Electricity spot prices above $5000/MWh

Victoria and South Australia, 18 January 2018

20 March 2018

AUSTRALIAN ENERGY REGULATOR

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1 Obligation

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

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

The AER is required to publish a report whenever the electricity spot price exceeds $5000/MWh in accordance with clause 3.13.7 (d) the National Electricity Rules.

The report:

- describes the significant factors contributing to the spot price exceeding $5000/MWh, including withdrawal of generation capacity and network availability;
- assesses whether rebidding contributed to the spot price exceeding $5000/MWh;
- identifies the marginal scheduled generating units; and
- identifies all units with offers for the trading interval equal to or greater than $5000/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 enforcement action.

2 Summary

On 18 January 2018, the spot price for electricity in Victoria and in South Australia exceeded $5000/MWh for the 4.30 pm to 6 pm trading intervals inclusive, as forecast by the market operator, AEMO, the day before.

Temperatures were high in both regions, reaching a maximum of 40ºC in Melbourne and 43ºC in Adelaide. Even though participants offered the vast majority of capacity at low prices, it wasn't enough to satisfy the level of demand for electricity.

The Basslink interconnector was providing electricity to Victoria from Tasmania at its full level of capability. In addition, the flow of electricity from New South Wales into Victoria was limited (as forecast by the market operator). As a result high-priced local supply of electricity was required to meet demand for electricity in the two regions, resulting in high prices.

Loy Yang B unit 1 tripped (stopped generating unexpectedly) at 3.35 pm, resulting in an immediate reduction of 530 MW of low-priced capacity. The unit returned to full service by around 6 pm. Coincidentally, demand fell by around 360 MW shortly before, perhaps mitigating earlier high prices due to the sudden reduction in low-priced supply.

Participants rebidding capacity from low to high prices did not contribute to the high prices.

3 Analysis

The Australian Energy Market Operator (AEMO) makes regular assessments of expected demand for electricity in each region, based on inputs including forecast temperature, season and the day of the week. AEMO issues “targets” to generators to generate electricity to meet this demand, taking into account network capability and generator offers. Generator offers comprise the mega-watt (MW) capacities generators are willing to supply at a range of prices and the total amount the generator can produce (generator availability).

To inform market participants about market conditions, AEMO publishes price, network capability and demand forecasts in five minute and 30 minute timeframes, updated every five minutes. These forecasts form the basis for AEMO’s assessments of interconnector capacity, transfers between regions, reserves and conditions that relate to power system security.

The following sections examine why the high spot prices occurred.

3.1 Overview of actual and expected conditions

Dispatch prices in Victoria and South Australia exceeded $10 000/MWh for sustained periods from around 4.20 pm to 5.45 pm. Table 1 and Table 2 show actual and forecast spot price, demand and availability for each high priced trading interval in Victoria and South Australia respectively. Demand and supply conditions are discussed in detail in section 3.2.

Table 1 shows:

- Prices in Victoria were forecast to exceed $5000/MWh 12 and four hours ahead for the 4.30 pm and 5 pm trading intervals.
- For the 5.30 pm and 6 pm trading intervals, although prices were forecast to exceed $5000/MWh 12 hours in advance, they were only expected to be around $115/MWh four hours in advance. The reason why the actual price was higher than expected four hours ahead was actual demand for electricity was up to 638 MW higher than forecast by AEMO.
- The 530 MW Loy Yang B unit 1 tripped (stopped generating unexpectedly at 3.35 pm). As a result, availability was up to 500 MW lower than forecast four hours ahead for the 4.30 pm to 5.30 pm trading intervals, inclusive. The unit started to return to service by 5 pm and had started generating sufficiently by 6 pm such that availability was close to forecast for that trading interval.

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

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
4.30 pm	5682	10 000	11 347	8718	8716	8652	8546	8976	8781
5 pm	12 931	10 000	11 928	8888	8695	8636	8455	8957	8786
5.30 pm	11 960	118	10 979	8900	8461	8405	8578	8957	8781
6 pm	5079	115	10 979	8955	8317	8244	8926	8956	8797

Table 2 shows:

- Prices were forecast to exceed $5000/MWh 12 and four hours ahead.
- Demand for electricity in South Australia was close to forecast.
- Available capacity was up to 91 MW higher than forecast four hours ahead because (semi scheduled) wind generation was up to 92 MW higher than forecast.

Table 2: Actual and forecast spot price, demand and available capacity for South Australia

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
4.30 pm	6256	11 916	13 100	2617	2680	2628	2948	2910	2856
5 pm	14 167	13 100	13 999	2680	2759	2691	2942	2851	2797
5.30 pm	13 136	13 100	13 809	2735	2829	2779	2900	2815	2780
6 pm	5693	13 999	13 966	2781	2858	2792	2875	2809	2771

3.2 Supply and Demand

Generators determine the amount of electricity or capacity (MW) they offer and the price they are prepared to receive ($/MWh) in ten price and quantity (MW) pairs. AEMO aggregates these offers from lowest to highest price to produce a dispatch stack. Every five minutes AEMO then “dispatches” sufficient capacity from each generator, on the basis of that dispatch stack and accounting for transmission capability, to meet forecast regional electricity demand at the lowest possible price.

The price of the highest offer needed to meet demand sets the 5-minute dispatch price. The spot price paid to generators is the average of the six dispatch prices that make up

the 30 minute trading interval; all dispatched generators are paid at this price for the amount of electricity that they produced, regardless of how they bid.

The following sections analyse supply and demand conditions relevant to the high prices.

3.2.1 Supply

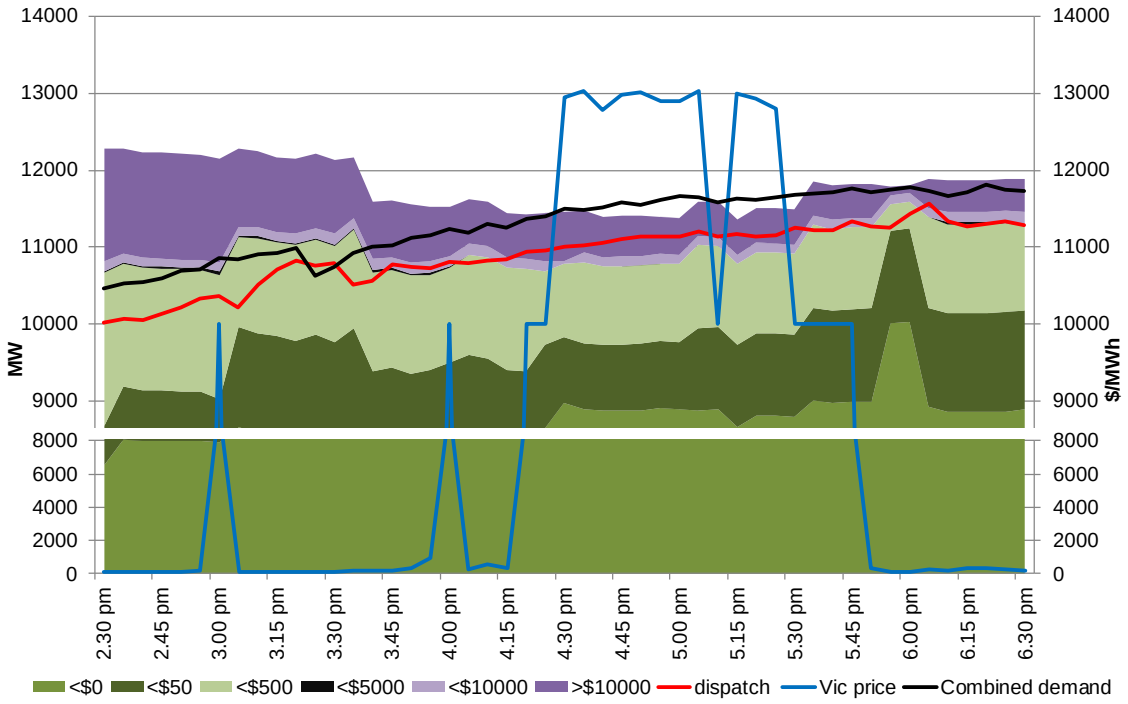
This section examines the supply side factors that contributed to the high price outcomes. Victoria and South Australia are electrically connected via two interconnectors: the 600 MW Heywood (Vic-SA) interconnector and the 220 MW[1] Murraylink interconnector. If one of the interconnectors allows electricity to flow freely between the regions, then the two regions are considered to be price-aligned, or, in other words, acting as a combined region. As the Heywood interconnector was unconstrained for the duration of the high prices, for analysis purposes we treat Victoria and South Australia as one region.

3.2.1.1 Generator offers

Figure 1 shows the combined cumulative generator offers for Victoria and South Australia. Also known as closing bids, the figure shows the actual capacity offered by generators in both regions, including amendments to their offers throughout the day to match changes to their own economic and/or physical positions (known as "rebidding"). The Figure also shows actual combined local generation dispatch (red line) and actual combined demand (black line). As the two regions were essentially acting as a combined region, we have chosen to include one price only. To this end, the blue line represents the 5-minute dispatch price in Victoria.

[1] These are the maximum ("nominal") flows from Victoria to South Australia.

Figure 1: Victorian and South Australian closing bids, combined dispatch and the Victorian dispatch price



Participants offered around 87 per cent of capacity priced below $5000/MWh through initial offers (made the day prior). Despite the high volume of low-priced capacity offered, prices were forecast to exceed $5000/MWh.

