



Electricity spot prices above \$5,000/MWh

**New South Wales &
Queensland,
10 June 2021**

9 August 2021

© Commonwealth of Australia 2021

This work is copyright. In addition to any use permitted under the Copyright Act 1968, all material contained within this work is provided under a Creative Commons Attributions 3.0 Australia licence, with the exception of:

- the Commonwealth Coat of Arms
- the ACCC and AER logos
- any illustration, diagram, photograph or graphic over which the Australian Competition and Consumer Commission does not hold copyright, but which may be part of or contained within this publication. The details of the relevant licence conditions are available on the Creative Commons website, as is the full legal code for the CC BY 3.0 AU licence.

Requests and inquiries concerning reproduction and rights should be addressed to the Director, Corporate Communications, Australian Competition and Consumer Commission, GPO Box 4141, CANBERRA ACT 2601 or publishing.unit@acc.gov.au.

Inquiries about this publication should be addressed to:

Australian Energy Regulator
GPO Box 520
MELBOURNE VIC 3001

Tel: (03) 9290 1444
Fax: (03) 9290 1457

Email: AERInquiry@ aer.gov.au
AER Reference: AER212799

Amendment Record

Version	Date	Pages
Final report	9/08/2021	23

Contents

1	Obligation	4
2	Summary	5
3	Analysis	6
	3.1. Overview of actual and expected conditions	6
	3.2. Demand	7
	3.3. Supply conditions	8
	3.3.1 Outages	8
	3.3.2 Capacity offered	9
	3.3.3 6 pm and 6.30 pm trading intervals	11
	3.4. Lack of Reserve	12
	Appendix A: Significant rebids	13
	Appendix B: 5 minute offers	16
	Appendix C: Price setter	21

1 Obligation

The Australian Energy Regulator (AER) regulates energy markets and networks under national legislation and rules in eastern and southern Australia (known as the National Energy Market (NEM)), 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 the performance of energy markets, including the annual State of the energy market report and biennial effective competition report, to assist stakeholders and the wider community.

The AER is required to publish a report whenever the electricity spot price exceeds \$5,000 per megawatt hour (\$/MWh) in accordance with clause 3.13.7 (d) of the National Electricity Rules.

The report:

- describes the significant factors contributing to the spot price exceeding \$5,000/MWh, including withdrawal of generation capacity and network availability;
- assesses whether rebidding contributed to the spot price exceeding \$5,000/MWh;
- identifies the marginal scheduled generating units; and
- identifies all units with offers for the trading interval equal to or greater than \$5,000/MWh and compares these dispatch offers to relevant dispatch offers in previous trading intervals.

These reports are designed to examine market events and circumstances that contributed to wholesale market price outcomes and are not an indicator of potential compliance issues or enforcement action.

2 Summary

On 10 June the spot price in New South Wales exceeded \$5,000/MWh for the 6 pm and 6.30 pm trading intervals, and in Queensland for the 6 pm trading interval. High prices were forecast from 12.30 pm the day prior.

The main drivers were similar to price events the previous week, and related to high demand and reduced supply.¹

- Demand was high during the evening peak, driven by extremely cold weather increasing heating requirements.
 - New South Wales hit its highest winter peak demand since 2010 at around 13,000 MW.
- Planned and unplanned generator outages meant almost 5,800 MW of baseload generation in across Queensland and New South Wales was unavailable.
 - About 3,300 MW of this capacity was undergoing planned maintenance, as expected during the lower demand periods of spring and autumn.
 - The remaining 1,800 MW of capacity on unplanned outages was all in Queensland, most of which had been out since significant failure of the Callide C unit 4 on 25 May.
 - Another 700 MW was unavailable due to technical issues – mostly at Liddell and Gladstone power stations.
- Interactions between the energy and FCAS markets limited the effective amount of low priced capacity available during high prices.
- No further imports could be sourced from Victoria, as the VIC-NSW interconnector was already operating at or close to its nominal limit.

Rebidding of capacity from low to high prices did not contribute to prices above \$5,000/MWh.

Though up to 91% of capacity across the 2 regions was offered below \$5,000/MWh, between 47 MW to 378 MW of capacity priced over \$5,000/MWh was required to meet demand.

¹ See the AER's 3 June 2021 report <https://www.aer.gov.au/wholesale-markets/performance-reporting/prices-above-5000-mwh-3-june-2021-qld>

3 Analysis

The high priced intervals discussed in this report occurred when Queensland and New South Wales were aligned, as interconnector flows between the two regions were unconstrained. This meant the same units set price across the two regions, so our analysis will consider them as one region. When we discuss a region specific price, the NSW price is used, but the Queensland price was similar. When discussing demand and availability, we have used the sum of both regions.

On 10 June the spot price in New South Wales exceeded \$5,000/MWh for the 6 pm and 6.30 pm trading intervals, and in Queensland for the 6 pm trading interval. All prices were forecast from 12.30 pm the day prior.

3.1 Overview of actual and expected conditions

The spot price in New South Wales was \$8,022/MWh and \$5,027/MWh for the 6 pm and 6.30 pm trading intervals respectively. The spot price in Queensland was \$7,933/MWh and \$4,955/MWh for the 6 pm and 6.30 pm trading intervals respectively, though the 6.30 pm interval in Queensland did not breach our reporting thresholds.

Table 1 shows that:

- spot prices at the cap of \$15,000/MWh were forecast from at least 12 hours out.
- prices were forecast to exceed \$12,000/MWh 4 hours ahead from 5 pm to 8 pm but only the 6 and 6.30 pm price actually exceeded \$5,000/MWh.
- demand was 98 MW to 187 MW lower than forecast 4 hours prior.
- availability was between 246 MW to 292 MW lower than forecast 4 hours prior, and 485 MW to 522 MW lower than forecast 12 hours prior.

Table 1: Actual and forecast spot price, demand and available capacity

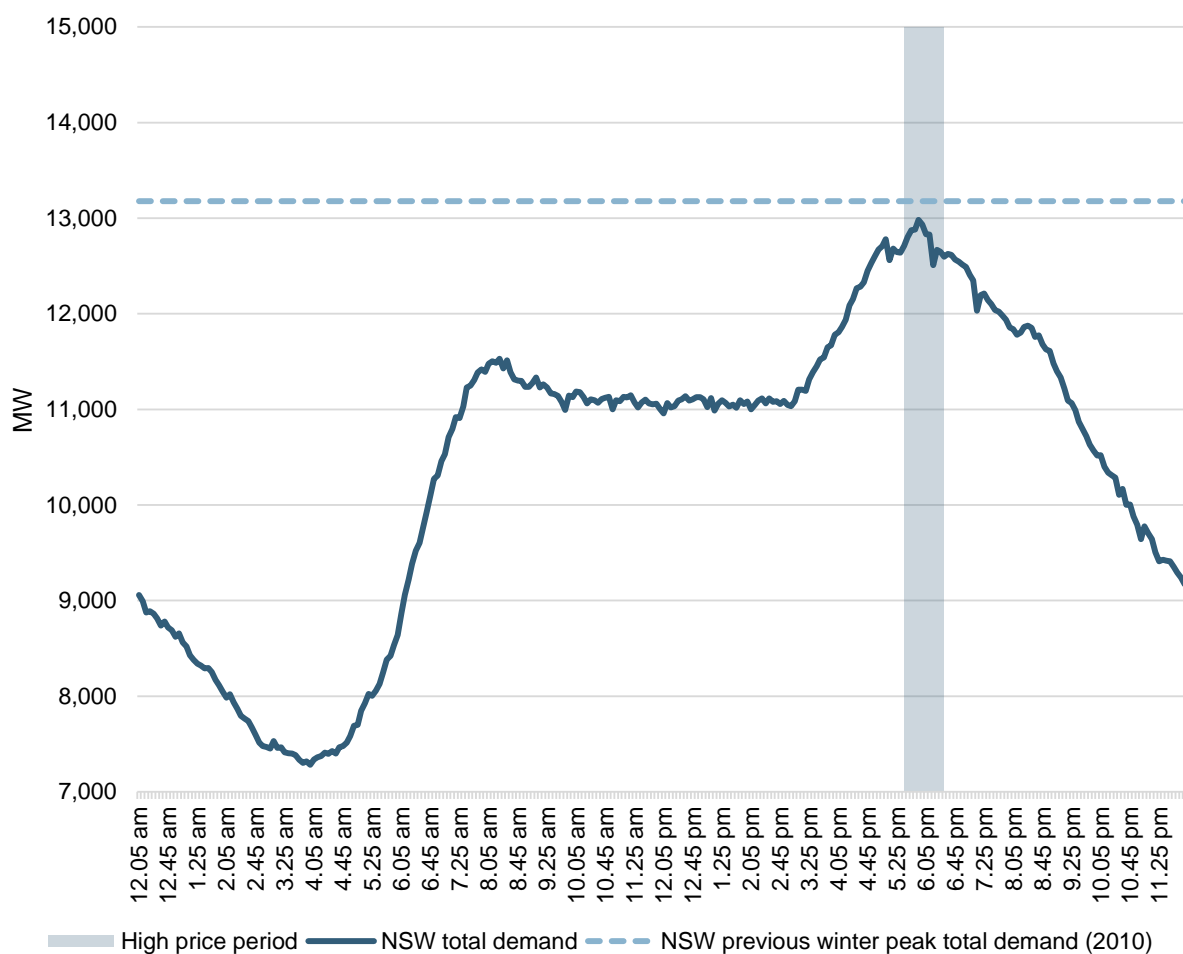
Trading interval	Price (\$/MWh)			Demand (MW)			Availability (MW)		
	Actual	4 hr forecast	12 hr forecast	Actual	4 hr forecast	12 hr forecast	Actual	4 hr forecast	12 hr forecast
5 pm	2,463	15,000	435	19,481	19,287	19,429	21,066	21,516	21,807
5.30 pm	2,401	15,000	14,747	20,064	20,165	20,194	20,900	21,184	21,472
6 pm	8,022	15,000	15,000	20,614	20,712	20,746	20,858	21,151	21,380
6.30 pm	5,027	15,000	15,000	20,495	20,683	20,757	20,871	21,117	21,357
7 pm	2,341	14,666	14,882	20,430	20,447	20,586	20,857	21,096	21,360
7.30 pm	2,352	12,993	13,096	19,973	20,063	20,240	20,834	21,092	21,348
8 pm	2,383	12,715	8,374	19,670	19,715	19,930	20,830	21,037	21,330
8.30 pm	2,165	101	8,373	19,534	19,338	19,549	20,851	20,710	20,997
9 pm	2,175	95	774	19,164	18,841	19,041	20,741	20,657	21,267
9.30 pm	2,247	227	453	18,537	18,186	18,373	20,708	20,637	21,246

