WEEKLY ELECTRICITY MARKET ANALYSIS

AUSTRALIAN ENERGY REGULATOR

27 January – 2 February 2013

Summary

The volume weighted average price in Queensland was $198/MWh this week as a result of high spot prices on Tuesday. There were eight spot prices above $1000/MWh with a maximum spot price of $6299/MWh. In accordance with clause 3.13.7 of the Electricity Rules, the AER will issue a separate report into the circumstances that led to the spot price exceeding $5000/MWh.

Spot market prices

Figure 1 sets out the volume weighted average (VWA) prices for the week 27 January to 2 February and the 12/13 financial year to date (YTD) across the NEM. It compares these prices with price outcomes from the previous week and year to date respectively.

Figure 1: Volume weighted average spot price by region ($/MWh)

	QLD	NSW	VIC	SA	TAS
Average price for 27 Jan - 2 Feb 2013	198	50	45	46	55
% change from previous week*	146	1	-8	-11	-2
12-13 financial YTD	75	57	64	65	50
% change from 11-12 financial YTD**	149	88	135	91	58

*The percentage change between last week's average spot price and the average price for the previous week. Calculated on VWA prices prior to rounding.
**The percentage change between the average spot price for the current financial year and the average spot price for the previous financial year. Percentage changes are calculated on VWA prices prior to rounding.

Further information is provided in Appendix A when the spot price exceeds three times the weekly average and is above $250/MWh or less than -$100/MWh. Longer term market trends are attached in Appendix B.[1]

Financial markets

Figures 2 to 9 show futures contract[2] prices traded on the Australian Securities Exchange (ASX) as at close of trade on Friday 1 February 2013. Figure 2 shows the base futures contract prices for the next three calendar years, and the average over these three years. Also shown are percentage changes[3] from the previous week.

[1] Monitoring the performance of the wholesale market is a key part of the AER's role and an overview of the market's performance in the long term is provided on the AER website. Long-term statistics can be found there on, amongst other things, demand, spot prices, contract prices and frequency control ancillary services prices. To access this information go to www.aer.gov.au -> Australian energy industry -> Performance of the energy sector

[2] Futures contracts traded on the ASX are listed by d-cyphaTrade (www.d-cyphatrade.com.au). A futures contract is typically for one MW of electrical energy per hour based on a fixed load profile. A base load profile is defined as the base load period from midnight to midnight Monday to Sunday over the duration of the contract quarter. A peak load profile is defined as the peak-period from 7 am to 10 pm Monday to Friday (excluding Public holidays) over the duration of the contract quarter.

[3] Calculated on prices prior to rounding.

Figure 2: Base calendar year futures contract prices ($/MWh)

	QLD		NSW		VIC		SA	
Calendar Year 2013	72	4%	56	0%	53	0%	58	0%
Calendar Year 2014	57 (55)	0%	57 (30)	0%	54	0%	58	0%
Calendar Year 2015	52	0%	52	0%	48	0%	50	0%
Three year average	60	1%	55	0%	52	0%	55	0%

Source: d-cyphaTrade/ASX www.d-cyphatrade.com.au
* a number in brackets denotes the number of trades in the product.

Figure 3 shows the $300 cap contract price for Q1 2013 and calendar year 2013 and the percentage change[4] from the previous week.

