



# **Electricity spot prices above \$5000/MWh**

**Queensland, 17 December 2014**

March 2015

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# 1 Introduction

The AER is required to publish a report whenever the electricity spot price exceeds \$5000/MWh.<sup>1</sup> 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.

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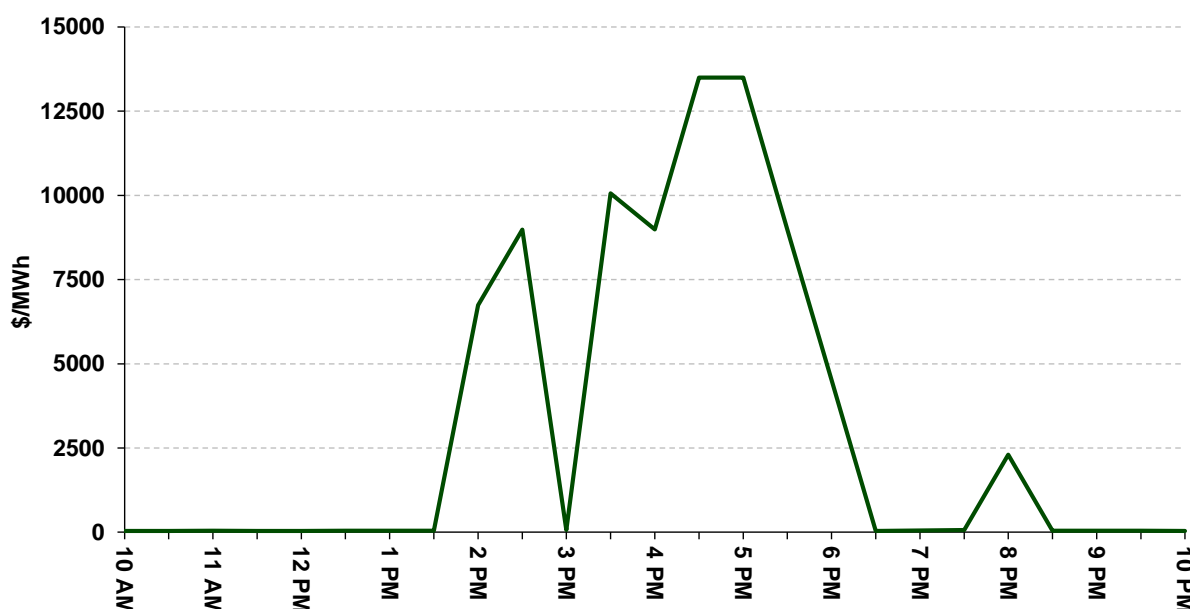
<sup>1</sup> This requirement is set out in clause 3.13.7 (d) of the National Electricity Rules.

## 2 Summary

As shown in Figure 1, on Wednesday 17 December 2014 the spot price in Queensland exceeded \$5000/MWh on seven occasions between 2 pm and 5.30 pm, almost reaching the market price cap of \$13 500/MWh at 4.30 pm and 5 pm. Only the 5 pm spot price of \$13 499/MWh was as forecast. High prices were forecast four hours ahead for the 5 pm and 5.30 pm trading intervals only. For most of the high-priced periods, half hour demand and availability was close to that forecast four hours ahead.

On the day, temperatures around Brisbane reached 38.5 degrees and exceeded 32 degrees across a number of other major Queensland centres. Despite a significant contribution from residential rooftop solar, regional demand was high, exceeding 8000 MW for all of the trading intervals where the spot price exceeded \$5000/MWh, and reaching the maximum for the day of 8445 MW<sup>2</sup> at 5 pm (around 500 MW below the record demand of 8933 MW in the 2009/10 summer).

**Figure 1: Spot price for 17 December 2014 (\$/MWh)**



While high levels of demand contributed to the high prices, the key underlying driver was supply conditions brought about by participant rebidding. Prior to the trading intervals in question, around 8000 MW of capacity was offered at prices less than \$35/MWh and all capacity above 8000 MW was offered at prices above \$6000/MWh. Given the supply and demand conditions, minor changes in availability, interconnector capability or demand had the potential to bring about dramatic price variations.

<sup>2</sup> Based on total demand.

### 3 Analysis

Table 1 shows actual and forecast spot price, demand and availability for each high price<sup>3</sup> trading interval. For most of the high-priced periods, half hour demand and availability was close to that forecast four hours ahead. The exception was the 8 pm trading interval, during which demand was around 250 MW higher than forecast. Table 1 also shows that high prices were forecast four hours ahead only for the 5 pm and 5.30 pm trading intervals.

The following analysis (sections 3.1 and 3.2) shows that rebidding by participants created supply conditions, such that small variations in demand had the potential to lead to large variations in price.

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

Time	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
2 pm	6737	37	39	8011	7974	7932	9991	10 053	10 099
2.30 pm	8980	64	37	8117	8109	8049	9979	10 083	10 099
3.30 pm	10 060	41	39	8317	8337	8233	10 080	10 089	10 134
4 pm	8993	2158	43	8385	8440	8329	10 101	10 085	10 134
4.30 pm	13 499	2158	45	8422	8506	8400	10 046	10 142	10 134
5 pm	13 499	13 499	45	8445	8563	8412	10 052	10 105	10 114
5.30 pm	8989	13 499	39	8395	8360	8225	9810	9844	9864
6 pm	4527	96	35	8252	8155	8037	9773	9828	9864
8 pm	2299	301	31	8153	7906	7863	9853	9887	9890

<sup>3</sup> The weekly report from 14 to 20 December 2014 stated that we would investigate all of these prices as part of this report.

### 3.1 Rebidding

All significant rebids that contributed to the high prices are contained in **Appendix A**. Figure 2 graphically summarises significant rebids made within 12 hours of dispatch and which were effective during the high price periods. Coloured areas above the horizontal axis represent capacity rebid from low prices to high prices for each trading interval, by participant. Coloured areas below the horizontal axis represent (generally low-price) capacity withdrawn for each trading interval.

Using the 2 pm trading interval as an example, the figure shows that CS Energy shifted around 670 MW (out of 1600 MW offered, all at Gladstone) from low prices to high prices, and AGL Hydro and Millmerran Energy Trader withdrew a combined total of around 190 MW of capacity (at their Yabulu and Millmerran plants respectively).

