

Electricity spot prices above $5000/MWh

Queensland, 5 March 2015

7 May 2015

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# Introduction

The AER is required to publish a report whenever the electricity spot price exceeds $5000/MWh.[[1]](#footnote-1) 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.

# Summary

On 5 March 2015, the spot price in Queensland exceeded $5000/MWh for all of the trading intervals from 4.30 pm to 7 pm, with the exception of the 6.30 pm trading interval (the price reached $4353/MWh). Both four and twelve hours ahead, the forecast spot price for these trading intervals was between $39/MWh and $60/MWh. Prices were volatile for the entire day with 39 dispatch intervals at or above $12 900/MWh.

It was the hottest weekday in Brisbane of the 2014/15 summer with the temperature in Brisbane and surrounding areas, reaching 36.1 degrees, as forecast. Maximum demand of 8969 MW[[2]](#footnote-2) occurred at 5 pm, a new record for Queensland. A demand side response from some commercial and industrial customers was also evident during the high price periods.

While high demand contributed to the high prices there was no capacity shortfall, with around 800 MW of available generation capacity in Queensland in excess of demand. Four hours ahead there was around 400 MW of capacity priced between $60/MWh and $12 500/MWh. Through rebidding, almost all of this capacity was shifted to high prices, the majority of which became effective within most of the high priced trading intervals.

For most of the high price periods a binding network constraint limited flows from New South Wales into Queensland on the QNI interconnector. In addition, the partial outage of the Terranora interconnector forced around 80 MW to flow (counter price) from Queensland to New South Wales.

Given these conditions, minor changes in availability, rebidding, or demand resulted in large price variations.

# Analysis

Table 1 shows actual and forecast spot price, demand and availability for each high price[[3]](#footnote-3) trading interval. The spot price in Queensland exceeded $5000/MWh for all but one of the trading intervals from 4.30 pm to 7 pm.

The table shows that high prices were not forecast four or twelve hours ahead of dispatch.

Actual demand for all the trading intervals was between 180 MW and 496 MW higher than forecast four hours ahead. Although availability was between 157 MW and 516 MW lower than forecast four hours ahead this did not materially affect prices as there was still around 800 MW in excess of demand.

The analysis in section 3.1 shows that supply conditions were such that small variations in demand and limited interconnector flows had the potential to lead to large variations in price.

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 |
| 4.30 pm | 12 958 | 59 | 55 | 8690 | 8510 | 8492 | 9922 | 10 433 | 10 461 |
| 5 pm | 9383 | 55 | 55 | 8809 | 8570 | 8521 | 9911 | 10 427 | 10 460 |
| 5.30 pm | 13 166 | 55 | 39 | 8758 | 8429 | 8341 | 9913 | 10 134 | 10 462 |
| 6 pm | 8673 | 39 | 39 | 8647 | 8355 | 8260 | 9922 | 10 129 | 10 441 |
| 6.30 pm | 4353 | 39 | 39 | 8597 | 8251 | 8268 | 9932 | 10 112 | 10 441 |
| 7 pm | 11 025 | 39 | 39 | 8794 | 8298 | 8341 | 9953 | 10 110 | 10 454 |

## Supply and Demand

This section discusses changes to the offered prices and capacity and market demand conditions relevant to the high price periods.

### Rebidding

Appendix A contains all significant rebids that contributed to the high prices. Figure 1 graphically summarises significant rebids made within 12 hours of dispatch and which were effective during the high price period.

Areas above the horizontal axis represent capacity rebid from low prices to high prices for each trading interval, by participant and station. Areas below the horizontal axis represent capacity withdrawn, for each trading interval. Hatched areas represent capacity rebids (some shortly before the trading interval i.e. late) becoming effective within the trading interval. The spot price in each interval is shown above each column.

Figure 1: Rebidding to high prices and capacity withdrawn, by trading interval



$4353/MWh

$13 166/MWh

$8673/MWh

$9383/MWh

$12 958/MWh

$11 025/MWh

To understand Figure 1, take for example the 5.30 pm trading interval, when the spot price reached its maximum for the day ($13 166/MWh):

* ERM rebid 32 MW of the 342 MW available at Oakey (light orange) from low prices to high prices.
* Millmerran rebid 60 MW of the 760 MW available at Millmerran (dark orange) from low prices to high prices.
* CS Energy rebid 340 MW of the 1120 MW available at Gladstone (green hatched) from low prices to high prices which became effective during the trading interval.
* CS Energy reduced the available capacity at Callide B (light red) by 10 MW.
* Origin reduced the available capacity at Darling Downs (purple) by 15 MW.
* Callide reduced the available capacity at Callide C (maroon) 10 MW.
* Millmerran reduced the available capacity at Millmerran (dark orange) by 55 MW.
* CS Energy reduced the available capacity at Wivenhoe (light blue) by 250 MW (this capacity was priced at the price cap).

