

WEEKLY ELECTRICITY MARKET ANALYSIS



AUSTRALIAN ENERGY
REGULATOR

1 - 7 April 2012

Summary

Weekly average spot prices ranged from \$21/MWh in South Australia to \$32/MWh in New South Wales. The lower average spot price in South Australia was the result of eight consecutive trading intervals of negative prices on Monday 2 April. Two of these spot prices reached close to the price floor. The negative prices were due to a combination of rebidding at Torrens Island, limited exports across interconnectors as a result of planned and unplanned network outages and higher than forecast wind generation.

On 3 April, the cost of SA local lower 60 seconds ancillary services totalled \$450 000. The outage of the Heywood to Moorabool line combined with increased generation at Mortlake resulted in increased lower service requirements in South Australia. Furthermore, Mortlake exceeded their dispatch target by over 100 MW which significantly increased the lower service requirements, resulting in the lower 60 second service price reaching the price cap.

Spot market prices

Figure 1 sets out the volume weighted average (VWA) prices for the week 1 April to 7 April and the 11/12 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 1 Apr – 7 Apr 2012	27	32	31	21	30
% change from previous week*	11	17	16	-31	-3
11/12 financial YTD	30	30	27	32	32
% change from 10/11 financial YTD **	-17	-38	-6	-28	6

*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 2 April 2012. Figure 2 shows the base futures contract

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 -> Monitoring, reporting and enforcement -> Electricity market reports -> Long-term analysis.

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

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	55	0%	58	-1%	53	0%	56	0%
Calendar Year 2014	53	-3%	56*	-5%	51	-4%	58	-6%
Calendar Year 2015	62	0%	59	0%	60	0%	69	0%
Three year average	57	-1%	58	-2%	55	-1%	61	-2%

Source: d-cyphaTrade www.d-cyphatrade.com.au
* denotes trades in the product.

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

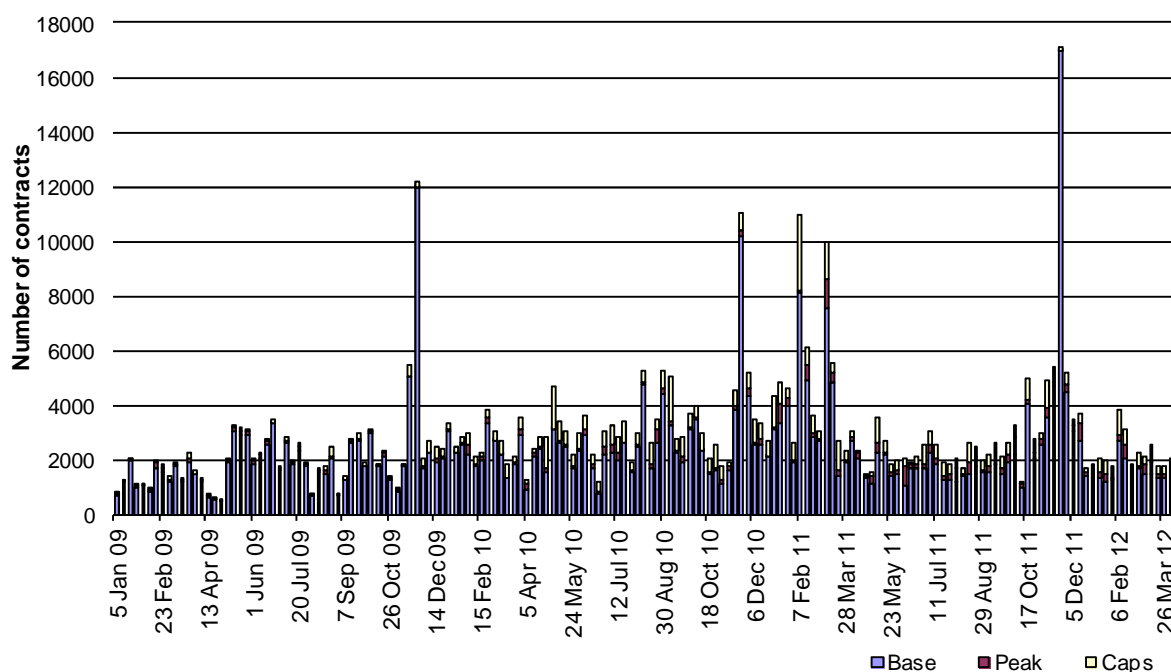
Figure 3: \$300 cap contract prices (\$/MWh)