Throughout the day participants rebid more capacity into low price bands. During the high price period around 95 per cent of capacity was priced below $5000/MWh (indeed almost all of this was priced below $50/MWh). Despite this response, there was still insufficient low priced capacity to meet demand and the forecast price remained high. Consequently, small increases in demand above the top of the low priced capacity led to high prices. Relevant rebids are contained in Appendix B.

Figure 1 also shows the sudden reduction of 530 MW of low-priced capacity (dark green band) when Loy Yang B unit 1 tripped at 3.35 pm. Demand fell by around 360 MW shortly before this (at 3.25 pm, as shown by the fall in the black line), perhaps mitigating earlier high prices. The reduction in availability after the Loy Yang trip is not reflected in the graph until 3.40 pm, after the rebid was received by AEMO.

With the trip of Loy Yang and demand increasing throughout the afternoon (shown by the black line), spare capacity in Victoria reduced to such levels that AEMO declared an actual Lack of Reserve (LOR) 1 condition at 3.45 pm and an LOR 2 condition at 4.35 pm. With Loy Yang B coming back on line from around 5 pm, AEMO cancelled the LOR 2 at 5.30 pm. See appendix A for a detailed explanation of LOR.

Appendix C details the generators involved in setting the price during the high-price periods, and how that price was determined by the market systems.

The closing bids for all participants in Victoria and South Australia with capacity priced at or above $5000/MWh for the high-price periods are set out in Appendix D.

3.2.1.2 Network Availability

Import and export limits control the maximum amount of electricity that can flow between regions. AEMO manages network outages using constraints to ensure that system security is maintained. Constraints are mathematical equations that determine the optimal output of generators based on their offers to manage or "limit" flows on specific transmission lines (including interconnectors) for each five minute interval.

Electricity is transferred between National Electricity Market (NEM) regions via high voltage interconnectors. The Vic-NSW interconnector connects Victoria to New South Wales. When the interconnector is operating at its optimum capability[2], up to 1300 MW of electricity can be supplied from New South Wales into Victoria. However, the operation of this interconnector was such that further cheap supply of electricity could not be delivered into the combined Victoria and South Australia region during the high price period. Basslink was exporting electricity from Tasmania into Victoria at its nominal limit during the high price period, as forecast.

Table 3 shows the actual and forecast import limit and flow from New South Wales into Victoria on the Vic-NSW interconnector.

Table 3: Actual and forecast network capability for Vic-NSW interconnector

Trading interval	Flows (MW)			Import limit (MW)		
	Actual	4 hr forecast	12 hr forecast	Actual	4 hr forecast	12 hr forecast
4.30 pm	-168	-164	-347	-168	-164	-347
5 pm	-186	-197	-351	-186	-197	-351
5.30 pm	-192	-96	-363	-192	-195	-363
6 pm	-116	20*	-364	-182	-201	-364

*Electricity was forecast to be flowing from Victoria into New South Wales

Table 3 shows for the 4.30 pm, 5 pm and 5.30 pm trading intervals flows from NSW into Victoria were at their limit (as forecast), which at 168 MW, was significantly lower than the nominal import limit of 1300 MW. Actual flows were lower than forecast for the 6 pm trading interval, as the Loy Yang unit was generating near its full capacity meaning that cheaper generation from NSW was no longer required.

3.2.2 Demand

On 18 January maximum temperatures in Melbourne and Adelaide exceeded 40°C [3] [4], leading to high forecast demand for electricity.

[2] In other words, its "nominal limit".

[3] http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=122&p_display_type=dailyDataFile&p_startYear=&p_c=&p_stn_num=023000

[4] http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=122&p_display_type=dailyDataFile&p_startYear=&p_c=&p_stn_num=086338

Across the afternoon, demand for electricity ranged from about 8700 MW to 9000 MW in Victoria and 2600 MW to 2800 MW in South Australia.

While demand for electricity was high in both regions, it has been much higher in the past. To put this in context, record maximum demand in Victoria reached 10 490 MW in January 2009, and 3397 MW in South Australia in January 2011. However, it is worth noting the closure of two power stations in recent times: Alinta's 540 MW Northern Power Station in South Australia in May 2016, and Engie's 1600 MW Hazelwood Power Station in Victoria in March 2017. These closures have reduced the amount of coal generation available in the two regions, some of which would traditionally have been offered at low prices.

Australian Energy Regulator

March 2018

Appendix A: Lack of Reserve

AEMO is required to monitor the level of reserve, or spare capacity, within each region of the NEM. Reserves are defined as the difference between the volume of electricity that can be made available to consumers, either by local generation or through the network from other regions of the NEM, and the regional customer demand at that time.

Reserves are an indicator of the supply demand balance and an important tool to communicate with the market potential and actual shortfalls. This is achieved through the release of LOR notices by AEMO. Forecast LOR notices are designed to elicit a market response from generators to increase their declared available capacity or retailers to reduce demand to address any forecast reserve shortfalls. Actual LOR notices are also issued when the thresholds are actually triggered.

There are three reserve thresholds, which relate to managing power system security following a defined number of unplanned failures of either transmission or generating equipment (credible contingencies). An example of a credible contingency would be the failure of a large generator or the failure of a transmission line that would reduce interconnector capacity.

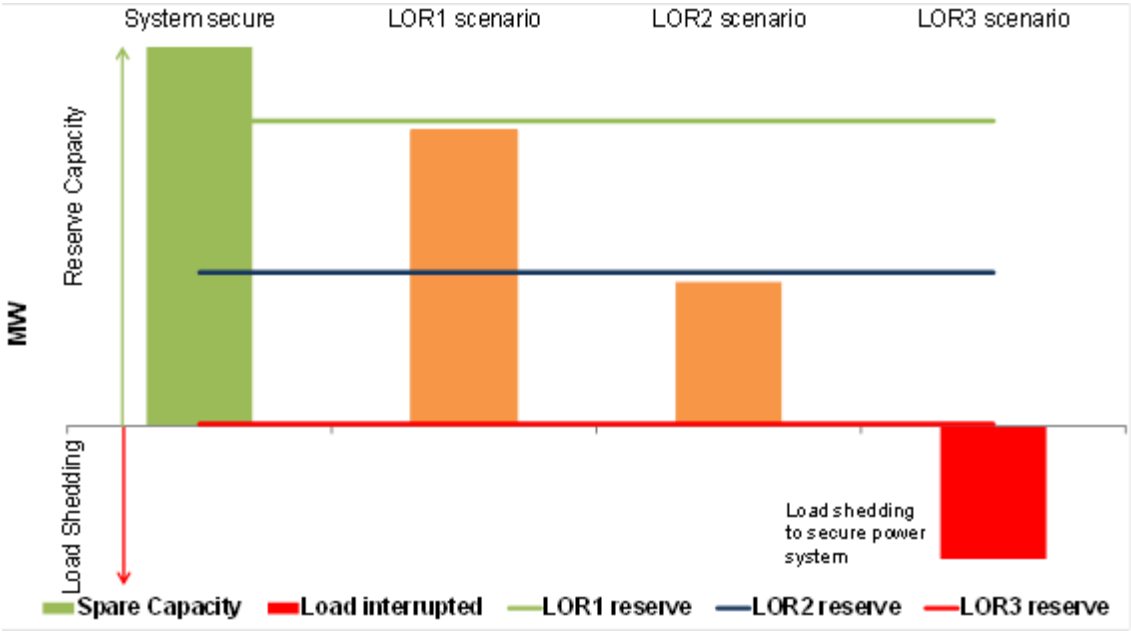
The three LOR levels are broadly categorised as follows:[5]

- An LOR1 is declared when AEMO considers load shedding is likely to occur after two single credible contingencies.
- An LOR2 is declared when AEMO considers load shedding is likely to occur after a single credible contingency.
- An LOR3 is declared when customer(s) load would be, or is, shed in order to maintain the security of the power system.

Figure 2 shows the four possible spare capacity and the lack of reserve threshold situations graphically.

5 These definitions have been simplified for the sake of readability. An interactive glossary of electricity market terms can be found on the AEMO website at: https://www.aemo.com.au/Datasource/Archives/Archive1767#

Figure 2: Spare capacity and lack of reserve



Assuming that the horizontal axis line represents a situation when supply equals demand, then excess generating capacity (above the x axis) amounts to spare or reserve capacity. As discussed above, the three reserve levels are shown as three horizontal lines, reserve requirements for LOR1 in green, for LOR2 in blue and where there are no reserves and all capacity is being used to meet demand, LOR3, in red.

The solid green and amber blocks represent spare capacity. As the spare capacity drops below a reserve line (the horizontal lines) either by a reduction in available capacity or an increase in demand, a new reserve condition exists. AEMO monitors this situation continuously and issues LOR notices to inform participants.

When there is insufficient capacity to meet demand load must be shed (customers interrupted) and an LOR3 is issued.

Appendix B: Significant Rebids

The rebidding tables highlight the relevant rebids submitted by generators that impacted on market outcomes during the time of high prices. It details the time the rebid was submitted and used by the dispatch process, the capacity involved, the change in the price of the capacity was being offered and the rebid reason. As both regions were acting as one, the rebids for each trading interval are amalgamated here.