### Supply curve

This section examines actual and forecast supply curves that existed as a result of the rebidding in 3.1.1 for the 5.30 pm trading interval (when the spot price reached its maximum for the day of $13 166/MWh).

Figure 2: Forecast and actual supply curves for 5.30 pm



Figure 2 shows the actual supply curve for the 5.30 pm trading interval (denoted by the solid green line), the supply curve forecast 12 hours ahead (i.e. 5 am, denoted by the solid blue line)[[4]](#footnote-4), and the supply curve forecast four hours ahead (i.e. 1 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 5.30 pm trading interval (represented as vertical dotted lines, they follow the same colour convention as the supply curves).

Figure 2 shows that the rebidding up to four hours ahead did not have a significant effect on the supply curve or forecast prices. However rebidding within four hours (i.e. after 1 pm) moved capacity priced between $60/MWh and $2000/MWh to prices greater than $12 900/MWh. The inset in Figure 2 shows the effect rebidding within four hours of dispatch had on the shape of the supply curve for prices up to $2000/MWh. The red (forecast) supply curve shifted to the left and became vertical, as shown by the green, or actual supply curve for 5.30 pm. The green supply curve shows that as a result of rebidding, there was no capacity left between $56/MWh and $12 900/MWh.

### Demand

The maximum temperature in Brisbane was, as forecast, 36 degrees making it the hottest week day for the 2014/15 summer. Maximum demand for the day reached 8969 MW[[5]](#footnote-5) at 5 pm, a new record for Queensland.

Figure 3 shows actual demand, forecast demand over several timeframes and demand adjusted for commercial and industrial customer response.

Figure 3: Actual and forecast demand



\* Note: the spot price at 6.30 pm was $4353/MWh

Taking the 5.30 pm (i.e. highest price trading interval) as an example, Figure 3 (as does Table 1) shows that that demand for the 5.30 pm trading interval was forecast to be 8341 MW twelve hours ahead (blue dashed line), 8429 MW four hours ahead and 8631 MW half an hour ahead of dispatch (green dashed line). However, actual demand (denoted by the red line) reached 8758 MW, almost 130 MW higher than forecast half an hour ahead.

According to data provided by AEMO, commercial and industrial customer demand reduced in response to the high prices by an average of 79 MW for the trading intervals from 2.30 pm to 9 pm.

The solid blue line in Figure 4 shows what demand would have been had the commercial and industrial demand not reduced in response to high prices. As these customers are non-scheduled their response at any point in time is not incorporated in AEMO’s demand forecasts. The figure shows that had these customers not reduced their demand, the demand forecast error of 127 MW half an hour ahead for the 5.30 pm trading interval would have been even larger at 208 MW.

Figure 4 shows 5-minute demand and price over the high price period. The figure shows that, with the vertical supply curve as discussed in section 3.1.2, 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.

## Network Availability

Table 2 shows the net import limit into Queensland from New South Wales was around 460 MW lower than the nominal limit of 600 MW during the time of high prices.

Table 2: Actual and forecast network capability

| Trading interval | Imports (MW) | Import limit (MW) |
| --- | --- | --- |
|  | Actual | 4 hr forecast | 12 hr forecast | Actual | 4 hr forecast | 12 hr forecast |
| 4.30 pm | 141 | 166 | 145 | 141 | 166 | 145 |
| 5 pm | 136 | 166 | 144 | 136 | 166 | 144 |
| 5.30 pm | 132 | 190 | 133 | 132 | 190 | 174 |
| 6 pm | 130 | 190 | 133 | 139 | 190 | 175 |
| 6.30 pm | 148 | 197 | 133 | 148 | 197 | 178 |
| 7 pm | 152 | 183 | 169 | 152 | 183 | 176 |

Flows into Queensland across QNI and Terranora interconnectors combined were limited to around 140 MW during the time of high prices.

Imports on the Queensland to New South Wales interconnector (QNI) were limited to around 220 MW by a system normal constraint designed to avoid voltage collapse in Queensland on the loss of the largest generator in Queensland.

Terranora has been partially out of service since August 2013 due to faulty cables. During the time of high prices, constraints on this line forced around 80 MW to flow counter price from Queensland to New South Wales. The interconnector is scheduled to return to service in mid-2015, which should return its nominal limit to around 110 MW.

Figure 5 shows the net import limit, and net target flows into Queensland. Interconnectors were operating close to, or at, their import limits at the time of high prices. As shown in Table 2, at the time of high prices the import limit was almost up to 60 MW lower than forecast four hours ahead.

Figure 5: Net import limit and target flows



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May 2015

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 capacity involved, the change in the price of the capacity was being offered and the rebid reason.

