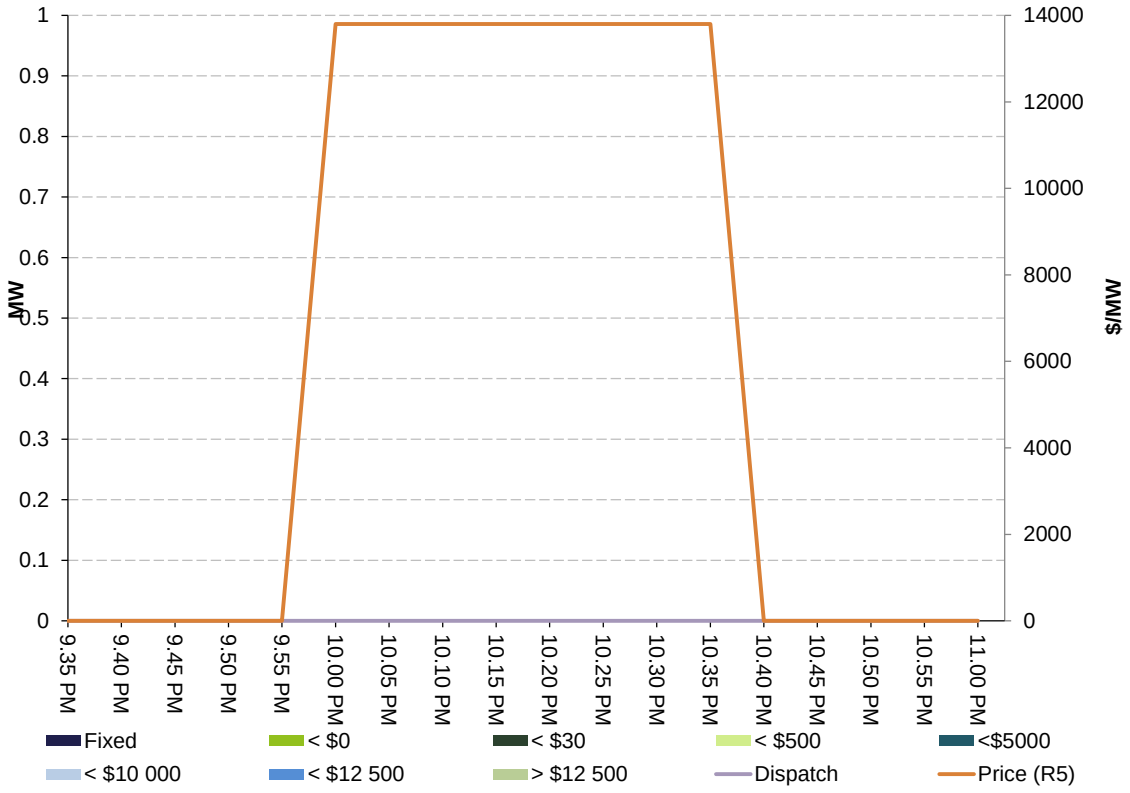


Figure B24b: Pelican Point Power Station (GDF Suez) raise 5 minute service closing bid prices, dispatch and dispatch price – effective offers



Appendix C Relevant Market Notices

The following market notices either were notifying the market of the regulation requirement for South Australia or were referenced in participant rebidding reasons.

Market Notice	Type	Date of issue	Last Changed
50212	Reserve Notice	28/10/2015 11:209:49	28/10/2015 11:20:49

External Reference

Forecast LOR2 in South Australia Region - 29 October 2015 to 07 November 2015

Reason

AEMO ELECTRICITY MARKET NOTICE

Forecast LOR2 condition South Australia Region - 07:00 hrs on 29 October 2015 to 12:30 hrs on 07 November 2015

A LOR2 condition is forecast for the South Australia region during the planned outage of South East - Heywood 275 kV No 2 line outage from 29 October 2015 to 07 November 2015

If a credible contingency event occurs during this outage period the South Australia region could separate from the rest of the NEM and is likely to result in interruptions to power supplies.

There are sufficient capacity reserves in the South Australia region to meet electricity demand but it may not be possible to bring the required additional capacity into service in time to avoid automatic under-frequency load shedding causing power interruptions.

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Operations Planning

Market Notice	Type	Date of issue	Last Changed
50251	Reserve Notice	01/11/2015 19:22:53	01/11/2015

External Reference

Actual LOR2 South Australia Region - Sunday, 1 November 2015

Reason

AEMO ELECTRICITY MARKET NOTICE

Actual LOR2 South Australia Region - 1 November 2015

Refer AEMO Electricity Market Notice 50212

An Actual LOR2 condition is declared for the South Australia region from 1900 hrs until further notice due to the planned outage of the Heywood Terminal Station- South East Substation No. 2 275 kV Line.

If a credible contingency event occurs during this period the South Australia region would separate from the rest of the NEM and is likely to result in interruptions to power supplies.

There are sufficient capacity reserves in the South Australia region to meet electricity demand but it may not be possible to bring the required additional capacity into service in time to avoid automatic under-frequency load shedding causing power interruptions.

Manager NEM Real Time Operations

Market Notice	Type	Date of issue	Last Changed
50258	POWER SYSTEM EVENTs	01/11/2015 22:11:49	01/11/2015 22:11:49

External Reference

Vic - SA Separation Event - 1 November 2015

Reason

AEMO ELECTRICITY MARKET NOTICE

At 2151 hrs, the Heywood South East No. 1 275kV Line tripped which resulted in South Australia separating from the NEM.

Approximately 150MW of load has been shed in the South Australia region due to under frequency load shedding.

An update will be provided at 2230hrs.

Manager NEM Real Time Operations

Market Notice	Type	Date of issue	Last Changed
50267	POWER SYSTEM EVENTs	01/11/2015 22:38:03	01/11/2015 22:38:03

External Reference

Update: Vic - SA Separation Event - 1 November 2015

Reason

AEMO ELECTRICITY MARKET NOTICE

Update to Market Notice 50258

At 2226 hrs Heywood South East No. 1 275kV Line was returned to service. South Australia is now reconnected to the NEM.

Load is currently being restored in South Australia.

Constraint Set I:VS_080 was invoked at 2235 hrs to limit the flow on the Heywood Interconnector (in the direction Vic to SA) to <= 80MW.

An update will be provided at 2300hrs.

Manager NEM Real Time Operations

Market Notice	Type	Date of issue	Last Changed
50269	POWER SYSTEM EVENTs	01/11/2015 23:22:13	01/11/2015 23:22:13

External Reference

Inter-regional transfer limit variation - Heywood Interconnector - 1 November 2015

Reason

AEMO ELECTRICITY MARKET NOTICE

Inter-regional transfer limit variation - Heywood Interconnector

Refer to Market Notice 50258

At 2151 hrs, the Heywood - South East No. 1 275kV Line tripped which resulted in South Australia separating from the NEM. The line was returned to service at 2226 hrs.

The cause of the line trip is under investigation. In the interim, to manage power system security the following constraint set has been invoked to limit the flow on the Heywood Interconnector (in the direction Vic to SA) to <= 50MW.

Constraint Set I:VS_050 invoked at 2255 hrs till further notice

Manager NEM Real Time Operations

Market Notice	Type	Date of issue	Last Changed
50270	ADMINISTERED PRICE CAP	02/11/2015 08:55:19	02/11/2015 08:55:19

External Reference

[EventId:70] AP STARTED for market ancillary services in SA at 02 November 2015 09:00

Reason

AEMO ELECTRICITY MARKET NOTICE

Issued by Australian Energy Market Operator Ltd at 0855 hrs on 2 November 2015

ADMINISTERED PRICE PERIOD DECLARED in SA region.

AEMO has determined that the rolling sum of the uncapped market ancillary Raise Reg services(s) prices for the SA region over the previous 2016 dispatch intervals has exceeded 6 times the cumulative price threshold (CPT) of $207,000.00.

In accordance with Clause 3.14 of the National Electricity Rules, AEMO has determined that an administered price period will commence at the dispatch interval starting 0900 hrs on 2 Nov 2015 and will continue through to the end of that trading day.

An administered price cap (APC) of 300 $/MWh will apply to all dispatch intervals during this administered price period. This APC will apply to all market ancillary service prices in the SA region.

An administered floor price (AFP) of 0 $/MWh AFP will apply to all market ancillary service prices.

AEMO will continue to monitor the rolling sum of the uncapped market ancillary service prices and issue further market notices as required.

This is an AEMO autogenerated Market Notice.