3.2 Demand

A very strong, widespread cold front brought low temperatures to south-east Australia over 9 and 10 June. In New South Wales, a large number of locations recorded record low June daily maximum temperatures.² This drove up demand in both New South Wales and Queensland.

Demand also peaked during the 6 pm trading interval at around 12,982 MW. Figure 1 shows actual demand (dark blue line) in New South Wales against the previous winter peak demand (dotted light blue line) of 13,176 MW in 2010.³ Though demand was slightly below levels forecast 4 hours prior, it was sufficiently high enough to require capacity priced above \$5,000/MWh to be dispatched.

Figure 1: New South Wales demand



Note – total demand is used by the national electricity market dispatch engine when determining price and is the demand against which generator targets for scheduled and semi-scheduled are calculated.

Demand was also high in Queensland during the high priced trading intervals. Demand was almost 7,700 MW at the start of the 6 pm trading interval and steadily climbed to over 7,800 MW by the end of the 6.30 pm trading interval. It then peaked at 7,930 MW during the 7 pm trading interval, about 260 MW less than the peak winter demand that occurred in 2018 at 8,191 MW.

² <http://www.bom.gov.au/climate/current/month/aus/archive/202106.summary.shtml> .

³ Winter demand refers to the period 1 May to 31 July each year.

Similar to New South Wales, though demand was below record level it was sufficiently high to require capacity priced above \$5,000/MWh to be dispatched.

3.3 Supply conditions

3.3.1 Outages

There was around 5,800 MW of baseload generation unavailable across Queensland and New South Wales, limiting the amount of low-priced capacity available (Table 2).

Around 5,100 MW of generation was on planned and unplanned outages.

- Almost 3,300 MW of that capacity was on planned outage, which was expected as generators generally undertake maintenance in autumn before returning to service for the winter peak from mid- to late-June.
- The remaining 1,800 MW of capacity of unplanned outages was all in Queensland. Most of this capacity had been out since the significant failure of the Callide C 4 unit on 25 May 2021 which we detail in our \$5,000/MWh report on that event.⁴

The balance of 700 MW of capacity unavailable came from generators with limited output due to technical issues. AGL Energy removed 300 MW of capacity from Liddell at 12.28 pm due to coal quality issues and then a further 30 MW effective 6 pm due to milling limits. Capacity at Gladstone was also limited due to testing on unit 5. Most of this capacity was previously offered at the floor, further limiting the amount of low-priced capacity available. Any significant rebids are contained in *Appendix A: Significant rebids*.

Table 2: Unavailable generation

Participant	Station	DUID	Registered capacity (MW)	Max avail offered (MW)	Unavailable capacity (MW)	Comment
Queensland						
CS Energy	Callide B	CALL_B_1	350	0	350	Unplanned outage following significant failure of Callide C 4 on 25 May
		CALL_B_2	350	0	350	Unplanned outage following significant failure of Callide C 4 on 25 May
	Gladstone	GSTONE2	280	0	280	Unplanned outage due to tube leak, out from 6 June
		GSTONE5	280	160	120	Availability limited due to testing – removed day prior

⁴ <https://www.aer.gov.au/wholesale-markets/performance-reporting/prices-above-5000-mwh-25-may-2021-queensland-and-nsw>

Participant	Station	DUID	Registered capacity (MW)	Max avail offered (MW)	Unavailable capacity (MW)	Comment
	Kogan Creek	KPP_1	744	0	744	Planned outage from 1 June
Callide Power Trading	Callide C	CPP_3	420	0	420	Unplanned outage following significant failure of Callide C 4 on 25 May
		CPP_4	420	0	420	Unplanned outage following significant failure of Callide C 4 on 25 May
Stanwell	Stanwell	STAN-2	365	0	365	Planned outage from 19 May
	Tarong	TARONG# 1	350	0	350	Planned outage from 30 April
Subtotal					3,399	
New South Wales						
AGL Energy	Bayswater	BW02	660	0	660	Planned outage from 5 March
	Liddell	LD01	500	0	500	Planned outage from 6 May
		LD02	500	320	180	Coal quality issues
		LD03	500	300	200	Coal quality issues
		LD04	500	300	200	Coal quality issues
Delta Electricity	Vales Point	VP6	660	0	660	Planned outage from 9 April
Subtotal					2,400	
Total					5,799	

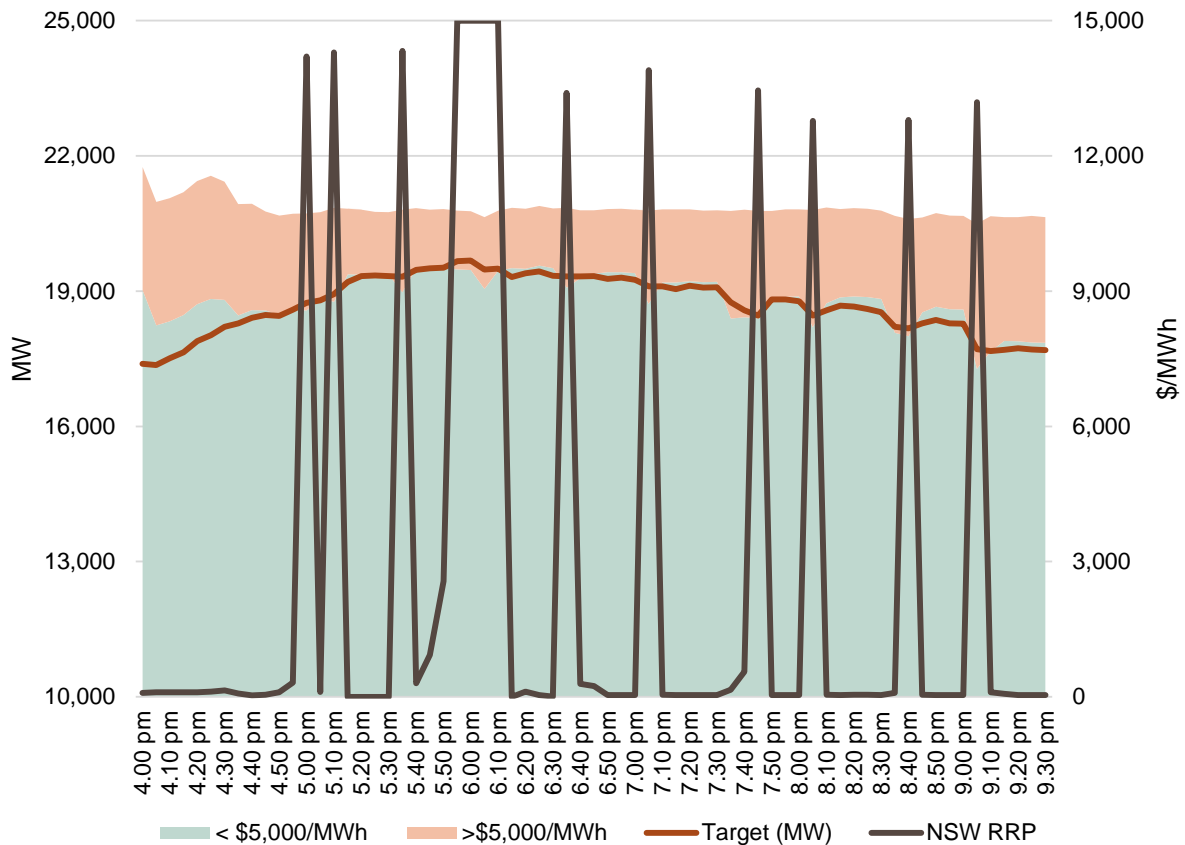
Note: max avail offered is during the trading interval where prices were above \$5,000/MWh.