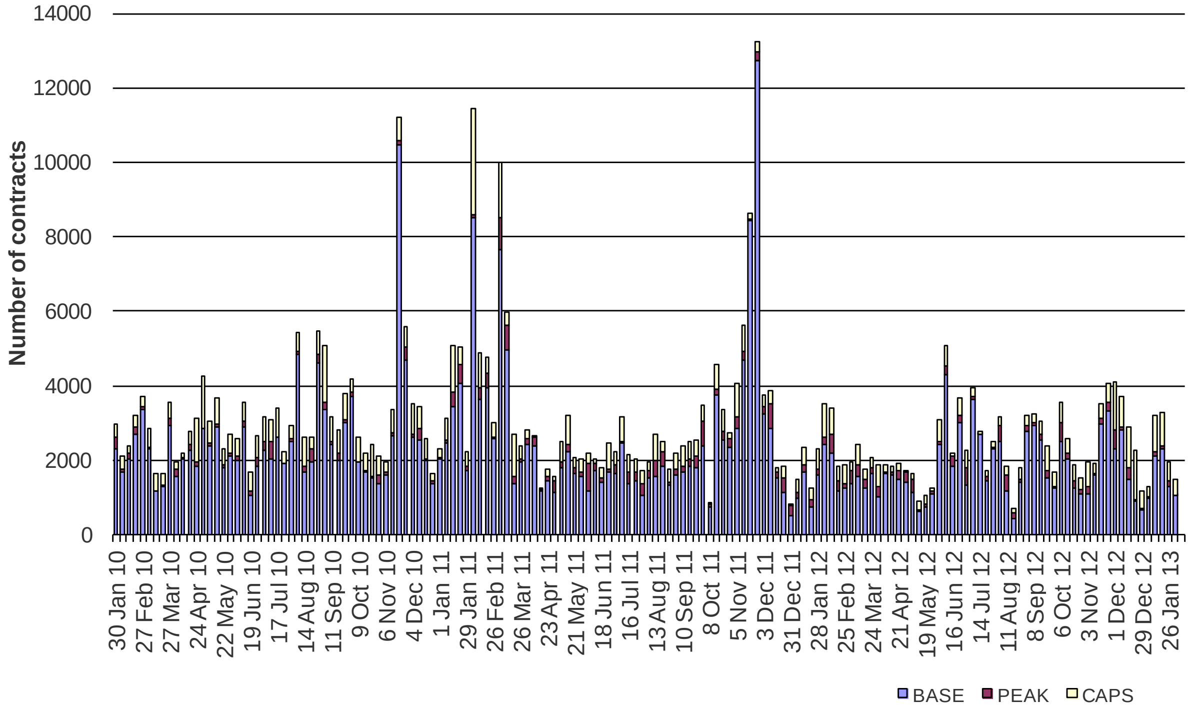
Figure 3: $300 cap contract prices ($/MWh)

	QLD		NSW		VIC		SA	
Q1 2013	31 (76)	17%	4 (192)	23%	6 (107)	10%	8	0%
2013	11	15%	4	8%	3	2%	5	-2%

Source: d-cyphaTrade/ASX www.d-cyphatrade.com.au
* a number in brackets denotes the number of trades in the product.

Figure 4 shows the weekly trading volumes for base, peak and cap contracts. The date represents the end of the trading week.

Figure 4: Number of exchange traded contracts per week

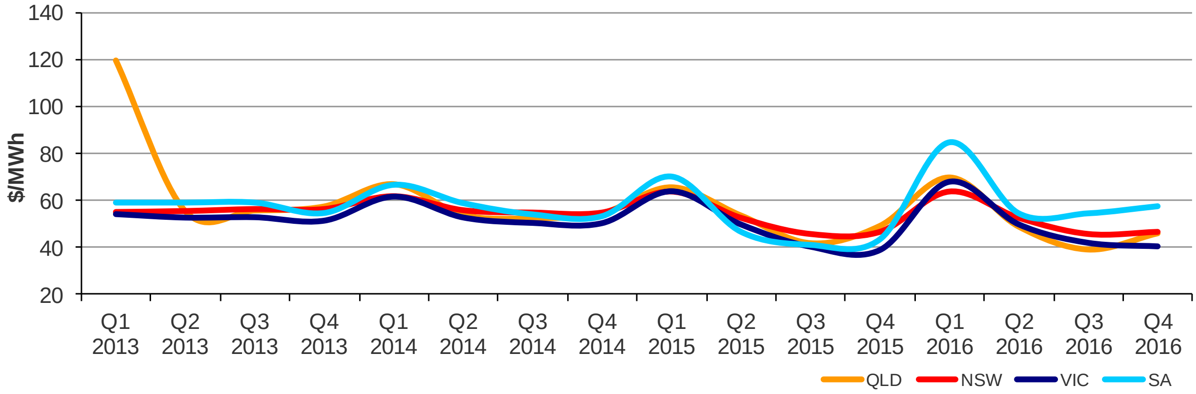


Source: d-cyphaTrade/ASX www.d-cyphatrade.com.au

[4] Calculated on prices prior to rounding.

Figure 5 shows the prices for base contracts for each quarter for the next four financial years.