Market Notice	Type	Date of issue	Last Changed
50446	ADMINISTERED PRICE CAP	09/11/2015 03:55:12	09/11/2015 03:55:12

External Reference

[EventId:76] AP ENDED for market ancillary services in SA at 09 November 2015 04:00

Reason

AEMO ELECTRICITY MARKET NOTICE

Issued by Australian Energy Market Operator Ltd at 0355 hrs on 9 November 2015

ADMINISTERED PRICE PERIOD ENDS in SA region.

In accordance with Clause 3.14.2(b) of the National Electricity Rules, AEMO is notifying market particpants that the administered price period declared for the SA region in market notice 50423 will end at 0400 hrs on 9 November 2015.

This is an AEMO autogenerated Market Notice.

Appendix D Price setter

The following tables identify for each five-minute dispatch interval where FCAS dispatch prices were above $5000/MW, the price and the generating units involved in setting the price for each FCAS in South Australia. This information is published by AEMO.[23] 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. The dispatch prices that are in italics are capped at the price cap of $13 800/MWh when published by AEMO.

Lower regulation

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
22:00	$13 800.00	AGL (SA)	TORRA4	Lower reg	$13 800.00	-1.00	-$13 800.00
22:05	*$14 061.76*	GDF Suez	PPCCGT	Lower reg	$13 800.00	-1.00	-$13 800.00
		GDF Suez	PPCCGT	Energy	$287.69	-1.00	-$287.69
		Stanwell	TARONG#1	Energy	$24.97	0.60	$14.98
		Stanwell	TARONG#3	Energy	$24.97	0.60	$14.98
		EnergyAustralia	YWPS4	Energy	$20.19	-0.41	-$8.28
		GDF Suez	LOYYB1	Energy	$16.15	0.08	$1.29
		GDF Suez	LOYYB2	Energy	$16.15	0.08	$1.29
		EnergyAustralia	YWPS1	Energy	$16.15	0.07	$1.13
		Hazelwood	HWPS1	Raise 6 sec	$1.50	1.07	$1.61
		AGL Energy	BW02	Raise 60 sec	$0.80	1.19	$0.95
		Stanwell	TARONG#1	Raise 60 sec	$0.79	-0.60	-$0.47
		Stanwell	TARONG#1	Raise 6 sec	$0.79	-0.54	-$0.43
		Stanwell	TARONG#3	Raise 60 sec	$0.79	-0.60	-$0.47
		Stanwell	TARONG#3	Raise 6 sec	$0.79	-0.54	-$0.43
			ENOF,LOYYB		$0.00	-6.44	$0.00
			ENOF,LOYYB		$0.00	-6.44	$0.00
			ENOF,TARON		$0.00	65.48	$0.00
			ENOF,TARON		$0.00	65.48	$0.00
			ENOF,YWPS1		$0.00	-5.72	$0.00
22:10	*$14 055.97*	GDF Suez	PPCCGT	Lower reg	$13 800.00	-1.00	-$13 800.00
		GDF Suez	PPCCGT	Raise reg	$13 800.00	1.00	$13 800.00
		AGL (SA)	TORRB4	Raise reg	$13 800.00	-1.00	-$13 800.00
		GDF Suez	PPCCGT	Energy	$287.69	-1.00	-$287.69
		Origin Energy	ER01	Energy	$30.80	0.39	$12.01

[23] 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
		Origin Energy	ER02	Energy	$30.80	0.39	$12.01
		Origin Energy	ER03	Energy	$30.80	0.39	$12.01
		EnergyAustralia	YWPS4	Energy	$20.19	-0.41	-$8.28
		GDF Suez	LOYYB1	Energy	$16.15	0.09	$1.45
		GDF Suez	LOYYB2	Energy	$16.15	0.09	$1.45
		EnergyAustralia	YWPS1	Energy	$16.15	0.08	$1.29
			ENOF,ER01,3		$0.00	23.39	$0.00
			ENOF,ER02,3		$0.00	23.39	$0.00
			ENOF,ER03,3		$0.00	23.39	$0.00
			ENOF,LOYYB		$0.00	-6.97	$0.00
			ENOF,LOYYB		$0.00	-6.97	$0.00
			ENOF,YWPS1		$0.00	-6.19	$0.00
22:15	*$14 059.74*	GDF Suez	PPCCGT	Lower reg	$13 800.00	-1.00	-$13 800.00
		GDF Suez	PPCCGT	Raise reg	$13 800.00	1.00	$13 800.00
		AGL (SA)	TORRB4	Raise reg	$13 800.00	-1.00	-$13 800.00
		GDF Suez	PPCCGT	Energy	$287.69	-1.00	-$287.69
		Origin Energy	ER01	Energy	$26.01	0.60	$15.61
		Origin Energy	ER04	Energy	$26.01	0.60	$15.61
		EnergyAustralia	YWPS4	Energy	$20.19	-0.42	-$8.48
		GDF Suez	LOYYB1	Energy	$16.15	0.17	$2.75
		GDF Suez	LOYYB2	Energy	$16.15	0.17	$2.75
			ENOF,ER01,2		$0.00	-35.84	$0.00
			ENOF,ER01,2		$0.00	-35.84	$0.00
			ENOF,ER02,2		$0.00	-35.84	$0.00
			ENOF,ER03,2		$0.00	-35.84	$0.00
			ENOF,LOYYB		$0.00	13.31	$0.00
			ENOF,LOYYB		$0.00	-13.31	$0.00
			ENOF,LOYYB		$0.00	13.31	$0.00
			ENOF,LOYYB		$0.00	-13.31	$0.00
22:20	$9000.00	AGL (SA)	TORRB4	Lower 5 min	$9000.00	-1.00	-$9000.00
22:25	*$14 032.70*	AGL (SA)	TORRB4	Raise reg	$13 800.00	-1.00	-$13 800.00
		GDF Suez	PPCCGT	Lower reg	$8869.69	-1.00	-$8869.69
		GDF Suez	PPCCGT	Raise reg	$8869.69	1.00	$8869.69
		GDF Suez	PPCCGT	Energy	$287.69	-1.00	-$287.69
		AGL (SA)	TORRA4	Energy	$54.99	1.00	$54.99
			ENOF,TORRA		$0.00	15.00	$0.00
			ENOF,TORRA		$0.00	15.00	$0.00
			ENOF,TORRA		$0.00	15.00	$0.00
			ENOF,TORRA		$0.00	60.00	$0.00

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
			ENOF,TORRA		$0.00	40.00	$0.00
			ENOF,TORRA		$0.00	60.00	$0.00
			ENOF,TORRA		$0.00	40.00	$0.00
22:30	*$32 399.30*	AGL (SA)	TORRA4	Lower reg	$13 800.00	-1.00	-$13 800.00
		AGL (SA)	TORRB2	Lower 60 sec	$13 800.00	-1.00	-$13 800.00
		AGL (SA)	TORRB2	Raise 60 sec	$13 800.00	-1.00	-$13 800.00
		AGL (SA)	TORRA4	Lower 60 sec	$8999.90	1.00	$8999.90
		AGL (SA)	TORRA4	Raise 60 sec	$0.80	1.00	$0.80
22:35	*$18 599.75*	AGL (SA)	TORRB2	Raise 60 sec	$13 800.00	-1.00	-$13 800.00
		AGL (SA)	TORRB4	Lower 60 sec	$13 800.00	-1.00	-$13 800.00
		AGL (SA)	TORRA4	Lower 60 sec	$8999.90	1.00	$8999.90
		AGL (SA)	TORRA4	Raise 60 sec	$0.80	1.00	$0.80
		AGL (SA)	TORRA4	Lower reg	$0.45	-1.00	-$0.45

Raise regulation

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
22:00	*$15 686.24*	GDF Suez	PPCCGT	Lower reg	$13 800.00	1.45	$20010.00
		GDF Suez	PPCCGT	Raise reg	$13 800.00	-0.82	-$11316.00
		AGL (SA)	TORRA4	Lower reg	$13 800.00	-0.48	-$6624.00
		GDF Suez	PPCCGT	Raise 6 sec	$13499.99	-0.64	-$8639.99
		Alinta Power	NPS1	Raise 5 min	$12399.79	-0.08	-$991.98
		Alinta Power	NPS1	Raise 60 sec	$12399.79	-0.08	-$991.98
		Alinta Power	NPS2	Raise 60 sec	$12399.79	0.08	$991.98
		AGL (SA)	TORRB2	Lower 5 min	$9000.00	-0.46	-$4140.00
		AGL (SA)	TORRB4	Lower 5 min	$9000.00	-0.46	-$4140.00
		Alinta Power	NPS1	Lower 5 min	$6499.79	-0.06	-$389.99
		Alinta Power	NPS2	Lower 60 sec	$1499.79	0.04	$59.99
		Alinta Power	NPS1	Lower 60 sec	$299.77	-0.04	-$11.99
		Alinta Power	NPS2	Raise reg	$299.77	-0.10	-$29.98
		GDF Suez	PPCCGT	Energy	$287.69	1.45	$417.15
		AGL (SA)	TORRB2	Energy	$45.99	-0.46	-$21.16
		AGL (SA)	TORRB4	Energy	$45.99	-0.46	-$21.16
		AGL Energy	BW01	Energy	$25.46	-0.16	-$4.07
		AGL Energy	BW02	Energy	$25.46	-0.16	-$4.07
		AGL Energy	BW04	Energy	$25.46	-0.16	-$4.07
		GDF Suez	LOYYB1	Energy	$16.15	-0.02	-$0.32
		GDF Suez	LOYYB2	Energy	$16.15	-0.02	-$0.32
			ENOF,BW01,4		$0.00	-43.66	$0.00