3.3.2 Capacity offered

Figure 2 shows how much available capacity was offered above and below \$5,000/MWh and how much local generation was targeted to meet demand across Queensland and New South Wales. During the 6 pm and 6.30 pm trading intervals, at least 91% of capacity across the 2 regions was offered below \$5,000/MWh. Despite this, higher-priced capacity was still required to meet demand. Other forecast high spot prices throughout the afternoon and evening

did not eventuate due to participant rebidding. In response to high prices at the start of trading intervals, participants would rebid capacity to low prices for the remainder of that trading interval, resulting in lower than forecast spot prices.

Figure 2: Generation offered above and below \$5,000/MWh, target and dispatch price



Note – dispatch price used is New South Wales as a proxy as both regions are shown in the chart.

Participants in both Queensland and New South Wales offered capacity priced above \$5,000/MWh, and are listed in [Table 3](#). The bids for all participants in Queensland and NSW with capacity priced at or above \$5,000/MWh for the high-price periods are set out in [Appendix B: Closing bids](#).

The majority of this capacity was set up the day prior. Participants rebid up to 720 MW of capacity from prices above \$5,000/MWh to the floor. Rebidding of capacity from low to high prices did not contribute to prices above \$5,000/MWh. Any significant rebids are contained in [Appendix A: Significant rebids](#).

Table 3: Capacity offered above \$5,000/MWh

Participant	Station	Fuel type	Registered Capacity (MW)	Capacity offered >\$5,000/MWh (MW)	
				6 pm	6.30 pm
Queensland					
Arrow Energy	Braemar 2	Gas	519	56	

Participant	Station	Fuel type	Registered Capacity (MW)	Capacity offered >\$5,000/MWh (MW)	
				6 pm	6.30 pm
CleanCo	Swanbank	Gas	385	15	25
	Wivenhoe	Hydro	570	300	320
CS Energy	Gladstone	Coal-Black	1,680	3	10
ERM Power	Oakey	Gas	288	85	128
InterGen	Millmerran	Coal-Black	852	17	
Origin Energy	Mt Stuart	Liquid	419	156	266
	Roma	Gas	80	37	37
RTA Yarwun	Yarwun	Gas	154	-	5
New South Wales					
Origin Energy	Eraring	Coal-Black	2,880	70	70
	Uranquinty	Gas	724	224	224
Snowy Hydro	Colongra	Gas	724	356	231
	Tumut	Hydro	1,500	160	148

Note: Capacity offered >\$5,000/MWh is calculated by using average offered capacity above \$5,000/MWh when the dispatch price in the trading interval is >\$5,000/MWh.

3.3.3 6 pm and 6.30 pm trading intervals

During the 6 pm and 6.30 pm trading intervals, there was little capacity offered in both regions between \$295/MWh and \$10,300/MWh. Most of the capacity originally offered between \$300/MWh and \$5,000/MWh up to 12 hours out was rebid to lower prices. This meant that small changes in demand, availability and interconnector flows could cause large fluctuations in price.

In addition, requirements for mainland raise FCAS services reduced the effective amount of low-priced capacity available to meet demand in the energy market. For example, a unit with 100 MW of low priced capacity may only be able to dispatch 80 MW in energy as the remaining 20 MW is needed to provide raise services. As a result, capacity priced above \$5,000/MWh may be required in its place. This trade-off between the provision of FCAS and energy effectively reduced low priced capacity by up to 60 MW and contributed to high dispatch prices.

At 5.35 pm, the dispatch price of \$14,332/MWh was close to forecast 4 hours prior, and as in previous trading intervals participants rebid capacity to lower prices (Appendix A). Dispatch prices ranged between \$304/MWh and \$2,567/MWh from 5.40 pm to 5.50 pm.

Then at 5.55 pm, demand in New South Wales increased by 103 MW and in Queensland by 57 MW. Demand in New South Wales hit a peak of 12,982 MW – the highest winter demand since 2010. The VIC-NSW interconnector was already flowing close to its nominal limit, so any further help from Victoria was limited.

The combination of the three factors above meant capacity in Queensland and New South Wales priced above \$5,000/MWh was required. The dispatch price was at or close to the price ceiling of \$15,000/MWh from 5.55 pm to 6.10 pm, with between 47 MW and 378 MW of capacity priced above \$5,000/MWh required to meet demand.

Dispatch prices then dropped below \$116/MWh for the remainder of the 6.30 pm trading interval as cheaper-priced generation came online and was no longer ramp-constrained and the VIC-NSW became unconstrained. The generators involved in setting the price during the high-price periods and how that price was determined by the market systems are detailed in *Appendix C: Price Setter*.

3.4 Lack of Reserve

When demand and supply conditions are tight AEMO notifies the market, through Lack Of Reserve (LOR) notices, to elicit a market response to increase generation or reduce demand. LORs have three levels – LOR 1, 2 and 3 with LOR 1 being the least severe and LOR 3 meaning there is not enough supply to meet demand. An actual LOR 3 requires AEMO to shed load in order to maintain power system security.

Due to the tight supply and demand conditions, AEMO forecast a LOR 1 in New South Wales from 4.30 pm to 6.30 pm and in Queensland from 5.30 pm to 6 pm.⁵ An actual LOR 1 was declared in New South Wales from 4.45 pm to 7 pm, and in Queensland from 6 pm to 6.30 pm.⁶

Australian Energy Regulator

August 2021

⁵ AEMO market notices 86849 and 86894 from <https://aemo.com.au/en/market-notices?MarketNoticeList>

⁶ AEMO market notices 86887 and 86902 from <https://aemo.com.au/en/market-notices?MarketNoticeList>

Appendix A: Significant rebids

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

Table 4: Queensland significant rebids for 6 pm trading interval

Submit time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
3.35 pm		Origin Energy	Mt Stuart	75	15,000	-1,000	1530A inc nsw dem 5pd 12502mw > 30pd 11646mw @hhe1630 sl
4.13 pm		ERM Power	Oakey	90	<14,701	-1,000	F 1610 1610 commit to economic start
4.24 pm		CS Energy	Gladstone	20	5,001	-1,000	1623A qld1 di 10-06-2021 16:25:00 rrp \$100.73 vs p5 rrp \$85.95 @ p5 run 10-06-2021 16:20:00 - rrp change of \$14.78-sl
5.12 pm		Origin Energy	Mt Stuart	165	15,000	-1,000	1710A constraint management - N>>N-NIL__B_15M sl
5.31 pm	5.40 pm	CS Energy	Gladstone	10	15,000	-1,000	1731A qld1 di 10-06-2021 17:35:00 demand 7699.21mw vs p5 demand 7577.18 @ p5 run 10-06-2021 17:30:00 change of 122.03mw-sl
5.32 pm	5.40 pm	Arrow Energy	Braemar 2	168	>13,988	-1,000	1730A qld price higher than forecast sl
5.32 pm	5.40 pm	ERM Power	Oakey	256	13,501	-1,000	A 1731 1730 increase in qld rrp for 1735: \$13,988 dispatch@1730 vs \$4,553.34 pd5@1725
5.33 pm	5.40 pm	InterGen	Millmerran	50	15,000	-1,000	qld1 rrp change +9435 (17:30 ds di 10/06/21 17:35 value 13988 vs 17:25 p5 di 10/06/21 17:35 value 4553) sl
5.37 pm	5.45 pm	CleanCo	Swanbank	15	14,200	-1,000	1736A change qld 5 min pd rrp-sl
5.37 pm	5.45 pm	CleanCo	Wivenhoe	30	15,000	-1,000	1736A change qld 5 min pd rrp-sl