	QLD		NSW		VIC		SA	
Q1 2013 (% change)	14	0%	15	0%	16*	-1%	24*	0%
2013 (% change)	7	0%	8	-1%	7	1%	10	-1%

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

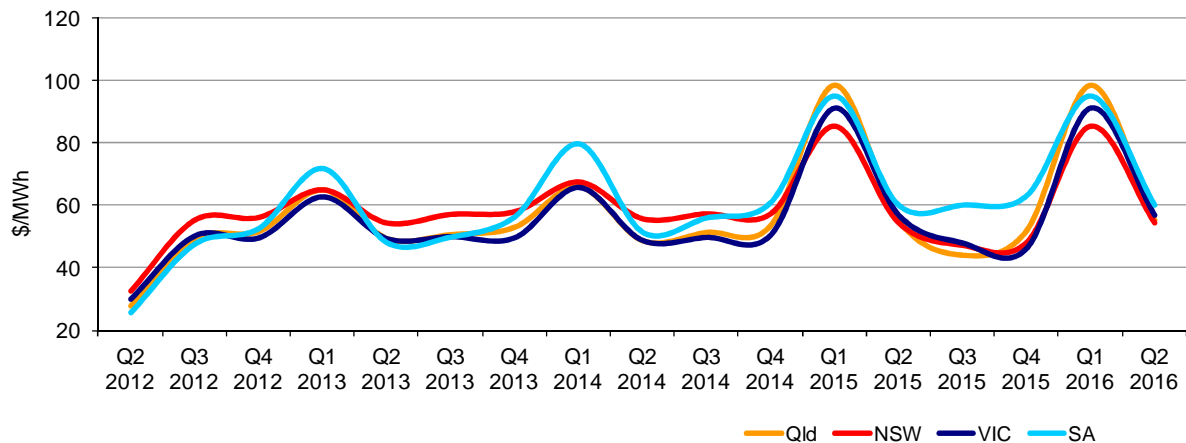
contract quarter. A peak load profile is defined as the peak-period from 7 am to 10 pm Monday to Friday (excluding Public holidays) over the duration of the contract quarter.

³ Calculated on prices prior to rounding.

⁴ Calculated on prices prior to rounding.

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

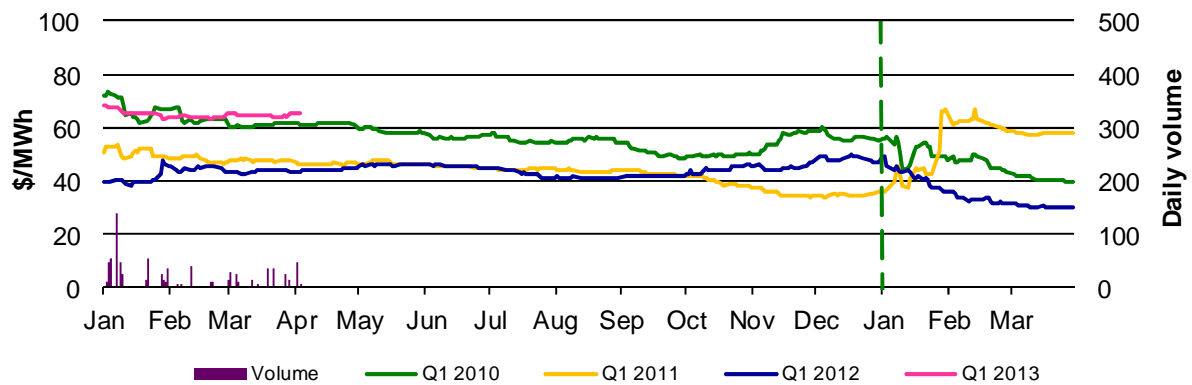
Figure 5: Quarterly base future prices Q2 2012 – Q2 2016