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
			ENOF,BW02,4		$0.00	-43.66	$0.00
			ENOF,BW03,4		$0.00	-43.66	$0.00
			ENOF,LOYYB		$0.00	-1.25	$0.00
			ENOF,LOYYB		$0.00	1.25	$0.00
			ENOF,LOYYB		$0.00	-1.25	$0.00
			ENOF,LOYYB		$0.00	1.25	$0.00
			ENOF,NPS1,2		$0.00	10.46	$0.00
			ENOF,TORRB		$0.00	-18.33	$0.00
			ENOF,TORRB		$0.00	-18.33	$0.00
			ENOF,TORRB		$0.00	-18.33	$0.00
			ENOF,TORRB		$0.00	-18.33	$0.00
		Alinta Power	NPS1	Energy	-$0.95	-0.10	$0.10
22:05	*$14 022.70*	GDF Suez	PPCCGT	Lower reg	$13 800.00	-1.00	-$13 800.00
		AGL (SA)	TORRA4	Lower reg	$13 800.00	1.00	$13 800.00
		AGL (SA)	TORRA4	Raise reg	$13 800.00	-1.00	-$13 800.00
		GDF Suez	PPCCGT	Energy	$287.69	-1.00	-$287.69
		AGL (SA)	TORRA4	Energy	$64.99	1.00	$64.99
			ENOF,TORRA		$0.00	40.00	$0.00
			ENOF,TORRA		$0.00	40.00	$0.00
			ENOF,TORRA		$0.00	40.00	$0.00
			ENOF,TORRA		$0.00	40.00	$0.00
			ENOF,TORRA		$0.00	20.00	$0.00
			ENOF,TORRA		$0.00	40.00	$0.00
			ENOF,TORRA		$0.00	20.00	$0.00
22:10	$13 800.00	AGL (SA)	TORRB4	Raise reg	$13 800.00	-1.00	-$13 800.00
22:15	$13 800.00	AGL (SA)	TORRB4	Raise reg	$13 800.00	-1.00	-$13 800.00
22:20	*$19 341.20*	GDF Suez	DRYCGT3	Energy	$10759.20	-1.00	-$10759.20
		GDF Suez	PPCCGT	Raise reg	$8869.69	-1.00	-$8869.69
		GDF Suez	PPCCGT	Energy	$287.69	1.00	$287.69
22:25	$13 800.00	AGL (SA)	TORRB4	Raise reg	$13 800.00	-1.00	-$13 800.00
22:30	$13 800.00	AGL (SA)	TORRB4	Raise reg	$13 800.00	-1.00	-$13 800.00
22:35	$13 800.00	AGL (SA)	TORRB4	Raise 5 min	$13 800.00	-1.00	-$13 800.00

Lower 6 second

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
22:00	$13 800.00	AGL (SA)	TORRA4	Lower 6 sec	$13 800.00	-1.00	-$13 800.00
22:05	$13 800.00	AGL (SA)	TORRB4	Lower 6 sec	$13 800.00	-1.00	-$13 800.00
22:10	$13 800.00	AGL (SA)	TORRB4	Lower 6 sec	$13 800.00	-1.00	-$13 800.00

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
22:15	$13 800.00	AGL (SA)	TORRA4	Lower 6 sec	$13 800.00	-1.00	-$13 800.00
22:20	$13 800.00	AGL (SA)	TORRB4	Lower 6 sec	$13 800.00	-1.00	-$13 800.00
22:25	*$18 663.00*	AGL (SA)	TORRB4	Raise reg	$13 800.00	-1.00	-$13 800.00
		GDF Suez	PPCCGT	Lower 6 sec	$13499.99	-1.00	-$13499.99
		GDF Suez	PPCCGT	Raise reg	$8869.69	1.00	$8869.69
		GDF Suez	PPCCGT	Energy	$287.69	-1.00	-$287.69
		AGL (SA)	TORRA4	Energy	$54.99	1.00	$54.99
			ENOF,TORRA		$0.00	15.00	$0.00
			ENOF,TORRA		$0.00	15.00	$0.00
			ENOF,TORRA		$0.00	15.00	$0.00
			ENOF,TORRA		$0.00	60.00	$0.00
			ENOF,TORRA		$0.00	40.00	$0.00
			ENOF,TORRA		$0.00	60.00	$0.00
			ENOF,TORRA		$0.00	40.00	$0.00
22:30	*$18 693.00*	AGL (SA)	TORRB4	Raise reg	$13 800.00	-1.00	-$13 800.00
		GDF Suez	PPCCGT	Lower 6 sec	$13 499.99	-1.00	-$13 499.99
		GDF Suez	PPCCGT	Raise reg	$8869.69	1.00	$8869.69
		GDF Suez	PPCCGT	Energy	$287.69	-1.00	-$287.69
		EnergyAustralia	YWPS4	Energy	$20.19	1.64	$33.11
		GDF Suez	LOYYB1	Energy	$16.15	-0.25	-$4.04
		GDF Suez	LOYYB2	Energy	$16.15	-0.25	-$4.04
			ENOF,LOYYB		$0.00	-19.98	$0.00
			ENOF,LOYYB		$0.00	19.98	$0.00
			ENOF,LOYYB		$0.00	-19.98	$0.00
			ENOF,LOYYB		$0.00	19.98	$0.00
22:35	*$18 688.45*	AGL (SA)	TORRB4	Raise 5 min	$13 800.00	-1.00	-$13 800.00
		GDF Suez	PPCCGT	Lower 6 sec	$13 499.99	-1.00	-$13 499.99
		GDF Suez	PPCCGT	Raise reg	$8869.69	1.00	$8869.69
		GDF Suez	PPCCGT	Energy	$287.69	-1.00	-$287.69
		Origin Energy	ER01	Energy	$26.01	0.53	$13.79
		Origin Energy	ER04	Energy	$26.01	0.53	$13.79
		GDF Suez	LOYYB1	Energy	$16.15	0.02	$0.32
		GDF Suez	LOYYB2	Energy	$16.15	0.02	$0.32
		CS Energy	W/HOE#2	Raise 5 min	$2.00	1.07	$2.14
		Origin Energy	ER01	Raise reg	$0.84	-0.53	-$0.45
		Origin Energy	ER04	Raise reg	$0.84	-0.53	-$0.45
			ENOF,ER01,2		$0.00	-32.00	$0.00
			ENOF,ER01,2		$0.00	-32.00	$0.00
			ENOF,ER02,2		$0.00	-32.00	$0.00

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
			ENOF,ER03,2		$0.00	-32.00	$0.00
			ENOF,LOYYB		$0.00	1.39	$0.00
			ENOF,LOYYB		$0.00	-1.39	$0.00
			ENOF,LOYYB		$0.00	1.39	$0.00
			ENOF,LOYYB		$0.00	-1.39	$0.00

