

WEEKLY ELECTRICITY MARKET ANALYSIS



AUSTRALIAN ENERGY
REGULATOR

25 November – 1 December 2012

Spot market prices

Figure 1 sets out the volume weighted average (VWA) prices for the week 25 November to 1 December 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 25 Nov - 1 Dec 2012	69	75	221	117	57
% change from previous week*	34	43	334	106	13
12/13 financial YTD	56	59	66	66	49
% change from 11/12 financial YTD **	89	86	135	78	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 B¹.

Financial markets

Figures 2 to 9 show futures contract² prices traded on the Australian Securities Exchange (ASX) as at close of trade on Monday 3 December 2012. 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 changes³ from the previous week.

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

	QLD		NSW		VIC		SA	
Calendar Year 2013	57	0%	58*	-2%	55*	1%	60*	1%
Calendar Year 2014	55	0%	57*	-1%	53	1%	57	1%
Calendar Year 2015	51	0%	52	0%	50	0%	53	0%
Three year average	54	0%	56	-1%	53	1%	57	1%

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

* denotes trades in the product.

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 3 shows the \$300 cap contract price for Q1 2013 and calendar year 2013 and the percentage change⁴ from the previous week.

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

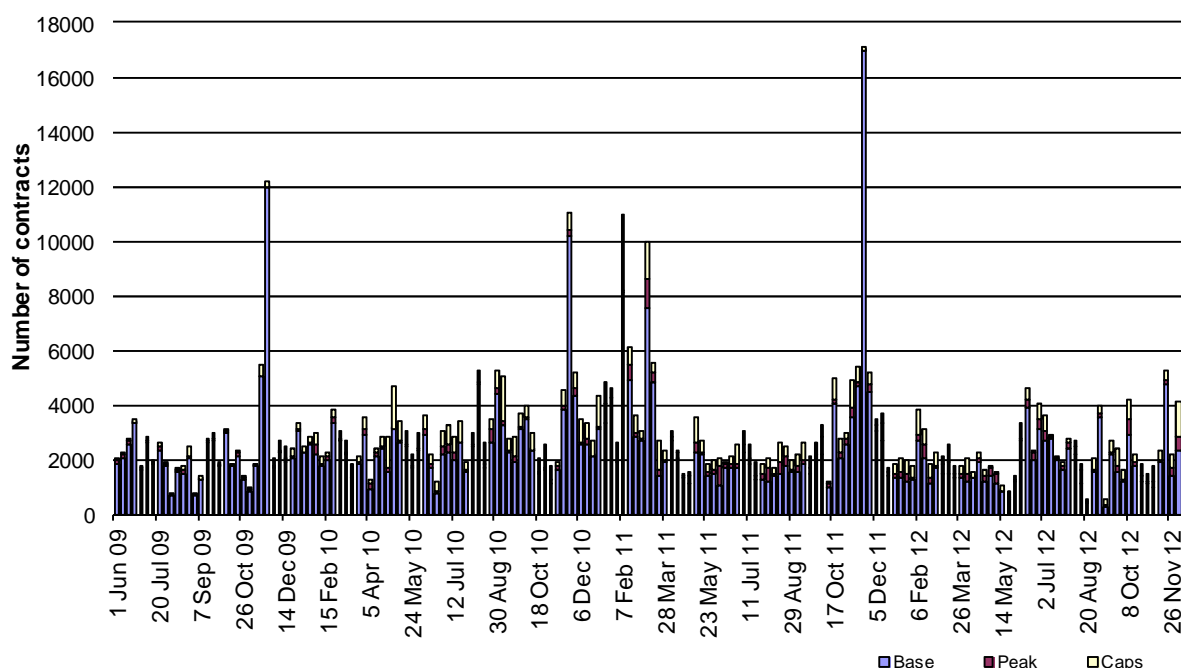
	QLD		NSW		VIC		SA	
Q1 2013 (% change)	13	3%	9*	-11%	11*	16%	15*	6%
2013 (% change)	6	2%	5	-8%	5	11%	7	3%

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

* denotes 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.