Significant rebids for 4.30 pm

| Submit time | Participant | Station | Capacity rebid (MW) | Price from ($/MWh) | Price to ($/MWh) | Rebid reason |
| --- | --- | --- | --- | --- | --- | --- |
| 12.36 pm | Origin | Darling Downs | -5 | -1 | N/A | 1234P change in avail - backpressure issues SL |
| 12.37 pm | CS Energy | Wivenhoe | -50 | 0 | N/A | 1236P technical issues-unit vibrations-SL |
| 12.48 pm | Callide | Callide C | -10 | <14 | N/A | 1248P unit max cap bfp |
| 12.49 pm | CS Energy | Callide B | -50 | 17 | N/A | 1248P coal quality-SL |
| 1.21 pm | CS Energy | Callide B | -25 | -17 | N/A | 1320P condenser unloading-SL |
| 1.36 pm | Origin | Darling Downs | -10 | -1 | N/A | 1335P change in avail - backpressure issues SL |
| 1.56 pm | Millmerran | Millmerran | -25 | -7 | N/A | 13:56 p: plant-limitation, condensate |
| 2.01 pm | CS Energy | Callide B | -15 | -17 | N/A | 1401P condenser vacuum-SL |
| 2.34 pm | Origin | Darling Downs | -10 | -1 | N/A | 1430P change in avail - backpressure issues SL |
| 3.34 pm | CS Energy | Wivenhoe | -250 | 13 000 | N/A | 1534P technical issues-control system-sl |
| 3.40 pm | Millmerran | Millmerran | -55 | 7 | N/A | 15:40 P high condensate temps |
| 3.50 pm | Callide | Callide C | -10 | <14 | N/A | 1549P both pa fan in hi motor load alarm |
| 3.51 pm | ERM | Oakey | 32 | 458 | 13 499 | 1550F material change in market conditions ::change mw distrib. |
| 3.57 pm (effective 4.05 pm) | CS Energy | Gladstone | 280 | <1400 | >13 000 | 1557A QLD demand higher than forecast-SL |
| 4.02 pm (effective 4.10 pm) | Millmerran | Millmerran | 60 | 7 | 13 500 | 16:02 A RRP above PD |
| **Total capacity rebid from low to high prices** | **372** |  |  |  |
| **Total capacity withdrawn** | **515** |  |  |  |

Significant rebids for 5 pm

| Submit time | Participant | Station | Capacity rebid (MW) | Price from ($/MWh) | Price to ($/MWh) | Rebid reason |
| --- | --- | --- | --- | --- | --- | --- |
| 12.36 pm | Origin | Darling Downs | -5 | -1 | N/A | 1234P change in avail - backpressure issues SL |
| 12.37 pm | CS Energy | Wivenhoe | -50 | 0 | N/A | 1236P technical issues-unit vibrations-SL |
| 12.48 pm | Callide | Callide C | -10 | <14 | N/A | 1248P unit max cap bfp |
| 12.49 pm | CS Energy | Callide B | -50 | 17 | N/A | 1248P coal quality-SL |
| 1.21 pm | CS Energy | Callide B | -25 | 17 | N/A | 1320P condenser unloading-SL |
| 1.36 pm | Origin | Darling Downs | -5 | -1 | N/A | 1335P change in avail - backpressure issues SL |
| 1.56 pm | Millmerran | Millmerran | -25 | 7 | N/A | 13:56 P: plant limitation, condensate |
| 2.34 pm | Origin | Darling Downs | -10 | -1 | N/A | 1430P change in avail - backpressure issues SL |
| 3.34 pm | CS Energy | Wivenhoe | -250 | 13 500 | N/A | 1534P technical issues-control system-sl |
| 3.40 pm | Millmerran | Millmerran | -55 | -7 | N/A | 15:40 P high condensate temps |
| 3.50 pm | Callide | Callide C | -10 | <14 | N/A | 1549P both pa fan in hi motor load alarm |
| 4.02 pm | Millmerran | Millmerran | 60 | 7 | 13 500 | 16:02 A RRP above pd |
| 4.07 pm | ERM | Oakey | 32 | 458 | 13 499 | 1606F material change in market conditions :: change mw distrib. |
| 4.20 pm | Origin | Mt Stuart | -8 | 55 | N/A | 1620P change in avail - ambient conditions SL |
| 4.26 pm (effective from 4.35 pm) | CS Energy | Gladstone | 80 | 39 | 13 500 | 1625A change in QLD demand-SL |
| 4.30 pm (effective from 4.40 pm) | CS Energy | Callide B | -10 | 17 | N/A | 1629P condenser vacuum-SL |
| 4.32 pm (effective from 4.40 pm) | CS Energy | Gladstone | 60 | 39 | 13 500 | 1630A dispatch price higher than 30min forecast-SL |
| 4.36 pm (effective from 4.45 pm) | Origin | Darling Downs | -5 | -1 | N/A | 1630P change in avail - backpressure issues SL[1] |
| 4.36 pm (effective from 4.45 pm) | CS Energy | Gladstone | 220 | <1400 | >13 000 | 1636A reviewed sensitivities-SL |
| **Total capacity rebid from low to high prices** | **452** |  |  |  |
| **Total capacity withdrawn** | **518** |  |  |  |