**Figure 2: Rebidding to high prices and capacity withdrawn, by trading interval**

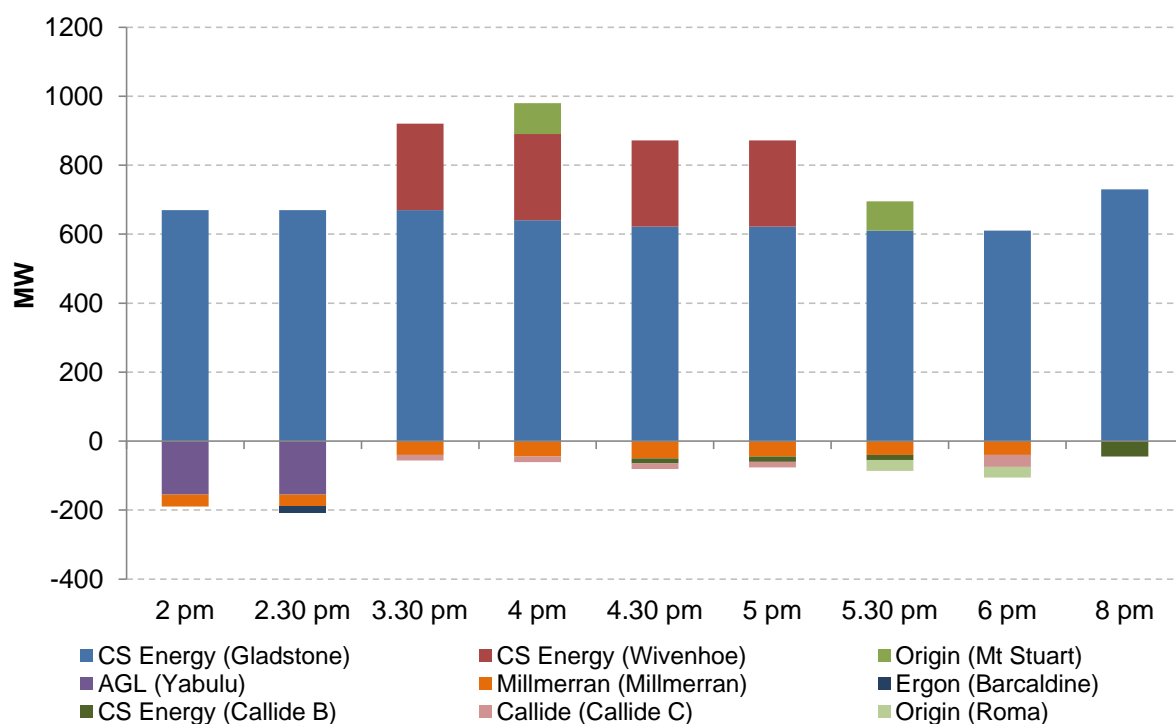


Figure 2 clearly shows that CS Energy was responsible for shifting the majority of capacity from low to high prices during the high price periods (mostly at the Gladstone Power Station, but also at the Wivenhoe Power Station). CS Energy’s rebid reasons related to published changes in market conditions and the return to service of one of the Gladstone units (as shown in Appendix A).

The other participant to shift capacity into high prices during the high price intervals was Origin Energy. Specifically, for the 4 pm and 5.30 pm trading intervals Origin Energy rebid 90 MW and 85 MW respectively from the price floor to close to the price cap. The rebid reasons related to constraint management.

Appendix A shows that participants who withdrew capacity (represented by the areas below the horizontal axis in Figure 2) did so for reasons related to technical plant conditions.

Further reducing the availability of low price capacity, the non-scheduled RTA Yarwun reduced its output from approximately 140 MW to zero over three dispatch intervals from 1.40 pm. All of this capacity was priced at -\$900/MWh.

## 3.2 Supply and demand

Figure 3 shows the actual supply curve for the 4.30 pm trading interval (denoted by the solid green line), the supply curve forecast 12 hours ahead (i.e. 4.30 am, denoted by the solid blue line), and the supply curve forecast 4 hours ahead (i.e. 12.30 pm, denoted by the solid red line). The supply curves were derived by summing the available capacity in each price band for all generators in Queensland.

Also shown is actual demand less imports, and forecast demand less forecast imports 12 and 4 hours ahead, for the 4.30 pm trading interval. Represented as vertical dotted lines, they follow the same colour convention as the supply curves. The 4.30 pm trading interval was chosen as this trading interval best demonstrates the effects of rebidding on the supply curve.

Figure 3 shows that from 12 hours ahead to 4 hours ahead the supply curve shifted to the left as a result of CS Energy rebidding capacity from low prices to high prices (as shown in Figure 2). This saw the forecast price increase from \$45/MWh to \$2158/MWh (see Table 1).

Particularly important to why the actual price for the 4.30 pm trading interval was much higher at \$13 499/MWh than the 4 hour forecast price of \$2158/MWh is the shape of the actual supply curve. The inset in Figure 3 shows the effect rebidding within four hours of dispatch had on the shape of the supply curve. As a result of rebidding, there was no capacity left between \$35/MWh and \$6000/MWh and only a small amount of capacity at \$6667/MWh. A significant amount of this capacity (155 MW) was removed by AGL Hydro at Yabulu over two rebids. The rebid reasons related to plant conditions.

The figure shows that as a result of the rebidding, the supply curve was practically vertical around the level of actual demand less imports (denoted by the solid green and dotted green lines, respectively).



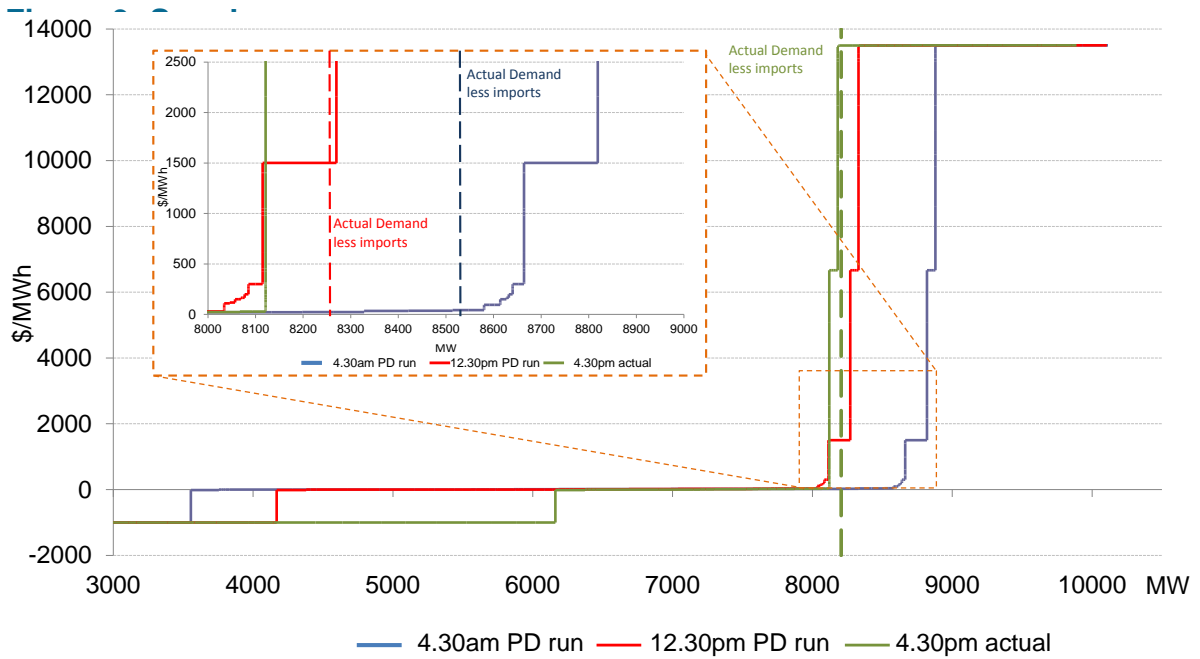
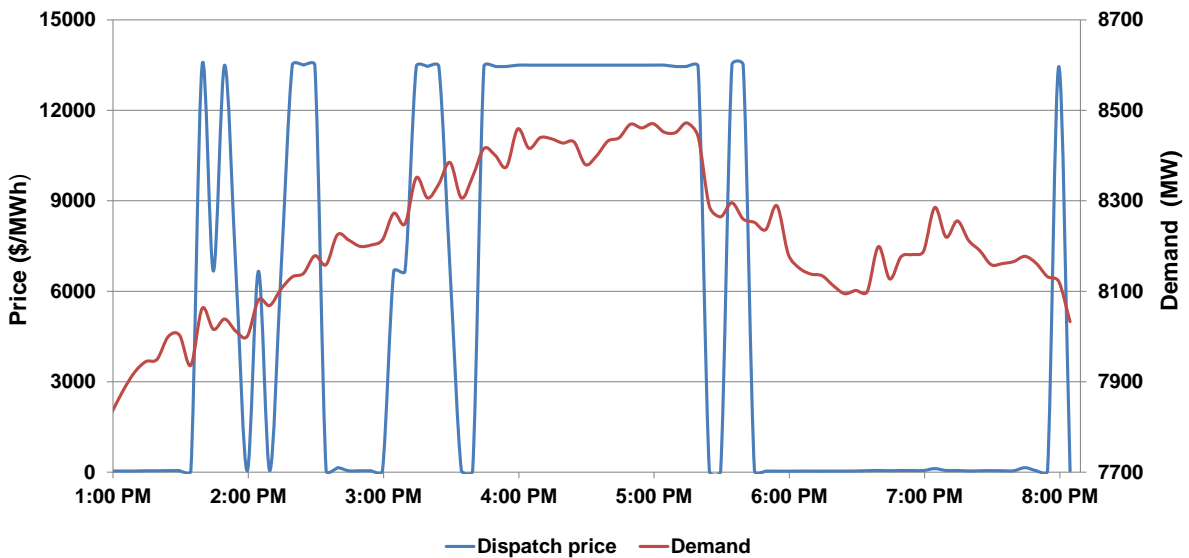


