

Electricity Pricing Event Report – Thursday 12 January 2017

Market Outcomes: Spot prices in Queensland (QLD) ranged between \$2,343.31/MWh and \$2,578.37/MWh for 7 trading intervals (TIs) between TI ending 1300 hrs and 1900 hrs on 12 January 2017.

Energy prices in other regions were not affected by this event. FCAS prices in all regions were not affected by this event.

Detailed Analysis: The 5-Minute dispatch energy prices in Queensland reached between \$13,642/MWh and the Market Price Cap (MPC) of \$14,000/MWh for 7 dispatch intervals (DIs) during the high price TIs. The high priced DIs were DI ending 1235 hrs, 1530 hrs, 1535 hrs, 1610 hrs, 1750 hrs, 1820 hrs and 1840 hrs. These high price can mainly be attributed to rebidding and shifting of generation capacity, during a period of high demand, while interconnector support was constrained.

Demand in QLD was high during the high priced TIs, ranging between 8,191 MW and 8,936 MW. This high demand coincided with high temperatures in QLD, with a daily peak of 37 degrees (Archerfield Airport).

Planned outage of the Kempsey – Raleigh No.9W2 132 kV line was scheduled between 1735 hrs on 09 January 2017 and 1557 hrs on 12 January 2017 and the Coffs Harbour – Koolkhan No.96H 132 kV line was scheduled between 0705 hrs on 10 January 2017 and 1700 hrs on 30 June 2017. The outage constraint set N-X_96H_9W2 was invoked between 0700 hrs on 10 January 2017 and 1605 hrs on 12 January 2017 and N-CHKK_96H was invoked between 1605 hrs on 12 January 2017 and 0700 hrs on 23 January 2017.

Flow on the Queensland – New South Wales Interconnector (QNI) ranged between 152 MW and 265 MW towards QLD during these high priced DIs, limited by the system normal constraint equations N^^Q_NIL_B1 and N>>N-NIL__3_OPENED. The thermal constraint equation N>>N-NIL__3_OPENED avoids overload of the Liddell – Muswellbrook No.83 330 kV line for the trip of the Liddell – Tamworth No.84 330 kV line. The N^^Q_NIL_B1 constraint equation avoids voltage collapse of Kogan Creek generator.

Flow on the Terranora interconnector ranged between 93 MW towards New South Wales (NSW) and 29 MW towards QLD. During four of these DIs, the flow on Terranora violated the limit set by the outage thermal constraint equations N>N-X+96H+9W2_1 and N>N-CHKK_TE_1. The N>N-X+96H+9W2_1 constraint equation avoids overload of the Armidale – Koolkhan No.966 132 kV line for the trip of the Coffs Harbour – Lismore No.89 330 kV line during the outage of the Coffs Harbour – Koolkhan No.96H 132 kV line and Kempsey – Raleigh No.9W2 132 kV line. The N>N-CHKK_TE_1 constraint equation avoids overload of the Armidale – Koolkhan No.966 132 kV line for the trip of the Coffs Harbour – Lismore No.89 330 kV line during the outage of the Coffs Harbour – Koolkhan No.96H 132 kV line.

For DI end 1235 hrs, Stanwell and Braemar Power rebid or shifted 152 MW from bands priced at \$98.94/MWh or below to bands priced at \$13,800/MWh and above. Lower priced capacity was available but required more than one DI to synchronise (Mt Stuart GT unit 3), or limited by ramp rates (Oakey PS unit 1).

For DI ending 1530 hrs, Stanwell rebid 180 MW from bands priced at \$98.94/MWh to the MPC. Lower priced capacity was available but required more than one DI to synchronise.

For DI ending 1535 hrs, Callide C unit 3 withdrew 66 MW of capacity with the reason "1453A RRP 330 DI 1530 IN P5 RUN ABOVE 30MIN PD SL". Flow on the Terranora interconnector was 56 MW towards NSW, violating the 98.50 MW limit set by the thermal constraint equation $N > N - X + 96H + 9W2_1$. Lower priced capacity was available but limited by their Fast Start Profile (Braemar 2 GT unit 5).

For DI ending 1605 hrs, 211 MW was shifted from bands priced at \$60.94/MWh or below to the MPC. This reduced availability of lower priced capacity in addition to an increase in demand of 104 MW between DI ending 1605 hrs and 1610 hrs resulted in the dispatch price reaching \$13,642/MWh for DI ending 1610hrs.

For DI ending 1745 hrs, Stanwell rebid 40 MW from bands priced at \$60.94/MWh to the MPC. This reduction in lower priced capacity resulted in the dispatch priced reaching \$13,654.53/MWh for DI ending 1750 hrs. Additionally, at DI ending 1750 hrs, Gladstone PS unit 1 withdrew 35 MW of generation capacity with the reason "1742P UNIT RAMPING REBID TO MATCH-SL".

Between DI ending 1815 hrs and 1820 hrs, demand in QLD increased by 107 MW and flow towards QLD reduced by 29 MW. Flow on the Terranora interconnector was 91 MW towards NSW, violating the 101.90 MW limit set by the thermal constraint equation $N > N - CHKK_TE_1$. For this DI Gladstone PS unit 1 withdrew 20 MW from the MFP with the reason "1811P UNIT RAMPING REBID TO MATCH-RAMP DOWN TO OUTAGE-SL".

For DI ending 1835 hrs, Origin and Callide Power shifted 100 MW from the MFP to bands priced at or above \$13,650.01/MWh. This reduced availability of lower priced capacity resulted in the dispatch price reaching \$13,650.01/MWh for DI ending 1840 hrs when demand increased by 171 MW between DI ending 1835 hrs and 1840 hrs.

Following each high priced DI, the 5-minute energy spot price in Queensland reduced to or below \$103.74/MWh as a result of demand decreasing and generation capacity being rebid from higher price bands to lower price bands.

The high 30-minute spot price for Queensland was forecast in the pre-dispatch schedules.