Significant rebids for 5.30 pm

| Submit time | Participant | Station | Capacity rebid (MW) | Price from ($/MWh) | Price to ($/MWh) | Rebid reason |
| --- | --- | --- | --- | --- | --- | --- |
| 1.36 pm | Origin | Darling Downs | -5 | -1 | N/A | 1335P change in avail - backpressure issues SL |
| 2.34 pm | Origin | Darling Downs | -10 | -1 | N/A | 1430P change in avail - backpressure issues SL[1] |
| 3.34 pm | CS Energy | Wivenhoe | -250 | 13 500 | N/A | 1534P technical issues-control system-sl |
| 3.40 pm | Millmerran | Millmerran | -55 | 7 | N/A | 15:40 P high condensate temps |
| 3.50 pm | Callide | Callide C | -10 | <14 | N/A | 1549P both pa fan in hi motor load alarm |
| 4.02 pm | Millmerran | Millmerran | 60 | 7 | 13 500 | 16:02 A RRP above PD |
| 4.20 pm | Origin | Mt Stuart | -8 | 55 | N/A | 1620P change in avail - ambient conditions SL |
| 4.30 pm | CS Energy | Callide B | -10 | 17 | N/A | 1629P condenser vacuum-SL |
| 4.40 pm | ERM | Oakey | 32 | 458 | 13 499 | 1639F material change in market conditions ::change mw distrib. |
| 4.56 PM (effective from 5.05 pm) | CS Energy | Gladstone | 340 | <1400 | >13 000 | 1651A QLD demand reduction-SL |
| 5.17 pm (effective from 5.25 pm) | Callide | Callide C | -6 | <14 | N/A | 1716P decreasing coal quality, maxing out feeder rates |
| **Total capacity rebid from low to high prices** | **432** |  |  |  |
| **Total capacity withdrawn** | **354** |  |  |  |

Significant rebids for 6 pm

| Submit time | Participant | Station | Capacity rebid (MW) | Price from ($/MWh) | Price to ($/MWh) | Rebid reason |
| --- | --- | --- | --- | --- | --- | --- |
| 3.34 pm | CS Energy | Wivenhoe | -250 | 13 500 | N/A | 1534P technical issues-control system-sl |
| 3.40 pm | Millmerran | Millmerran | -55 | 7 | N/A | 15:40 P high condensate temps |
| 3.50 pm | Callide | Callide C | -10 | <14 | N/A | 1549P both pa fan in hi motor load alarm |
| 4.02 pm | Millmerran | Millmerran | 60 | 7 | 13 500 | 16:02 A RRP above PD |
| 4.20 pm | Origin | Mt Stuart | -7 | 55 | N/A | 1620P change in avail - ambient conditions SL |
| 4.30 pm | CS Energy | Callide B | -10 | 17 | N/A | 1629P condenser vacuum-SL |
| 5.03 pm | ERM | Oakey | 32 | 458 | 13 499 | 1703F material change in market conditions ::change mw distrib. |
| 5.17 pm | Callide | Callide C | -6 | <14 | N/A | 1716P decreasing coal quality, maxing out feeder rates |
| 5.25 pm (effective from 5.35 pm) | CS Energy | Gladstone | 340 | <1400 | >13 000 | 1724A QLD demand reduction-SL |
| 5.46 pm (effective from 5.55 pm) | CS Energy | Gladstone | 100 | 35 | 13 500 | 1744A QLD demand reduction-SL |
| **Total capacity rebid from low to high prices** | **532** |  |  |  |
| **Total capacity withdrawn** | **338** |  |  |  |

Significant rebids for 6.30 pm

| Submit time | Participant | Station | Capacity rebid (MW) | Price from ($/MWh) | Price to ($/MWh) | Rebid reason |
| --- | --- | --- | --- | --- | --- | --- |
| 3.34 pm | CS Energy | Wivenhoe | -250 | 13 500 | N/A | 1534P technical issues-control system-sl |
| 3.40 pm | Millmerran | Millmerran | -55 | <7 | N/A | 15:40P high condensate temps |
| 3.50 pm | Callide | Callide C | -10 | <14 | N/A | 1549P both pa fan in hi motor load alarm |
| 4.02 pm | Millmerran | Millmerran | 60 | 7 | 13 500 | 16:02 A rrp above pd |
| 4.20 pm | Origin | Mt Stuart | -7 | 55 | N/A | 1620P change in avail - ambient conditions sl |
| 4.30 pm | CS Energy | Callide B | -10 | 17 | N/A | 1629P condenser vacuum-sl |
| 5.17 pm | Callide | Callide C | -6 | <14 | N/A | 1716P decreasing coal quality, maxing out feeder rates |
| 5.40 pm | ERM | Oakey | 32 | 458 | 13 499 | 1740F material change in market conditions::change mw distrib. |
| 5.44 pm | Callide | Callide C | -4 | <14 | N/A | 1743P coal quality still falling, feeder rates maxed out |
| 5.56 pm (effective from 6.05 pm) | CS Energy | Wivenhoe | 50 | 0 | 13 500 | 1754P fuel management-manage splityard creek level- sl |
| 6.02 pm (effective from 6.10 pm) | CS Energy | Wivenhoe | 150 | 0 | 13 500 | 1802P fuel management-manage splityard creek level- sl |
| 6.06 pm (effective from 6.15 pm) | Callide | Callide C | -10 | <14 | NA | 1805P unit feeder maxed on low cv coal |
| 6.13 pm (effective from 6.20 pm) | CS Energy | Gladstone | 140 | 1400 | 13 000 | 1813P portfolio rearrangement due to-W/hoe reduction-sl |
| **Total capacity rebid from low to high prices** | **432** |  |  |  |
| **Total capacity withdrawn** | **352** |  |  |  |