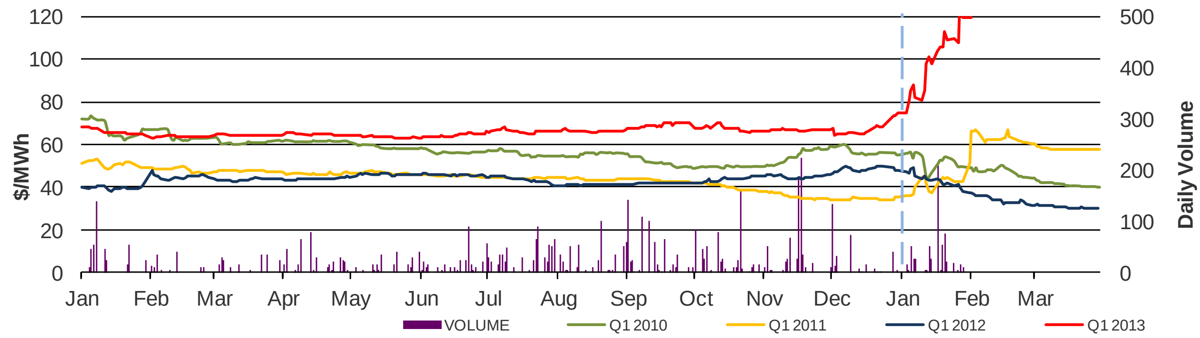
Figure 5: Quarterly base future prices Q1 2013 – Q4 2016



Source: d-cyphaTrade/ASX www.d-cyphatrade.com.au

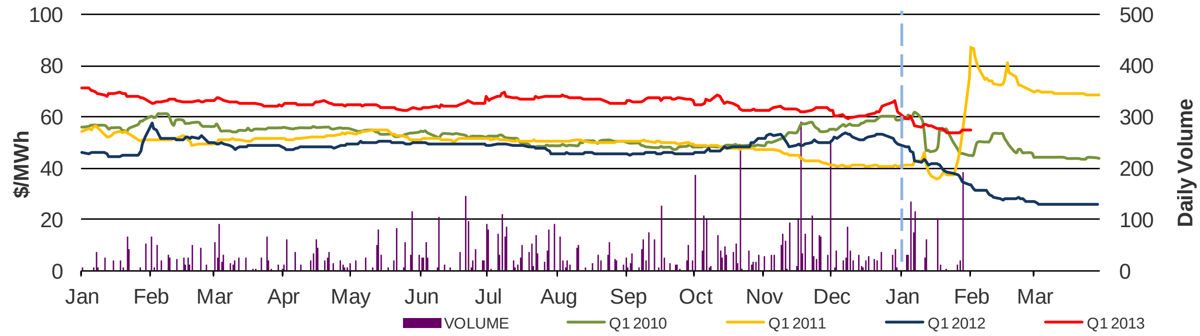
Figures 6-9 compare for each region the closing daily base contract prices for the first quarter of 2010, 2011, 2012 and 2013. Also shown is the daily volume of Q1 2013 base contracts traded. The vertical dashed line signifies the start of the Q1 period for which the contracts are being purchased.

Figure 6: Queensland Q1 2010, 2011, 2012 and 2013



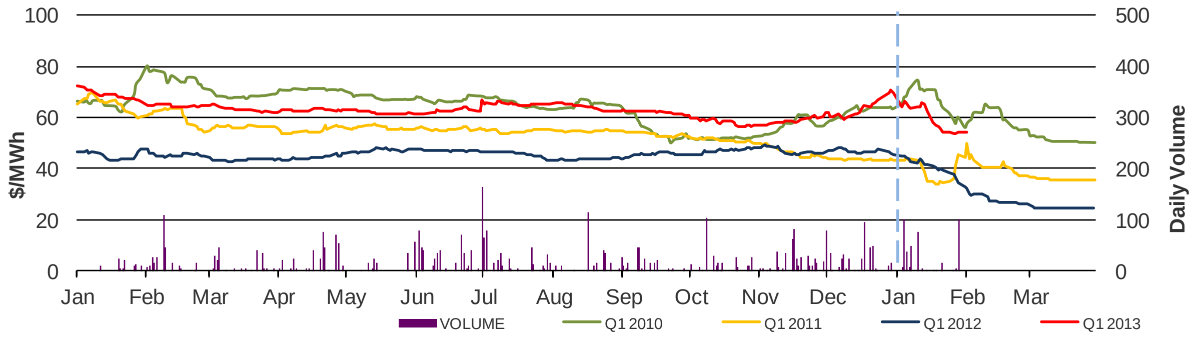
Source: d-cyphaTrade/ASX www.d-cyphatrade.com.au