Table 4: Significant energy rebids for 4.30 pm in Victoria and South Australia

Submit time	Time effective	Participant (region)	Station	Capacity rebid (MW)	Price from ($/MWh)	Price to ($/MWh)	Rebid reason
1.04 pm		AGL Energy (SA)	Torrens Island	120	<135	14 200	1207~F~040 chg in contract pos~see log
1.07 pm		Engie (SA)	Mintaro	70	14 200	<119	1300~A~SA 5MPD price higher than 30MPD: $323.10 > $125.00 @ 13:30~
1.45 pm		EnergyAustralia (SA)	Hallett	40	13 999	-1000	1340~A~band adj due to change in 5min pd price > fcast 13000 vs 135 @ 1430 sa sl~
2.55 pm		Ecogen Energy (Vic)	J' lang A	60	>11501	-1000	1445~A~band adj due to material change in demand 8357 vs 8249 @ 1515 vic sl~
2.56 pm		Origin Energy (Vic)	Mortlake	22	N/A	87	1450P change in avail - ambient conditions sl
3.24 pm		AGL Energy (SA)	Torrens Island	35	14200	105	1510~F~020 chg in agl f/cast dmd~20 incr agl sa demand forecast [1600]
3.30 pm		Alinta Energy (Vic)	Loy Yang B	-525	<10	N/A	1530~P~unit trip~

Submit time	Time effective	Participant (region)	Station	Capacity rebid (MW)	Price from ($/MWh)	Price to ($/MWh)	Rebid reason
3.31 pm		Snowy Hydro (Vic)	Murray	40	14194	-1000	15:30:06 A Vic 5MIN actual price $97.34 higher than 5min pd 15:35@15:26 ($171.76)
3.46 pm		Engie (SA)	Dry Creek	38	13100	<369	1545~A~RESPOND TO HIGH PRICES IN 5 MIN PD~
3.51 pm		Snowy Hydro (Vic)	Murray	40	14194	-1000	15:46:00 A Vic 5min pd price $403.24 higher than 5min pd 15:55@15:41 ($709.74)
3.52 pm		Engie (SA)	Dry Creek	38	13100	<369	1550~A~respond to high prices in 5 min pd~
4.14 pm	4.25 pm	AGL Energy (SA)	Torrens Island	65	105	14200	1601~A~030 chg in AEMO avail cap~30 decrease Vic -366MW [1630]
4.16 pm	4.25 pm	Snowy Hydro (Vic)	Murray	11	14194	-1000	16:15:04 A Vic 5MIN actual price $9,874.72 higher than 30min pd 16:20@16:02 ($9,999.81)

Table 5: Significant energy rebids for 5 pm in Victoria and South Australia

Submit time	Time effective	Participant (region)	Station	Capacity rebid (MW)	Price from ($/MWh)	Price to ($/MWh)	Rebid reason
1.04 pm		AGL Energy	Torrens Island	140	<135	14200	1207~F~040 chg in contract pos~see log
3.24 pm		AGL Energy	Torrens Island	60	14200	105	1510~F~020 chg in AGL f/cast dmd~20 incr agl SA demand forecast [1600]
3.30 pm		Alinta Energy (Vic)	Loy Yang B	-525	<10	N/A	1530~P~unit trip~

Submit time	Time effective	Participant (region)	Station	Capacity rebid (MW)	Price from ($/MWh)	Price to ($/MWh)	Rebid reason
3.31 pm		Snowy Hydro (Vic)	Murray	40	14 194	-1000	15:30:06 A Vic 5min actual price $97.34 higher than 5min pd 15:35@15:26 ($171.76)
3.51 pm		Snowy Hydro (Vic)	Murray	40	14 194	-1000	15:46:00 A Vic 5min pd price $403.24 higher than 5min pd 15:55@15:41 ($709.74)
4.14 pm		AGL Energy (SA)	Torrens Island	50	105	14200	1601~A~030 chg in AEMO avail cap~30 decrease Vic -366MW [1630]

Table 6: Significant energy rebids for 5.30 pm in Victoria and South Australia

Submit time	Time effective	Participant (region)	Station	Capacity rebid (MW)	Price from ($/MWh)	Price to ($/MWh)	Rebid reason
1.45 pm		EnergyAustralia (SA)	Hallett	40	13999	-1000	1340~A~band adj due to change in 5min pd price > fcast 13000 vs 135 @ 1430 SA sl~
3.30 pm		Alinta Energy (Vic)	Loy Yang B	-525	<10	N/A	1530~P~UNIT TRIP~
3.31 pm		Snowy Hydro (Vic)	Murray	40	14 194	-1000	15:30:06 A Vic 5min actual price $97.34 higher than 5min pd 15:35@15:26 ($171.76)

Submit time	Time effective	Participant (region)	Station	Capacity rebid (MW)	Price from ($/MWh)	Price to ($/MWh)	Rebid reason
3.51 pm		Snowy Hydro (Vic)	Murray	40	14 194	-1000	15:46:00 A Vic 5min pd price $403.24 higher than 5min pd 15:55@15:41 ($709.74)
3.56 pm		EnergyAustralia (SA)	Hallett	15	13 999	369	1550~A~adj bands mat increase SA price 1555 SL~
4.18 pm		Snowy Hydro (Vic)	Murray	10	14 194	-1000	16:15:04 A Vic 5min actual price $9,874.72 higher than 30min pd 16:20@16:02 ($9,999.81)
4.30 pm		Origin Energy	Q' antine	25	14 200	-1000	1625A ensure economic dispatch - avoid short shutdown sl
5.12 pm	5.20 pm	Alinta Energy (Vic)	Loy Yang B	150	N/A	-1000	1715~P~update rts profile~

Table 7: Significant energy rebids for 6 pm in Victoria and South Australia

Submit time	Time effective	Participant	Station	Capacity rebid (MW)	Price from ($/MWh)	Price to ($/MWh)	Rebid reason
2.03 pm		Engie (SA)	Dry Creek	43	13100	<300	1400~A~respond to high price 5 min pd~
2.55 pm		Ecogen Energy (Vic)	Jeeralang A	60	>11501	-1000	1445~A~band adj due to material change in demand 8357 vs 8249 @ 1515 Vic sl~

Submit time	Time effective	Participant	Station	Capacity rebid (MW)	Price from ($/MWh)	Price to ($/MWh)	Rebid reason
2.56 pm		Origin Energy (Vic)	Mortlake	16	N/A	87	1450P change in avail - ambient conditions sl
3.24 pm		AGL Energy (SA)	Torrens Island	25	14200	105	1510~F~020 chg in AGL f/cast dmd~20 incr AGL SA demand forecast [1600]
3.31 pm		Snowy Hydro (Vic)	Murray	40	14194	-1000	15:30:06 A Vic 5min actual price $97.34 higher than 5min pd 15:35@15:26 ($171.76)
3.39 pm		AGL Energy (Vic)	Loy Yang A	30	N/A	-1000	1535~P~030 increase in avail cap~302 unexp ambient temp effects xxxmw
3.46 pm		Engie (SA)	Dry Creek	38	13100	<369	1545~A~respond to high prices in 5 min pd~
3.51 pm		Snowy Hydro (Vic)	Murray	40	14194	-1000	15:46:00 A Vic 5min pd price $403.24 higher than 5min pd 15:55@15:41 ($709.74)
3.52 pm		Engie (SA)	Dry Creek	38	13100	<369	1550~A~respond to high prices in 5 min pd~
3.56 pm		EnergyAustralia (SA)	Hallett	15	13999	369	1550~A~adj bands mat increase SA price 1555 sl~
3.58 pm		Engie (SA)	Snuggery	35	14200	<300	1550~A~respond to high prices in 5 min pd~
4.18 pm		Snowy Hydro (Vic)	Murray	10	14194	-1000	16:15:04 A Vic 5min actual price $9,874.72 higher than 30min pd 16:20@16:02 ($9,999.81)

Submit time	Time effective	Participant	Station	Capacity rebid (MW)	Price from ($/MWh)	Price to ($/MWh)	Rebid reason
4.30 pm		Origin Energy (SA)	Quarantine	25	14200	-1000	1625A ensure economic dispatch - avoid short shutdown sl
4.35 pm		Engie (SA)	Snuggery	-7	300	N/A	1635~P~update avail: current ambient temperature~
4.45 pm		AGL Energy (SA)	Torrens Island	85	105	14200	1631~A~030 chg in AEMO avail cap~30 decrease Vic -407MW [1730]
4.50 pm		Alinta Energy (Vic)	Loy Yang B	50	N/A	10	1625~P~UPDATE RTS PROFILE~
4.54 pm		Snowy Hydro (Vic)	Valley Power	14	N/A	<435	16:51:00 A Vic 5min pd price $12,805.21 higher than 5min pd 17:05@16:46 ($13,141.45)
4.57 pm		EnergyAustralia (SA)	Hallett	10	13999	369	1650~A~band adj due to price above pd30 11149 vs 210 sl~
5.12 pm		Alinta Energy (Vic)	Loy Yang B	300	N/A	<10	1715~P~update rts profile~
5.15 pm		Origin Energy (SA)	Quarantine	45	14200	-1000	1713A INC Vic dem 5pd 8817mw > 30pd 8545mw @1800 sl
5.31 pm	5.40 pm	Hornsdale Power Reserve Pty Ltd (SA)	Hornsdale Power Reserve	-30	-1000	N/A	1731 P SOC forecast differs from actual
5.46 pm	5.55 pm	AGL Energy (SA)	Torrens Island	749	>105	-1000	1740~A~040 chg in AEMO disp~46 price increase vs pd SA 30/5 $11,266.99 v 30pd $304.63
5.48 pm	5.55 pm	Engie (SA)	Pelican Point	113	89	-1000	1745~P~respond to pl1 trip - redistribute mw~