Significant rebids for 7 pm

| Submit time | Participant | Station | Capacity rebid (MW) | Price from ($/MWh) | Price to ($/MWh) | Rebid reason |
| --- | --- | --- | --- | --- | --- | --- |
| 3.34 pm | CS Energy | Wivenhoe | -250 | 13 500 | N/A | 1534P technical issues-control system-sl |
| 3.40 pm | Millmerran | Millmerran | -55 | 7 | N/A | 15:40 P high condensate temps |
| 3.50 pm | Callide | Callide C | -10 | <14 | N/A | 1549P both pa fan in hi motor load alarm |
| 4.02 pm | Millmerran | Millmerran | 60 | 7 | 13 500 | 16:02 A RRP above PD |
| 4.30 pm | CS Energy | Callide B | -10 | 17 | N/A | 1629P condenser vacuum - sl |
| 5.17 pm | Callide | Callide C | -6 | <14 | N/A | 1716P decreasing coal quality, maxing out feeder rates |
| 5.44 pm | Callide | Callide C | -4 | <14 | N/A | 1743P coal quality still falling, feeder rates maxed out |
| 6.02 pm | CS Energy | Wivenhoe | 200 | 0 | 13 500 | 1802P fuel management-manage splityard creek level- |
| 6.02 pm | ERM | Oakey | 22 | <458 | 13 499 | 1802F material change in market conditions ::change |
| 6.06 pm | Callide | Callide C | -10 | <14 | N/A | 1805P unit feeder maxed on low cv coal |
| 6.37 pm (effective from 6.45 pm) | Callide | Callide C | -6 | <14 | N/A | 1836P coal quality still falling, feeder rates at max |
| **Total capacity rebid from low to high prices** | **282** |  |  |  |
| **Total capacity withdrawn** | **351** |  |  |  |

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.[[6]](#footnote-6) The 30-minute spot price is the average of the six dispatch interval prices.

4.30 pm

| DI | Dispatch Price ($/MWh) | Participant | Unit | Service | Offer price ($/MWh) | Marginal change | Contribution |
| --- | --- | --- | --- | --- | --- | --- | --- |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 16:05 | 12 949.00 | Origin Energy | MSTUART1 | Energy | 12 949.00 | 0.34 | $4402.66 |
|  |  | Origin Energy | MSTUART2 | Energy | 12 949.00 | 0.34 | $4402.66 |
|  |  | Origin Energy | MSTUART3 | Energy | 12 949.00 | 0.31 | $4014.19 |
| 16:10 | 12 949.00 | Origin Energy | MSTUART1 | Energy | 12 949.00 | 0.34 | $4402.66 |
|  |  | Origin Energy | MSTUART2 | Energy | 12 949.00 | 0.34 | $4402.66 |
|  |  | Origin Energy | MSTUART3 | Energy | 12 949.00 | 0.31 | $4014.19 |
| 16:15 | 12 949.00 | Origin Energy | MSTUART1 | Energy | 12 949.00 | 0.50 | $6474.50 |
|  |  | Origin Energy | MSTUART2 | Energy | 12 949.00 | 0.50 | $6474.50 |
| 16:20 | 13 000.00 | CS Energy | GSTONE1 | Energy | 13 000.00 | 0.25 | $3250.00 |
|  |  | CS Energy | GSTONE3 | Energy | 13 000.00 | 0.25 | $3250.00 |
|  |  | CS Energy | GSTONE4 | Energy | 13 000.00 | 0.25 | $3250.00 |
|  |  | CS Energy | GSTONE6 | Energy | 13 000.00 | 0.25 | $3250.00 |
| 16:25 | 12 949.00 | Origin Energy | MSTUART1 | Energy | 12 949.00 | 0.50 | $6474.50 |
|  |  | Origin Energy | MSTUART2 | Energy | 12 949.00 | 0.50 | $6474.50 |
| 16:30 | 12 949.00 | Origin Energy | MSTUART1 | Energy | 12 949.00 | 0.50 | $6474.50 |
|  |  | Origin Energy | MSTUART2 | Energy | $12 949.00 | 0.50 | $6474.50 |
| **Spot Price** | **$12 958/MWh** |  |  |  |  |