Figure 7: New South Wales Q1 2010, 2011, 2012 and 2013



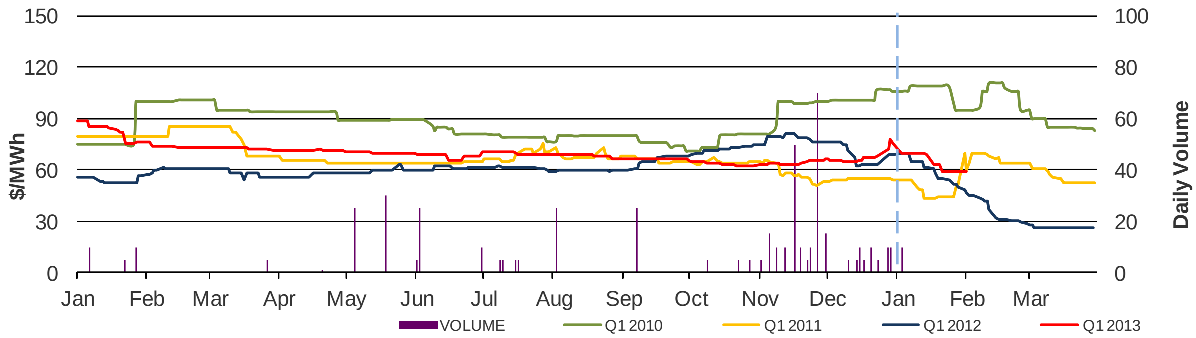
Source: d-cyphaTrade/ASX www.d-cyphatrade.com.au

Figure 8: Victoria Q1 2010, 2011, 2012 and 2013



Source: d-cyphaTrade/ASX www.d-cyphatrade.com.au

Figure 9: South Australia Q1 2010, 2011, 2012 and 2013



Source: d-cyphaTrade/ASX www.d-cyphatrade.com.au

*The daily volume scale for South Australia is smaller than for other regions to reflect the lower liquidity in the market in South Australia.

Spot market forecasting variations

The AER is required under the National Electricity Rules to determine whether there is a significant variation between the forecast spot price published by the Australian Energy Market Operator (AEMO) and the actual spot price and, if there is a variation, state why the AER considers the significant price variation occurred. It is not unusual for there to be significant variations as demand forecasts vary and as participants react to changing market conditions. There were 173 trading intervals throughout the week where actual prices varied significantly from forecasts[5]. This compares to the weekly average in 2012 of 60 counts and the average in 2011 of 78. Reasons for these variances are summarised in Figure 10[6].

Figure 10: Reasons for variations between forecast and actual prices

	Availability	Demand	Network	Combination
% of total above forecast	17	20	1	5
% of total below forecast	25	31	0	1

The total may not equal 100% due to rounding

[5] A trading interval is counted as having a variation if the actual price differs significantly from the forecast price either four or 12 hours ahead.

[6] The table summarises (as a percentage) the number of times when the actual price differs significantly from the forecast price four or 12 hours ahead and the major reason for that variation. The reasons are classified as availability (which means that there is a change in the total quantity or price offered for generation), demand forecast inaccuracy, changes to network capability or as a combination of factors (when there is not one dominant reason). An instance where both four and 12 hour ahead forecasts differ significantly from the actual price will be counted as two variations.

Demand and bidding patterns

The AER reviews demand, network limitations and generator bidding as part of its market monitoring to better understand the drivers behind price variations. Figure 11 shows the weekly change in total available capacity at various price levels during peak periods[7]. For example, in Queensland 268 MW less capacity was offered at prices under $20/MWh this week compared to the previous week. Also included is the change in average demand during peak periods, for comparison.

Figure 11: Changes in available generation and average demand compared to the previous week during peak periods

MW	<$20/MWh	Between $20 and $50/MWh	Total availability	Change in average demand
QLD	-268	-10	-605	-73
NSW	-385	-680	-709	-690
VIC	37	-178	213	-723
SA	-101	21	-254	-360
TAS	-6	-20	46	-31
Total	-723	-867	-1309	-1877