Raise 6 second

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
22:00	*$15 386.23*	GDF Suez	PPCCGT	Lower reg	$13 800.00	1.45	$20010.00
		GDF Suez	PPCCGT	Raise reg	$13 800.00	0.18	$2484.00
		AGL (SA)	TORRA4	Lower reg	$13 800.00	-0.48	-$6624.00
		GDF Suez	PPCCGT	Raise 6 sec	$13 499.99	-1.64	-$22 139.98
		Alinta Power	NPS1	Raise 5 min	$12399.79	-0.08	-$991.98
		Alinta Power	NPS1	Raise 60 sec	$12399.79	-0.08	-$991.98
		Alinta Power	NPS2	Raise 60 sec	$12 399.79	0.08	$991.98
		AGL (SA)	TORRB2	Lower 5 min	$9000.00	-0.46	-$4140.00
		AGL (SA)	TORRB4	Lower 5 min	$9000.00	-0.46	-$4140.00
		Alinta Power	NPS1	Lower 5 min	$6499.79	-0.06	-$389.99
		Alinta Power	NPS2	Lower 60 sec	$1499.79	0.04	$59.99
		Alinta Power	NPS1	Lower 60 sec	$299.77	-0.04	-$11.99
		Alinta Power	NPS2	Raise reg	$299.77	-0.10	-$29.98
		GDF Suez	PPCCGT	Energy	$287.69	1.45	$417.15
		AGL (SA)	TORRB2	Energy	$45.99	-0.46	-$21.16
		AGL (SA)	TORRB4	Energy	$45.99	-0.46	-$21.16
		AGL Energy	BW01	Energy	$25.46	-0.16	-$4.07
		AGL Energy	BW02	Energy	$25.46	-0.16	-$4.07
		AGL Energy	BW04	Energy	$25.46	-0.16	-$4.07
		GDF Suez	LOYYB1	Energy	$16.15	-0.02	-$0.32
		GDF Suez	LOYYB2	Energy	$16.15	-0.02	-$0.32
			ENOF,BW01,4		$0.00	-43.66	$0.00
			ENOF,BW02,4		$0.00	-43.66	$0.00
			ENOF,BW03,4		$0.00	-43.66	$0.00
			ENOF,LOYYB		$0.00	-1.25	$0.00
			ENOF,LOYYB		$0.00	1.25	$0.00
			ENOF,LOYYB		$0.00	-1.25	$0.00
			ENOF,LOYYB		$0.00	1.25	$0.00
			ENOF,NPS1,2		$0.00	10.46	$0.00
			ENOF,TORRB		$0.00	-18.33	$0.00

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
			ENOF,TORRB		$0.00	-18.33	$0.00
			ENOF,TORRB		$0.00	-18.33	$0.00
			ENOF,TORRB		$0.00	-18.33	$0.00
		Alinta Power	NPS1	Energy	-$0.95	-0.10	$0.10
22:05	$13 800.00	AGL (SA)	TORRB2	Raise 6 sec	$13 800.00	-1.00	-$13 800.00
22:10	$13 800.00	AGL (SA)	TORRB2	Raise 6 sec	$13 800.00	-1.00	-$13 800.00
22:15	*$34 600.18*	GDF Suez	PPCCGT	Lower reg	$13 800.00	-2.74	-$37 812.00
		GDF Suez	PPCCGT	Raise reg	$13 800.00	2.74	$37 812.00
		AGL (SA)	TORRA4	Lower reg	$13 800.00	0.98	$13 524.00
		AGL (SA)	TORRA4	Lower 60 sec	$13 800.00	-0.15	-$2070.00
		AGL (SA)	TORRA4	Lower 6 sec	$13 800.00	-0.13	-$1794.00
		AGL (SA)	TORRA4	Raise reg	$13 800.00	-0.83	-$11 454.00
		AGL (SA)	TORRA4	Raise 60 sec	$13 800.00	-0.15	-$2070.00
		AGL (SA)	TORRB2	Lower 60 sec	$13 800.00	0.07	$966.00
		AGL (SA)	TORRB4	Raise reg	$13 800.00	-2.24	-$30 912.00
		Alinta Power	NPS1	Raise reg	$299.00	0.19	$56.81
		GDF Suez	PPCCGT	Energy	$287.69	-2.74	-$788.27
		Alinta Power	NPS1	Lower 5 min	$93.79	0.10	$9.38
		Alinta Power	NPS1	Lower 60 sec	$93.79	0.08	$7.50
		Alinta Power	NPS1	Raise 5 min	$93.79	0.14	$13.13
		Alinta Power	NPS1	Raise 60 sec	$93.79	0.15	$14.07
		Alinta Power	NPS1	Raise 6 sec	$93.79	0.16	$15.01
		AGL (SA)	TORRA4	Energy	$64.99	0.83	$53.94
		AGL (SA)	TORRB4	Energy	$45.99	0.83	$38.17
		Origin Energy	ER01	Energy	$26.01	0.04	$1.04
		Origin Energy	ER04	Energy	$26.01	0.04	$1.04
		EnergyAustralia	YWPS4	Energy	$20.19	-0.03	-$0.61
		Alinta Power	NPS1	Lower 6 sec	$19.79	0.13	$2.57
		GDF Suez	LOYYB1	Energy	$16.15	0.01	$0.16
		GDF Suez	LOYYB2	Energy	$16.15	0.01	$0.16
		AGL (SA)	TORRB2	Lower reg	$0.45	0.83	$0.37
		AGL (SA)	TORRB4	Lower reg	$0.45	0.83	$0.37
		AGL (SA)	TORRB2	Energy	$0.00	0.83	$0.00
			ENOF,AGLHA		$0.00	24.91	$0.00
			ENOF,CLEMG		$0.00	10.70	$0.00
			ENOF,ER01,2		$0.00	-2.13	$0.00
			ENOF,ER01,2		$0.00	-2.13	$0.00
			ENOF,ER02,2		$0.00	-2.13	$0.00
			ENOF,ER03,2		$0.00	-2.13	$0.00

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
			ENOF,LOYYB		$0.00	0.79	$0.00
			ENOF,LOYYB		$0.00	-0.79	$0.00
			ENOF,LOYYB		$0.00	0.79	$0.00
			ENOF,LOYYB		$0.00	-0.79	$0.00
			ENOF,NPS1,1		$0.00	-28.15	$0.00
			ENOF,NPS1,1		$0.00	27.77	$0.00
			ENOF,NPS1,1		$0.00	-30.97	$0.00
			ENOF,NPS1,1		$0.00	8.45	$0.00
			ENOF,NPS1,1		$0.00	8.45	$0.00
			ENOF,NPS1,1		$0.00	8.45	$0.00
			ENOF,NPS1,1		$0.00	-8.45	$0.00
			ENOF,NPS1,1		$0.00	11.26	$0.00
			ENOF,NPS1,1		$0.00	-14.08	$0.00
			ENOF,NPS1,1		$0.00	11.26	$0.00
			ENOF,NPS1,1		$0.00	-14.08	$0.00
			ENOF,TORRA		$0.00	33.21	$0.00
			ENOF,TORRA		$0.00	33.21	$0.00
			ENOF,TORRA		$0.00	33.21	$0.00
			ENOF,TORRA		$0.00	33.21	$0.00
			ENOF,TORRA		$0.00	16.61	$0.00
			ENOF,TORRA		$0.00	33.21	$0.00
			ENOF,TORRA		$0.00	16.61	$0.00
			ENOF,TORRB		$0.00	33.21	$0.00
			ENOF,TORRB		$0.00	-12.45	$0.00
			ENOF,TORRB		$0.00	8.30	$0.00
			ENOF,TORRB		$0.00	33.21	$0.00
		Alinta Power	NPS1	Energy	-$1000.00	0.19	-$190.00
22:20	*$31 162.42*	GDF Suez	DRYCGT3	Energy	$10 759.20	-2.84	-$30 556.13
		AGL (SA)	TORRB2	Lower 5 min	$9000.00	0.72	$6480.00
		AGL (SA)	TORRB4	Lower 5 min	$9000.00	-0.72	-$6480.00
		AGL (SA)	TORRB4	Energy	$54.99	0.72	$39.59
		AGL (SA)	TORRB2	Energy	$45.99	0.72	$33.11
		Origin Energy	ER03	Energy	$26.01	0.82	$21.33
		EnergyAustralia	YWPS4	Energy	$20.19	-0.29	-$5.86
		GDF Suez	LOYYB1	Energy	$16.15	0.11	$1.78
		GDF Suez	LOYYB2	Energy	$16.15	0.11	$1.78
		AGL Energy	LYA1	Lower reg	$0.80	-0.82	-$0.66
		Origin Energy	ER03	Lower reg	$0.43	0.82	$0.35
			ENOF,CLEMG		$0.00	40.92	$0.00