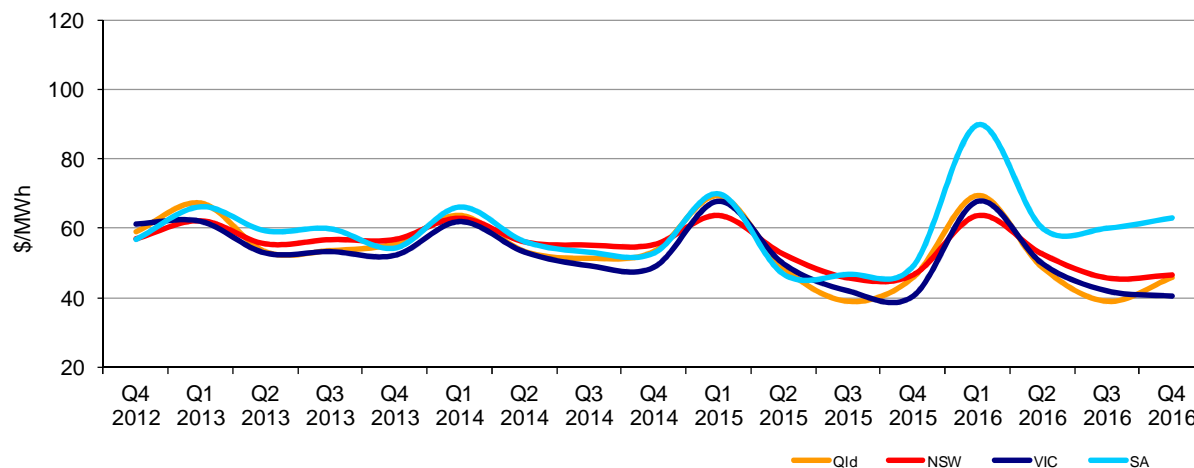
Figure 4: Number of exchange traded contracts per week



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

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

Figure 5: Quarterly base future prices Q4 2012 – Q4 2016

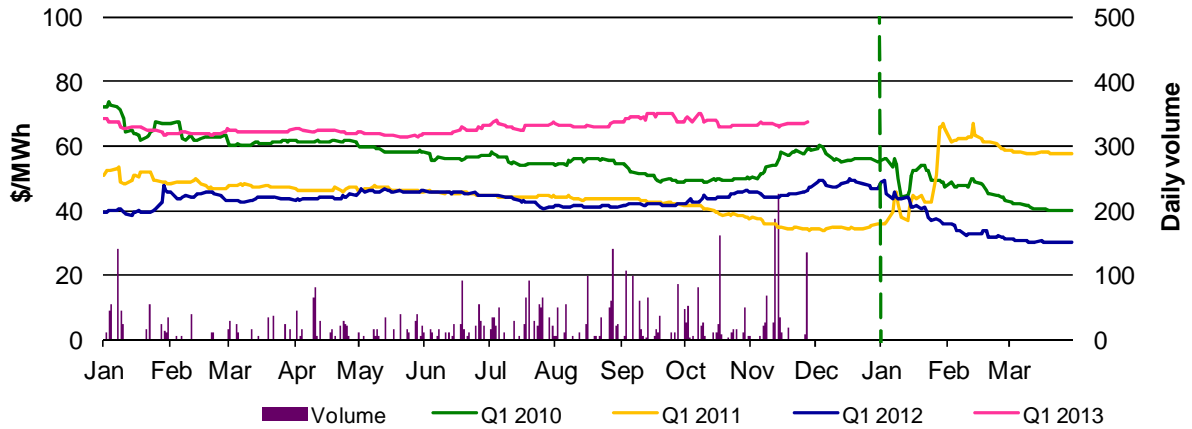


Source: d-cyphaTrade/ASX www.d-cyphatrade.com.au

⁴ Calculated on prices prior to rounding.