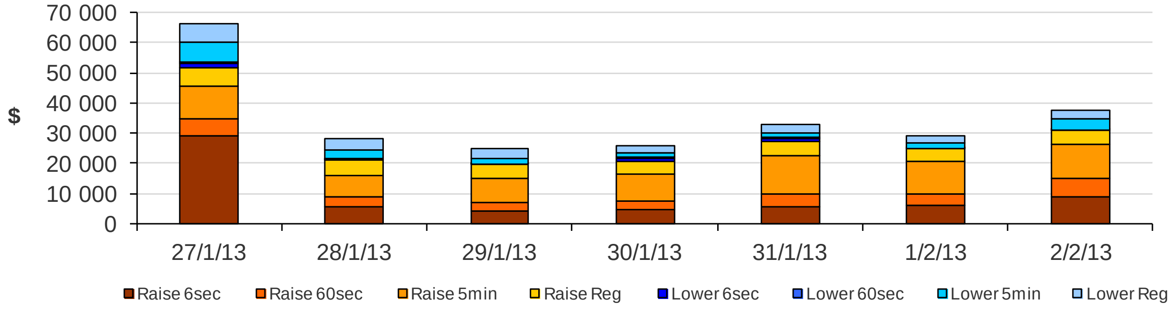
Ancillary services market

The total cost of frequency control ancillary services (FCAS) on the mainland for the week was $184 500 or less than one per cent of energy turnover on the mainland.

The total cost of FCAS in Tasmania for the week was $62 000 or less than one per cent of energy turnover in Tasmania. Around half of this cost occurred on Sunday when the price for Raise 6 second services reached $1640/MW at 4.20 pm and $1612/MW at 10.30 pm. Details of the events are described in the Tasmanian section in Appendix A.

Figure 12 shows the daily breakdown of cost for each FCAS for the NEM.

Figure 12: Daily frequency control ancillary service cost



Australian Energy Regulator
March 2013

[7] A peak period is defined as between 7 am and 10 pm on weekdays.

27 January – 2 February 2013

Queensland:

There were thirteen occasions where the spot price in Queensland was greater than three times the Queensland weekly average price of $197/MWh and above $250/MWh.

Tuesday, 29 January

8:30 AM	Actual	4 hr forecast	12 hr forecast
Price ($/MWh)	2278.03	155.05	59.90
Demand (MW)	6334	6487	6636
Available capacity (MW)	8218	8485	9348

Conditions at the time saw demand around 300 MW lower than that forecast 12 hours ahead and 150 MW lower four hours ahead. Available capacity was 1130 MW less than forecast 12 hours ahead and 270 MW lower four hours ahead.

Over several rebids from 12.14 am CS Energy reduced the available capacity of Gladstone power station by a total of around 1000 MW (740 MW of which was priced below $55/MWh). The reasons given included "Mill limit-wet coal –SL" and "technical issues-DA pump issue-SL".

Over three rebids from 7.38 am AGL reduced the available capacity of Yabulu and Oakey unit 2 by a total of 196 MW almost all of which was priced below $120/MWh. The reasons given were "chg in dispatch::price increase vs pd [qld] [$12k] 30/5" and "unexpected plant limitations::load variation during rts".

At 8.07 am, effective at 8.15 am, CS Energy rebid to increase the consumption at its Wivenhoe Pump 2 scheduled load. At 8.15 am Wivenhoe Pump 2 was targeted at 184 MW and the 5-minute price reached $12 500/MWh.

There was no other significant rebidding.

Tuesday, 29 January

12:30 PM	Actual	4 hr forecast	12 hr forecast
Price ($/MWh)	1369.72	299.99	489.99
Demand (MW)	6975	7058	7399
Available capacity (MW)	8199	8952	9205

Conditions at the time saw demand close to forecast. Available capacity was around 750 MW less than forecast four hours ahead mainly due to the reduction in availability of Gladstone power station described previously.

At 11.57 am, effective from 12.05 pm, CS Energy rebid 175 MW of capacity at Wivenhoe unit 2 (generator) from prices below $296/MWh to above $7100/MWh. The reason given was “water management – SL”. The 5-minute price reached $7201/MWh at 12.05 pm with Wivenhoe unit 2 setting the price.

There was no other significant rebidding.