Figure 4 shows 5 minute demand and price over the high price period. The figure shows that, consistent with the almost vertical supply curve as discussed above, small increases in 5-minute demand coincided with increases in price.

**Figure 4: Queensland 5-minute price and demand graph**



Appendix B 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 Queensland with capacity priced at or above \$5000/MWh for the high-price periods are set out in Appendix C.

### 3.3 Network Availability

Table 2 shows the net import limit into Queensland from New South Wales was significantly lower (in the order of 350 MW) than the nominal limit of 600 MW during the time of high prices. Imports across the Queensland to New South Wales interconnector (QNI) were limited to 220 MW by system normal constraints. These constraints manage the overloading of the Liddell to Muswellbrook line on the trip of the Liddell to Tamworth line and are designed to avoid voltage collapse in Queensland on the loss of the largest generator in Queensland. At the time of high prices CS Energy’s Kogan Creek unit was the largest operating unit, at 680 MW.

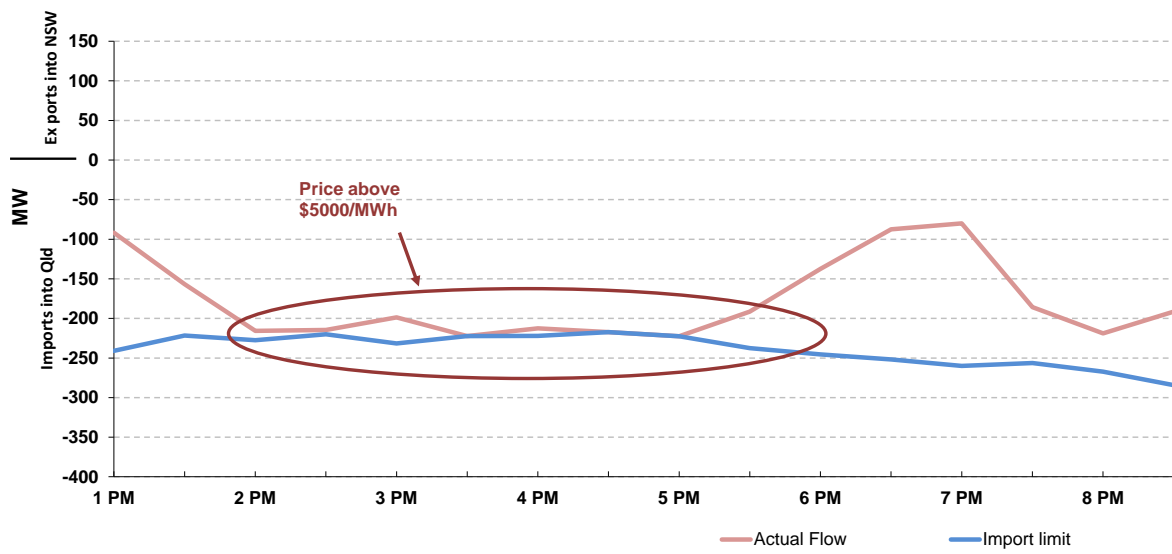
**Table 2: Actual and forecast network capability**

Time	Imports (MW)			Import limit (MW)		
	Actual	4 hr forecast	12 hr forecast	Actual	4 hr forecast	12 hr forecast
2 pm	-216	114	333	-228	-283	-252
2.30 pm	-215	-228	205	-220	-228	-290
3.30 pm	-222	-171	308	-222	-251	-293
4 pm	-212	-221	273	-222	-221	-292
4.30 pm	-217	-220	120	-217	-220	-289
5 pm	-223	-219	87	-223	-219	-284
5.30 pm	-192	-219	69	-237	-219	-289
6 pm	-138	-220	69	-246	-220	-297
8 pm	-219	-248	78	-267	-248	-313

Figure 5: shows the net import limit, and net target flows into Queensland. Flows into Queensland across the Terranora interconnector were limited to 10 MW during the time of high prices. Terranora has been partially out of service since August 2013 due to faulty cables, which has reduced its maximum import limit to around 30 MW. The interconnector is scheduled to return to service in mid-2015, which should return its nominal limit to around 110 MW.

Interconnectors were operating close to, or at their limits, and close to forecast during the time of high prices.

Figure 5: Net import limit and target flows



Australian Energy Regulator

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## A 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 amount of capacity involved and the change in the price of the capacity was being offered. The reason submitted at the time of the rebid is also included.