Submit time	Time effective	Participant	Station	Capacity rebid (MW)	Price from ($/MWh)	Price to ($/MWh)	Rebid reason
5.48 pm	5.55 pm	Engie (SA)	Dry Creek	74	>300	-1000	1745~P~respond to pl1 trip - redistribute mw~
5.48 pm	5.55 pm	Engie (SA)	Mintaro	41	119	-1000	1745~P~respond to pl1 trip - redistribute mw~
5.48 pm	5.55 pm	Engie (SA)	Port Lincoln	26	14200	-1000	1745~P~respond to pl1 trip - redistribute mw~
5.48 pm	5.55 pm	Engie (SA)	Snuggery	34	300	-1000	1745~P~respond to pl1 trip - redistribute mw~

Appendix C: Price setter

The following table identifies for the trading interval in which the spot price exceeded $5000/MWh, each five minute dispatch interval price and the generating units involved in setting the energy price. This information is published by AEMO.[6] The 30-minute spot price is the average of the six dispatch interval prices. The dispatch prices that are in italics are capped at the price cap of $13 800/MWh when published by AEMO.

Victoria

Table 8: 4.30 pm

DI	Dispatch Price ($/MWh)	Participant	Unit	Service	Offer price ($/MWh)	Marginal change	Contribution
16:05	$265.53	Engie	DRYCGT3	Energy	$300.02	0.89	$267.02
16:10	$548.47	Arrow	BRAEMAR6	Energy	$84.50	-1.06	-$89.57
		Snowy Hydro	UPPTUMU	Energy	$299.60	2.13	$638.15
16:15	$331.46	Engie	DRYCGT1	Energy	$369.02	0.41	$151.30
		Engie	DRYCGT2	Energy	$369.02	0.49	$180.82
16:20	$9999.81	Ecogen Energy	JLA01	Energy	$9999.81	0.17	$1699.97
		Ecogen Energy	JLA02	Energy	$9999.81	0.17	$1699.97
		Ecogen Energy	JLB01	Energy	$9999.81	0.22	$2199.96
		Ecogen Energy	JLB02	Energy	$9999.81	0.22	$2199.96
		Ecogen Energy	JLB03	Energy	$9999.81	0.22	$2199.96
16:25	$9999.81	Ecogen Energy	JLB01	Energy	$9999.81	0.33	$3299.94
		Ecogen Energy	JLB02	Energy	$9999.81	0.33	$3299.94
		Ecogen Energy	JLB03	Energy	$9999.81	0.33	$3299.94
16:30	$12 946.94	AGL (SA)	TORRA1	Energy	$14200.00	0.09	$1278.00
		AGL (SA)	TORRA3	Energy	$14200.00	0.09	$1278.00
		AGL (SA)	TORRA4	Energy	$14200.00	0.08	$1136.00
		AGL (SA)	TORRB1	Energy	$14200.00	0.16	$2272.00
		AGL (SA)	TORRB2	Energy	$14200.00	0.16	$2272.00
		AGL (SA)	TORRB3	Energy	$14200.00	0.16	$2272.00
		AGL (SA)	TORRB4	Energy	$14200.00	0.17	$2414.00

Spot Price $ 5682/MWh

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

Table 9: 5 pm

DI	Dispatch Price ($/MWh)	Participant	Unit	Service	Offer price ($/MWh)	Marginal change	Contribution
16:35	$13 023.23	EnergyAustralia	AGLHAL	Energy	$13998.99	0.93	$13 019.06
16:40	$13 418.38	Origin Energy	QPS1	Energy	$14200.00	0.03	$426.00
		Origin Energy	QPS2	Energy	$14200.00	0.03	$426.00
		Origin Energy	QPS3	Energy	$14200.00	0.03	$426.00
		Origin Energy	QPS4	Energy	$14200.00	0.03	$426.00
		Engie	POR01	Energy	$14200.00	0.08	$1136.00
		Engie	POR03	Energy	$14200.00	0.03	$426.00
		AGL (SA)	TORRA1	Energy	$14200.00	0.06	$852.00
		AGL (SA)	TORRA3	Energy	$14200.00	0.07	$994.00
		AGL (SA)	TORRA4	Energy	$14200.00	0.06	$852.00
		AGL (SA)	TORRB1	Energy	$14200.00	0.13	$1846.00
		AGL (SA)	TORRB2	Energy	$14200.00	0.13	$1846.00
		AGL (SA)	TORRB3	Energy	$14200.00	0.13	$1846.00
		AGL (SA)	TORRB4	Energy	$14200.00	0.13	$1846.00
16:45	$13 348.38	Origin Energy	QPS1	Energy	$14200.00	0.03	$426.00
		Origin Energy	QPS2	Energy	$14200.00	0.03	$426.00
		Origin Energy	QPS3	Energy	$14200.00	0.03	$426.00
		Origin Energy	QPS4	Energy	$14200.00	0.03	$426.00
		Engie	POR01	Energy	$14200.00	0.08	$1136.00
		Engie	POR03	Energy	$14200.00	0.03	$426.00
		AGL (SA)	TORRA1	Energy	$14200.00	0.06	$852.00
		AGL (SA)	TORRA3	Energy	$14200.00	0.07	$994.00
		AGL (SA)	TORRA4	Energy	$14200.00	0.06	$852.00
		AGL (SA)	TORRB1	Energy	$14200.00	0.13	$1846.00
		AGL (SA)	TORRB2	Energy	$14200.00	0.13	$1846.00
		AGL (SA)	TORRB3	Energy	$14200.00	0.13	$1846.00
		AGL (SA)	TORRB4	Energy	$14200.00	0.13	$1846.00
16:55	$13 411.26	Engie	POR01	Energy	$14200.00	0.09	$1278.00
		Engie	POR03	Energy	$14200.00	0.04	$568.00
		AGL (SA)	TORRA1	Energy	$14200.00	0.07	$994.00
		AGL (SA)	TORRA3	Energy	$14200.00	0.08	$1136.00
		AGL (SA)	TORRA4	Energy	$14200.00	0.07	$994.00
		AGL (SA)	TORRB1	Energy	$14200.00	0.15	$2130.00
		AGL (SA)	TORRB2	Energy	$14200.00	0.15	$2130.00
		AGL (SA)	TORRB3	Energy	$14200.00	0.15	$2130.00
		AGL (SA)	TORRB4	Energy	$14200.00	0.15	$2130.00
17:00	$13 470.43	Engie	POR01	Energy	$14200.00	0.09	$1278.00

DI	Dispatch Price ($/MWh)	Participant	Unit	Service	Offer price ($/MWh)	Marginal change	Contribution
		Engie	POR03	Energy	$14200.00	0.04	$568.00
		AGL (SA)	TORRA1	Energy	$14200.00	0.07	$994.00
		AGL (SA)	TORRA3	Energy	$14200.00	0.08	$1136.00
		AGL (SA)	TORRA4	Energy	$14200.00	0.07	$994.00
		AGL (SA)	TORRB1	Energy	$14200.00	0.15	$2130.00
		AGL (SA)	TORRB2	Energy	$14200.00	0.15	$2130.00
		AGL (SA)	TORRB3	Energy	$14200.00	0.15	$2130.00
		AGL (SA)	TORRB4	Energy	$14200.00	0.15	$2130.00
Spot Price	**$12 931/MWh**						

Table 10: 5.30 pm

DI	Dispatch Price ($/MWh)	Participant	Unit	Service	Offer price ($/MWh)	Marginal change	Contribution
17:05	$13 340.06	Engie	POR01	Energy	$14200.00	0.09	$1278.00
		Engie	POR03	Energy	$14200.00	0.04	$568.00
		AGL (SA)	TORRA1	Energy	$14200.00	0.07	$994.00
		AGL (SA)	TORRA3	Energy	$14200.00	0.07	$994.00
		AGL (SA)	TORRA4	Energy	$14200.00	0.06	$852.00
		AGL (SA)	TORRB1	Energy	$14200.00	0.15	$2130.00
		AGL (SA)	TORRB2	Energy	$14200.00	0.15	$2130.00
		AGL (SA)	TORRB3	Energy	$14200.00	0.15	$2130.00
		AGL (SA)	TORRB4	Energy	$14200.00	0.16	$2272.00
17:10	$9999.81	Ecogen Energy	JLB01	Energy	$9999.81	0.33	$3299.94
		Ecogen Energy	JLB02	Energy	$9999.81	0.33	$3299.94
		Ecogen Energy	JLB03	Energy	$9999.81	0.33	$3299.94
17:15	$12 999.05	Engie	POR01	Energy	$14200.00	0.09	$1278.00
		Engie	POR03	Energy	$14200.00	0.04	$568.00
		AGL (SA)	TORRA1	Energy	$14200.00	0.07	$994.00
		AGL (SA)	TORRA3	Energy	$14200.00	0.07	$994.00
		AGL (SA)	TORRA4	Energy	$14200.00	0.06	$852.00
		AGL (SA)	TORRB1	Energy	$14200.00	0.14	$1988.00
		AGL (SA)	TORRB2	Energy	$14200.00	0.14	$1988.00
		AGL (SA)	TORRB3	Energy	$14200.00	0.14	$1988.00
		AGL (SA)	TORRB4	Energy	$14200.00	0.15	$2130.00
17:20	$12 930.44	Engie	POR01	Energy	$14200.00	0.09	$1278.00
		Engie	POR03	Energy	$14200.00	0.04	$568.00
		AGL (SA)	TORRA1	Energy	$14200.00	0.07	$994.00
		AGL (SA)	TORRA3	Energy	$14200.00	0.07	$994.00

