

## Electricity Pricing Event Report – Saturday 14 January 2017

**Market Outcomes:** Spot prices in Queensland (QLD) ranged between \$2,195.38/MWh and \$12,641.69/MWh for 14 trading intervals (TIs) between TI ending 0700 hrs and 2300 hrs on 14 January 2017.

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

Counter price flows caused negative settlement residues of approximately \$500,000 to accumulate on the Queensland to New South Wales directional interconnector between TIs ending 0630 hrs and 0700 hrs. The Negative Residue Management (NRM) constraint did not operate during this period as a price revision event was under review when the accumulation of negative settlements residue exceeded the threshold of \$100,000.

**Detailed Analysis:** The 5-Minute energy prices in Queensland (QLD) reached between \$12,440.02/MWh and \$13,800/MWh for 30 dispatch intervals (DIs) during the high price TIs. These high prices can be mainly 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, reaching a peak of 8,666 MW for TI ending 1730 hrs. This high demand coincided with consecutive high temperature days in QLD, with a daily peak of 35 degrees (Archerfield Airport) on 14 January 2017.

Planned outage of the Coffs Harbour – Koolkhan No.96H 132 kV line is scheduled between 0705 hrs on 01 October 2016 and 1700 hrs on 30 June 2017. The outage constraint set N-CHKK\_96H was invoked for the duration of the outage.

For most high priced DIs, generation capacity of up to 340 MW was shifted or rebid by a number of generators, from lower priced bands to bands priced at or above \$12,518.69/MWh. Cheaper priced generation was available but were limited due to ramp rates, FCAS profiles or required more than one DI to synchronize. Lower priced generation was also constrained off by the system normal constraint equation  $Q > \text{NIL\_BI\_FB}$ . The  $Q > \text{NIL\_BI\_FB}$  constraint equation avoids overloading the Boyne Island feeder bushing on Calliope River – Boyne Island 132 kV lines, for the loss of a single Calliope River – Boyne Island 132 kV line. This constraint equation violated for the high price DIs ending 1325 hrs, 1410 hrs, 1715 and 1945 hrs.

During the high priced DIs, the target flow on the QNI interconnector towards QLD was limited between 129 MW and 277 MW by the system normal constraint equations  $N^{^}Q\_NIL\_B1$ ,  $N >> N-NIL\_3\_OPENED$  or  $N^{^}Q\_NIL\_A$ . The  $N^{^}Q\_NIL\_B1$  constraint equation avoids voltage collapse in NSW for the loss of Kogan Creek PS. 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 parallel Liddell – Tamworth No.84 330 kV line. The  $N^{^}Q\_NIL\_A$  constraint equation avoids voltage collapse in NSW for the trip of the Liddell – Muswellbrook No.83 330 kV line.

For DI ending 0640 hrs, the target flow on the Terranora interconnector was towards QLD and limited to 69 MW by the system normal constraint equation  $N^{^}Q\_NIL\_B1$ . For all other high priced DIs, the target flow on the Terranora interconnector was towards NSW and limited between 3 MW and 106 MW by constraint equations  $N^{^}Q\_NIL\_A$ ,  $N^{^}Q\_NIL\_B1$ ,  $N >> N-NIL\_3\_OPENED$ ,  $NQTE\_ROC$ ,  $N > N-CHKK\_TE\_1$  or  $\#N-Q-MNSP1\_I\_E$ . The constraint equation  $NQTE\_ROC$  limits the rate of change on the Terranora interconnector to 80 MW per 5 minutes. The outage constraint

equation N>N-CHKK\_TE\_1 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. The constraint equation #N-Q-MNSP1\_I\_E manages dispatch target oscillations on the Terranora interconnector caused by the outage of the Coffs Harbour – Koolkhan No.96H 132 kV line.

The 5-minute energy spot prices in Queensland reduced to \$310.02/MWh or below in the DIs subsequent to the high priced intervals, when demand decreased and generation capacity was also rebid from higher price bands to lower price bands.

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