### Significant Rebids for 2 pm Trading interval

Submit time	Participant	Station	Capacity rebid (mw)	Price from (\$/mwh)	Price to (\$/mwh)	Rebid reason
9.55 am	CS Energy	Gladstone	400	22	Price cap	0945P Rearrangement due to GPS2 RTS2 RTS-SL
11.41 am	CS Energy	Gladstone	180	22	290	1139A change in Qld generation Oakey2 online - SL
12.20 pm	CS Energy	Gladstone	180	290	Price cap	1202A Reviewed sensitivities – 2014121717-SL
12.22 pm	Millmerran Energy Trader	Millmerran	-15	Price floor	N/A	12:22P: Plant limitation, condensate
12.31 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	12:31P: Plant limitation, condensate
12.59 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	12:59P: Plant limitation, condensate
1.11 pm	CS Energy	Gladstone	90	22	Price cap	1309A QNI actual limit > than 30min PD-SL
1.35 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	13:35P: Plant limitation, condensate
1.53 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	13:52P: Plant limitation, condensate
1.47 pm	AGL Hydro	Yabulu	-155	2200	N/A	1321-P-050 Chg in unit operation-run confirmed with station

## Significant Rebids for 2.30 pm Trading interval

Submit time	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
9.55 am	CS Energy	Gladstone	400	22	Price cap	0945P Rearrangement due to GPS2 RTS2 RTS-SL
12.20 am	CS Energy	Gladstone	180	22	Price cap	1202A reviewed sensitivities-2014121717 - SL
12.22 pm	Millmerran Energy Trader	Millmerran	-15	Price floor	N/A	12:22P: Plant limitation, condensate
12.31 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	12:31P: Plant limitation, condensate
12.59 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	12:59P: Plant limitation, condensate
1.35 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	13:35P: Plant limitation, condensate
1.53 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	13:52P: Plant limitation, condensate
1.47pm	CS Energy	Gladstone	90	22	Price cap	1347A dispatch price higher than 30 min forecast-SL
1.47 pm	AGL Hydro	Yabulu	-135	2200	N/A	1321-P-050 Chg in unit operation-run confirmed with station
2.11 pm	AGL Hydro	Yabulu	-20	Price floor	N/A	1408~P~020 reduction in avail cap~run up delayed
2.18 pm	Ergon	Barcaldine	-18	Price floor	N/A	17/12/2014 14:17 P: line outage SL

## Significant Rebids for 3.30 pm Trading interval

Submit time	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
9.55 am	CS Energy	Gladstone	400	22	Price cap	0945P Rearrangement due to GPS2 RTS2 RTS-SL
12.20 am	CS Energy	Gladstone	180	22	Price cap	1202A reviewed sensitivities-2014121717 - SL
12.22 pm	Millmerran Energy Trader	Millmerran	-15	Price floor	N/A	12:22P: Plant limitation, condensate
12.31 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	12:31P: Plant limitation, condensate
12.59 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	12:59P: Plant limitation, condensate
1.35 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	13:35P: Plant limitation, condensate
1.53 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	13:52P: Plant limitation, condensate
1.54 pm	CS Energy	Wivenhoe	250	15	Price cap	1354A dispatch price gigher than 30min forecast-SL
2.11 pm	CS Energy	Gladstone	90	22	Price cap	1354A dispatch price gigher than 30min forecast-SL
2.58 pm	Callide	Callide C	-16	Price floor	N/A	1456P UNIT 4 rebid 390MW PA fans both in motor load alarm
3.23 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	15:23P: Plant limitation, condensate

## Significant Rebids for 4 pm Trading interval

Submit time	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
9.55 am	CS Energy	Gladstone	400	22	Price cap	0945P Rearrangement due to GPS2 RTS2 RTS-SL
12.20 am	CS Energy	Gladstone	180	22	Price cap	1202A reviewed sensitivities-2014121717 - SL
12.22 pm	Millmerran Energy Trader	Millmerran	-15	Price floor	N/A	12:22P: Plant limitation, condensate
12.31 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	12:31P: Plant limitation, condensate
12.59 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	12:59P: Plant limitation, condensate
1.35 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	13:35P: Plant limitation, condensate
1.53 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	13:52P: Plant limitation, condensate
2.39 pm	CS Energy	Gladstone, Wivenhoe	340	<22	Price cap	1438A change in sensitivities-SL
3.23 pm	CS Energy	Gladstone	30	Price cap	Price floor	1523P rearrangment due to KPP derating-SL
3.23 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	15:23P: Plant limitation, condensate
3.24 pm	CS Energy	Gladstone	30	Price cap	Price floor	1523P rearrangment due to KPP derating-SL
3.37 pm	Origin	Mt Stuart	90	Price floor	13 454	1535A constraint management - N^MQ_NIL_B1 SL
3.39 pm	CS Energy	Gladstone	30	Price floor	Price cap	1523P rearrangment due to KPP load increasing-SL
3.51 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	15:51P: Plant limitation, condensate

## Significant Rebids for 4.30 pm Trading interval

Submit time	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
9.55 am	CS Energy	Gladstone	400	22	Price cap	0945P Rearrangement due to GPS2 RTS2 RTS-SL
12.20 am	CS Energy	Gladstone	180	22	Price cap	1202A reviewed sensitivities-2014121717 - SL
12.22 pm	Millmerran Energy Trader	Millmerran	-15	Price floor	N/A	12:22P: Plant limitation, condensate
12.31 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	12:31P: Plant limitation, condensate
12.59 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	12:59P: Plant limitation, condensate
1.35 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	13:35P: Plant limitation, condensate
1.53 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	13:52P: Plant limitation, condensate
2.39 pm	CS Energy	Gladstone, Wivenhoe	340	<22	Price cap	1438A change in sensitivities-SL
3.23 pm	CS Energy	Gladstone	30	Price cap	Price floor	1523P rearrangement due to KPP derating-SL
3.23 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	15:23P: Plant limitation, condensate
3.51 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	15:51P: Plant limitation, condensate
3.56 pm	CS Energy	Kogan	-10	13	N/A	1555P rebid unit to match load due to vibration issue-SL
3.56 pm	Callide	Callide C	-16	Price floor	N/A	1556P unit 4 rebid max cap 390MW feeders at max cap
3.57 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	15:57P: Plant limitation, condensate



Submit time	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
4.01 pm	CS Energy	Kogan	-5	13	N/A	1600P rebid unit to match load due to vibration issue-SL
4.03 pm	CS Energy	Callide B	-15	16	N/A	1602P vacuum limit-SL
4.07 pm	CS Energy	Gladstone	18	Price cap	Price floor	1606P rearrangement due to Callide B derating-SL

### Significant Rebids for 5 pm Trading interval

Submit time	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
9.55 am	CS Energy	Gladstone	400	22	Price cap	0945P Rearrangement due to GPS2 RTS2 RTS-SL
12.20 am	CS Energy	Gladstone	180	22	Price cap	1202A reviewed sensitivities-2014121717 - SL
12.22 pm	Millmerran Energy Trader	Millmerran	-15	Price floor	N/A	12:22P: Plant limitation, condensate
12.31 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	12:31P: Plant limitation, condensate
12.59 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	12:59P: Plant limitation, condensate
1.35 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	13:35P: Plant limitation, condensate
1.53 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	13:52P: Plant limitation, condensate
2.39 pm	CS Energy	Gladstone, Wivenhoe	340	<22	Price cap	1438A change in sensitivities-SL
3.23 pm	CS Energy	Gladstone	30	Price cap	Price floor	1523P rearrangement due to KPP derating-SL
3.23 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	15:23P: Plant limitation, condensate