DI	Dispatch Price ($/MWh)	Participant	Unit	Service	Offer price ($/MWh)	Marginal change	Contribution
		AGL (SA)	TORRA4	Energy	$14200.00	0.06	$852.00
		AGL (SA)	TORRB1	Energy	$14200.00	0.14	$1988.00
		AGL (SA)	TORRB2	Energy	$14200.00	0.14	$1988.00
		AGL (SA)	TORRB3	Energy	$14200.00	0.14	$1988.00
		AGL (SA)	TORRB4	Energy	$14200.00	0.15	$2130.00
17:25	$12 797.60	Engie	POR01	Energy	$14200.00	0.09	$1278.00
		Engie	POR03	Energy	$14200.00	0.04	$568.00
		AGL (SA)	TORRA1	Energy	$14200.00	0.07	$994.00
		AGL (SA)	TORRA3	Energy	$14200.00	0.07	$994.00
		AGL (SA)	TORRA4	Energy	$14200.00	0.06	$852.00
		AGL (SA)	TORRB1	Energy	$14200.00	0.14	$1988.00
		AGL (SA)	TORRB2	Energy	$14200.00	0.14	$1988.00
		AGL (SA)	TORRB3	Energy	$14200.00	0.14	$1988.00
		AGL (SA)	TORRB4	Energy	$14200.00	0.15	$2130.00
17:30	$9999.81	Ecogen Energy	JLB02	Energy	$9999.81	0.50	$4999.91
		Ecogen Energy	JLB03	Energy	$9999.81	0.50	$4999.91

Spot Price $ 11 960/MWh

Table 11: 6 pm

DI	Dispatch Price ($/MWh)	Participant	Unit	Service	Offer price ($/MWh)	Marginal change	Contribution
17:35	$9999.81	Ecogen Energy	JLB01	Energy	$9999.81	0.33	$3299.94
		Ecogen Energy	JLB02	Energy	$9999.81	0.33	$3299.94
		Ecogen Energy	JLB03	Energy	$9999.81	0.33	$3299.94
17:40	$9999.81	Ecogen Energy	JLB01	Energy	$9999.81	0.33	$3299.94
		Ecogen Energy	JLB02	Energy	$9999.81	0.33	$3299.94
		Ecogen Energy	JLB03	Energy	$9999.81	0.33	$3299.94
17:45	$9999.81	Ecogen Energy	JLA01	Energy	$9999.81	0.17	$1699.97
		Ecogen Energy	JLA02	Energy	$9999.81	0.17	$1699.97
		Ecogen Energy	JLB01	Energy	$9999.81	0.22	$2199.96
		Ecogen Energy	JLB02	Energy	$9999.81	0.22	$2199.96
		Ecogen Energy	JLB03	Energy	$9999.81	0.22	$2199.96
17:50	$325.71	EnergyAustralia	AGLHAL	Energy	$368.81	0.88	$324.55
17:55	$73.96	Alcoa	APD01	Raise 60	$0.99	1.13	$1.12
		Stanwell	STAN-2	Energy	$64.78	1.13	$73.20
		Stanwell	STAN-2	Raise 60	$0.50	-1.13	-$0.57
18:00	$72.52	EnergyAustralia	TALWA1	Energy	$65.76	1.10	$72.34

Spot Price $5079/MWh

South Australia

Table 12: 4.30 pm

DI	Dispatch Price ($/MWh)	Participant	Unit	Service	Offer price ($/MWh)	Marginal change	Contribution
16:05	$300.02	Engie	DRYCGT3	Energy	$300.02	1.00	$300.02
16:10	$620.01	Arrow	BRAEMAR6	Energy	$84.50	-1.20	-$101.40
		Snowy Hydro	UPPTUMU	Energy	$299.60	2.41	$722.04
16:15	$369.02	Engie	DRYCGT1	Energy	$369.02	0.45	$166.06
		Engie	DRYCGT2	Energy	$369.02	0.55	$202.96
16:20	$10 964.92	Ecogen Energy	JLA01	Energy	$9999.81	0.18	$1799.97
		Ecogen Energy	JLA02	Energy	$9999.81	0.18	$1799.97
		Ecogen Energy	JLB01	Energy	$9999.81	0.24	$2399.95
		Ecogen Energy	JLB02	Energy	$9999.81	0.24	$2399.95
		Ecogen Energy	JLB03	Energy	$9999.81	0.24	$2399.95
16:25	$11 079.26	Ecogen Energy	JLB01	Energy	$9999.81	0.37	$3699.93
		Ecogen Energy	JLB02	Energy	$9999.81	0.37	$3699.93
		Ecogen Energy	JLB03	Energy	$9999.81	0.37	$3699.93
16:30	$14 200.00	AGL (SA)	TORRA1	Energy	$14 200.00	0.09	$1278.00
		AGL (SA)	TORRA3	Energy	$14 200.00	0.09	$1278.00
		AGL (SA)	TORRA4	Energy	$14 200.00	0.08	$1136.00
		AGL (SA)	TORRB1	Energy	$14 200.00	0.18	$2556.00
		AGL (SA)	TORRB2	Energy	$14 200.00	0.18	$2556.00
		AGL (SA)	TORRB3	Energy	$14 200.00	0.18	$2556.00
		AGL (SA)	TORRB4	Energy	$14 200.00	0.19	$2698.00

Spot Price $ 6256/MWh

Table 13: 5 pm

DI	Dispatch Price ($/MWh)	Participant	Unit	Service	Offer price ($/MWh)	Marginal change	Contribution
16:35	$13 998.99	EnergyAustralia	AGLHAL	Energy	$13 998.99	1.00	$13 998.99
16:40	$14 200.00	Origin Energy	QPS1	Energy	$14 200.00	0.03	$426.00
		Origin Energy	QPS2	Energy	$14 200.00	0.04	$568.00
		Origin Energy	QPS3	Energy	$14 200.00	0.03	$426.00
		Origin Energy	QPS4	Energy	$14 200.00	0.04	$568.00
		Engie	POR01	Energy	$14 200.00	0.08	$1136.00
		Engie	POR03	Energy	$14 200.00	0.03	$426.00
		AGL (SA)	TORRA1	Energy	$14 200.00	0.06	$852.00
		AGL (SA)	TORRA3	Energy	$14 200.00	0.07	$994.00
		AGL (SA)	TORRA4	Energy	$14 200.00	0.06	$852.00

DI	Dispatch Price ($/MWh)	Participant	Unit	Service	Offer price ($/MWh)	Marginal change	Contribution
		AGL (SA)	TORRB1	Energy	$14 200.00	0.14	$1988.00
		AGL (SA)	TORRB2	Energy	$14 200.00	0.14	$1988.00
		AGL (SA)	TORRB3	Energy	$14 200.00	0.14	$1988.00
		AGL (SA)	TORRB4	Energy	$14 200.00	0.14	$1988.00
16:45	$14 200.00	Origin Energy	QPS1	Energy	$14 200.00	0.03	$426.00
		Origin Energy	QPS2	Energy	$14 200.00	0.04	$568.00
		Origin Energy	QPS3	Energy	$14 200.00	0.03	$426.00
		Origin Energy	QPS4	Energy	$14 200.00	0.04	$568.00
		Engie	POR01	Energy	$14 200.00	0.08	$1136.00
		Engie	POR03	Energy	$14 200.00	0.03	$426.00
		AGL (SA)	TORRA1	Energy	$14 200.00	0.06	$852.00
		AGL (SA)	TORRA3	Energy	$14 200.00	0.07	$994.00
		AGL (SA)	TORRA4	Energy	$14 200.00	0.06	$852.00
		AGL (SA)	TORRB1	Energy	$14 200.00	0.14	$1988.00
		AGL (SA)	TORRB2	Energy	$14 200.00	0.14	$1988.00
		AGL (SA)	TORRB3	Energy	$14 200.00	0.14	$1988.00
		AGL (SA)	TORRB4	Energy	$14 200.00	0.14	$1988.00
16:50	$14 200.00	Origin Energy	QPS1	Energy	$14 200.00	0.03	$426.00
		Origin Energy	QPS2	Energy	$14 200.00	0.04	$568.00
		Origin Energy	QPS3	Energy	$14 200.00	0.03	$426.00
		Origin Energy	QPS4	Energy	$14 200.00	0.04	$568.00
		Engie	POR01	Energy	$14 200.00	0.08	$1136.00
		Engie	POR03	Energy	$14 200.00	0.03	$426.00
		AGL (SA)	TORRA1	Energy	$14 200.00	0.06	$852.00
		AGL (SA)	TORRA3	Energy	$14 200.00	0.07	$994.00
		AGL (SA)	TORRA4	Energy	$14 200.00	0.06	$852.00
		AGL (SA)	TORRB1	Energy	$14 200.00	0.14	$1988.00
		AGL (SA)	TORRB2	Energy	$14 200.00	0.14	$1988.00
		AGL (SA)	TORRB3	Energy	$14 200.00	0.14	$1988.00
		AGL (SA)	TORRB4	Energy	$14 200.00	0.14	$1988.00
16:55	$14 200.00	Engie	POR01	Energy	$14 200.00	0.10	$1420.00
		Engie	POR03	Energy	$14 200.00	0.04	$568.00
		AGL (SA)	TORRA1	Energy	$14 200.00	0.07	$994.00
		AGL (SA)	TORRA3	Energy	$14 200.00	0.08	$1136.00
		AGL (SA)	TORRA4	Energy	$14 200.00	0.07	$994.00
		AGL (SA)	TORRB1	Energy	$14 200.00	0.16	$2272.00
		AGL (SA)	TORRB2	Energy	$14 200.00	0.16	$2272.00
		AGL (SA)	TORRB3	Energy	$14 200.00	0.16	$2272.00