5 pm

| DI | Dispatch Price ($/MWh) | Participant | Unit | Service | Offer price ($/MWh) | Marginal change | Contribution |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 16:35 | 1400.00 | CS Energy | GSTONE1 | Energy | 1400.00 | 0.25 | $350.00 |
|  |  | CS Energy | GSTONE3 | Energy | 1400.00 | 0.25 | $350.00 |
|  |  | CS Energy | GSTONE4 | Energy | 1400.00 | 0.25 | $350.00 |
|  |  | CS Energy | GSTONE6 | Energy | 1400.00 | 0.25 | $350.00 |
| 16:40 | 1400.00 | CS Energy | GSTONE1 | Energy | 1400.00 | 0.25 | $350.00 |
|  |  | CS Energy | GSTONE3 | Energy | 1400.00 | 0.25 | $350.00 |
|  |  | CS Energy | GSTONE4 | Energy | 1400.00 | 0.25 | $350.00 |
|  |  | CS Energy | GSTONE6 | Energy | 1400.00 | 0.25 | $350.00 |
| 16:45 | 13 499.00 | Stanwell | STAN-1 | Energy | 13 499.00 | 0.12 | $1619.88 |
|  |  | Stanwell | STAN-2 | Energy | 13 499.00 | 0.14 | $1889.86 |
|  |  | Stanwell | STAN-3 | Energy | 13 499.00 | 0.12 | $1619.88 |
|  |  | Stanwell | STAN-4 | Energy | 13 499.00 | 0.17 | $2294.83 |
|  |  | Stanwell | TARONG#1 | Energy | 13 499.00 | 0.15 | $2024.85 |
|  |  | Stanwell | TARONG#3 | Energy | 13 499.00 | 0.15 | $2024.85 |
|  |  | Stanwell | TARONG#4 | Energy | 13 499.00 | 0.15 | $2024.85 |
| 16:50 | 13 499.00 | Stanwell | STAN-1 | Energy | 13 499.00 | 0.12 | $1619.88 |
|  |  | Stanwell | STAN-2 | Energy | 13 499.00 | 0.14 | $1889.86 |
|  |  | Stanwell | STAN-3 | Energy | 13 499.00 | 0.12 | $1619.88 |
|  |  | Stanwell | STAN-4 | Energy | 13 499.00 | 0.17 | $2294.83 |
|  |  | Stanwell | TARONG#1 | Energy | 13 499.00 | 0.15 | $2024.85 |
|  |  | Stanwell | TARONG#3 | Energy | 13 499.00 | 0.15 | $2024.85 |
|  |  | Stanwell | TARONG#4 | Energy | 13 499.00 | 0.15 | $2024.85 |
| 16:55 | 13 000.00 | CS Energy | GSTONE1 | Energy | 13 000.00 | 0.25 | $3250.00 |
|  |  | CS Energy | GSTONE3 | Energy | 13 000.00 | 0.25 | $3250.00 |
|  |  | CS Energy | GSTONE4 | Energy | 13 000.00 | 0.25 | $3250.00 |
|  |  | CS Energy | GSTONE6 | Energy | 13 000.00 | 0.25 | $3250.00 |
| 17:00 | 13 499.00 | Stanwell | STAN-1 | Energy | 13 499.00 | 0.12 | $1619.88 |
|  |  | Stanwell | STAN-2 | Energy | 13 499.00 | 0.14 | $1889.86 |
|  |  | Stanwell | STAN-3 | Energy | 13 499.00 | 0.12 | $1619.88 |
|  |  | Stanwell | STAN-4 | Energy | 13 499.00 | 0.17 | $2294.83 |
|  |  | Stanwell | TARONG#1 | Energy | 13 499.00 | 0.15 | $2024.85 |
|  |  | Stanwell | TARONG#3 | Energy | 13 499.00 | 0.15 | $2024.85 |
|  |  | Stanwell | TARONG#4 | Energy | 13 499.00 | 0.15 | $2024.85 |
| **Spot Price** | **$9383/MWh** |  |  |  |  |  |