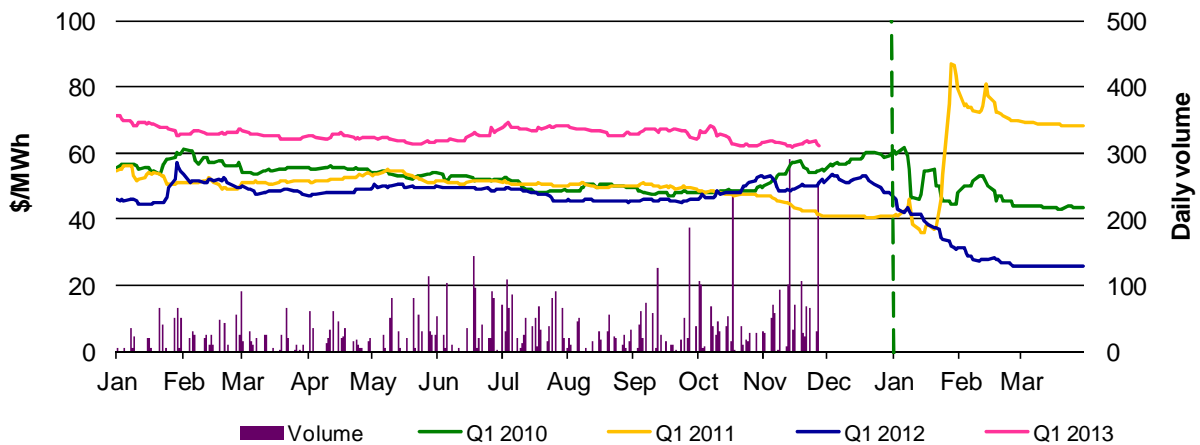
Figures 6-9 compare for each region the closing daily base contract prices for the first quarter of 2010, 2011, 2012 and 2013. Also shown is the daily volume of Q1 2013 base contracts traded. The vertical dashed line signifies the start of the Q1 period for which the contracts are being purchased.

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



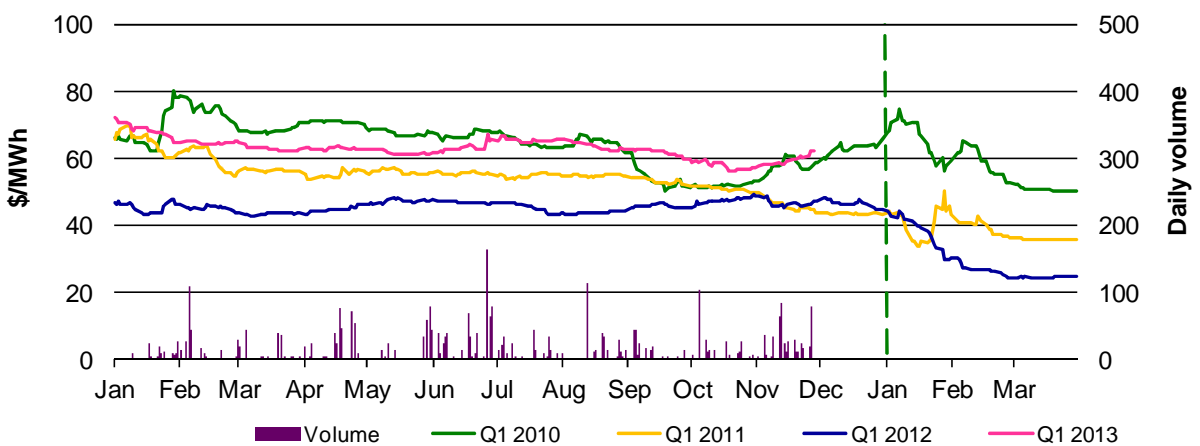
Source: d-cyphaTrade/ASX www.d-cyphatrade.com.au

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



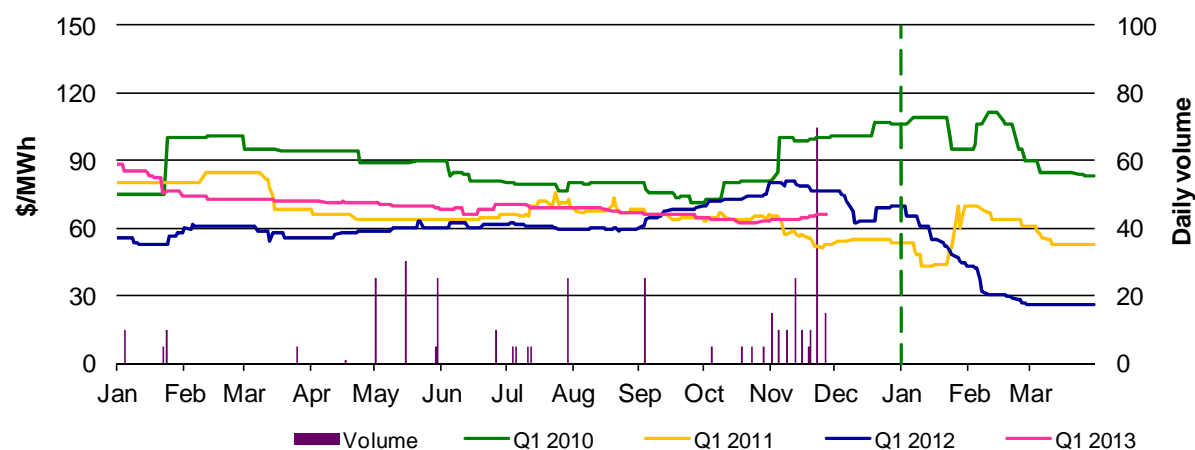
Source: d-cyphaTrade/ASX www.d-cyphatrade.com.au