DI	Dispatch Price ($/MWh)	Participant	Unit	Service	Offer price ($/MWh)	Marginal change	Contribution
		AGL (SA)	TORRB4	Energy	$14 200.00	0.16	$2272.00
17:00	$14 200.00	Engie	POR01	Energy	$14 200.00	0.10	$1420.00
		Engie	POR03	Energy	$14 200.00	0.04	$568.00
		AGL (SA)	TORRA1	Energy	$14 200.00	0.07	$994.00
		AGL (SA)	TORRA3	Energy	$14 200.00	0.08	$1136.00
		AGL (SA)	TORRA4	Energy	$14 200.00	0.07	$994.00
		AGL (SA)	TORRB1	Energy	$14 200.00	0.16	$2272.00
		AGL (SA)	TORRB2	Energy	$14 200.00	0.16	$2272.00
		AGL (SA)	TORRB3	Energy	$14 200.00	0.16	$2272.00
		AGL (SA)	TORRB4	Energy	$14 200.00	0.17	$2414.00

Spot Price **$ 14 167/MWh**

Table 14: 5.30 pm

DI	Dispatch Price ($/MWh)	Participant	Unit	Service	Offer price ($/MWh)	Marginal change	Contribution
17:05	$14 200.00	Engie	POR01	Energy	$14 200.00	0.10	$1420.00
		Engie	POR03	Energy	$14 200.00	0.04	$568.00
		AGL (SA)	TORRA1	Energy	$14 200.00	0.08	$1136.00
		AGL (SA)	TORRA3	Energy	$14 200.00	0.08	$1136.00
		AGL (SA)	TORRA4	Energy	$14 200.00	0.07	$994.00
		AGL (SA)	TORRB1	Energy	$14 200.00	0.16	$2272.00
		AGL (SA)	TORRB2	Energy	$14 200.00	0.16	$2272.00
		AGL (SA)	TORRB3	Energy	$14 200.00	0.16	$2272.00
		AGL (SA)	TORRB4	Energy	$14 200.00	0.17	$2414.00
17:10	$10 863.92	Ecogen Energy	JLB01	Energy	$9999.81	0.36	$3599.93
		Ecogen Energy	JLB02	Energy	$9999.81	0.36	$3599.93
		Ecogen Energy	JLB03	Energy	$9999.81	0.36	$3599.93
17:15	$14 200.00	Engie	POR01	Energy	$14 200.00	0.10	$1420.00
		Engie	POR03	Energy	$14 200.00	0.04	$568.00
		AGL (SA)	TORRA1	Energy	$14 200.00	0.08	$1136.00
		AGL (SA)	TORRA3	Energy	$14 200.00	0.08	$1136.00
		AGL (SA)	TORRA4	Energy	$14 200.00	0.07	$994.00
		AGL (SA)	TORRB1	Energy	$14 200.00	0.16	$2272.00
		AGL (SA)	TORRB2	Energy	$14 200.00	0.16	$2272.00
		AGL (SA)	TORRB3	Energy	$14 200.00	0.16	$2272.00
		AGL (SA)	TORRB4	Energy	$14 200.00	0.17	$2414.00
17:20	$14 200.00	Engie	POR01	Energy	$14 200.00	0.10	$1420.00
		Engie	POR03	Energy	$14 200.00	0.04	$568.00

DI	Dispatch Price ($/MWh)	Participant	Unit	Service	Offer price ($/MWh)	Marginal change	Contribution
		AGL (SA)	TORRA1	Energy	$14 200.00	0.08	$1136.00
		AGL (SA)	TORRA3	Energy	$14 200.00	0.08	$1136.00
		AGL (SA)	TORRA4	Energy	$14 200.00	0.07	$994.00
		AGL (SA)	TORRB1	Energy	$14 200.00	0.16	$2272.00
		AGL (SA)	TORRB2	Energy	$14 200.00	0.16	$2272.00
		AGL (SA)	TORRB3	Energy	$14 200.00	0.16	$2272.00
		AGL (SA)	TORRB4	Energy	$14 200.00	0.17	$2414.00
17:25	$14 200.00	Engie	POR01	Energy	$14 200.00	0.10	$1420.00
		Engie	POR03	Energy	$14 200.00	0.04	$568.00
		AGL (SA)	TORRA1	Energy	$14 200.00	0.08	$1136.00
		AGL (SA)	TORRA3	Energy	$14 200.00	0.08	$1136.00
		AGL (SA)	TORRA4	Energy	$14 200.00	0.07	$994.00
		AGL (SA)	TORRB1	Energy	$14 200.00	0.16	$2272.00
		AGL (SA)	TORRB2	Energy	$14 200.00	0.16	$2272.00
		AGL (SA)	TORRB3	Energy	$14 200.00	0.16	$2272.00
		AGL (SA)	TORRB4	Energy	$14 200.00	0.17	$2414.00
17:30	$11 152.63	Ecogen Energy	JLB02	Energy	$9999.81	0.56	$5599.89
		Ecogen Energy	JLB03	Energy	$9999.81	0.56	$5599.89

Spot Price $ 13 136/MWh

Table 15: 6 pm

DI	Dispatch Price ($/MWh)	Participant	Unit	Service	Offer price ($/MWh)	Marginal change	Contribution
17:35	$11 210.84	Ecogen Energy	JLB01	Energy	$9999.81	0.37	$3699.93
		Ecogen Energy	JLB02	Energy	$9999.81	0.37	$3699.93
		Ecogen Energy	JLB03	Energy	$9999.81	0.37	$3699.93
17:40	$11 150.21	Ecogen Energy	JLB01	Energy	$9999.81	0.37	$3699.93
		Ecogen Energy	JLB02	Energy	$9999.81	0.37	$3699.93
		Ecogen Energy	JLB03	Energy	$9999.81	0.37	$3699.93
17:45	$11 266.99	Ecogen Energy	JLA01	Energy	$9999.81	0.19	$1899.96
		Ecogen Energy	JLA02	Energy	$9999.81	0.19	$1899.96
		Ecogen Energy	JLB01	Energy	$9999.81	0.25	$2499.95
		Ecogen Energy	JLB02	Energy	$9999.81	0.25	$2499.95
		Ecogen Energy	JLB03	Energy	$9999.81	0.25	$2499.95
17:50	$368.81	EnergyAustralia	AGLHAL	Energy	$368.81	1.00	$368.81
17:55	$82.11	Stanwell	STAN-2	Energy	$64.78	1.26	$81.62
18:00	$79.23	EnergyAustralia	TALWA1	Energy	$65.76	1.20	$78.91

Spot Price $ 5 693/MWh

Appendix D: Closing bids

Figures D1 to D6 highlight the half hour closing bids for participants in Victoria and South Australia with capacity priced at or above $5000/MWh during the periods in which the spot price exceeded $5000/MWh. They also show generation output and the spot price.

Figure D1 - AGL (Loy Yang A, Macarthur WF, Oaklands Hill WF, Somerton, Dartmouth, Eildon, McKay and West Kiewa) closing bids, dispatch and spot price - Victoria

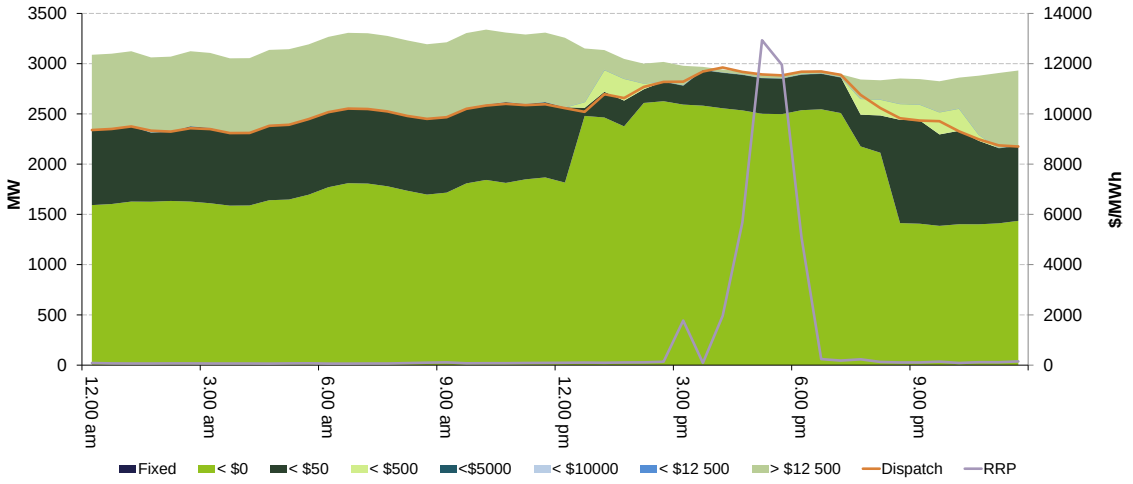


Figure D2 - AGL (Torrens Island, The Bluff, Hallett WF and North Brown Hill WF,) closing bids, dispatch and spot price – South Australia