Table 5: New South Wales significant rebids for 6 pm trading interval

Submit time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
9.05 am		Snowy Hydro	Colongra	356	15,000	-1,000	08:34:00 A NSW 30min pd -500 sensitivity \$4,235.59 higher than 30min pd 19:00@08:04 (\$12,611.09) sl
9.05 am		Snowy Hydro	Tumut	140	<300	15,000	08:34:00 A NSW 30min pd -500 sensitivity \$4,235.59 higher than 30min pd 19:00@08:04 (\$12,611.09) sl
9.05 am		Snowy Hydro	Guthega	68	15,000	-1,000	08:34:00 A NSW 30min pd -500 sensitivity \$4,235.59 higher than 30min pd 19:00@08:04 (\$12,611.09) sl
11.23 am		AGL Energy	Bayswater	-10	-1,000	N/A	1140~P~010 unexpected/plant limits~106 aux/plant failure~
12.28 pm		AGL Energy	Liddell	-300	-1,000	N/A	12:15~P~020 reduction in avail cap~202 coal quality issues
3.13 pm		Origin Energy	Uranquinty	280	15,000	-1,000	1511A INC NSW dem 5pd 11830 mw > 30pd 11318mw @hhe1600 sl
4.17 pm		AGL Energy	Bayswater	-130	-1,000	N/A	1615~P~010 unexpected/plant limits~101 milling limits~
4.47 pm		AGL Energy	Bayswater	60	N/A	-1,000	1640~P~030 increase in avail cap~301 plant limit lifted - oil firing~
5.06 pm		Infigen Energy	Smithfield	30	15,983	-1,065	1700~A~NSW price dp@1710 for 1710 13991 higher than 5pd@1705 sl~~
5.08 pm		AGL Energy	Bayswater	30	N/A	-1,000	1705~P~030 increase in avail cap~301 plant limit lifted - oil firing~
5.53 pm	6 pm	AGL Energy	Liddell	-30	-1,000	N/A	1753~P~010 unexpected/plant limits~101 milling limits~

Table 6: New South Wales significant rebids, 6.30 pm trading interval

Submit time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
9.05 am		Snowy Hydro	Colongra	356	15,000	-1,000	08:34:00 A NSW 30min pd - 500 sensitivity \$4,235.59 higher than 30min pd 19:00@08:04 (\$12,611.09) sl
9.05 am		Snowy Hydro	Tumut	145	<300	15,000	08:34:00 A NSW 30min pd - 500 sensitivity \$4,235.59 higher than 30min pd 19:00@08:04 (\$12,611.09) sl
9.05 am		Snowy Hydro	Guthega	68	15,000	-1,000	08:34:00 A NSW 30min pd - 500 sensitivity \$4,235.59 higher than 30min pd 19:00@08:04 (\$12,611.09) sl
11.23 am		AGL Energy	Bayswater	-10	-1,000	N/A	1140~P~010 unexpected/plant limits~106 aux/plant failure~
12.28 pm		AGL Energy	Liddell	-300	-1,000	N/A	12:15~P~020 reduction in avail cap~202 coal quality issues
3.13 pm		Origin Energy	Uranquinty	280	15,000	-1,000	1511A INC NSW dem 5pd 11830 mw > 30pd 11318mw @hhe1600 sl
4.17 pm		AGL Energy	Bayswater	-130	-1,000	N/A	1615~P~010 unexpected/plant limits~101 milling limits~
4.47 pm		AGL Energy	Bayswater	60	N/A	-1,000	1640~P~030 increase in avail cap~301 plant limit lifted - oil firing~
5.01 pm		Infigen Energy	Woodlawn WF	38	14,700	-1,000	1640~A~NSW price 5pd@1700 for 1710 14324 lower than 5pd@1655 sl~~
5.06 pm		Infigen Energy	Smithfield	30	15,983	-1,065	1700~A~NSW price dp@1710 for 1710 13991 higher than 5pd@1705 sl~~
5.08 pm		AGL Energy	Bayswater	30	N/A	-1,000	1705~P~030 increase in avail cap~301 plant limit lifted - oil firing~
5.53 pm	6 pm	AGL Energy	Liddell	-30	-1,000	N/A	1753~P~010 unexpected/plant limits~101 milling limits~
5.58 pm	6.05 pm	Snowy Hydro	Colongra	125	15,000	-1,000	17:45:05 A NSW 5min actual price \$2,566.83 higher than 5min pd 17:50@17:41 (\$2,566.83) sl
6.05 pm	6.15 pm	AGL Energy	Liddell	-10	-1,000	N/A	1800~P~010 unexpected/plant limits~101 milling limits~

Appendix B: 5 minute offers

Figure B1 to B9 highlight the 5 minute offers for participants in Queensland and New South Wales with capacity priced at or above \$5,000/MWh during the trading intervals in which the spot price exceeded \$5,000/MWh. They also show generation output and the dispatch price.

Queensland

Figure B1. Arrow Energy (Braemar 2) closing bids, dispatch and dispatch price

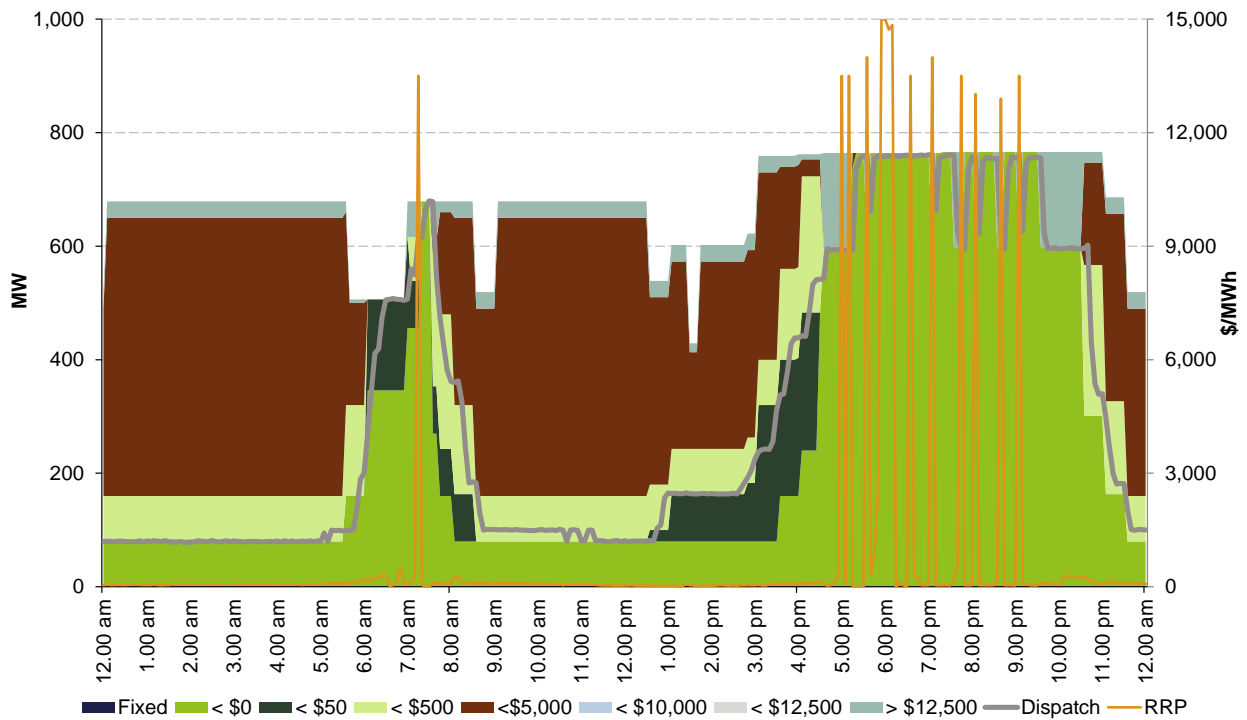


Figure B2. CleanCo (Wivenhoe, Swanbank E, Barron Gorge and Kareeya) closing bids, dispatch and dispatch price