Submit time	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
3.51 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	15:51P: Plant limitation, condensate
3.56 pm	Callide	Callide C	-16	Price floor	N/A	1556P unit 4 rebid max cap 390MW feeders at max cap
3.57 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	15:57P: Plant limitation, condensate
4.01 pm	CS Energy	Kogan	-5	13	N/A	1600P rebid unit to match load due to vibration issue-SL
4.03 pm	CS Energy	Callide B	-15	16	N/A	1602P vacuum limit-SL
4.07 pm	CS Energy	Gladstone	18	Price cap	Price floor	1606P rearrngment due to Callide B derating-SL
4.28 pm	Millmerran Energy Trader	Millmerran	5	N/A	Price floor	16:28P: Plant limitation, condensate

### Significant Rebids for 5.30 pm Trading interval

Submit time	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
12.22 pm	Millmerran Energy Trader	Millmerran	-15	Price floor	N/A	12:22P: Plant limitation, condensate
12.31 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	12:31P: Plant limitation, condensate
12.58 am	CS Energy	Gladstone	580	22	Price cap	1257A reviewed sensitivities-2014121718 - SL
12.59 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	12:59P: Plant limitation, condensate
1.35 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	13:35P: Plant limitation, condensate

Submit time	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
1.53 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	13:52P: Plant limitation, condensate
2.39 pm	CS Energy	Gladstone	30	22	Price cap	1438A change in sensitivities-SL
3.23 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	15:23P: Plant limitation, condensate
3.51 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	15:51P: Plant limitation, condensate
3.57 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	15:57P: Plant limitation, condensate
4.03 pm	CS Energy	Callide B	-15	16	N/A	1602P vacuum limit-SL
4.28 pm	Millmerran Energy Trader	Millmerran	5	N/A	Price floor	16:28P: Plant limitation, condensate
4.47 pm	Origin	Mt Stuart	85	Price floor	Price cap	1645A constraint management - N^Q_NIL_B1 SL
4.58 pm	Millmerran Energy Trader	Millmerran	5	N/A	Price floor	16:58P: Plant limitation, condensate
5.18 pm	Origin	Roma	-31	<30	N/A	1716P change in avail – unit trip SL

### Significant Rebids for 6 pm Trading interval

Submit time	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
12.22 pm	Millmerran Energy Trader	Millmerran	-15	Price floor	N/A	12:22P: Plant limitation, condensate
12.31 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	12:31P: Plant limitation, condensate

Submit time	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
12.58 am	CS Energy	Gladstone	580	22	Price cap	1257A reviewed sensitivities-2014121718 - SL
12.59 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	12:59P: Plant limitation, condensate
1.35 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	13:35P: Plant limitation, condensate
1.53 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	13:52P: Plant limitation, condensate
2.39 pm	CS Energy	Gladstone	30	22	Price cap	1438A change in sensitivities-SL
3.23 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	15:23P: Plant limitation, condensate
3.51 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	15:51P: Plant limitation, condensate
3.57 pm	Millmerran Energy Trader	Millmerran	-5	Price floor	N/A	15:57P: Plant limitation, condensate
4.03 pm	CS Energy	Callide B	-15	16	N/A	1602P vacuum limit-SL
4.28 pm	Millmerran Energy Trader	Millmerran	5	N/A	Price floor	16:28P: Plant limitation, condensate
4.58 pm	Millmerran Energy Trader	Millmerran	5	N/A	Price floor	16:58P: Plant limitation, condensate
5.18 pm	Origin	Roma	-31	<30	N/A	1716P change in avail – unit trip SL
5.29 pm	CS Energy	Callide B	-20	16	N/A	1729P vacuum limit-SL
5.33 pm	CS Energy	Kogan	-10	13	N/A	1733P turbine vibration-SL

## Significant Rebids for 8 pm Trading interval

Submit time	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
12.58 am	CS Energy	Gladstone	580	22	Price cap	1257A reviewed sensitivities-2014121718 - SL
6.37 pm	CS Energy	Callide	-45	16	N/A	1836P vacuum limit-SL 305
7.49 pm	CS Energy	Gladstone	150	Price floor	Price cap	1949A interconnector constraint-change in QNI limits-SL

## B 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.<sup>4</sup> The 30-minute spot price is the average of the six dispatch interval prices.

### Queensland - 2 pm

Time	Dispatch Price	Participant	Unit	Service	Marginal change	Contribution
13:35	\$47.33	Snowy Hydro	UPPTUMUT	Energy	\$41.96	1.13
13:40	\$13 499.00	Stanwell	BARRON-2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA1	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA4	Energy	\$13 499.00	0.01
		Stanwell	STAN-1	Energy	\$13 499.00	0.12
		Stanwell	STAN-2	Energy	\$13 499.00	0.12
		Stanwell	STAN-3	Energy	\$13 499.00	0.12
		Stanwell	STAN-4	Energy	\$13 499.00	0.12
		Stanwell	TARONG#1	Energy	\$13 499.00	0.17
		Stanwell	TARONG#3	Energy	\$13 499.00	0.17
		Stanwell	TARONG#4	Energy	\$13 499.00	0.17
13:45	\$6666.66	Stanwell	STAN-1	Energy	\$6666.66	0.25
		Stanwell	STAN-2	Energy	\$6666.66	0.25
		Stanwell	STAN-3	Energy	\$6666.66	0.25
		Stanwell	STAN-4	Energy	\$6666.66	0.25
13:50	\$13 499.00	Stanwell	BARRON-2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA1	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA4	Energy	\$13 499.00	0.01

<sup>4</sup> Details on how the price is determined can be found at [www.aemo.com.au](http://www.aemo.com.au)

Time	Dispatch Price	Participant	Unit	Service	Marginal change	Contribution
		Stanwell	STAN-1	Energy	\$13 499.00	0.12
		Stanwell	STAN-2	Energy	\$13 499.00	0.12
		Stanwell	STAN-3	Energy	\$13 499.00	0.12
		Stanwell	STAN-4	Energy	\$13 499.00	0.12
		Stanwell	TARONG#1	Energy	\$13 499.00	0.17
		Stanwell	TARONG#3	Energy	\$13 499.00	0.17
		Stanwell	TARONG#4	Energy	\$13 499.00	0.17
13:55	\$6666.66	Stanwell	STAN-1	Energy	\$6666.66	0.25
		Stanwell	STAN-2	Energy	\$6666.66	0.25
		Stanwell	STAN-3	Energy	\$6666.66	0.25
		Stanwell	STAN-4	Energy	\$6666.66	0.25
14:00	\$40.94	Macquarie Generation	LD02	Energy	\$35.96	1.14
	Spot Price	\$6737/MWh				