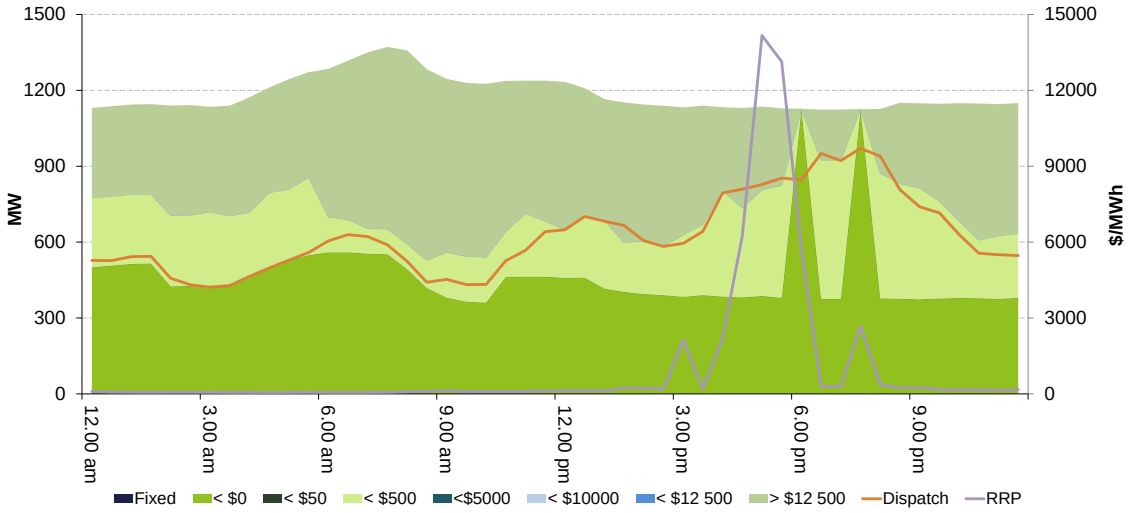


Figure D3 – Ecogen (Jeeralang A, Jeeralang B and Newport) closing bids, dispatch and spot price – Victoria

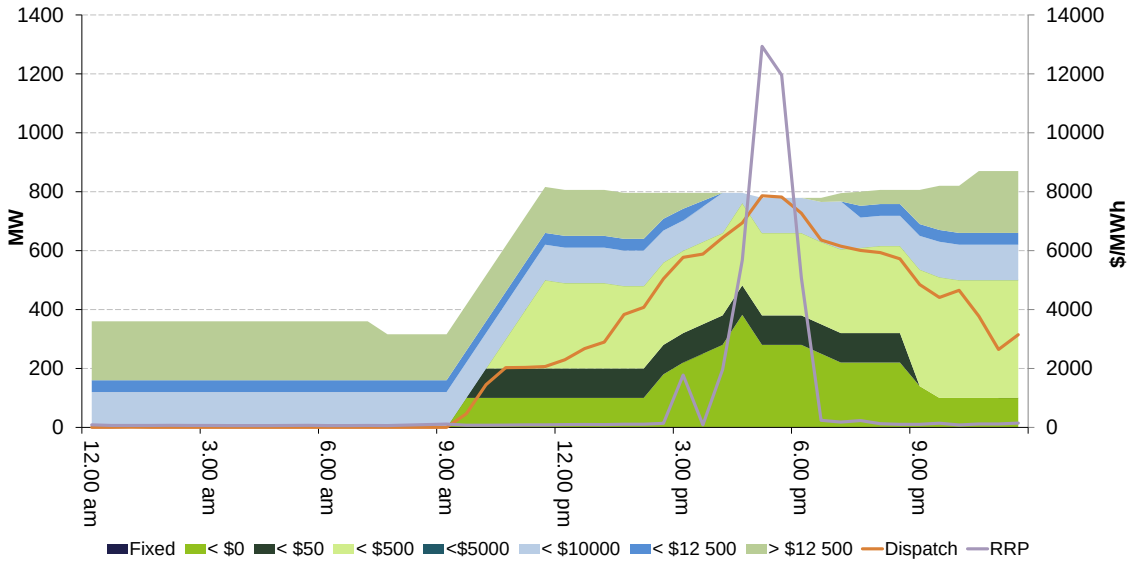


Figure D4 Engie (Pelican Point, Dry Creek, Mintaro, Port Lincoln and Snuggery) closing bids, dispatch and spot price – South Australia

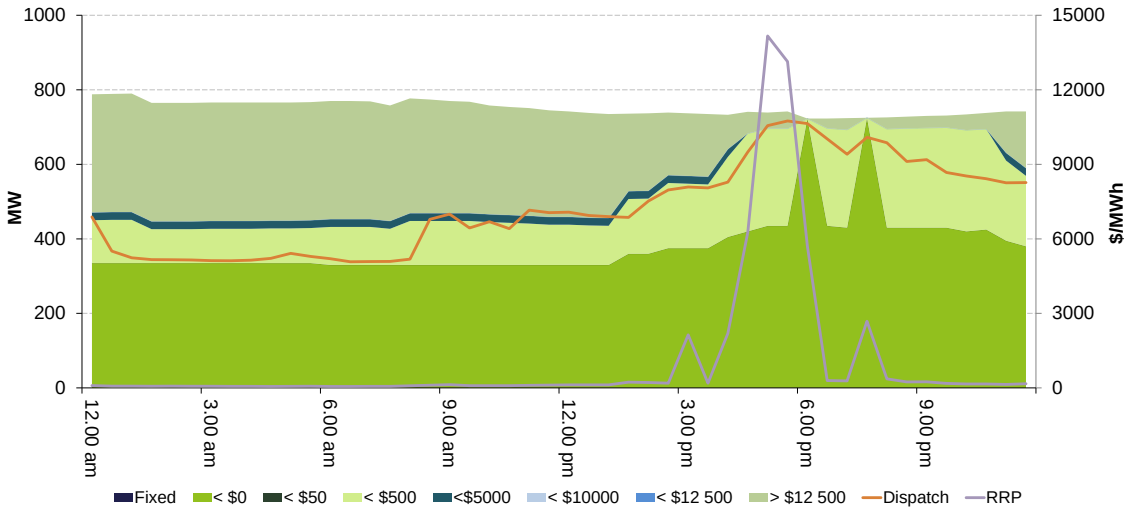


Figure D5 – EnergyAustralia (Hallett and Waterloo WF) closing bids, dispatch and spot price – South Australia

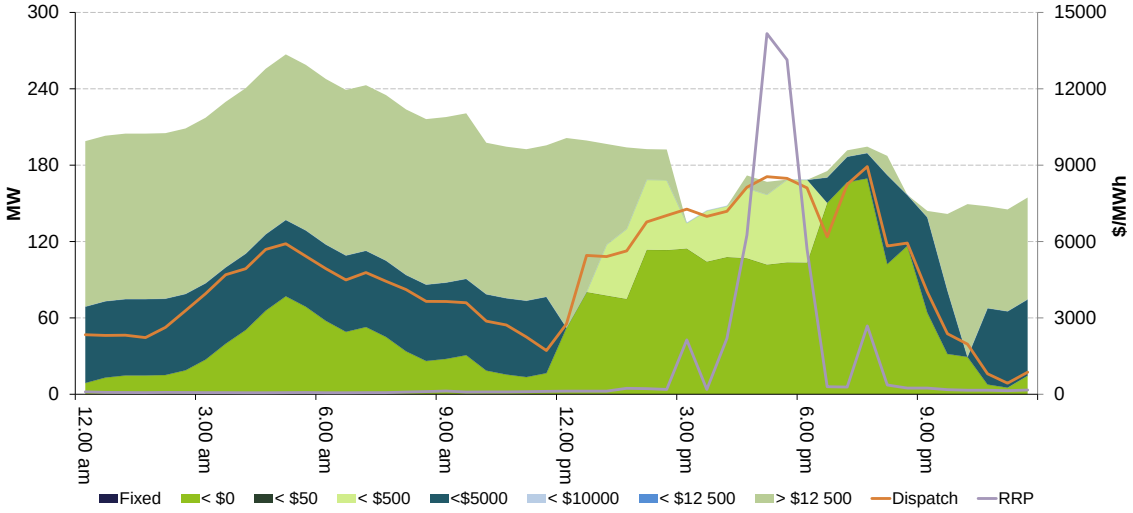
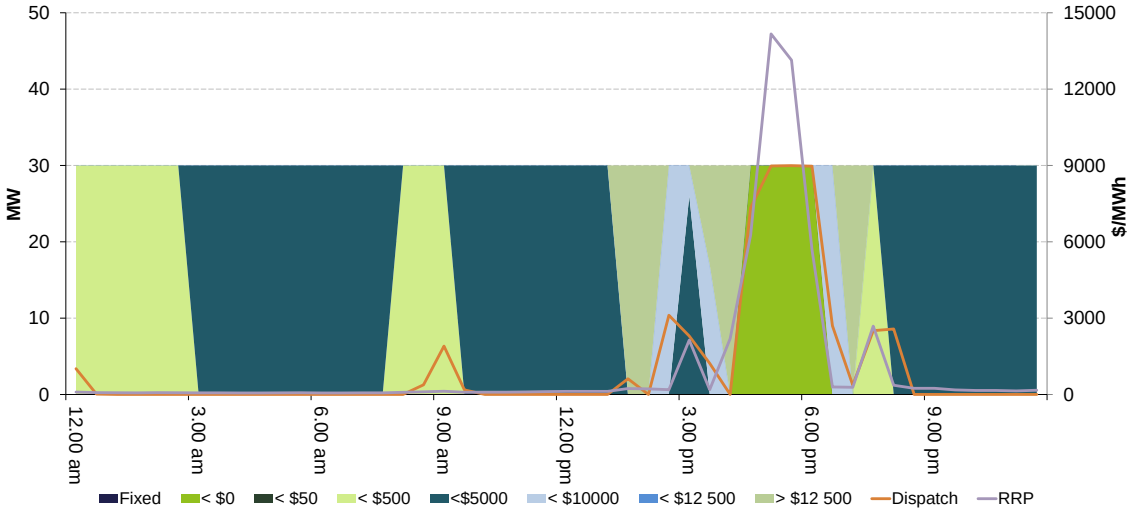