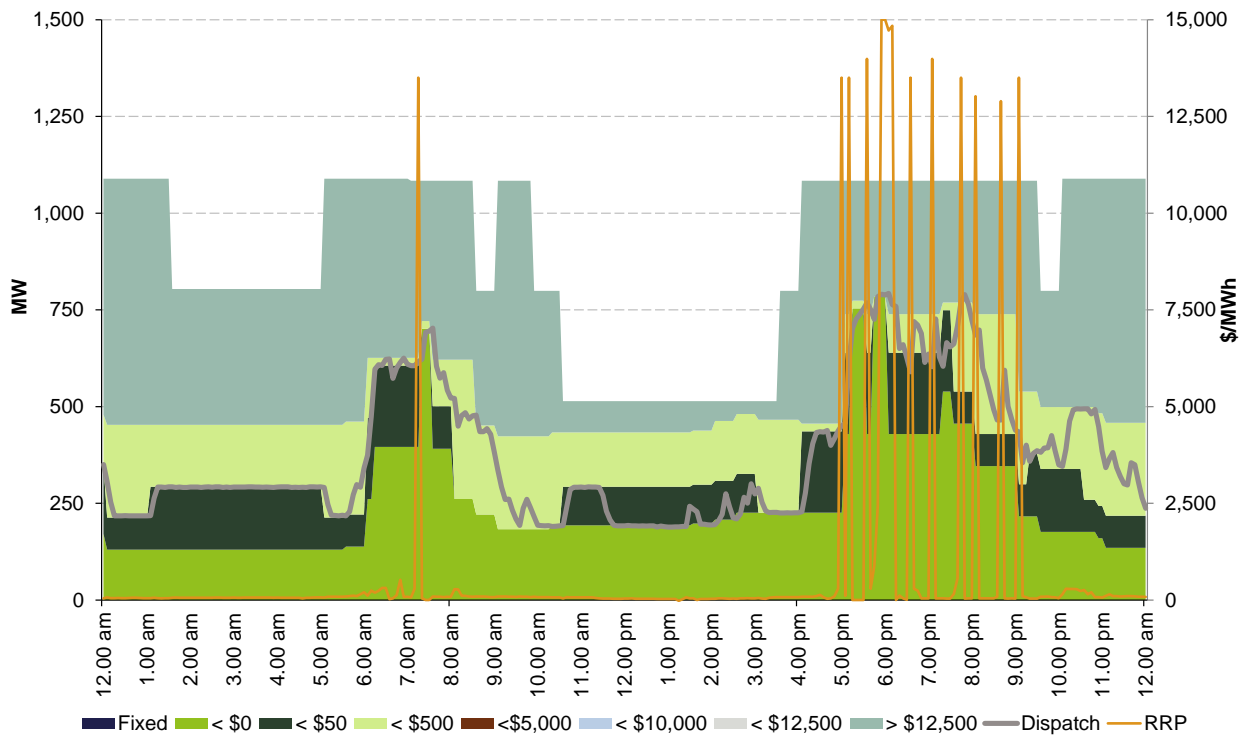


Figure B3. CS Energy (Callide B, Gladstone, Kogan Creek) closing bids, dispatch and dispatch price

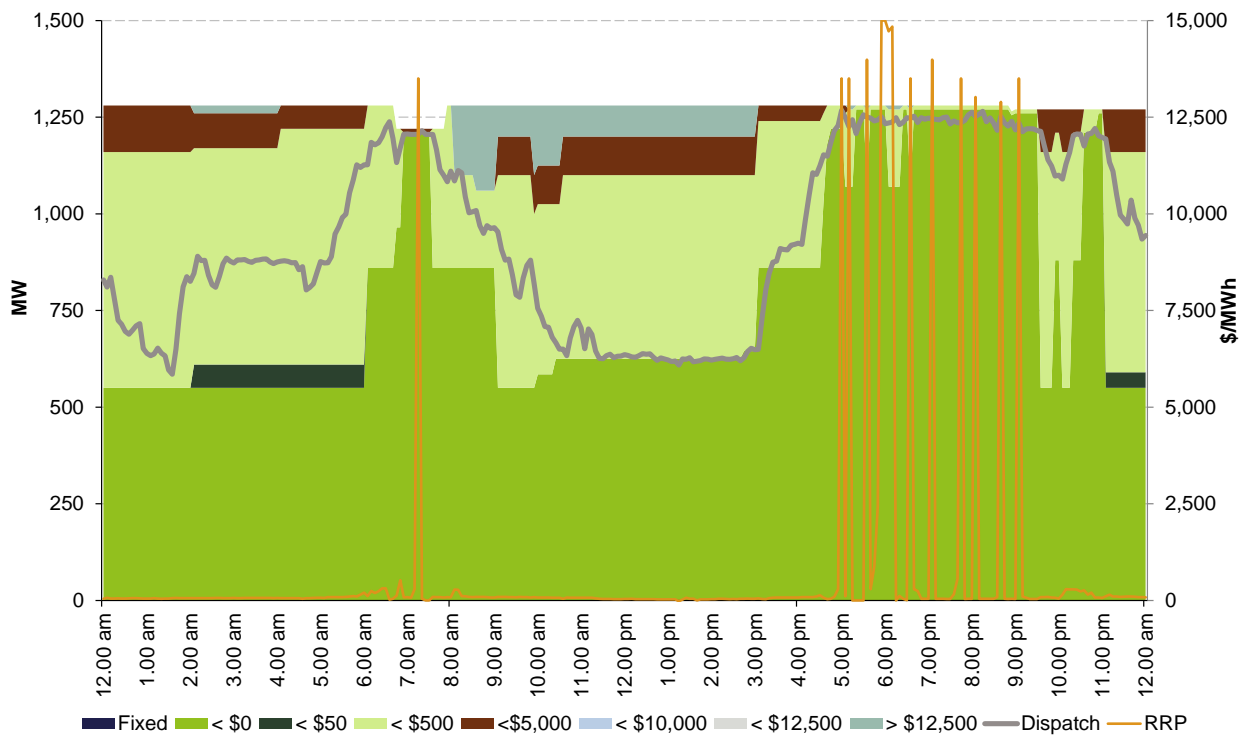


Figure B4. ERM Power (Oakey power station) closing bids, dispatch and dispatch price