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 76 trading intervals throughout the week where actual prices varied significantly from forecasts⁵. This compares to the weekly average in 2011 of 78 counts and the average in 2010 of 57. Reasons for these variances are summarised in Figure 10⁶.

Figure 10: Reasons for variations between forecast and actual prices

	Availability	Demand	Network	Combination
% of total above forecast	16	36	1	1
% of total below forecast	24	15	0	8

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 periods⁷. For example, in Queensland 564 MW more 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.

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.

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

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	564	-520	119	219
NSW	600	-479	1253	1349
VIC	208	-617	11	893
SA	91	-128	75	341
TAS	296	-304	-97	43
TOTAL	1759	-2048	1361	2845

Ancillary services market

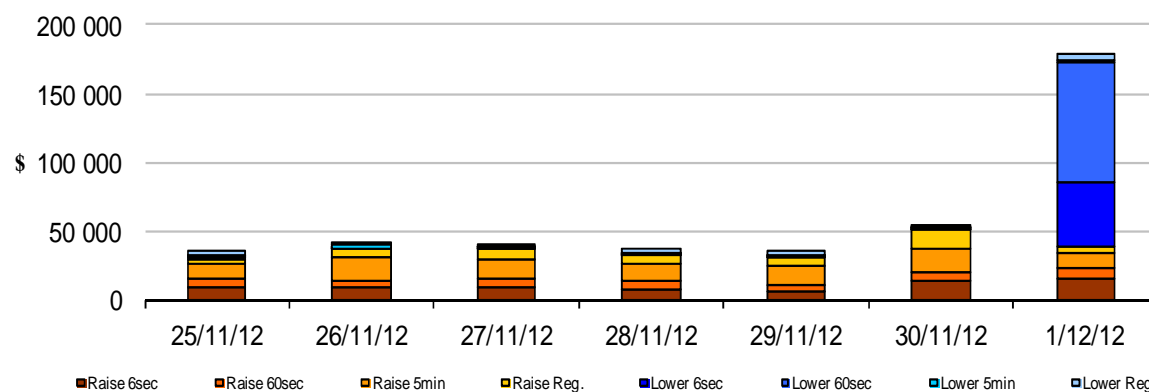
The total cost of frequency control ancillary services (FCAS) on the mainland for the week was \$371 000 or less than one per cent of energy turnover on the mainland.

On 1 December, there were a number of network outages, including the continuation of an unplanned outage of the Davenport to Brinkworth line in South Australia from the previous day, and a planned outage of the Heywood to Mortlake PS 500 kV line in Victoria. In addition lightning storms north of Adelaide resulted in the reclassification of the simultaneous loss of the Para-Robertstown and Robertstown-Tungkillo 275kV lines as a credible contingency from 9.50 am. This led to reduced import and export limits across the Heywood and Murraylink interconnectors and local lower frequency control ancillary services (FCAS) requirements for South Australia when exporting across Heywood.

At 2.35 pm, there was a 173 MW increase in wind output to 727 MW. South Australia native demand at the time was only around 1300 MW. The large increase in wind generation resulted in a number of network constraints being violated. Scheduled exports across Heywood and Murraylink exceeded the limits. Increased exports also resulted in higher local lower service requirements by around 20-30 MW for each service. This saw the price spike to \$1242/MW for lower 5 minute and lower regulation services and up to \$12 900/MW (the price cap) for the remaining lower services for the 2.40 pm dispatch interval. This event led to around \$135 000 of local services. The energy price fell to the price floor at the same time, which is discussed further in Appendix A.

