Electricity Pricing Event Report - Sunday 12 February 2017

Market Outcomes: The spot price in Victoria (VIC) reached -$319.03/MWh for trading interval (TI) ending 0230 hrs. Spot prices in Queensland (QLD) ranged between $2,259.16/MWh and $9,004.95/MWh for all 6 TIs between TI ending 1700 hrs and TI ending 1930 hrs.

Energy prices in other regions were not materially affected by these events. FCAS prices in all regions were not affected by these events.

An Actual Lack of Reserve Level 1 (LOR1) condition was declared for the QLD region from 1600 hrs until 2020 hrs (MN 57472 and 57475), with Actual Lack of Reserve Leve 2 (LOR2) condition declared from 1700 hrs until 1930 hrs (MN 57473 and 57474).

Detailed Analysis: The 5-minute energy prices in Victoria (VIC) reached the Market Floor Price (MFP) of -$1,000/MWh for dispatch intervals (DIs) ending 0210 hrs and 0215 hrs. These low prices can mainly be attributed to unplanned outage restricting power flows out of Victoria, while higher priced generation was constrained on.

Between 0205 hrs and 0710 hrs, AEMO de-energised the Hazelwood – South Morang No.1 500 kV line to manage voltages in the Victoria region (MN 57450 and 57462). The outage constraint set V-HSWM was invoked for the duration of the outage.

Between DIs ending 0205 hrs and 0210 hrs, target flow towards New South Wales (NSW) on the VIC – NSW interconnector decreased by 342 MW, to reach 451 MW. The decreased target flow into NSW was limited by the transient stability constraint equation V::N_HWSM_S1. This constraint equation avoids transient instability for fault and trip of a Hazelwood – South Morang 500 kV line, during the outage of a parallel Hazelwood – South Morang 500 kV line. Target flow on the Heywood interconnector was limited to 587 MW towards South Australia (SA) by the constraint equation V:S_600_HY_TEST_DYN. This constraint equation limits the dynamic headroom for the upper transfer limit on the VIC to SA Heywood interconnector to 600 MW. Once the 600 MW flow limit is exceeded by more than 10 MW, the limit is temporarily reduced by the amount of exceedance.

Between DIs ending 0210 hrs and 0215 hrs, demand in VIC decreased by 45 MW. Furthermore, between these DIs, target flow towards NSW on the VIC – NSW interconnector increased by 64 MW due to the constraint equation V::N_HWSM_S1. However, target flow towards South Australia (SA) on the Heywood interconnector decreased by 53 MW due to the constraint equation V_S_NIL_ROCOF. This system normal constraint equation limits flow towards SA on the Heywood interconnector to prevent Rate of Change of Frequency in exceeding 3 Hz/sec in SA following the loss of the Heywood interconnector.

Target flow on the Basslink interconnector was limited to 478 MW towards Tasmania (TAS) by the constraint equation that sets the VIC to TAS limit, V_T_NIL_BL1. Target flow on the Murraylink interconnector was limited to either 136 MW or 137 MW towards Victoria by constraint equations V::N_HWSM_S1 and S>V_NIL_NIL_RBNW. The thermal constraint equation prevents the overloading of either of the two Robertstown – North West Bend 132 lines.

The decrease in VIC demand and interconnector export resulted in excess cheaper priced capacity within Victoria, while higher priced generation was limited by their ramp down rates in both DIs (Ararat Windfarm, Bald Hills Wind Farm, Hazelwood Power Station units 1-8, Loy Yang A units 1-4, Loy Yang B units 1-2 and Yallourn Power Station units 1-4). This caused the dispatch price in Victoria to reduce to -$1,000/MWh for DIs ending 0210 hrs and 0215 hrs.

The 5-minute price increased to $9.20/MWh for DI ending 0220 hrs when higher priced generation was no longer limited by their ramp rates in VIC.

The low 30-minute spot price for Victoria was not forecast in the pre-dispatch schedules, as it was due to an unplanned outage restricting power flows out of Victoria.

The 5-minute energy prices in Queensland (QLD) ranged between $13,000/MWh and the Market Price Cap (MPC) of $14,000/MWh for 11 DIs during the high priced TIs. These high prices can mainly be attributed to high QLD demand and withdrawals of generator capacity, while interconnector support was constrained.

Demand in QLD was high during the high priced TIs, reaching a daily peak of 9,390 MW for TI ending 1730 hrs. This high demand coincided with high temperatures in QLD, with a daily peak of 35.2 degrees (Archerfield Airport).

Flow on the QNI interconnector ranged between 126 MW and 182 MW towards QLD during these high priced DIs, limited by the constraint equation N>>N-NIL__3_OPENED. This system normal constraint equation avoids overload of the Liddell – Muswellbrook No.83 330 kV line for the trip of the Liddell – Tamworth No.84 kV line.

Flow on the Terranora interconnector ranged between 188 MW and 192 MW towards NSW during these high priced DIs, due to the constraint equation N>N-CHKK_TE_1. This thermal 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. The Coffs Harbour – Koolkhan No.96H 132 kV line had a planned outage between 0705 hrs on 10 January 2017 and 0948 hrs on 8 April 2017.

Prior to the high priced DIs, at 1510 hrs, Braemer unit 5 failed to start and withdrew its 148 MW of available capacity. Furthermore, between DIs ending 1620 hrs and 1715 hrs, Stanwell withdrew 448 MW of generation capacity from its Stanwell Power Station, Tarong Power Station and Tarong North Power Station units due to technical reasons. During the high priced TIs, Stanwell withdrew a further 250 MW of generation capacity from its Tarong Power Station units and CS Energy withdrew 20 MW of generation capacity from its Callide B units due to technical reasons.

For several high priced DIs, demand in the QLD region increased by up to 136 MW and generation capacity of up to 87 MW was shifted or rebid from bands priced at $0/MWh or the MPF to bands priced at $13,000/MWh or above.

Lower priced generation was available but was trapped (Callide B unit 2) or was limited by ramp rates (Callide C units 3 & 4, Stanwell Power Station units 3 & 4 and Tarong Power Station units 3 & 4).

The 5-minute QLD prices reduced to $299.00/MWh or below in the DIs subsequent to the high priced intervals, when demand in the QLD region decreased by up to 196 MW and generation capacity of up to 30 MW was rebid from bands priced at $13,440.69/MWh and above to band priced at the MFP.

The high 30-minute spot prices for Queensland were not forecast in the pre-dispatch schedules as they were due to withdrawals of generation capacity.