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

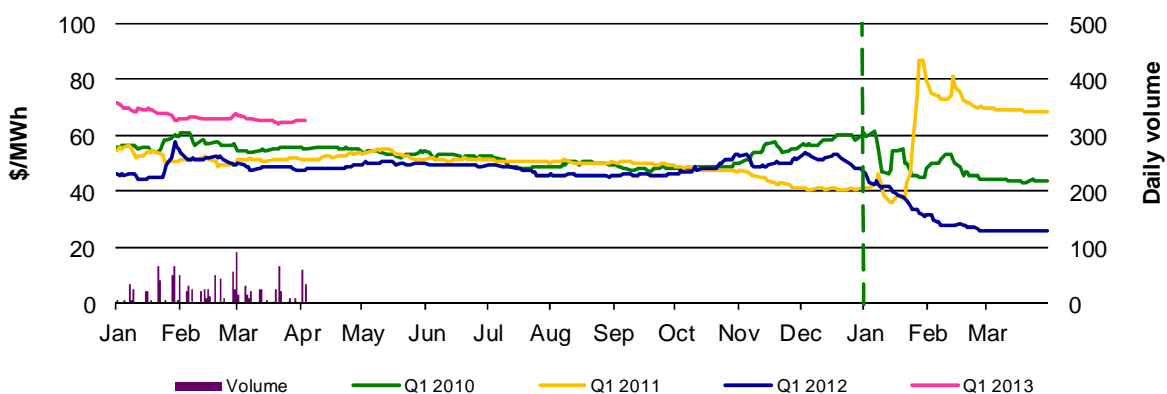
Figures 6-9 compare for each region the closing daily base contract prices for the first quarter of 2010, 2011, 2012 and 2013. Also shown is the daily volume of Q1 2013 base contracts traded. The vertical dashed line signifies the start of the Q1 period for which the contracts are being purchased.

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



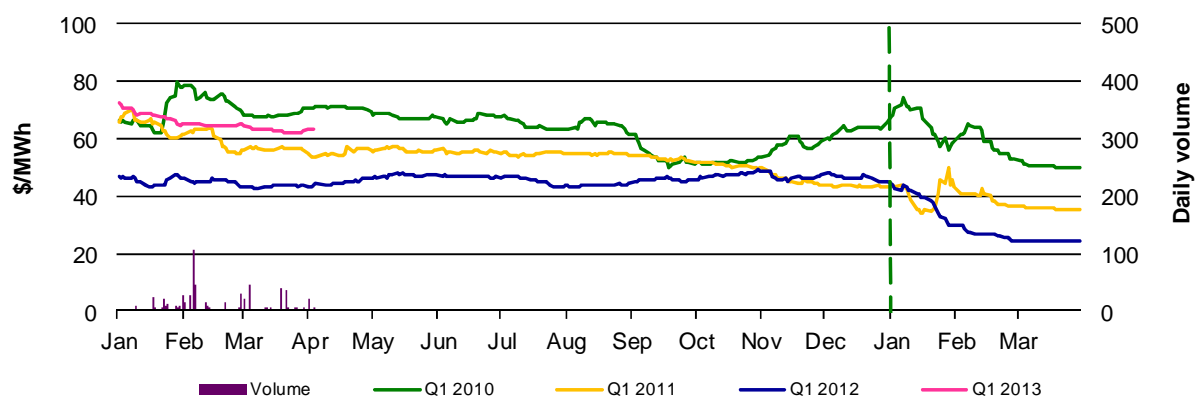
Source: d-cyphaTrade www.d-cyphatrade.com.au