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
			ENOF,ER01,2		$0.00	49.06	$0.00
			ENOF,ER02,2		$0.00	49.06	$0.00
			ENOF,ER03,2		$0.00	49.06	$0.00
			ENOF,LOYYB		$0.00	9.11	$0.00
			ENOF,LOYYB		$0.00	-9.11	$0.00
			ENOF,LOYYB		$0.00	9.11	$0.00
			ENOF,LOYYB		$0.00	-9.11	$0.00
			ENOF,NPS1,1		$0.00	-107.70	$0.00
			ENOF,NPS1,1		$0.00	106.26	$0.00
			ENOF,NPS1,1		$0.00	-118.47	$0.00
			ENOF,NPS1,1		$0.00	32.31	$0.00
			ENOF,NPS1,1		$0.00	32.31	$0.00
			ENOF,NPS1,1		$0.00	32.31	$0.00
			ENOF,NPS1,1		$0.00	-32.31	$0.00
			ENOF,NPS1,1		$0.00	43.08	$0.00
			ENOF,NPS1,1		$0.00	-53.85	$0.00
			ENOF,NPS1,1		$0.00	43.08	$0.00
			ENOF,NPS1,1		$0.00	-53.85	$0.00
			ENOF,TORRA		$0.00	10.77	$0.00
			ENOF,TORRA		$0.00	10.77	$0.00
			ENOF,TORRA		$0.00	10.77	$0.00
			ENOF,TORRA		$0.00	-10.77	$0.00
			ENOF,TORRB		$0.00	28.72	$0.00
			ENOF,TORRB		$0.00	43.08	$0.00
			ENOF,TORRB		$0.00	28.72	$0.00
			ENOF,TORRB		$0.00	-7.18	$0.00
			ENOF,TORRB		$0.00	28.72	$0.00
			ENOF,TORRB		$0.00	43.08	$0.00
		Alinta Power	NPS1	Energy	-$1000.00	0.72	-$720.00
22:25	*$30 807.24*	AGL (SA)	TORRB2	Lower 60 sec	$13 800.00	-0.08	-$1104.00
		AGL (SA)	TORRB2	Raise 60 sec	$13 800.00	0.00	$0.00
		AGL (SA)	TORRB4	Raise reg	$13 800.00	-1.94	-$26 772.00
		GDF Suez	PPCCGT	Lower 6 sec	$13 499.99	-0.13	-$1755.00
		AGL (SA)	TORRB2	Lower 5 min	$9000.00	-0.10	-$900.00
		GDF Suez	PPCCGT	Lower reg	$8869.69	-1.66	-$14 723.69
		GDF Suez	PPCCGT	Raise reg	$8869.69	1.79	$15 876.75
		Alinta Power	NPS2	Raise reg	$299.77	0.19	$56.96
		GDF Suez	PPCCGT	Energy	$287.69	-1.79	-$514.97
		Alinta Power	NPS2	Lower 5 min	$93.79	0.10	$9.38

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
		Alinta Power	NPS2	Lower 60 sec	$93.79	0.08	$7.50
		Alinta Power	NPS2	Raise 5 min	$93.79	0.14	$13.13
		Alinta Power	NPS2	Raise 60 sec	$93.79	0.15	$14.07
		Alinta Power	NPS2	Raise 6 sec	$93.79	0.16	$15.01
		AGL (SA)	TORRA4	Energy	$54.99	-2.51	-$138.02
		AGL (SA)	TORRB4	Energy	$54.99	0.83	$45.64
		Delta Electricity	VP6	Energy	$26.00	0.95	$24.70
		EnergyAustralia	YWPS4	Energy	$20.19	-0.33	-$6.66
		Alinta Power	NPS2	Lower 6 sec	$19.79	0.13	$2.57
		GDF Suez	LOYYB1	Energy	$16.15	0.09	$1.45
		GDF Suez	LOYYB2	Energy	$16.15	0.09	$1.45
		EnergyAustralia	YWPS1	Energy	$16.15	0.08	$1.29
		AGL (SA)	TORRB2	Lower reg	$1.50	0.83	$1.25
		AGL (SA)	TORRB4	Lower reg	$0.45	0.83	$0.37
		GDF Suez	LOYYB1	Lower 60 sec	$0.15	-0.09	-$0.01
		GDF Suez	LOYYB2	Lower 60 sec	$0.15	0.09	$0.01
		EnergyAustralia	AGLHAL	Energy	$0.00	0.83	$0.00
		AGL (SA)	TORRB2	Energy	$0.00	0.83	$0.00
			ENOF,AGLHA		$0.00	-34.04	$0.00
			ENOF,AGLHA		$0.00	-12.45	$0.00
			ENOF,CLEMG		$0.00	47.32	$0.00
			ENOF,CLEMG		$0.00	10.70	$0.00
			ENOF,LADBR		$0.00	-34.87	$0.00
			ENOF,LADBR		$0.00	-7.88	$0.00
			ENOF,LADBR		$0.00	34.87	$0.00
			ENOF,LADBR		$0.00	7.88	$0.00
			ENOF,LOYYB		$0.00	-6.89	$0.00
			ENOF,LOYYB		$0.00	-6.89	$0.00
			ENOF,NPS1,1		$0.00	-167.72	$0.00
			ENOF,NPS1,1		$0.00	122.88	$0.00
			ENOF,NPS1,1		$0.00	-136.99	$0.00
			ENOF,NPS1,1		$0.00	37.36	$0.00
			ENOF,NPS1,1		$0.00	37.36	$0.00
			ENOF,NPS1,1		$0.00	37.36	$0.00
			ENOF,NPS1,1		$0.00	-37.36	$0.00
			ENOF,NPS1,1		$0.00	49.82	$0.00
			ENOF,NPS1,1		$0.00	-62.27	$0.00
			ENOF,NPS1,1		$0.00	49.82	$0.00
			ENOF,NPS1,1		$0.00	-62.27	$0.00

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
			ENOF,NPS2,1		$0.00	27.77	$0.00
			ENOF,NPS2,1		$0.00	-30.97	$0.00
			ENOF,NPS2,1		$0.00	8.45	$0.00
			ENOF,NPS2,1		$0.00	8.45	$0.00
			ENOF,NPS2,1		$0.00	8.45	$0.00
			ENOF,NPS2,1		$0.00	-8.45	$0.00
			ENOF,NPS2,1		$0.00	11.26	$0.00
			ENOF,NPS2,1		$0.00	-14.08	$0.00
			ENOF,NPS2,1		$0.00	11.26	$0.00
			ENOF,NPS2,1		$0.00	-14.08	$0.00
			ENOF,TORRA		$0.00	-37.63	$0.00
			ENOF,TORRA		$0.00	12.45	$0.00
			ENOF,TORRA		$0.00	-37.63	$0.00
			ENOF,TORRA		$0.00	12.45	$0.00
			ENOF,TORRA		$0.00	-37.63	$0.00
			ENOF,TORRA		$0.00	12.45	$0.00
			ENOF,TORRA		$0.00	-150.51	$0.00
			ENOF,TORRA		$0.00	-100.34	$0.00
			ENOF,TORRA		$0.00	-150.51	$0.00
			ENOF,TORRA		$0.00	-112.79	$0.00
			ENOF,TORRB		$0.00	49.82	$0.00
			ENOF,TORRB		$0.00	-12.45	$0.00
			ENOF,TORRB		$0.00	33.21	$0.00
			ENOF,TORRB		$0.00	49.82	$0.00
			ENOF,VP5,2,		$0.00	-198.50	$0.00
			ENOF,YWPS1		$0.00	-6.13	$0.00
		Alinta Power	NPS1	Energy	-$1000.00	0.83	-$830.00
		Alinta Power	NPS2	Energy	-$1000.00	0.19	-$190.00
22:30	*$63 615.38*	AGL (SA)	TORRA4	Lower reg	$13 800.00	-1.76	-$24 288.00
		AGL (SA)	TORRB2	Lower 60 sec	$13 800.00	-1.84	-$25 392.00
		AGL (SA)	TORRB2	Raise 60 sec	$13 800.00	-1.76	-$24 288.00
		AGL (SA)	TORRB4	Raise reg	$13 800.00	-0.28	-$3864.00
		GDF Suez	PPCCGT	Lower 6 sec	$13 499.99	-0.13	-$1755.00
		AGL (SA)	TORRA4	Lower 60 sec	$8999.90	1.76	$15 839.82
		GDF Suez	PPCCGT	Raise reg	$8869.69	0.13	$1153.06
		Alinta Power	NPS2	Raise reg	$299.77	0.19	$56.96
		GDF Suez	PPCCGT	Energy	$287.69	-0.13	-$37.40
		Alinta Power	NPS2	Lower 5 min	$93.79	0.10	$9.38
		Alinta Power	NPS2	Lower 60 sec	$93.79	0.08	$7.50