### Queensland – 2.30 pm

Time	Dispatch Price	Participant	Unit	Service	Marginal change	Contribution
14:05	\$6666.66	Stanwell	STAN-1	Energy	\$6666.66	0.25
		Stanwell	STAN-2	Energy	\$6666.66	0.25
		Stanwell	STAN-3	Energy	\$6666.66	0.25
		Stanwell	STAN-4	Energy	\$6666.66	0.25
14:10	\$47.42	Snowy Hydro	UPPTUMUT	Energy	\$41.96	1.13
14:15	\$6666.66	Stanwell	STAN-1	Energy	\$6666.66	0.25
		Stanwell	STAN-2	Energy	\$6666.66	0.25
		Stanwell	STAN-3	Energy	\$6666.66	0.25
		Stanwell	STAN-4	Energy	\$6666.66	0.25
14:20	\$13 499.00	Stanwell	BARRON-2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA1	Energy	\$13 499.00	0.01

Time	Dispatch Price	Participant	Unit	Service	Marginal change	Contribution
		Stanwell	KAREEYA2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA4	Energy	\$13 499.00	0.01
		Stanwell	STAN-1	Energy	\$13 499.00	0.13
		Stanwell	STAN-2	Energy	\$13 499.00	0.13
		Stanwell	STAN-4	Energy	\$13 499.00	0.13
		Stanwell	TARONG#1	Energy	\$13 499.00	0.19
		Stanwell	TARONG#3	Energy	\$13 499.00	0.19
		Stanwell	TARONG#4	Energy	\$13 499.00	0.19
14:25	\$13 499.00	Stanwell	BARRON-2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA1	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA4	Energy	\$13 499.00	0.01
		Stanwell	STAN-1	Energy	\$13 499.00	0.12
		Stanwell	STAN-2	Energy	\$13 499.00	0.12
		Stanwell	STAN-3	Energy	\$13 499.00	0.12
		Stanwell	STAN-4	Energy	\$13 499.00	0.12
		Stanwell	TARONG#1	Energy	\$13 499.00	0.17
		Stanwell	TARONG#3	Energy	\$13 499.00	0.17
		Stanwell	TARONG#4	Energy	\$13 499.00	0.17
14:30	\$13 499.00	Stanwell	BARRON-2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA1	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA4	Energy	\$13 499.00	0.01
		Stanwell	STAN-1	Energy	\$13 499.00	0.12
		Stanwell	STAN-2	Energy	\$13 499.00	0.12
		Stanwell	STAN-3	Energy	\$13 499.00	0.12
		Stanwell	STAN-4	Energy	\$13 499.00	0.12



Time	Dispatch Price	Participant	Unit	Service	Marginal change	Contribution
		Stanwell	TARONG#1	Energy	\$13 499.00	0.17
		Stanwell	TARONG#3	Energy	\$13 499.00	0.17
		Stanwell	TARONG#4	Energy	\$13 499.00	0.17
	Spot Price	\$8980/MWh				

### Queensland – 3.30 pm

Time	Dispatch Price	Participant	Unit	Service	Marginal change	Contribution
15:05	\$6666.66	Stanwell	STAN-1	Energy	\$6666.66	0.25
		Stanwell	STAN-2	Energy	\$6666.66	0.25
		Stanwell	STAN-3	Energy	\$6666.66	0.25
		Stanwell	STAN-4	Energy	\$6666.66	0.25
15:10	\$6666.66	Stanwell	STAN-1	Energy	\$6666.66	0.25
		Stanwell	STAN-2	Energy	\$6666.66	0.25
		Stanwell	STAN-3	Energy	\$6666.66	0.25
		Stanwell	STAN-4	Energy	\$6666.66	0.25
15:15	\$13454.00	Origin Energy	MSTUART3	Energy	\$13454.00	1.00
15:20	\$13454.00	Origin Energy	MSTUART3	Energy	\$13454.00	1.00
15:25	\$13454.00	Origin Energy	MSTUART3	Energy	\$13454.00	1.00
15:30	\$6666.66	Stanwell	STAN-1	Energy	\$6666.66	0.25
		Stanwell	STAN-2	Energy	\$6666.66	0.25
		Stanwell	STAN-3	Energy	\$6666.66	0.25
		Stanwell	STAN-4	Energy	\$6666.66	0.25
	Spot Price	\$10 060/MWh				

## Queensland – 4 pm

Time	Dispatch Price	Participant	Unit	Service	Marginal change	Contribution
15:35	\$47.54	Snowy Hydro	UPPTUMUT	Energy	\$41.96	1.13
15:40	\$47.95	Snowy Hydro	UPPTUMUT	Energy	\$41.96	1.14
15:45	\$13 454.00	Origin Energy	MSTUART1	Energy	\$13 454.00	0.50
		Origin Energy	MSTUART2	Energy	\$13 454.00	0.50
15:50	\$13 454.00	Origin Energy	MSTUART1	Energy	\$13 454.00	0.21
		Origin Energy	MSTUART2	Energy	\$13 454.00	0.21
		Origin Energy	MSTUART3	Energy	\$13 454.00	0.59
15:55	\$13 454.00	Origin Energy	MSTUART1	Energy	\$13 454.00	0.50
		Origin Energy	MSTUART2	Energy	\$13 454.00	0.50
16:00	\$13 499.00	Stanwell	BARRON-2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA1	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA4	Energy	\$13 499.00	0.01
		Stanwell	STAN-1	Energy	\$13 499.00	0.12
		Stanwell	STAN-2	Energy	\$13 499.00	0.12
		Stanwell	STAN-3	Energy	\$13 499.00	0.12
		Stanwell	STAN-4	Energy	\$13 499.00	0.12
		Stanwell	TARONG#1	Energy	\$13 499.00	0.17
		Stanwell	TARONG#3	Energy	\$13 499.00	0.17
		Stanwell	TARONG#4	Energy	\$13 499.00	0.17
	Spot Price	\$8993/MWh				

## Queensland – 4.30 pm

Time	Dispatch Price	Participant	Unit	Service	Marginal change	Contribution
16:05	\$13 499.00	Stanwell	BARRON-2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA1	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA4	Energy	\$13 499.00	0.01
		Stanwell	STAN-1	Energy	\$13 499.00	0.12
		Stanwell	STAN-2	Energy	\$13 499.00	0.12
		Stanwell	STAN-3	Energy	\$13 499.00	0.12
		Stanwell	STAN-4	Energy	\$13 499.00	0.12
		Stanwell	TARONG#1	Energy	\$13 499.00	0.17
		Stanwell	TARONG#3	Energy	\$13 499.00	0.17
		Stanwell	TARONG#4	Energy	\$13 499.00	0.17
		16:10	\$13 499.00	Stanwell	BARRON-2	Energy
Stanwell	KAREEYA1			Energy	\$13 499.00	0.01
Stanwell	KAREEYA2			Energy	\$13 499.00	0.01
Stanwell	KAREEYA4			Energy	\$13 499.00	0.01
Stanwell	STAN-1			Energy	\$13 499.00	0.12
Stanwell	STAN-2			Energy	\$13 499.00	0.12
Stanwell	STAN-3			Energy	\$13 499.00	0.12
Stanwell	STAN-4			Energy	\$13 499.00	0.12
Stanwell	TARONG#1			Energy	\$13 499.00	0.17
Stanwell	TARONG#3			Energy	\$13 499.00	0.17
Stanwell	TARONG#4			Energy	\$13 499.00	0.17
16:15	\$13 499.00			Stanwell	BARRON-2	Energy
		Stanwell	KAREEYA1	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA4	Energy	\$13 499.00	0.01