Figure D6 – Hornsdale Power Reserve (Hornsdale battery) closing bids, dispatch and spot price – South Australia*



*Only 30 MW of the 100 MW battery is offered to the market on a commercial basis. The remaining 70 MW is reserved for the SA Government and therefore has not been included in Figure D6

Appendix E: Relevant Market Notices

The following market notices either were notifying the market of the network issues in Victoria.

Market Notice	Type	Date of issue	Last Changed
60739	Reserve notice	15/01/2018 15:03:01	16/01/2018 15:03:01

External Reference
STPASA - Forecast Lack Of Reserve Level 1 (LOR1) in the Victoria Region on 18/01/2018

Reason
AEMO ELECTRICITY MARKET NOTICE AEMO declares a Forecast LOR1 condition under clause 4.8.4(b) of the National Electricity Rules for the VIC region for the following period: From 1630 hrs to 1700 hrs on 18/01/2018. The contingency capacity reserve required is 1120 MW. The minimum reserve available is 1115 MW. Daniel Ghantous AEMO Operations

Market Notice	Type	Date of issue	Last Changed
60761	Reserve notice	16/01/2018 14:51:11	16/01/2018 14:51:11

External Reference
STPASA - Forecast Lack Of Reserve Level 1 (LOR1) in the South Australia Region on 18/01/2018

Reason
AEMO ELECTRICITY MARKET NOTICE AEMO declares a Forecast LOR1 condition under clause 4.8.4(b) of the National Electricity Rules for the SA region for the following period: From 1800 hrs to 1830 hrs on 18/01/2018. The contingency capacity reserve required is 600 MW. The minimum reserve available is 575 MW. Harmohan Singh AEMO Operations

Market Notice	Type	Date of issue	Last Changed
60762	Reserve notice	16/01/2018 14:55:39	16/01/2018 14:55:39

External Reference

STPASA - Update of the Forecast Lack Of Reserve Level 1 (LOR1) in the VIC Region on 18 and 19 Jan 2018

Reason

AEMO ELECTRICITY MARKET NOTICE

The Forecast LOR1 condition in the VIC region advised in AEMO Electricity Market Notice No. 60739 has been updated at 1400 hrs 16/01/2018 to the following:

1. From 1600 hrs to 1800 hrs on 18/01/2018.

The contingency capacity reserve required is 1120 MW.

The minimum reserve available is 919 MW.

2. From 1500 hrs to 1700 hrs on 19/01/2018.

The contingency capacity reserve required is 1120 MW.

The minimum reserve available is 852 MW.

Hitesh Bavarva

AEMO Operations

Market Notice	Type	Date of issue	Last Changed
60772	Reserve notice	17/01/2018 15:21:03	17/01/2018 15:21:03

External Reference

PDPASA - Forecast Lack Of Reserve Level 1 (LOR1) in South Australia region on 18/01/2018

Reason

AEMO ELECTRICITY MARKET NOTICE

AEMO declares a Forecast LOR1 condition under clause 4.8.4(b) of the National Electricity Rules for the SA region for the following period: (refer to Market Notice No. 60761)

From 1730 hrs to 1830 hrs on 18/01/2018.

The contingency capacity reserve required is 600 MW.

The minimum reserve available is 578 MW.

Harmohan Singh

AEMO Operations

Market Notice	Type	Date of issue	Last Changed
60774	Reserve notice	17/01/2018 15:21:59	17/01/2018 15:21:59

External Reference

PDPASA - Forecast Lack Of Reserve Level 1 (LOR1) in the VIC Region on 18/01/2018

Reason

AEMO ELECTRICITY MARKET NOTICE

AEMO declares a Forecast LOR1 condition under clause 4.8.4(b) of the National Electricity Rules for the VIC region for the following period: (Refer to Market Notice No.60762)

From 1600 hrs to 1730 hrs on 18/01/2018.

The contingency capacity reserve required is 1100 MW.

The minimum reserve available is 862 MW.

Hitesh Bavarva

AEMO Operations

Market Notice	Type	Date of issue	Last Changed
60791	Reserve notice	18/01/2018 11:35:02	18/01/2018 11:35:02

External Reference

PDPASA - Update of the Forecast Lack Of Reserve Level 1 (LOR1) in the VIC Region on Thursday, 18 January 2018

Reason

AEMO ELECTRICITY MARKET NOTICE

The Forecast LOR1 condition in the VIC region advised in AEMO Electricity Market Notice No. 60774 has been updated at 1100 hrs 18/01/2018 to the following:

From 1600 hrs 18/01/2018 to 1800 hrs on 18/01/2018.

The contingency capacity reserve required is 1100 MW.

The minimum reserve available is 822 MW.

Manager NEM Real Time Operations

Market Notice	Type	Date of issue	Last Changed
60792	Reserve notice	18/01/2018 11:35:20	18/01/2018 11:35:20

External Reference

PDPASA - Update of the Forecast Lack Of Reserve Level 1 (LOR1) in the SA Region on Thursday, 18 January 2018

Reason

AEMO ELECTRICITY MARKET NOTICE

The Forecast LOR1 condition in the SA region advised in AEMO Electricity Market Notice No. 60772 has been updated at 1100 hrs 18/01/2018 to the following:

From 1700 hrs 18/01/2018 to 1900 hrs on 18/01/2018.

The contingency capacity reserve required is 600 MW.

The minimum reserve available is 502 MW.

Manager NEM Real Time Operations

Market Notice	Type	Date of issue	Last Changed
60796	Reserve notice	18/01/2018 16:05:50	18/01/2018 16:05:50

External Reference

Actual Lack Of Reserve Level 1 (LOR1) in the VIC Region - 18/01/2018

Reason

AEMO ELECTRICITY MARKET NOTICE

Actual Lack Of Reserve Level 1 (LOR1) in the VIC Region - 18/01/2018

An Actual LOR1 condition has been declared for the VIC Region from 1545 hrs.

The Actual LOR1 condition is forecast to exist until 1830 hrs

The contingency capacity reserve required is 1100 MW

The minimum reserve available is 815 MW

Manager NEM Real Time Operations

Market Notice	Type	Date of issue	Last Changed
60799	Reserve notice	18/01/2018 17:05:48	18/01/2018 17:05:48

External Reference

Actual Lack Of Reserve Level 2 (LOR2) in the VIC Region - Thursday, 18 January 2018

Reason

AEMO ELECTRICITY MARKET NOTICE

Actual Lack Of Reserve Level 2 (LOR2) in the VIC Region - Thursday, 18 January 2018

An Actual LOR2 condition has been declared for the VIC region from 1635 hrs.

The Actual LOR2 condition is forecast to exist until 1800 hrs

The contingency capacity reserve required is 560 MW

The minimum reserve available is 383 MW

AEMO is seeking a market response.

Manager NEM Real Time Operations

Market Notice	Type	Date of issue	Last Changed
60801	Reserve notice	18/01/2018 17:45:00	18/01/2018 17:45:00

External Reference

Cancellation of the Actual (LOR2) condition in the VIC region - 18/01/2018

Reason

AEMO ELECTRICITY MARKET NOTICE

Cancellation of the Actual (LOR2) condition in the VIC region - 18/01/2018

The Actual LOR2 condition in the VIC Region advised in AEMO Electricity Market Notice No.60799 is cancelled at 1730 hrs 18/01/2018.

Manager NEM Real Time Operations

Market Notice	Type	Date of issue	Last Changed
60815	Reserve notice	18/01/2018 20:12:06	18/01/2018 20:12:06

External Reference

Cancellation of Actual (LOR1) condition in the Vic region - 18/01/2018

Reason

AEMO ELECTRICITY MARKET NOTICE

Cancellation of Actual (LOR1) condition in the Vic region - 18/01/2018

The Actual LOR1 Condition in the Vic Region advised in AEMO Electricity Market Notice No.60796 is cancelled at 2010 hrs 18/01/2018.

Manager NEM Real Time Operations