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
		Alinta Power	NPS2	Raise 5 min	$93.79	0.14	$13.13
		Alinta Power	NPS2	Raise 60 sec	$93.79	0.15	$14.07
		Alinta Power	NPS2	Raise 6 sec	$93.79	0.16	$15.01
		AGL (SA)	TORRB4	Energy	$45.99	0.83	$38.17
		EnergyAustralia	YWPS4	Energy	$20.19	-5.52	-$111.45
		Alinta Power	NPS2	Lower 6 sec	$19.79	0.13	$2.57
		GDF Suez	LOYYB1	Energy	$16.15	0.84	$13.57
		GDF Suez	LOYYB2	Energy	$16.15	0.84	$13.57
		AGL (SA)	TORRB2	Lower reg	$3.50	0.83	$2.91
		AGL (SA)	TORRA4	Raise 60 sec	$0.80	1.76	$1.41
		AGL (SA)	TORRB4	Lower reg	$0.45	0.83	$0.37
		AGL (SA)	TORRB2	Energy	$0.00	0.83	$0.00
			ENOF,AGLHA		$0.00	-46.49	$0.00
			ENOF,AGLHA		$0.00	-10.51	$0.00
			ENOF,CLEMG		$0.00	-47.32	$0.00
			ENOF,CLEMG		$0.00	10.70	$0.00
			ENOF,LADBR		$0.00	-34.87	$0.00
			ENOF,LADBR		$0.00	-7.88	$0.00
			ENOF,LADBR		$0.00	-34.87	$0.00
			ENOF,LADBR		$0.00	-7.88	$0.00
			ENOF,LOYYB		$0.00	67.43	$0.00
			ENOF,LOYYB		$0.00	-67.43	$0.00
			ENOF,LOYYB		$0.00	67.43	$0.00
			ENOF,LOYYB		$0.00	-67.43	$0.00
			ENOF,NPS1,1		$0.00	-167.72	$0.00
			ENOF,NPS1,1		$0.00	122.88	$0.00
			ENOF,NPS1,1		$0.00	-136.99	$0.00
			ENOF,NPS1,1		$0.00	37.36	$0.00
			ENOF,NPS1,1		$0.00	37.36	$0.00
			ENOF,NPS1,1		$0.00	37.36	$0.00
			ENOF,NPS1,1		$0.00	-37.36	$0.00
			ENOF,NPS1,1		$0.00	49.82	$0.00
			ENOF,NPS1,1		$0.00	-62.27	$0.00
			ENOF,NPS1,1		$0.00	49.82	$0.00
			ENOF,NPS1,1		$0.00	-62.27	$0.00
			ENOF,NPS2,1		$0.00	27.77	$0.00
			ENOF,NPS2,1		$0.00	-30.97	$0.00
			ENOF,NPS2,1		$0.00	8.45	$0.00
			ENOF,NPS2,1		$0.00	8.45	$0.00

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
			ENOF,NPS2,1		$0.00	8.45	$0.00
			ENOF,NPS2,1		$0.00	-8.45	$0.00
			ENOF,NPS2,1		$0.00	11.26	$0.00
			ENOF,NPS2,1		$0.00	-14.08	$0.00
			ENOF,NPS2,1		$0.00	11.26	$0.00
			ENOF,NPS2,1		$0.00	-14.08	$0.00
			ENOF,TORRB		$0.00	33.21	$0.00
			ENOF,TORRB		$0.00	-12.45	$0.00
			ENOF,TORRB		$0.00	8.30	$0.00
			ENOF,TORRB		$0.00	33.21	$0.00
			HALLWF1	Energy	-$89.98	0.83	-$74.68
		Alinta Power	NPS1	Energy	-$1000.00	0.83	-$830.00
		Alinta Power	NPS2	Energy	-$1000.00	0.19	-$190.00
22:35	*$21 002.29*	AGL (SA)	TORRB2	Raise 60 sec	$13 800.00	-2.15	-$29 670.00
		AGL (SA)	TORRB4	Lower 60 sec	$13 800.00	-2.15	-$29 670.00
		AGL (SA)	TORRB4	Raise 5 min	$13 800.00	1.44	$19 872.00
		AGL (SA)	TORRA4	Lower 60 sec	$8999.90	2.15	$19 349.79
		AGL (SA)	TORRA4	Energy	$64.99	0.72	$46.79
		Origin Energy	ER01	Energy	$26.01	-1.53	-$39.80
		Origin Energy	ER04	Energy	$26.01	-1.53	-$39.80
		GDF Suez	LOYYB1	Energy	$16.15	-0.05	-$0.81
		GDF Suez	LOYYB2	Energy	$16.15	-0.05	-$0.81
		CS Energy	W/HOE#2	Raise 5 min	$2.00	-3.06	-$6.12
		Origin Energy	ER01	Raise reg	$0.84	1.53	$1.29
		Origin Energy	ER04	Raise reg	$0.84	1.53	$1.29
		AGL (SA)	TORRA4	Raise 60 sec	$0.80	2.15	$1.72
		AGL (SA)	TORRA4	Lower reg	$0.45	-1.44	-$0.65
		AGL (SA)	TORRA4	Raise reg	$0.45	-0.72	-$0.32
		AGL (SA)	TORRB2	Lower reg	$0.45	0.72	$0.32
		AGL (SA)	TORRB2	Raise reg	$0.45	-0.72	-$0.32
		AGL (SA)	TORRB4	Lower reg	$0.45	0.72	$0.32
		AGL (SA)	TORRB2	Energy	$0.00	0.72	$0.00
		AGL (SA)	TORRB4	Energy	$0.00	0.72	$0.00
			ENOF,AGLHA		$0.00	-32.31	$0.00
			ENOF,CLEMG		$0.00	-40.92	$0.00
			ENOF,ER01,2		$0.00	91.91	$0.00
			ENOF,ER01,2		$0.00	91.91	$0.00
			ENOF,ER02,2		$0.00	91.91	$0.00
			ENOF,ER03,2		$0.00	91.91	$0.00

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
			ENOF,LADBR		$0.00	-30.16	$0.00
			ENOF,LADBR		$0.00	-30.16	$0.00
			ENOF,LOYYB		$0.00	-3.99	$0.00
			ENOF,LOYYB		$0.00	3.99	$0.00
			ENOF,LOYYB		$0.00	-3.99	$0.00
			ENOF,LOYYB		$0.00	3.99	$0.00
			ENOF,NPS1,1		$0.00	-187.39	$0.00
			ENOF,NPS1,1		$0.00	106.26	$0.00
			ENOF,NPS1,1		$0.00	-118.47	$0.00
			ENOF,NPS1,1		$0.00	32.31	$0.00
			ENOF,NPS1,1		$0.00	32.31	$0.00
			ENOF,NPS1,1		$0.00	32.31	$0.00
			ENOF,NPS1,1		$0.00	-32.31	$0.00
			ENOF,NPS1,1		$0.00	43.08	$0.00
			ENOF,NPS1,1		$0.00	-53.85	$0.00
			ENOF,NPS1,1		$0.00	43.08	$0.00
			ENOF,NPS1,1		$0.00	-53.85	$0.00
			ENOF,TORRA		$0.00	28.72	$0.00
			ENOF,TORRA		$0.00	28.72	$0.00
			ENOF,TORRA		$0.00	28.72	$0.00
			ENOF,TORRA		$0.00	28.72	$0.00
			ENOF,TORRA		$0.00	14.36	$0.00
			ENOF,TORRA		$0.00	28.72	$0.00
			ENOF,TORRA		$0.00	14.36	$0.00
		Alinta Power	NPS1	Energy	-$1000.00	0.72	-$720.00

Lower 60 second

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
22:00	$8999.90	AGL (SA)	TORRA4	Lower 60 sec	$8999.90	-1.00	-$8999.90
22:05	$8999.90	AGL (SA)	TORRA4	Lower 60 sec	$8999.90	-1.00	-$8999.90
22:10	$8999.90	AGL (SA)	TORRA4	Lower 60 sec	$8999.90	-1.00	-$8999.90
22:15	$13 800.00	AGL (SA)	TORRB2	Lower 60 sec	$13 800.00	-1.00	-$13 800.00
22:20	$13 800.00	AGL (SA)	TORRB2	Lower 60 sec	$13 800.00	-1.00	-$13 800.00
22:25	$13 800.00	AGL (SA)	TORRB2	Lower 60 sec	$13 800.00	-1.00	-$13 800.00
22:30	$13 800.00	AGL (SA)	TORRB2	Lower 60 sec	$13 800.00	-1.00	-$13 800.00
22:35	$13 800.00	AGL (SA)	TORRB4	Lower 60 sec	$13 800.00	-1.00	-$13 800.00