The total cost of FCAS in Tasmania for the week was \$54 000 or less than one per cent of energy turnover in Tasmania. Figure 12 shows the daily breakdown of cost for each FCAS for the NEM.

Figure 12: Daily frequency control ancillary service cost





25 November – 1 December 2012

Queensland:

There were two occasions where the spot price in Queensland was greater than three times the Queensland weekly average price of \$69/MWh and above \$250/MWh.

Thursday, 29 November

3:00 PM	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	274.55	73.53	71.00
Demand (MW)	7230	7232	7282
Available capacity (MW)	9821	10 087	9917
4:00 PM	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	276.28	274.56	66.97
Demand (MW)	7323	7282	7347
Available capacity (MW)	9845	10086	10197

Conditions at the time saw demand close to forecast and available capacity up to 266 MW below that forecast four hours ahead. On the day there was high demand across all NEM regions. Dispatch prices were aligned across all mainland regions for most of the afternoon until around 3 pm.

At 12.42 pm, Callide Power Trading reduced the available capacity at Callide C Power Station unit 4 by 196 MW, all of which was price close to the price floor. The reason given was "1240P only 1 cw pump available". Over two rebids at 1.37 pm and 2.07 pm, 70 MW of this capacity was returned to service due to "cond. vac limiting factor".

At 2.14 pm, Stanwell Corporation rebid 130 MW of available capacity priced below \$50/MWh at its Swanbank E Power Station to above \$12 400/MWh. The reason given was "1410A 1410 qld rrp material change 1405 5 min qld price pd".

At 2.17 pm, effective from 2.25 pm, CS Energy rebid 100 MW of capacity at Gladstone Power Station from prices below \$65/MWh to above \$12 700/MWh. The reason given was "1415A interconnector constraint-sl". Two further rebids at 2.47 pm and 2.51 pm reduced the availability at Callied B Power Station by 215 MW, all of which was priced below \$50/MWh. The reason given for both rebids was "1445P fuel management-extend outage-sl".

There was no other significant rebidding.

New South Wales:

There were seven occasions where the spot price in New South Wales was greater than three times the New South Wales weekly average price of \$75/MWh and above \$250/MWh.

Thursday, 29 November

1:30 PM	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	265.49	61.64	62.17
Demand (MW)	10 049	9769	9557
Available capacity (MW)	13 340	13 690	13 724
2:00 PM	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	279.00	65.10	67.25
Demand (MW)	10 164	9790	9594
Available capacity (MW)	13 579	13 692	13 724
3:00 PM	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	303.86	81.18	75.10
Demand (MW)	10 339	9955	9726
Available capacity (MW)	13 584	13 690	13 725
4:00 PM	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	317.97	299.00	73.29
Demand (MW)	10 620	10 184	9897
Available capacity (MW)	13 584	13 691	13 726

Conditions at the time saw demand up to 436 MW higher than that forecast four hours ahead and available capacity up to 350 MW lower than that forecast four hours ahead. On the day there was high demand across all NEM regions. Dispatch prices were aligned across all mainland regions for most of the afternoon until around 3 pm.

Over two rebids at 10.22 am and 11.27 am (effective from the 11 am and 12 noon trading intervals, respectively), Macquarie Generation rebid up to 550 MW of capacity at Bayswater and Liddell Power Stations from prices below \$55/MWh to above \$260/MWh (350 MW of which was priced above \$11 450/MWh). The reasons given were “0953P manage forecast NSW to VIC interconnector constraint” and “1122A revised AEMO demand forecast”.

At 11.53 am, Energy Australia rebid 600 MW of capacity at Mt Piper and Wallerawang Power Stations from prices below \$80/MWh to above \$12 350/MWh. The reason given was “11:52 A band adj due to change in pd5 price @1145”.

There was no other significant rebidding.

Friday, 30 November

1:00 PM	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	254.14	273.99	144.99
Demand (MW)	11 494	11 305	11 218
Available capacity (MW)	13 590	13 589	13 676
2:30 PM	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	257.78	272.07	262.00
Demand (MW)	11 675	11 677	11 522
Available capacity (MW)	13 571	13 554	13 624
3:00 PM	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	263.85	279.19	270.26
Demand (MW)	11 776	11 996	11 699
Available capacity (MW)	13 604	13 549	13 618

Conditions on the day saw demand, available capacity and price close to forecast.