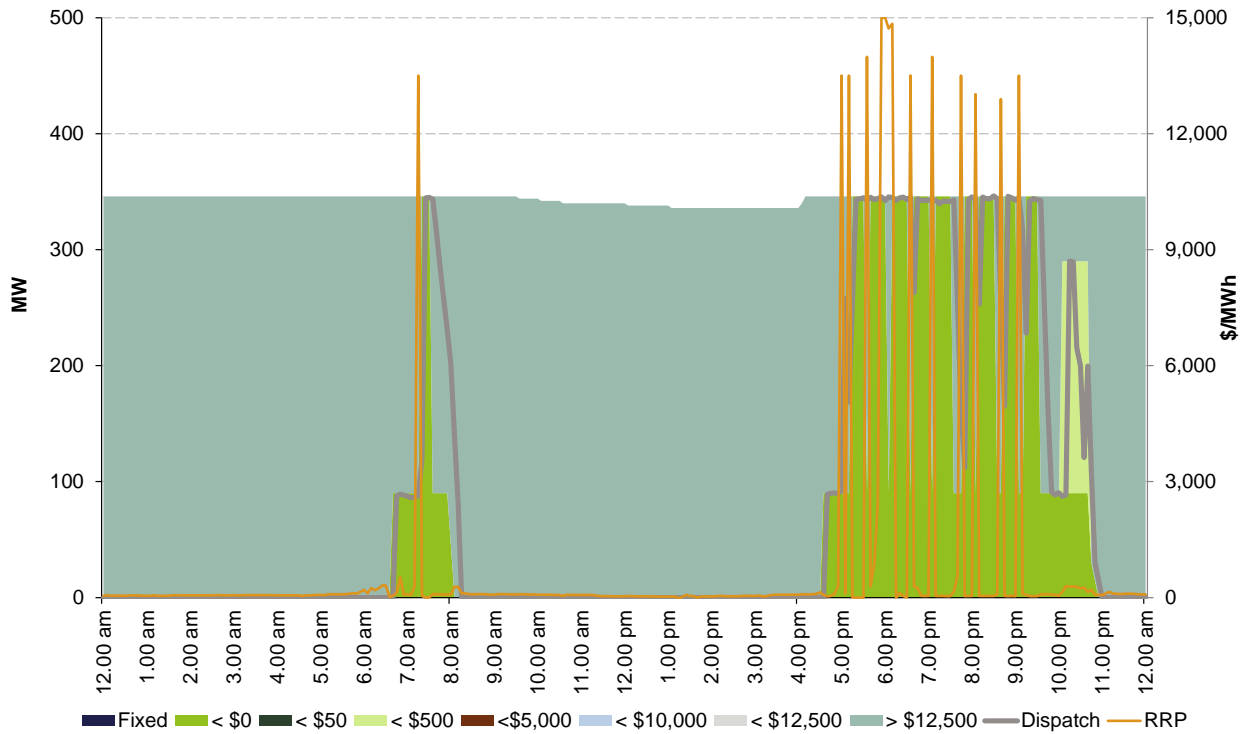


Figure B5. InterGen (Millmerran) closing bids, dispatch and dispatch price

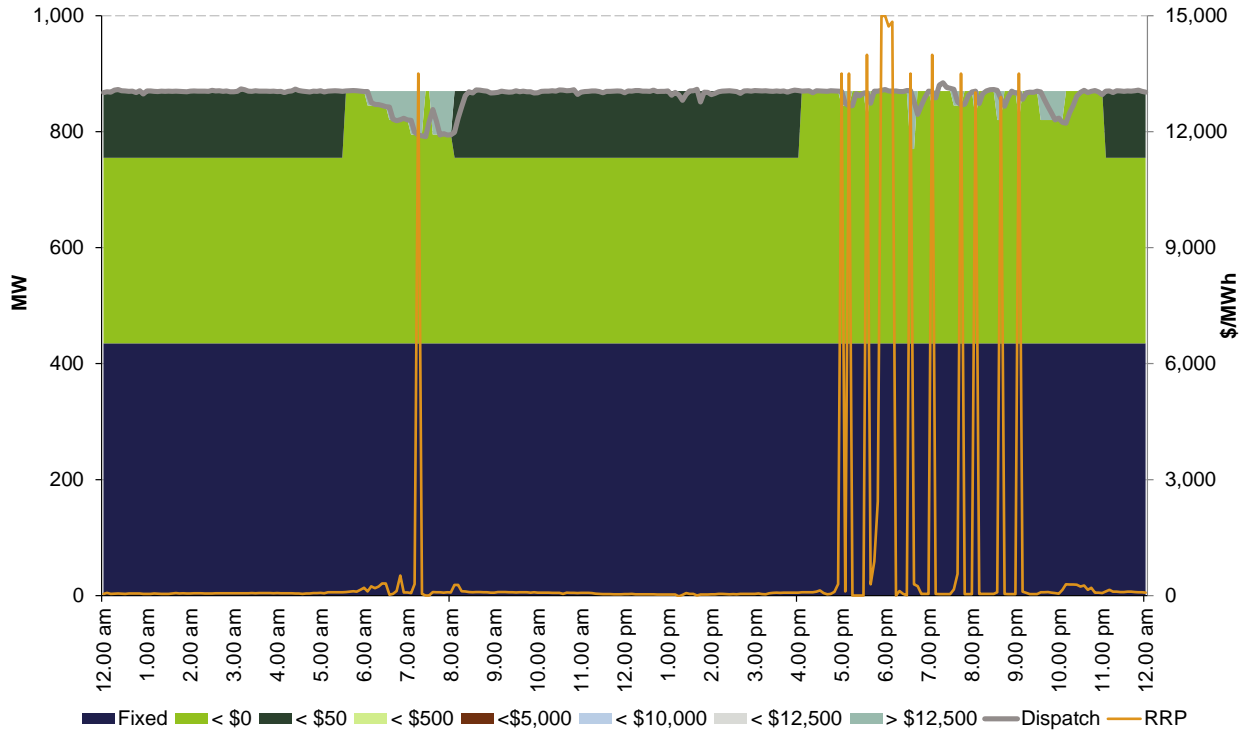


Figure B6. Origin Energy (Darling Downs, Mt Stuart, Roma) closing bids, dispatch and dispatch price

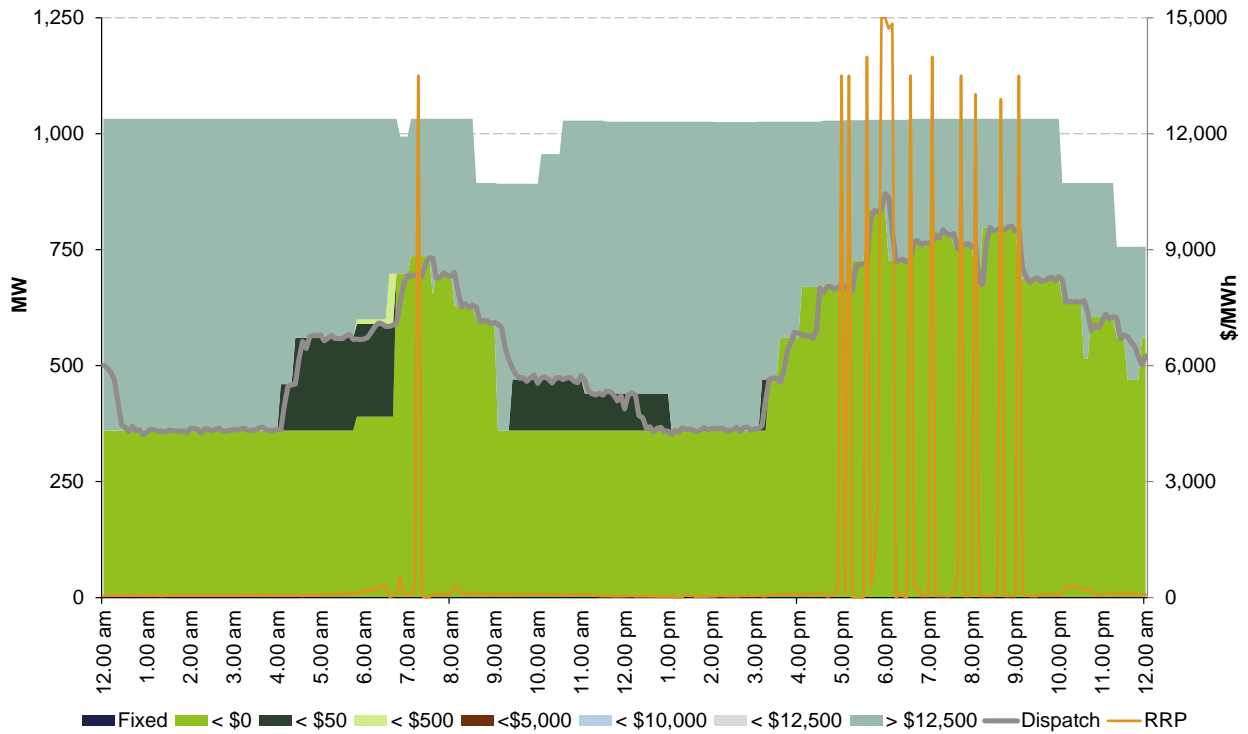
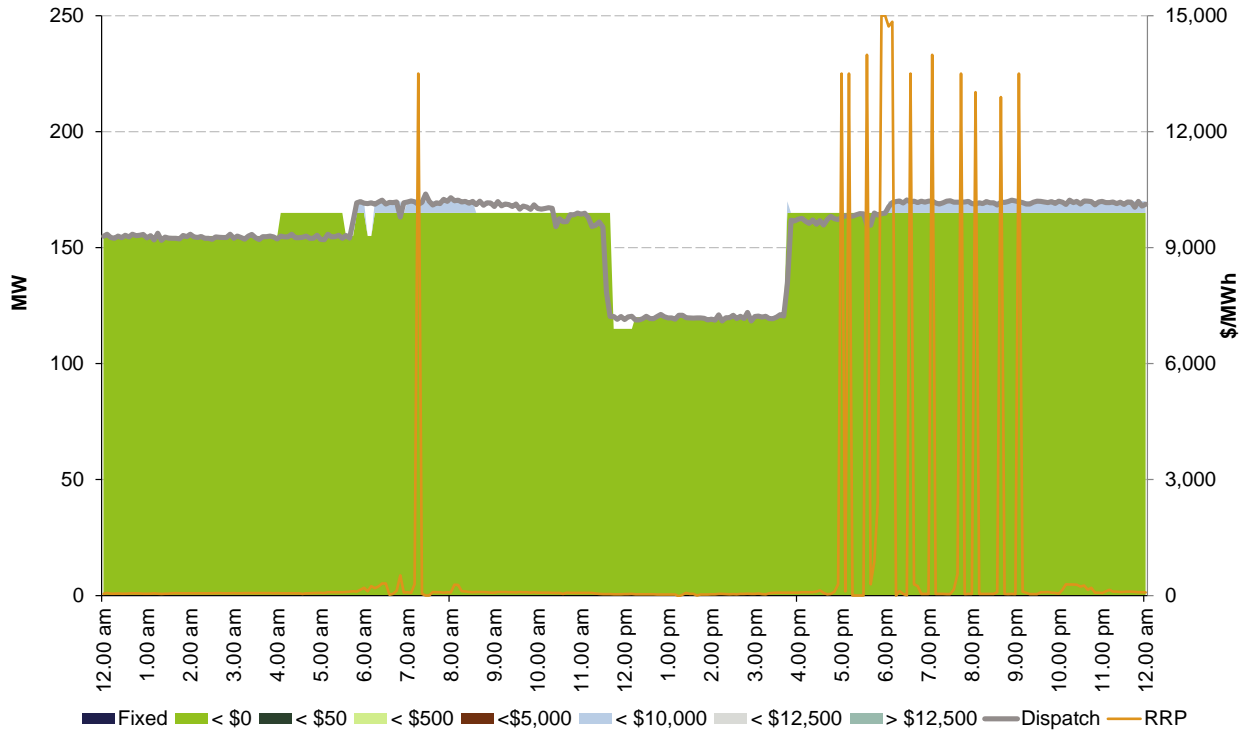