Tuesday, 29 January

2 PM	Actual	4 hr forecast	12 hr forecast
Price ($/MWh)	826.71	195.06	578.00
Demand (MW)	7298	7299	7660
Available capacity (MW)	8209	9032	9172
2:30 PM	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	1449.33	299.99	578.00
Demand (MW)	7399	7416	7725
Available capacity (MW)	8164	8551	9172
4 PM	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	3100.37	299.99	10 100.00
Demand (MW)	7601	7455	7833
Available capacity (MW)	8229	8556	9152
4:30 PM	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	3166.71	440.00	10 100.00
Demand (MW)	7709	7475	7857
Available capacity (MW)	8210	8543	9152

5 PM	Actual	4 hr forecast	12 hr forecast
Price ($/MWh)	6298.63	489.99	10 100.00
Demand (MW)	7809	7522	7898
Available capacity (MW)	8184	8301	9152
6:30 PM	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	1323.67	440.00	440.00
Demand (MW)	7525	7292	7458
Available capacity (MW)	8205	8292	9157
7 PM	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	658.53	440.00	489.99
Demand (MW)	7498	7351	7459
Available capacity (MW)	8303	8318	9162
7:30 PM	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	1591.77	559.99	489.99
Demand (MW)	7639	7459	7489
Available capacity (MW)	8340	8338	9147

In accordance with clause 3.13.7 of the Electricity Rules, the AER will issue a separate report into the circumstances that led to the spot price exceeding $5000/MWh. The report will also include the above spot prices in the analysis.

Tuesday, 29 January

11 PM	Actual	4 hr forecast	12 hr forecast
Price ($/MWh)	644.93	299.95	150.34
Demand (MW)	6226	6379	6313
Available capacity (MW)	8378	8380	8593

Conditions at the time saw demand and available capacity close to that forecast.

Over two rebids at 10.03 pm and 10.32 pm, effective from 10.05 pm and 10.40 pm respectively, Arrow Energy shifted 160 MW of capacity at Braemar unit five from prices below $360/MWh to above $2370/MWh and then 160 MW of capacity at unit six from prices below $445/MWh to above $3000/MWh. The reasons given were “2200A QLD price higher than fcast:avoid uneconomic start SL” and “Fuel management:change in gas position SL”. Both units had been forecast to shut down by 9.30 pm and 11 pm respectively.

The 5-minute price increased from $470/MWh at 10.35 pm to $3200/MWh at 10.40 pm. The price reduced to below $52/MWh at 10.45 pm, when a number of units were no longer ramp up rate limited. There were no other significant rebids.

Wednesday, 30 January

8 AM	Actual	4 hr forecast	12 hr forecast
Price ($/MWh)	2240.42	299.99	299.99
Demand (MW)	6742	6829	6897
Available capacity (MW)	8692	8750	8702

Conditions at the time saw demand and available capacity close to that forecast.

CS Energy's Wivenhoe Pump 2 scheduled load was setting the price for the 7.25 am and 7.30 am dispatch intervals at around $300/MWh. At 7.26 am, effective from 7.35 am, CS Energy rebid 245 MW of capacity at Pump 2 priced at $285/MWh to the price cap. The reason given was “0725P water manage-split yard creek-sl”.

With peaking plant offline and other generation ramp rate limited, Wivenhoe Pump 2 continued to set price at 7.35 pm, but at the price cap. The priced reduced to around $300/MWh, when a number of units were no longer ramp rate limited.

There was no other significant rebidding.

Thursday, 31 January

7:30 PM	Actual	4 hr forecast	12 hr forecast
Price ($/MWh)	2215.47	64.83	58.36
Demand (MW)	7155	6997	7236
Available capacity (MW)	8900	9139	10 163

Conditions at the time saw demand around 160 MW greater than forecast four hours ahead and around 80 MW lower than forecast 12 hours ahead. Available capacity was around 240 MW lower than forecast four hours ahead and 1260 MW lower than forecast 12 hours ahead.

At 8.18 am, Callide Power Trading delayed the return to service of Callide C unit 3, reducing available capacity by 406 MW (all of which was priced below $40/MWh).

Over several rebids from 8.20 am CS Energy reduced the available capacity of Gladstone Power station by around 460 MW (a majority of which was priced at zero). The reasons given included “technical issues-a id fan failure-sl”, “mill limit-wet coal-sl” and “condenser backflush-sl”.

At 5.37 pm, effective from 6.05 pm, Callide Power Trading reduced the available capacity of Callide C unit 4 by 176 MW (all of which was priced below $40/MWh). The reason given was “wet coal - bogging coal feeders”.

At 7.05 pm there was around a 55 MW increase in demand, generation was either offline or ramp rate limited so high priced generation was dispatched to meet the increase. This saw the 5-minute rice at 7.05 pm reach the price cap.

There was no other significant rebidding.