Time	Dispatch Price	Participant	Unit	Service	Marginal change	Contribution
		Stanwell	STAN-1	Energy	\$13 499.00	0.12
		Stanwell	STAN-2	Energy	\$13 499.00	0.12
		Stanwell	STAN-3	Energy	\$13 499.00	0.12
		Stanwell	STAN-4	Energy	\$13 499.00	0.12
		Stanwell	TARONG#1	Energy	\$13 499.00	0.17
		Stanwell	TARONG#3	Energy	\$13 499.00	0.17
		Stanwell	TARONG#4	Energy	\$13 499.00	0.17
16:20	\$13 499.00	Stanwell	BARRON-2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA1	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA4	Energy	\$13 499.00	0.01
		Stanwell	STAN-1	Energy	\$13 499.00	0.12
		Stanwell	STAN-2	Energy	\$13499.00	0.12
		Stanwell	STAN-3	Energy	\$13 499.00	0.12
		Stanwell	STAN-4	Energy	\$13 499.00	0.12
		Stanwell	TARONG#1	Energy	\$13 499.00	0.17
		Stanwell	TARONG#3	Energy	\$13 499.00	0.17
		Stanwell	TARONG#4	Energy	\$13 499.00	0.17
16:25	\$13 499.00	Stanwell	BARRON-2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA1	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA4	Energy	\$13 499.00	0.01
		Stanwell	STAN-1	Energy	\$13 499.00	0.12
		Stanwell	STAN-2	Energy	\$13 499.00	0.12
		Stanwell	STAN-3	Energy	\$13 499.00	0.12
		Stanwell	STAN-4	Energy	\$13 499.00	0.12
		Stanwell	TARONG#1	Energy	\$13 499.00	0.17

Time	Dispatch Price	Participant	Unit	Service	Marginal change	Contribution
		Stanwell	TARONG#3	Energy	\$13 499.00	0.17
		Stanwell	TARONG#4	Energy	\$13 499.00	0.17
16:30	\$13 499.00	Stanwell	BARRON-2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA1	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA4	Energy	\$13 499.00	0.01
		Stanwell	STAN-1	Energy	\$13 499.00	0.12
		Stanwell	STAN-2	Energy	\$13 499.00	0.12
		Stanwell	STAN-3	Energy	\$13 499.00	0.12
		Stanwell	STAN-4	Energy	\$13 499.00	0.12
		Stanwell	TARONG#1	Energy	\$13 499.00	0.17
		Stanwell	TARONG#3	Energy	\$13 499.00	0.17
		Stanwell	TARONG#4	Energy	\$13 499.00	0.17
<b>Spot Price</b>		<b>\$13 499/MWh</b>				

### Queensland – 5 pm

Time	Dispatch Price	Participant	Unit	Service	Marginal change	Contribution
16:35	\$13 499.00	Stanwell	BARRON-2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA1	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA4	Energy	\$13 499.00	0.01
		Stanwell	STAN-1	Energy	\$13 499.00	0.12
		Stanwell	STAN-2	Energy	\$13 499.00	0.12
		Stanwell	STAN-3	Energy	\$13 499.00	0.12
		Stanwell	STAN-4	Energy	\$13 499.00	0.12
		Stanwell	TARONG#1	Energy	\$13 499.00	0.17
		Stanwell	TARONG#3	Energy	\$13 499.00	0.17

Time	Dispatch Price	Participant	Unit	Service	Marginal change	Contribution
		Stanwell	TARONG#4	Energy	\$13 499.00	0.17
16:40	\$13 499.00	Stanwell	BARRON-2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA1	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA4	Energy	\$13 499.00	0.01
		Stanwell	STAN-1	Energy	\$13 499.00	0.12
		Stanwell	STAN-2	Energy	\$13 499.00	0.12
		Stanwell	STAN-3	Energy	\$13 499.00	0.12
		Stanwell	STAN-4	Energy	\$13 499.00	0.12
		Stanwell	TARONG#1	Energy	\$13 499.00	0.17
		Stanwell	TARONG#3	Energy	\$13 499.00	0.17
		Stanwell	TARONG#4	Energy	\$13 499.00	0.17
16:45	\$13 499.00	Stanwell	BARRON-2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA1	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA4	Energy	\$13 499.00	0.01
		Stanwell	STAN-1	Energy	\$13 499.00	0.12
		Stanwell	STAN-2	Energy	\$13 499.00	0.12
		Stanwell	STAN-3	Energy	\$13 499.00	0.12
		Stanwell	STAN-4	Energy	\$13 499.00	0.12
		Stanwell	TARONG#1	Energy	\$13 499.00	0.17
		Stanwell	TARONG#3	Energy	\$13 499.00	0.17
		Stanwell	TARONG#4	Energy	\$13 499.00	0.17
16:50	\$13 499.00	Stanwell	BARRON-2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA1	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA4	Energy	\$13 499.00	0.01

Time	Dispatch Price	Participant	Unit	Service	Marginal change	Contribution
		Stanwell	STAN-1	Energy	\$13 499.00	0.12
		Stanwell	STAN-2	Energy	\$13 499.00	0.12
		Stanwell	STAN-3	Energy	\$13 499.00	0.12
		Stanwell	STAN-4	Energy	\$13 499.00	0.12
		Stanwell	TARONG#1	Energy	\$13 499.00	0.17
		Stanwell	TARONG#3	Energy	\$13 499.00	0.17
		Stanwell	TARONG#4	Energy	\$13 499.00	0.17
16:55	\$13 499.00	Stanwell	BARRON-2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA1	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA4	Energy	\$13 499.00	0.01
		Stanwell	STAN-1	Energy	\$13 499.00	0.12
		Stanwell	STAN-2	Energy	\$13 499.00	0.12
		Stanwell	STAN-3	Energy	\$13 499.00	0.12
		Stanwell	STAN-4	Energy	\$13 499.00	0.12
		Stanwell	TARONG#1	Energy	\$13 499.00	0.17
		Stanwell	TARONG#3	Energy	\$13 499.00	0.17
		Stanwell	TARONG#4	Energy	\$13 499.00	0.17
17:00	\$13 499.00	Stanwell	BARRON-2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA1	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA4	Energy	\$13 499.00	0.01
		Stanwell	STAN-1	Energy	\$13 499.00	0.12
		Stanwell	STAN-2	Energy	\$13 499.00	0.12
		Stanwell	STAN-3	Energy	\$13 499.00	0.12
		Stanwell	STAN-4	Energy	\$13 499.00	0.12
		Stanwell	TARONG#1	Energy	\$13 499.00	0.17