At 11.18 am, effective from 11.30 am, Macquarie Generation rebid 200 MW of capacity across its Bayswater and Liddell units from prices below \$60/MWh to above \$11450/MWh. The reason given was "1116A unforecast start of additional gen in VIC".

At 12.18 pm, effective from 12.25 pm, Delta Electricity rebid 220 MW of capacity at Vales Point Power Station from prices below \$140/MWh to above \$285/MWh. The rebid reason given was "1216A 5min PD demand is 100 MW lower than HH PD demand SL".

There was no significant rebidding.

Victoria:

There were five occasions where the spot price in Victoria was greater than three times the Victoria weekly average price of \$221/MWh and above \$250/MWh.

Thursday, 29 November

3:30 PM	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	2321.29	349.01	349.01
Demand (MW)	9318	8951	8187
Available capacity (MW)	9196	9344	9464
4:00 PM	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	8955.53	353.42	349.01
Demand (MW)	9373	9018	8263
Available capacity (MW)	9206	9363	9464
4:30 PM	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	9974.42	481.56	349.01
Demand (MW)	9378	9092	8274
Available capacity (MW)	9210	9315	9391
5:00 PM	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	8218.90	411.89	110.55
Demand (MW)	9339	9021	8255
Available capacity (MW)	9184	9317	9386
5:30 PM	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	962.00	330.66	102.23
Demand (MW)	9179	8798	8019
Available capacity (MW)	9108	9322	9388

Conditions at the time saw demand up to 1160 MW higher than that forecast 12 hours ahead and available capacity up to 280 MW less than that forecast 12 hours ahead.

The Victorian price exceeded \$5000/MWh for three trading intervals. In accordance with clause 3.13.7 of the National Electricity Rules, the AER is required to publish a report into the circumstances that led to the spot prices exceeding \$5000/MWh.

South Australia:

There were six occasions where the spot price in South Australia was greater than three times the South Australia weekly average price of \$117/MWh and above \$250/MWh and there was one occasion where the spot price was below -\$100/MWh.

Thursday, 29 November

3:30 PM

	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	2110.80	340.48	361.00
Demand (MW)	2209	2418	2540
Available capacity (MW)	3170	3151	3168

4:00 PM

	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	1014.85	349.21	367.35
Demand (MW)	2136	2415	2577
Available capacity (MW)	3229	3096	3151

4:30 PM

	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	2479.02	475.99	367.43
Demand (MW)	2101	2446	2590
Available capacity (MW)	3187	3092	3136

5:00 PM

	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	1403.71	416.73	116.36
Demand (MW)	2073	2500	2611
Available capacity (MW)	3126	3101	3095

Conditions at the time saw demand up to 427 MW below that forecast four hours ahead and available capacity close to forecast. Demand and price in Victoria, however, was significantly higher than forecast. Prices in South Australia were aligned at times with those in Victoria.

At 3.15 pm the Victoria and South Australian 5-minute prices spiked to \$12501/MWh and \$11373/MWh respectively when imports from New South Wales reached the limit. The South Australian 5-minute price spiked again at 3.35 pm to \$5666/MWh, when the Victorian price spiked to \$11533/MWh. At 4.05 pm, 4.10 pm and 4.50 pm the 5-minute price exceeded \$7000/MWh but at other times the price was generally less than \$100/MWh.

Over a number of rebids from 1.32 pm, AGL rebid up to 418 MW of capacity at Torrens Island Power Station from prices below \$300/MWh to the price cap. The reasons given were "P chg in pipeline cond::avoid unauth overrun seagas sl", "A chg in forecast::pd price increase [SA] [>\$400]", "A unfcst network constraint::energy risk V-SA" and "A unfcst network constraint::fcas/energy risk".

There was no other significant rebidding.

Friday, 30 November

Midnight	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	2176.83	65.80	56.93
Demand (MW)	1527	1548	1464
Available capacity (MW)	2371	2456	2604

At 11.23 pm Alinta Energy rebid 50 MW of capacity at Northern unit 2 from less than \$60/MWh to \$11 566/MWh. this rebid applied for the 11.30 pm dispatch interval. The reason given was "2322A NPS2 Heywood interconnector binding@23:23". This reduced the dispatch of the unit.