Tasmania:

There were two occasions where the spot price in Tasmania was greater than three times the Tasmania weekly average price of $55/MWh and above $250/MWh.

Sunday, 27 January

4:30 PM	Actual	4 hr forecast	12 hr forecast
Price ($/MWh)	2184.06	42.05	44.60
Demand (MW)	1045	1061	1072
Available capacity (MW)	2366	2366	2366
10:30 PM	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	2184.17	40.18	40.57
Demand (MW)	1095	1005	1038
Available capacity (MW)	2366	2366	2366

Conditions at the time saw demand and available capacity close to that forecast.

The high prices were driven by network constraints in Tasmania. The constraint T>>T_NIL_BL_EXP_5F is a network control scheme managing post contingent flows on the Hadspen to Georgetown 220 kV lines, preventing an overload on the parallel line in the event of a trip. The constraint affects Tasmanian generation and forces exports to Victoria across Basslink.

An increased in flows across the Hadspen-Georgetown 220 kV line at 4.20 pm and 11.30 pm activated the T>>T_NIL_BL_EXP_5F constraint, which causes generating units in eastern and southern Tasmania to be constrained down and generating units in western and southern Tasmania to be constrained on.

Due to limited ramp rate capability (and generators trapped in FCAS) the constraint violated for the 4.20 pm and 10.30 pm dispatch intervals, with flows on Basslink reduced to levels below that required by the constraint to meet demand in Tasmania (flows were reduced to 81 MW and 83 MW respectively). Five minute dispatch prices reached the price cap ($12 900/MWh) at 4.20 pm and 10.30 pm respectively.

There was no significant rebidding.

Detailed NEM Price and Demand Trends

for Weekly Market Analysis

27 January - 2 February 2013

AUSTRALIAN ENERGY REGULATOR

Table 1: Financial year to date spot market volume weighted average price

Financial year	QLD	NSW	VIC	SA	TAS
2012-13 ($/MWh) YTD	75	57	64	65	50
2011-12 ($/MWh) YTD	30	30	27	34	31
Change*	149%	88%	135%	91%	58%
2011-12 ($/MWh)	30	31	28	32	33

Table 2: NEM turnover

Financial year	NEM Turnover** ($, billion)	Energy (TWh)
2012-13 YTD	7.327	115
2011-12	5.987	199
2010-11	7.445	204

Table 3: Recent monthly and quarterly spot market volume weighted average price and turnover

Volume weighted average ($/MWh)	QLD	NSW	VIC	SA	TAS	Turnover ($, billion)
September-12	53	53	55	56	40	0.812
October-12	53	58	52	52	44	0.848
November-12	55	58	94	72	51	1.045
December-12	62	50	55	57	47	0.881
January-13	170	51	60	68	57	1.489
Q1 2013 QTD	170	51	60	68	57	1.489
Q1 2012 QTD	35	26	25	28	39	0.492
Change*	392%	100%	135%	141%	44%	2.026

Table 4: ASX energy futures contract prices at end of 1 February 2013

	QLD		NSW		VIC		SA	
Q1 2013	Base	Peak	Base	Peak	Base	Peak	Base	Peak
Price on 25 Jan ($/MWh)	108	132	54	60	54	66	59	79
Price on 1 Feb ($/MWh)	120	153	55	62	54	66	59	79
Open Interest on 1 Feb ($/MWh)	1552	324	2444	693	1240	177	270	0
Traded in the last week (MW)	25	1	210	3	104	1	0	0
Traded since 1 Jan 12 (MW)	5764	600	8656	1068	4218	290	481	0
Settled price for Q1 12 ($/MWh)	30	37	26	28	25	29	26	30

Table 5: Changes to availability of low priced generation capacity offered to the market

Comparison:	QLD	NSW	VIC	SA	TAS	NEM
November 12 with November 11						
MW Priced $20/MWh	-3407	78	-1859	-61	-283	-5533
MW Priced $20/MWh to $50/MWh	2797	-1617	452	-242	77	1467
December 12 with December 11						
MW Priced $20/MWh	-2990	273	-1725	-115	-219	-4777
MW Priced $20/MWh to $50/MWh	2632	-867	605	-235	33	2168
January 13 with January 12						
MW Priced $20/MWh	-2772	-2217	-1360	-41	-235	-6625
MW Priced $20/MWh to $50/MWh	1812	1269	1255	-346	339	4330

*Note: These percentage changes are calculated on VWA prices prior to rounding

** Estimated value