Time	Dispatch Price	Participant	Unit	Service	Marginal change	Contribution
		Stanwell	TARONG#3	Energy	\$13 499.00	0.17
		Stanwell	TARONG#4	Energy	\$13 499.00	0.17
<b>Spot Price</b>		<b>\$13 499/MWh</b>				

### Queensland – 5.30 pm

Time	Dispatch Price	Participant	Unit	Service	Marginal change	Contribution
17:05	\$13 499.00	Stanwell	BARRON-2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA1	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA2	Energy	\$13 499.00	0.01
		Stanwell	KAREEYA4	Energy	\$13 499.00	0.01
		Stanwell	STAN-1	Energy	\$13 499.00	0.12
		Stanwell	STAN-2	Energy	\$13 499.00	0.12
		Stanwell	STAN-3	Energy	\$13 499.00	0.12
		Stanwell	STAN-4	Energy	\$13 499.00	0.12
		Stanwell	TARONG#1	Energy	\$13 499.00	0.16
		Stanwell	TARONG#3	Energy	\$13 499.00	0.16
		Stanwell	TARONG#4	Energy	\$13 499.00	0.16
17:10	\$13 454.00	Origin Energy	MSTUART1	Energy	\$13 454.00	0.36
		Origin Energy	MSTUART2	Energy	\$13 454.00	0.36
		Origin Energy	MSTUART3	Energy	\$13 454.00	0.28
17:15	\$13 454.00	Origin Energy	MSTUART1	Energy	\$13 454.00	0.36
		Origin Energy	MSTUART2	Energy	\$13 454.00	0.36
		Origin Energy	MSTUART3	Energy	\$13 454.00	0.28
17:20	\$13 454.00	Origin Energy	MSTUART1	Energy	\$13 454.00	0.36
		Origin Energy	MSTUART2	Energy	\$13 454.00	0.36
		Origin Energy	MSTUART3	Energy	\$13 454.00	0.28



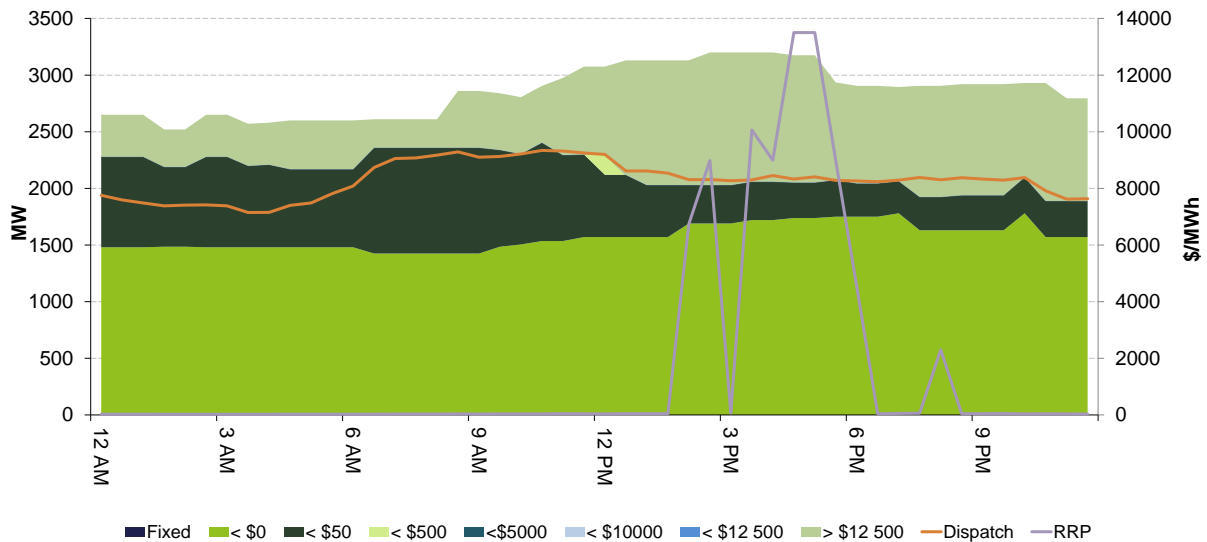
17:25	\$37.42	Snowy Hydro	MURRAY	Energy	\$32.80	1.14
17:30	\$37.43	Snowy Hydro	MURRAY	Energy	\$32.80	1.14
<b>Spot Price</b>	<b>\$8989/MWh</b>					

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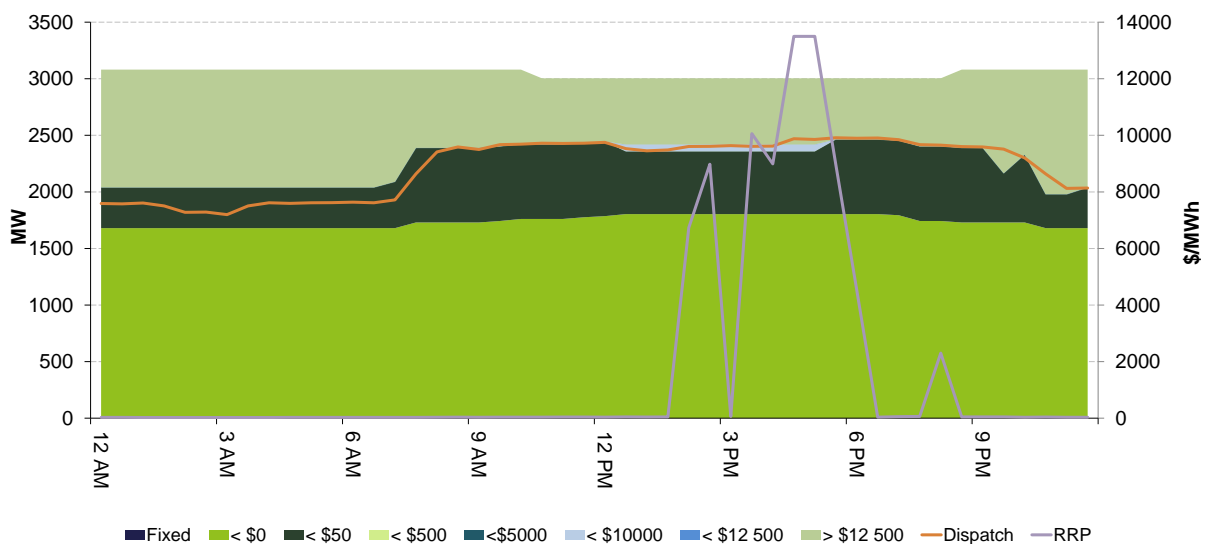
## C Closing bids

Figures C1, C2 and C3 highlight the half hour closing bids for participants in Queensland with significant 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 C1 - CS Energy (Callide B, Gladstone, Kogan Creek, Wivenhoe) closing bid prices, dispatch and spot price**



**Figure C2 - Stanwell (Barron Gorge, Kareeya, Mackay, Stanwell, Tarong, Tarong North) closing bid prices, dispatch and spot price**



**Figure C3 - Origin (Darling Downs, Mt Stuart, Roma) closing bid prices, dispatch and spot price**