Raise 60 second

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
22:00	*$28 094.41*	GDF Suez	PPCCGT	Lower reg	$13 800.00	1.86	$25 668.00
		GDF Suez	PPCCGT	Raise reg	$13 800.00	-1.05	-$14 490.00
		AGL (SA)	TORRA4	Lower reg	$13 800.00	-0.62	-$8556.00
		GDF Suez	PPCCGT	Raise 6 sec	$13 499.99	-0.82	-$11 069.99
		Alinta Power	NPS1	Raise 5 min	$12 399.79	-0.10	-$1239.98
		Alinta Power	NPS1	Raise 60 sec	$12 399.79	-0.10	-$1239.98
		Alinta Power	NPS2	Raise 60 sec	$12 399.79	-0.90	-$11 159.81
		AGL (SA)	TORRB2	Lower 5 min	$9000.00	-0.59	-$5310.00
		AGL (SA)	TORRB4	Lower 5 min	$9000.00	-0.59	-$5310.00
		AGL (SA)	TORRA4	Lower 60 sec	$8999.90	0.53	$4769.95
		Alinta Power	NPS1	Lower 5 min	$6499.79	-0.07	-$454.99
		Alinta Power	NPS2	Lower 60 sec	$1499.79	-0.48	-$719.90
		Alinta Power	NPS1	Lower 60 sec	$299.77	-0.06	-$17.99
		Alinta Power	NPS2	Raise reg	$299.77	1.15	$344.74
		GDF Suez	PPCCGT	Energy	$287.69	1.86	$535.10
		AGL (SA)	TORRB2	Energy	$45.99	-0.59	-$27.13
		AGL (SA)	TORRB4	Energy	$45.99	-0.59	-$27.13
		AGL Energy	BW01	Energy	$25.46	-0.20	-$5.09
		AGL Energy	BW02	Energy	$25.46	-0.20	-$5.09
		AGL Energy	BW04	Energy	$25.46	-0.20	-$5.09
		GDF Suez	LOYYB1	Energy	$16.15	-0.02	-$0.32
		GDF Suez	LOYYB2	Energy	$16.15	-0.02	-$0.32
			ENOF,BW01,4		$0.00	-55.89	$0.00
			ENOF,BW02,4		$0.00	-55.89	$0.00
			ENOF,BW03,4		$0.00	-55.89	$0.00
			ENOF,LOYYB		$0.00	-1.60	$0.00
			ENOF,LOYYB		$0.00	1.60	$0.00
			ENOF,LOYYB		$0.00	-1.60	$0.00
			ENOF,LOYYB		$0.00	1.60	$0.00
			ENOF,NPS1,2		$0.00	13.39	$0.00
			ENOF,TORRB		$0.00	-23.46	$0.00
			ENOF,TORRB		$0.00	-23.46	$0.00
			ENOF,TORRB		$0.00	-23.46	$0.00
			ENOF,TORRB		$0.00	-23.46	$0.00
		Alinta Power	NPS1	Energy	-$0.95	-0.13	$0.12
22:05	*$21 975.72*	GDF Suez	PPCCGT	Lower reg	$13 800.00	-1.28	-$17 664.00
		AGL (SA)	TORRA4	Lower reg	$13 800.00	1.28	$17 664.00
		AGL (SA)	TORRA4	Raise reg	$13 800.00	-1.28	-$17 664.00
		Alinta Power	NPS2	Raise 60 sec	$12 399.79	-1.00	-$12 399.79

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
		AGL (SA)	TORRA4	Lower 60 sec	$8999.90	0.53	$4769.95
		Alinta Power	NPS2	Lower 60 sec	$8899.79	-0.53	-$4716.89
		Alinta Power	NPS2	Raise reg	$6499.79	1.28	$8319.73
		GDF Suez	PPCCGT	Energy	$287.69	-1.28	-$368.24
		AGL (SA)	TORRA4	Energy	$64.99	1.28	$83.19
			ENOF,TORRA		$0.00	51.20	$0.00
			ENOF,TORRA		$0.00	51.20	$0.00
			ENOF,TORRA		$0.00	51.20	$0.00
			ENOF,TORRA		$0.00	51.20	$0.00
			ENOF,TORRA		$0.00	25.60	$0.00
			ENOF,TORRA		$0.00	51.20	$0.00
			ENOF,TORRA		$0.00	25.60	$0.00
22:10	*$21 690.67*	AGL (SA)	TORRB4	Raise reg	$13 800.00	-1.28	-$17 664.00
		Alinta Power	NPS2	Raise 60 sec	$12 399.79	-1.00	-$12 399.79
		AGL (SA)	TORRA4	Lower 60 sec	$8999.90	0.53	$4769.95
		Alinta Power	NPS2	Lower 60 sec	$8899.79	-0.53	-$4716.89
		Alinta Power	NPS2	Raise reg	$6499.79	1.28	$8319.73
22:15	*$14 059.74*	GDF Suez	PPCCGT	Lower reg	$13 800.00	-1.00	-$13 800.00
		GDF Suez	PPCCGT	Raise reg	$13 800.00	1.00	$13 800.00
		AGL (SA)	TORRA4	Lower reg	$13 800.00	1.00	$13 800.00
		AGL (SA)	TORRA4	Lower 60 sec	$13 800.00	-1.00	-$13 800.00
		AGL (SA)	TORRA4	Raise 60 sec	$13 800.00	-1.00	-$13 800.00
		AGL (SA)	TORRB2	Lower 60 sec	$13 800.00	1.00	$13 800.00
		AGL (SA)	TORRB4	Raise reg	$13 800.00	-1.00	-$13 800.00
		GDF Suez	PPCCGT	Energy	$287.69	-1.00	-$287.69
		Origin Energy	ER01	Energy	$26.01	0.60	$15.61
		Origin Energy	ER04	Energy	$26.01	0.60	$15.61
		EnergyAustralia	YWPS4	Energy	$20.19	-0.42	-$8.48
		GDF Suez	LOYYB1	Energy	$16.15	0.17	$2.75
		GDF Suez	LOYYB2	Energy	$16.15	0.17	$2.75
			ENOF,ER01,2		$0.00	-35.84	$0.00
			ENOF,ER01,2		$0.00	-35.84	$0.00
			ENOF,ER02,2		$0.00	-35.84	$0.00
			ENOF,ER03,2		$0.00	-35.84	$0.00
			ENOF,LOYYB		$0.00	13.31	$0.00
			ENOF,LOYYB		$0.00	-13.31	$0.00
			ENOF,LOYYB		$0.00	13.31	$0.00
			ENOF,LOYYB		$0.00	-13.31	$0.00
22:20	$13 800.00	AGL (SA)	TORRB4	Raise 60 sec	$13 800.00	-1.00	-$13 800.00

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
22:25	$13 800.00	AGL (SA)	TORRB2	Raise 60 sec	$13 800.00	-1.00	-$13 800.00
22:30	$13 800.00	AGL (SA)	TORRB2	Raise 60 sec	$13 800.00	-1.00	-$13 800.00
22:35	$13 800.00	AGL (SA)	TORRB2	Raise 60 sec	$13 800.00	-1.00	-$13 800.00

Lower 5 minutes

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
22:00	$13 800.00	AGL (SA)	TORRA4	Lower reg	$13 800.00	-1.00	-$13 800.00
22:05	*$14 061.76*	GDF Suez	PPCCGT	Lower reg	$13 800.00	-1.00	-$13 800.00
		GDF Suez	PPCCGT	Energy	$287.69	-1.00	-$287.69
		Stanwell	TARONG#1	Energy	$24.97	0.60	$14.98
		Stanwell	TARONG#3	Energy	$24.97	0.60	$14.98
		EnergyAustralia	YWPS4	Energy	$20.19	-0.41	-$8.28
		GDF Suez	LOYYB1	Energy	$16.15	0.08	$1.29
		GDF Suez	LOYYB2	Energy	$16.15	0.08	$1.29
		EnergyAustralia	YWPS1	Energy	$16.15	0.07	$1.13
		Hazelwood	HWPS1	Raise 6 sec	$1.50	1.07	$1.61
		AGL Energy	BW02	Raise 60 sec	$0.80	1.19	$0.95
		Stanwell	TARONG#1	Raise 60 sec	$0.79	-0.60	-$0.47
		Stanwell	TARONG#1	Raise 6 sec	$0.79	-0.54	-$0.43
		Stanwell	TARONG#3	Raise 60 sec	$0.79	-0.60	-$0.47
		Stanwell	TARONG#3	Raise 6 sec	$0.79	-0.54	-$0.43
			ENOF,LOYYB		$0.00	-6.44	$0.00
			ENOF,LOYYB		$0.00	-6.44	$0.00
			ENOF,TARON		$0.00	65.48	$0.00
			ENOF,TARON		$0.00	65.48	$0.00
			ENOF,YWPS1		$0.00	-5.72	$0.00
22:10	*$14 055.97*	GDF Suez	PPCCGT	Lower reg	$13 800.00	-1.00	-$13 800.00
		GDF Suez	PPCCGT	Raise reg	$13 800.00	1.00	$13 800.00
		AGL (SA)	TORRB4	Raise reg	$13 800.00	-1.00	-$13 800.00
		GDF Suez	PPCCGT	Energy	$287.69	-1.00	-$287.69
		Origin Energy	ER01	Energy	$30.80	0.39	$12.01
		Origin Energy	ER02	Energy	$30.80	0.39	$12.01
		Origin Energy	ER03	Energy	$30.80	0.39	$12.01
		EnergyAustralia	YWPS4	Energy	$20.19	-0.41	-$8.28
		GDF Suez	LOYYB1	Energy	$16.15	0.09	$1.45
		GDF Suez	LOYYB2	Energy	$16.15	0.09	$1.45
		EnergyAustralia	YWPS1	Energy	$16.15	0.08	$1.29
			ENOF,ER01,3		$0.00	23.39	$0.00