5.30 pm

| DI | Dispatch Price ($/MWh) | Participant | Unit | Service | Offer price ($/MWh) | Marginal change | Contribution |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 17:05 | 13 499.00 | Stanwell | STAN-1 | Energy | 13 499.00 | 0.12 | $1619.88 |
|  |  | Stanwell | STAN-2 | Energy | 13 499.00 | 0.14 | $1889.86 |
|  |  | Stanwell | STAN-3 | Energy | 13 499.00 | 0.12 | $1619.88 |
|  |  | Stanwell | STAN-4 | Energy | 13 499.00 | 0.17 | $2294.83 |
|  |  | Stanwell | TARONG#1 | Energy | 13 499.00 | 0.15 | $2024.85 |
|  |  | Stanwell | TARONG#3 | Energy | 13 499.00 | 0.15 | $2024.85 |
|  |  | Stanwell | TARONG#4 | Energy | 13 499.00 | 0.15 | $2024.85 |
| 17:10 | 13 499.00 | Stanwell | STAN-1 | Energy | 13 499.00 | 0.12 | $1619.88 |
|  |  | Stanwell | STAN-2 | Energy | 13 499.00 | 0.14 | $1889.86 |
|  |  | Stanwell | STAN-3 | Energy | 13 499.00 | 0.12 | $1619.88 |
|  |  | Stanwell | STAN-4 | Energy | 13 499.00 | 0.17 | $2294.83 |
|  |  | Stanwell | TARONG#1 | Energy | 13 499.00 | 0.15 | $2024.85 |
|  |  | Stanwell | TARONG#3 | Energy | 13 499.00 | 0.15 | $2024.85 |
|  |  | Stanwell | TARONG#4 | Energy | 13 499.00 | 0.15 | $2024.85 |
| 17:15 | 13 000.00 | CS Energy | GSTONE1 | Energy | 13 000.00 | 0.25 | $3250.00 |
|  |  | CS Energy | GSTONE3 | Energy | 13 000.00 | 0.25 | $3250.00 |
|  |  | CS Energy | GSTONE4 | Energy | 13 000.00 | 0.25 | $3250.00 |
|  |  | CS Energy | GSTONE6 | Energy | 13 000.00 | 0.25 | $3250.00 |
| 17:20 | 13 000.00 | CS Energy | GSTONE1 | Energy | 13 000.00 | 0.25 | $3250.00 |
|  |  | CS Energy | GSTONE3 | Energy | 13 000.00 | 0.25 | $3250.00 |
|  |  | CS Energy | GSTONE4 | Energy | 13 000.00 | 0.25 | $3250.00 |
|  |  | CS Energy | GSTONE6 | Energy | 13 000.00 | 0.25 | $3250.00 |
| 17:25 | 13 000.00 | CS Energy | GSTONE1 | Energy | 13 000.00 | 0.25 | $3250.00 |
|  |  | CS Energy | GSTONE3 | Energy | 13 000.00 | 0.25 | $3250.00 |
|  |  | CS Energy | GSTONE4 | Energy | 13 000.00 | 0.25 | $3250.00 |
|  |  | CS Energy | GSTONE6 | Energy | 13 000.00 | 0.25 | $3250.00 |
| 17:30 | 12 999.62 | CS Energy | GSTONE3 | Energy | 13 000.00 | 0.33 | $4290.00 |
|  |  | CS Energy | GSTONE3 | Lower reg | 0.01 | 0.33 | $0.00 |
|  |  | CS Energy | GSTONE4 | Energy | 13 000.00 | 0.33 | $4290.00 |
|  |  | CS Energy | GSTONE4 | Lower reg | 0.01 | 0.33 | $0.00 |
|  |  | CS Energy | GSTONE6 | Energy | 13 000.00 | 0.33 | $4290.00 |
|  |  | CS Energy | GSTONE6 | Lower reg | 0.01 | 0.33 | $0.00 |
|  |  | Hydro Tasmania | JBUTTERS | Lower 5 min | 0.39 | -1.00 | -$0.39 |
| **Spot Price** | **$13 166/MWh** |  |  |  |  |

6 pm

| DI | Dispatch Price ($/MWh) | Participant | Unit | Service | Offer price ($/MWh) | Marginal change | Contribution |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 17:35 | 12 999.58 | CS Energy | GSTONE3 | Energy | 13 000.00 | 0.33 | $4290.00 |
|  |  | CS Energy | GSTONE3 | Lower reg | 0.01 | 0.33 | $0.00 |
|  |  | CS Energy | GSTONE4 | Energy | 13 000.00 | 0.33 | $4290.00 |
|  |  | CS Energy | GSTONE4 | Lower reg | 0.01 | 0.33 | $0.00 |
|  |  | CS Energy | GSTONE6 | Energy | 13 000.00 | 0.33 | $4290.00 |
|  |  | CS Energy | GSTONE6 | Lower reg | 0.01 | 0.33 | $0.00 |
|  |  | EnergyAustralia | MP1 | Lower reg | 0.43 | -1.00 | -$0.43 |
| 17:40 | 12 949.00 | Origin Energy | MSTUART1 | Energy | 12 949.00 | 0.50 | $6474.50 |
|  |  | Origin Energy | MSTUART2 | Energy | 12 949.00 | 0.50 | $6474.50 |
| 17:45 | 13 000.00 | CS Energy | GSTONE1 | Energy | 13 000.00 | 0.33 | $4290.00 |
|  |  | CS Energy | GSTONE3 | Energy | 13 000.00 | 0.33 | $4290.00 |
|  |  | CS Energy | GSTONE6 | Energy | 13 000.00 | 0.33 | $4290.00 |
| 17:50 | 55.18 | Origin Energy | MSTUART1 | Energy | 55.18 | 0.32 | $17.66 |
|  |  | Origin Energy | MSTUART2 | Energy | 55.18 | 0.38 | $20.97 |
|  |  | Origin Energy | MSTUART3 | Energy | 55.18 | 0.30 | $16.55 |
| 17:55 | 13 000.00 | CS Energy | GSTONE1 | Energy | 13 000.00 | 0.50 | $6500.00 |
|  |  | CS Energy | GSTONE6 | Energy | 13 000.00 | 0.50 | $6500.00 |
| 18:00 | 35.97 | Snowy Hydro | MURRAY | Energy | 28.15 | 1.28 | $36.03 |
| **Spot Price** | **$8673/MWh** |  |  |  |  |