The 5-minute scheduled demand increased by 133 MW from 1677 MW at 11.30 pm to 1544 MW at 11.35 pm, due to the expected start up of off peak hot water load in South Australia. This rapid increase saw all generators in South Australia either ramp rate limited or trapped in its FCAS trapezium. As a result imports across Murraylink exceeded the limit. The 5-minute price reached \$12 900/MWh, set by Northern unit 1.

At 11.39 pm Alinta Energy reversed its earlier rebid on Northern unit 2 by shifting 50 MW of capacity from \$11 566/MWh to less than \$60/MWh. At the same time 50 MW of capacity on Northern unit 1 was shifted from less than \$60/MWh to \$32/MWh. These rebids applied for the 11.50 pm to midnight dispatch intervals. The reason given was "2338A NSP1 NPS2 SA SPOT PRICE @\$12900@23:39".

A number other participants also rebid in response, leading to around 600 MW of capacity rebid into very low prices following the price spike. As a result the 5-minute price fell, reaching \$-19/MWh at midnight.

Saturday, 1 December

3:00 PM	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	-134.51	50.81	57.50
Demand (MW)	1139	1150	1150
Available capacity (MW)	2540	2437	2492

As described in the "Ancillary services market" section, there were a number of network outages, which reduced limits across the Heywood and Murraylink interconnectors.

At 2.35 pm, there was a 173 MW increase in wind output to 727 MW. The large increase in wind generation caused a number of constraints to bind for the 2.40 pm dispatch interval. Every South Australia generator was then ramped down at its ramp rate (with the remaining generators trapped in the provision of FCAS). The wind farms, which had increased in output rapidly (at greater than their offered ramp rate), were only able to be ramped down at a relatively low ramp rate (noting that wind farms are not required to follow targets unless there is a binding network constraint).

This led to a number of network constraints being violated. Scheduled exports across Heywood and Murraylink exceeded the limit (with actual metered flows across Heywood of 285 MW compared to the limit of 88 MW). The 5-minute price decreased to the floor for the 2.40 pm dispatch interval.

Detailed NEM Price and Demand Trends

for Weekly Market Analysis
25 November - 1 December 2012



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

Financial year	QLD	NSW	VIC	SA	TAS
2012-13 (\$/MWh) YTD	56	59	66	66	49
2011-12 (\$/MWh) YTD	30	32	28	37	31
Change*	89%	86%	135%	78%	58%
2011-12 (\$/MWh)	30	31	28	32	33

Table 2: NEM turnover

Financial year	NEM Turnover** (\$, billion)	Energy (TWh)
2012-13 (YTD)	\$4.933	82
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)
July-12	65	68	76	83	60	1.228
August-12	55	58	57	65	48	0.971
September-12	53	53	55	56	40	0.812
October-12	53	58	52	52	44	0.848
November-12 (MTD)	55	58	94	72	51	1.045
Q4 2012 (QTD)	54	58	72	61	47	1.922
Q4 2011 (QTD)	31	34	26	37	32	1.040
Change*	73%	69%	181%	66%	48%	84.83%

Table 4: ASX energy futures contract prices at end of 03 December 2012

	QLD		NSW		VIC		SA	
	Base	Peak	Base	Peak	Base	Peak	Base	Peak
Q1 2013								
Price on 26 Nov (\$/MWh)	67	89	63	79	60	77	65	85
Price on 03 Dec (\$/MWh)	67	90	62	78	62	79	66	85
Open interest on 03 Dec	1362	302	2105	662	1232	112	224	0
Traded in the last week (MW)	143	0	418	290	137	0	85	0
Traded since 1 Jan 12 (MW)	4931	518	7374	957	3491	185	386	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
September 12 with September 11						
MW Priced <\$20/MWh	-2600	-525	-1694	13	-126	-4932
MW Priced \$20 to \$50/MWh	2307	-1266	823	-316	111	1658
October 12 with October 11						
MW Priced <\$20/MWh	-3085	-908	-2042	-48	98	-5985
MW Priced \$20 to \$50/MWh	2830	-1652	857	-175	148	2008
November 12 with November 11						
MW Priced <\$20/MWh	-3407	78	-1859	-61	-283	-5533
MW Priced \$20 to \$50/MWh	2797	-1617	452	-242	77	1467

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

** Estimated value