Figure B7. RTA Yarwun (Yarwun) closing bids, dispatch and dispatch price



New South Wales

Figure B8. Origin Energy (Eraring, Shoalhaven, Uranquinty) closing bids, dispatch and dispatch price

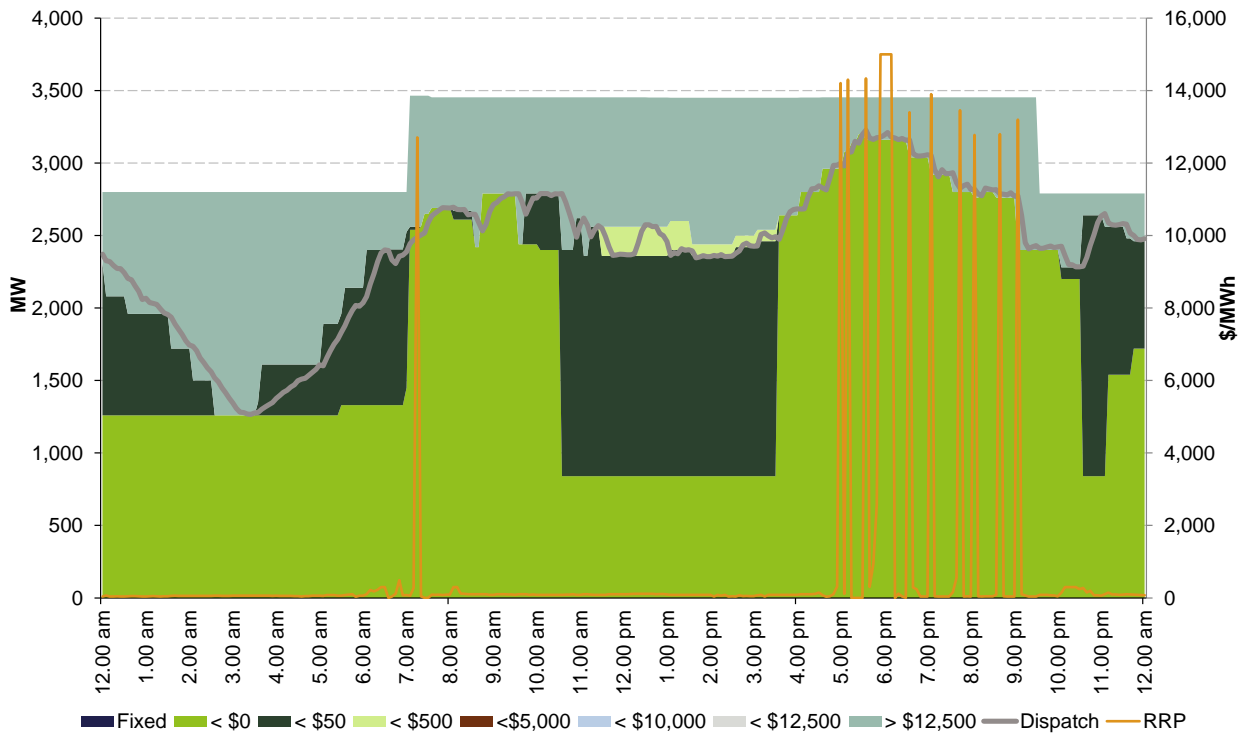
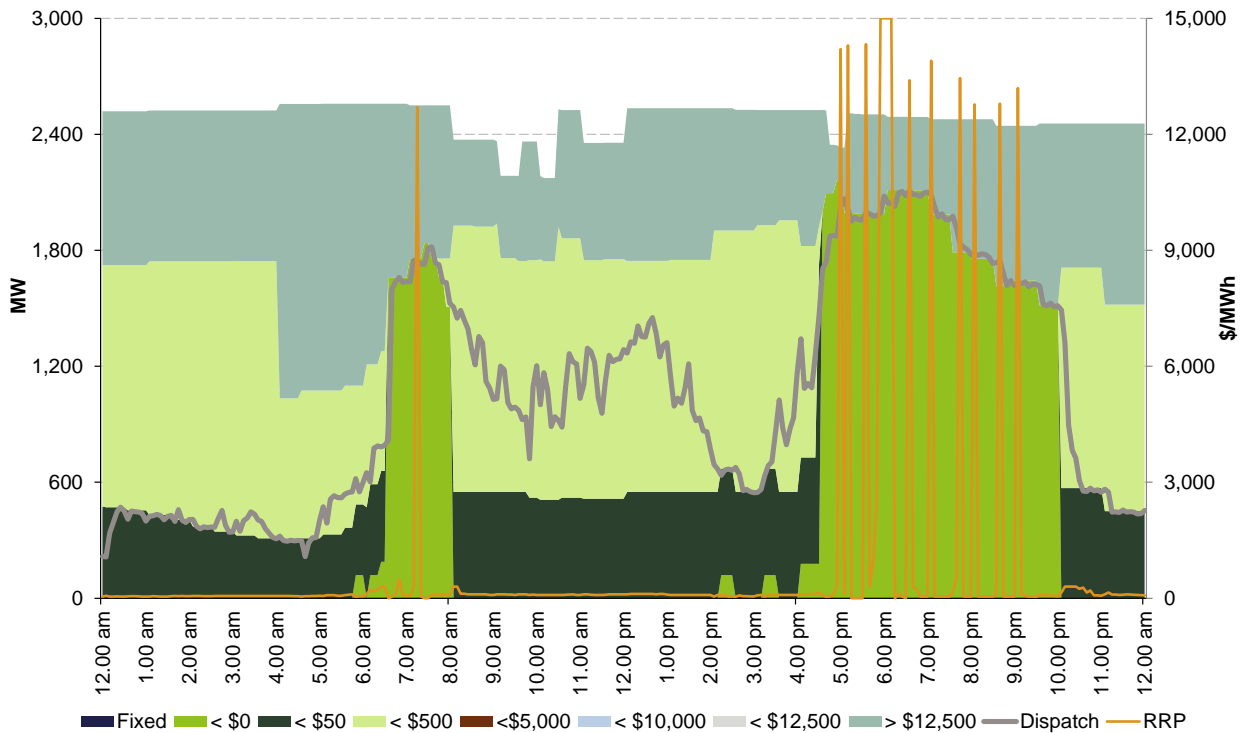


Figure B9. Snowy Hydro (Colongra, Tumut, Upper Tumut, Guthega, Blowering) closing bids, dispatch and dispatch price



Appendix C: Price setter

The following tables identify for the trading interval in which the spot price exceeded \$5,000/MWh, each 5 minute dispatch interval price and the generating units involved in setting the energy price. This information is published by AEMO.⁷ The 30-minute spot price is the average of the 6 dispatch interval prices. We have only included the price setter data for New South Wales here as the regions were aligned and the same units set price in both regions. The dispatch prices that are in italics are capped at the price cap of \$15,000/MWh when published by AEMO.