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
			ENOF,ER02,3		$0.00	23.39	$0.00
			ENOF,ER03,3		$0.00	23.39	$0.00
			ENOF,LOYYB		$0.00	-6.97	$0.00
			ENOF,LOYYB		$0.00	-6.97	$0.00
			ENOF,YWPS1		$0.00	-6.19	$0.00
22:15	*$14 059.74*	GDF Suez	PPCCGT	Lower reg	$13 800.00	-1.00	-$13 800.00
		GDF Suez	PPCCGT	Raise reg	$13 800.00	1.00	$13 800.00
		AGL (SA)	TORRB4	Raise reg	$13 800.00	-1.00	-$13 800.00
		GDF Suez	PPCCGT	Energy	$287.69	-1.00	-$287.69
		Origin Energy	ER01	Energy	$26.01	0.60	$15.61
		Origin Energy	ER04	Energy	$26.01	0.60	$15.61
		EnergyAustralia	YWPS4	Energy	$20.19	-0.42	-$8.48
		GDF Suez	LOYYB1	Energy	$16.15	0.17	$2.75
		GDF Suez	LOYYB2	Energy	$16.15	0.17	$2.75
			ENOF,ER01,2		$0.00	-35.84	$0.00
			ENOF,ER01,2		$0.00	-35.84	$0.00
			ENOF,ER02,2		$0.00	-35.84	$0.00
			ENOF,ER03,2		$0.00	-35.84	$0.00
			ENOF,LOYYB		$0.00	13.31	$0.00
			ENOF,LOYYB		$0.00	-13.31	$0.00
			ENOF,LOYYB		$0.00	13.31	$0.00
			ENOF,LOYYB		$0.00	-13.31	$0.00
22:20	$9000.00	AGL (SA)	TORRB4	Lower 5 min	$9000.00	-1.00	-$9000.00
22:25	$9000.00	AGL (SA)	TORRB2	Lower 5 min	$9000.00	-1.00	-$9000.00
22:30	*$32 399.30*	AGL (SA)	TORRA4	Lower reg	$13 800.00	-1.00	-$13 800.00
		AGL (SA)	TORRB2	Lower 60 sec	$13 800.00	-1.00	-$13 800.00
		AGL (SA)	TORRB2	Raise 60 sec	$13 800.00	-1.00	-$13 800.00
		AGL (SA)	TORRA4	Lower 60 sec	$8999.90	1.00	$8999.90
		AGL (SA)	TORRA4	Raise 60 sec	$0.80	1.00	$0.80
22:35	*$18 599.75*	AGL (SA)	TORRB2	Raise 60 sec	$13 800.00	-1.00	-$13 800.00
		AGL (SA)	TORRB4	Lower 60 sec	$13 800.00	-1.00	-$13 800.00
		AGL (SA)	TORRA4	Lower 60 sec	$8999.90	1.00	$8999.90
		AGL (SA)	TORRA4	Raise 60 sec	$0.80	1.00	$0.80
		AGL (SA)	TORRA4	Lower reg	$0.45	-1.00	-$0.45

Raise 5 minutes

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
22:00	*$15 686.24*	GDF Suez	PPCCGT	Lower reg	$13 800.00	1.45	$20 010.00

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
		GDF Suez	PPCCGT	Raise reg	$13 800.00	-0.82	-$11 316.00
		AGL (SA)	TORRA4	Lower reg	$13 800.00	-0.48	-$6624.00
		GDF Suez	PPCCGT	Raise 6 sec	$13 499.99	-0.64	-$8639.99
		Alinta Power	NPS1	Raise 5 min	$12 399.79	-0.08	-$991.98
		Alinta Power	NPS1	Raise 60 sec	$12 399.79	-0.08	-$991.98
		Alinta Power	NPS2	Raise 60 sec	$12 399.79	0.08	$991.98
		AGL (SA)	TORRB2	Lower 5 min	$9000.00	-0.46	-$4140.00
		AGL (SA)	TORRB4	Lower 5 min	$9000.00	-0.46	-$4140.00
		Alinta Power	NPS1	Lower 5 min	$6499.79	-0.06	-$389.99
		Alinta Power	NPS2	Lower 60 sec	$1499.79	0.04	$59.99
		Alinta Power	NPS1	Lower 60 sec	$299.77	-0.04	-$11.99
		Alinta Power	NPS2	Raise reg	$299.77	-0.10	-$29.98
		GDF Suez	PPCCGT	Energy	$287.69	1.45	$417.15
		AGL (SA)	TORRB2	Energy	$45.99	-0.46	-$21.16
		AGL (SA)	TORRB4	Energy	$45.99	-0.46	-$21.16
		AGL Energy	BW01	Energy	$25.46	-0.16	-$4.07
		AGL Energy	BW02	Energy	$25.46	-0.16	-$4.07
		AGL Energy	BW04	Energy	$25.46	-0.16	-$4.07
		GDF Suez	LOYYB1	Energy	$16.15	-0.02	-$0.32
		GDF Suez	LOYYB2	Energy	$16.15	-0.02	-$0.32
			ENOF,BW01,4		$0.00	-43.66	$0.00
			ENOF,BW02,4		$0.00	-43.66	$0.00
			ENOF,BW03,4		$0.00	-43.66	$0.00
			ENOF,LOYYB		$0.00	-1.25	$0.00
			ENOF,LOYYB		$0.00	1.25	$0.00
			ENOF,LOYYB		$0.00	-1.25	$0.00
			ENOF,LOYYB		$0.00	1.25	$0.00
			ENOF,NPS1,2		$0.00	10.46	$0.00
			ENOF,TORRB		$0.00	-18.33	$0.00
			ENOF,TORRB		$0.00	-18.33	$0.00
			ENOF,TORRB		$0.00	-18.33	$0.00
			ENOF,TORRB		$0.00	-18.33	$0.00
		Alinta Power	NPS1	Energy	-$0.95	-0.10	$0.10
22:05	*$14 022.70*	GDF Suez	PPCCGT	Lower reg	$13 800.00	-1.00	-$13 800.00
		AGL (SA)	TORRA4	Lower reg	$13 800.00	1.00	$13 800.00
		AGL (SA)	TORRA4	Raise reg	$13 800.00	-1.00	-$13 800.00
		GDF Suez	PPCCGT	Energy	$287.69	-1.00	-$287.69
		AGL (SA)	TORRA4	Energy	$64.99	1.00	$64.99
			ENOF,TORRA		$0.00	40.00	$0.00

DI	Dispatch Price ($/MW)	Participant	Unit	Service	Offer price ($/MW)	Marginal change	Contribution
			ENOF,TORRA		$0.00	40.00	$0.00
			ENOF,TORRA		$0.00	40.00	$0.00
			ENOF,TORRA		$0.00	40.00	$0.00
			ENOF,TORRA		$0.00	20.00	$0.00
			ENOF,TORRA		$0.00	40.00	$0.00
			ENOF,TORRA		$0.00	20.00	$0.00
22:10	$13 800.00	AGL (SA)	TORRB4	Raise reg	$13 800.00	-1.00	-$13 800.00
22:15	$13 800.00	AGL (SA)	TORRB4	Raise reg	$13 800.00	-1.00	-$13 800.00
22:20	$13 800.00	AGL (SA)	TORRB2	Raise 5 min	$13 800.00	-1.00	-$13 800.00
22:25	$13 800.00	AGL (SA)	TORRB4	Raise reg	$13 800.00	-1.00	-$13 800.00
22:30	$13 800.00	AGL (SA)	TORRB4	Raise reg	$13 800.00	-1.00	-$13 800.00
22:35	$13 800.00	AGL (SA)	TORRB4	Raise 5 min	$13 800.00	-1.00	-$13 800.00