7 pm

| DI | Dispatch Price ($/MWh) | Participant | Unit | Service | Offer price ($/MWh) | Marginal change | Contribution |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 18:35 | 302.01 | ERMPower | BRAEMAR5 | Energy | 302.01 | 0.50 | $151.01 |
|  |  | ERMPower | BRAEMAR6 | Energy | 302.01 | 0.50 | $151.01 |
| 18:40 | 12 949.00 | Origin Energy | MSTUART1 | Energy | 12 949.00 | 0.50 | $6474.50 |
|  |  | Origin Energy | MSTUART2 | Energy | 12 949.00 | 0.50 | $6474.50 |
| 18:45 | 12 949.00 | Origin Energy | MSTUART1 | Energy | 12 949.00 | 0.50 | $6474.50 |
|  |  | Origin Energy | MSTUART2 | Energy | 12 949.00 | 0.50 | $6474.50 |
| 18:50 | 13 499.00 | Stanwell | STAN-1 | Energy | 13 499.00 | 0.12 | $1619.88 |
|  |  | Stanwell | STAN-2 | Energy | 13 499.00 | 0.14 | $1889.86 |
|  |  | Stanwell | STAN-3 | Energy | 13 499.00 | 0.12 | $1619.88 |
|  |  | Stanwell | STAN-4 | Energy | 13 499.00 | 0.17 | $2294.83 |
|  |  | Stanwell | TARONG#1 | Energy | 13 499.00 | 0.15 | $2024.85 |
|  |  | Stanwell | TARONG#3 | Energy | 13 499.00 | 0.15 | $2024.85 |
|  |  | Stanwell | TARONG#4 | Energy | 13 499.00 | 0.15 | $2024.85 |
| 18:55 | 12 949.00 | Origin Energy | MSTUART1 | Energy | 12 949.00 | 0.50 | $6474.50 |
|  |  | Origin Energy | MSTUART2 | Energy | 12 949.00 | 0.50 | $6474.50 |
| 19:00 | 13 499.00 | Stanwell | STAN-1 | Energy | 13 499.00 | 0.12 | $1619.88 |
|  |  | Stanwell | STAN-2 | Energy | 13 499.00 | 0.14 | $1889.86 |
|  |  | Stanwell | STAN-3 | Energy | 13 499.00 | 0.12 | $1619.88 |
|  |  | Stanwell | STAN-4 | Energy | 13 499.00 | 0.17 | $2294.83 |
|  |  | Stanwell | TARONG#1 | Energy | 13 499.00 | 0.15 | $2024.85 |
|  |  | Stanwell | TARONG#3 | Energy | 13 499.00 | 0.15 | $2024.85 |
|  |  | Stanwell | TARONG#4 | Energy | 13 499.00 | 0.15 | $2024.85 |
| **Spot Price** | **$11 025/MWh** |  |  |  |  |

C Closing bids

Figures C1 to C5 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 - Millmerran Energy Trader (Millmerran) closing bid prices, dispatch and spot price



Figure C4 - ERM (Oakey) closing bid prices, dispatch and spot price



Figure C5 – Origin (Darling Downs, Mt Stuart, Roma) closing bid prices, dispatch and spot price



1. This requirement is set out in clause 3.13.7 (d) of the National Electricity Rules. [↑](#footnote-ref-1)
2. Previous record was 8933 MW in summer 2009/10. [↑](#footnote-ref-2)
3. Although below $5000/MWh, the spot price of $4353/MWh at 6.30 pm is discussed as part of this report as it was within the period of high prices. [↑](#footnote-ref-3)
4. This line is difficult to see as it effectively coincides with the supply curves for the 1 pm and 5 am since the forecasts are very similar. [↑](#footnote-ref-4)
5. Previous record was 8933 MW in summer 2009/10. This is based on native demand, a different measure to that used in Figure 3. Figure 3 uses total demand which is used when determining prices. See AEMO’s [Regional demand definition](http://www.aemo.com.au/Electricity/Market-Operations/Dispatch/Regional-Demand-Definition) document for further details. [↑](#footnote-ref-5)
6. Details on how the price is determined can be found at [www.aemo.com.au](http://www.aemo.com.au) [↑](#footnote-ref-6)