Table 7: 10 June 2021 - NSW price setter 6 pm

DI	Dispatch Price (\$/MWh)	Participant	Unit	Service	Offer price (\$/MWh)	Marginal change	Contribution
17:35	\$14,332.38	Arrow Energy	BRAEMAR5	Energy	\$13,988.00	0.34	\$4,755.92
		Arrow Energy	BRAEMAR6	Energy	\$13,988.00	0.34	\$4,755.92
		Arrow Energy	BRAEMAR7	Energy	\$13,988.00	0.34	\$4,755.92
17:40	\$303.55	CleanCo	W/HOE#2	Energy	\$292.00	1.04	\$303.68
17:45	\$ 929.56	Hydro Tasmania	TUNGATIN	Energy	\$130.22	6.52	\$849.03
		Basslink	T-V-MNSP1,VIC1	Energy	\$0.01	6.14	\$0.06
		Snowy Hydro	MURRAY	Energy	\$0.00	-4.69	\$0.00
		Energy	YWPS3	Raise 60	\$39.00	6.14	\$239.46
		Hydro Tasmania	GORDON	Raise 60	\$26.00	-6.14	-\$159.64
17:50	\$2,566.83	Hydro Tasmania	BASTYAN	Energy	\$130.25	2.16	\$281.34
		Hydro Tasmania	GORDON	Energy	\$55.36	4.47	\$247.46
		Basslink	T-V-	Energy	\$0.01	6.17	\$0.06
		Snowy Hydro	MURRAY	Energy	\$0.00	-4.71	\$0.00
		EnergyAustralia	YWPS2	Raise reg	\$450.50	6.17	\$2,779.59
		CS Energy	GSTONE4	Raise reg	\$23.73	-6.17	-\$146.41
		Hydro Tasmania	REECE1	Raise 60	\$26.00	-6.17	-\$160.42
		CS Energy	GSTONE4	Raise 60	\$7.73	6.17	\$47.69
		Hydro Tasmania	BASTYAN	Raise 6	\$86.00	-0.17	-\$14.62
		Hydro Tasmania	GORDON	Raise 6	\$86.00	-6.00	-\$516.00
17:55	\$15,000	Origin Energy	ER01	Energy	\$15,000.00	0.33	\$4,950.00
		Origin Energy	ER03	Energy	\$15,000.00	0.33	\$4,950.00
		Origin Energy	ER04	Energy	\$15,000.00	0.33	\$4,950.00
		Snowy Hydro	TUMUT3	Energy	\$14,999.50	0.20	\$2,999.90
		Engie	PPCCGT	Energy	\$65.44	-1.00	-\$65.44
		Snowy Hydro	MURRAY	Energy	\$0.00	0.91	\$0.00

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

DI	Dispatch Price (\$/MWh)	Participant	Unit	Service	Offer price (\$/MWh)	Marginal change	Contribution
		Enel X Australia	ASNENC1	Raise 5	\$0.99	1.00	\$0.99
		Origin Energy	ER01	Raise 5	\$0.00	-0.33	\$0.00
		Origin Energy	ER03	Raise 5	\$0.00	-0.33	\$0.00
		Origin Energy	ER04	Raise 5	\$0.00	-0.33	\$0.00
		Engie	PPCCGT	Raise 60	\$8.90	1.00	\$8.90
		Origin Energy	ER01	Raise 60	\$0.00	-0.33	\$0.00
		Origin Energy	ER03	Raise 60	\$0.00	-0.33	\$0.00
		Origin Energy	ER04	Raise 60	\$0.00	-0.33	\$0.00
		Engie	PPCCGT	Raise 6	\$8.88	1.00	\$8.88
		Origin Energy	ER01	Raise 6	\$0.00	-0.33	\$0.00
		Origin Energy	ER03	Raise 6	\$0.00	-0.33	\$0.00
		Origin Energy	ER04	Raise 6	\$0.00	-0.33	\$0.00
18:00	\$15,000	Origin Energy	ER01	Energy	\$15,000.00	0.33	\$4,950.00
		Origin Energy	ER03	Energy	\$15,000.00	0.33	\$4,950.00
		Origin Energy	ER04	Energy	\$15,000.00	0.33	\$4,950.00
		Snowy Hydro	TUMUT3	Energy	\$14,999.50	0.16	\$2,399.92
		Basslink	T-V-MNSP1,VIC1	Energy	\$0.01	-1.00	-\$0.01
		Snowy Hydro	MURRAY	Energy	\$0.00	0.76	\$0.00
		Hydro Tasmania	REECE2	Energy	-\$69.65	-1.06	\$73.83
		CS Energy	GSTONE3	Raise reg	\$33.73	1.00	\$33.73
		Origin Energy	ER01	Raise reg	\$0.00	-0.33	\$0.00
		Origin Energy	ER03	Raise reg	\$0.00	-0.33	\$0.00
		Origin Energy	ER04	Raise reg	\$0.00	-0.33	\$0.00
		Hydro Tasmania	GORDON	Raise 60	\$26.00	1.00	\$26.00
		CS Energy	GSTONE3	Raise 60	\$13.73	-1.00	-\$13.73
		Hydro Tasmania	CETHANA	Raise 6	\$1,000.00	0.72	\$720.00
		Hydro Tasmania	REECE2	Raise 6	\$42.00	0.27	\$11.34
		CS Energy	GSTONE3	Raise 6	\$13.73	-1.00	-\$13.73
Spot Price		\$8,022/MWh					

Table 8: 10 June 2021 - NSW price setter 6.30 pm

DI	Dispatch Price (\$/MWh)	Participant	Unit	Service	Offer price (\$/MWh)	Marginal change	Contribution
18:05	\$15,000	CleanCo	SWAN_E	Energy	\$14,200.00	1.02	\$14,484.00
		Snowy Hydro	PTSTAN1	Energy	\$379.95	1.34	\$509.13
		AGL Energy	LYA1	Energy	\$5.01	-1.53	-\$7.67
		Hydro Tasmania	CETHANA	Raise 5	\$0.90	1.02	\$0.92
		Origin Energy	ER02	Raise 5	\$0.00	-1.02	\$0.00

DI	Dispatch Price (\$/MWh)	Participant	Unit	Service	Offer price (\$/MWh)	Marginal change	Contribution
		CleanCo	SWAN_E	Raise reg	\$0.00	-1.02	\$0.00
		Origin Energy	ER02	Raise reg	\$0.00	1.02	\$0.00
		Energy Australia	YWPS4	Raise 60 sec	\$39.00	-0.51	-\$19.89
		AGL Energy	LYA1	Raise 60	\$22.00	1.53	\$33.66
		Origin Energy	ER02	Raise 60	\$0.00	-1.02	\$0.00
		AGL Energy	LYA1	Raise 6	\$21.00	1.02	\$21.42
		Origin Energy	ER02	Raise 6	\$0.00	-1.02	\$0.00
18:10	\$14,999.50	Snowy Hydro	TUMUT3	Energy	\$14,999.50	1.00	\$14,999.50
18:15	\$0	AGL Hydro	DARTM1	Energy	\$0.00	1.21	\$0.00
18:20	\$116.65	CS Energy	GSTONE3	Energy	\$70.73	0.50	\$35.37
		CS Energy	GSTONE4	Energy	\$70.73	0.50	\$35.37
		Basslink	T-V-	Energy	\$0.01	-0.69	-\$0.01
		Moorabool Wind	MOORAWF	Energy	-\$31.58	0.66	-\$20.84
		Hydro Tasmania	GORDON	Energy	-\$69.47	-0.74	\$51.41
		CS Energy	GSTONE3	Raise reg	\$33.73	-0.50	-\$16.87
		CS Energy	GSTONE4	Raise reg	\$33.73	-0.50	-\$16.87
		Energy Australia	BALBG1	Raise reg	\$7.89	0.99	\$7.81
		Hydro Tasmania	GORDON	Raise 60	\$26.00	0.99	\$25.74
		Energy Australia	BALBG1	Raise 60 sec	\$12.89	-0.99	-\$12.76
		Hydro Tasmania	GORDON	Raise 6	\$42.00	0.99	\$41.58
		Energy Australia	BALBG1	Raise 6 sec	\$13.25	-0.99	-\$13.12
18:25	\$41.39	CleanCo	SWAN_E	Energy	\$42.00	0.99	\$41.58
18:30	\$6.06	AGL Energy	LYA1	Energy	\$5.01	1.21	\$6.06
Spot Price		\$5,027/MWh					