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



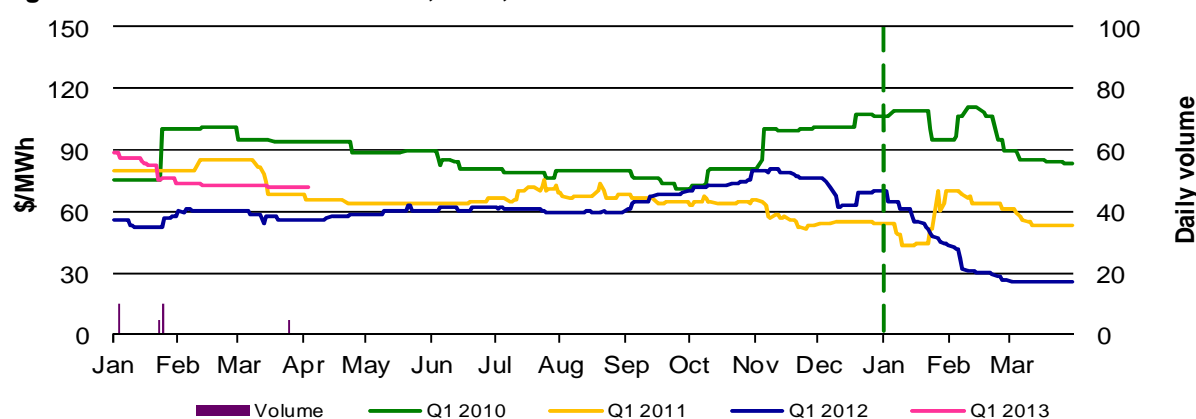
Source: d-cyphaTrade www.d-cyphatrade.com.au

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



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

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



Source: d-cyphaTrade 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 85 trading intervals throughout the week where actual prices varied significantly from forecasts⁵. This compares to the weekly average in 2010 of 57 counts and the average in 2009 of 103. 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	9	31	0	3
% of total below forecast	24	23	0	10

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 periods⁷. For example, in Queensland 247 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	-247	208	101	-43
NSW	-1641	814	-1140	-15
VIC	-260	-487	-301	-185
SA	153	-15	90	-23
TAS	5	-10	34	-12
TOTAL	-1990	510	-1216	-278

Ancillary services market

The total cost of frequency control ancillary services (FCAS) on the mainland for the week was \$337 000 or less than one per cent of energy turnover on the mainland. In addition there was a requirement for local FCAS in South Australia as a result of network outages affecting the interconnectors over 2 and 3 April at a cost of around \$510 000.

The total cost of FCAS in Tasmania for the week was \$59 000 or around one per cent of energy turnover in Tasmania.

On Tuesday 3 April, from 6.05 am, there was an outage of the Heywood to Moorabool line, which led to a requirement for local FCAS in South Australia. This outage combined with increased generation output from Mortlake⁸ resulted in increased exports from South Australia into Victoria on the Heywood interconnector.

The dispatch target at Mortlake increased from zero at 2.45 pm to 27 MW at 2.50 pm and to 94 MW at 2.55 pm. Increased flows at Mortlake impacted on the flows across the Heywood interconnector which changed from 8 MW into South Australia at 2.55 pm to 127 MW into Victoria at 3 pm. The change in flows saw an increased in local lower ancillary service requirements in South Australia. The lower 60 seconds service requirement increased from zero at 2.55 pm to 73 MW at 3 pm. The lower 60 second ancillary service price in South Australia reached \$9111/MWh at 3 pm and \$9030/MWh at 3.05 pm

At 3.10 pm Mortlake generated significantly above its target, which led to further increased exports into Victoria (from 127 MW at 3.05 pm to 169 MW at 3.10 pm) and the lower 60 seconds service requirement increased from 74 MW to 116 MW. As a result the ancillary service price increased to the price cap and remained at this level until 3.20 pm before reducing below \$5/MWh at 3.25 pm. The lower 60 service requirement remained above 70 MW until 3.30 pm, the time at which Mortlake shutdown.

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

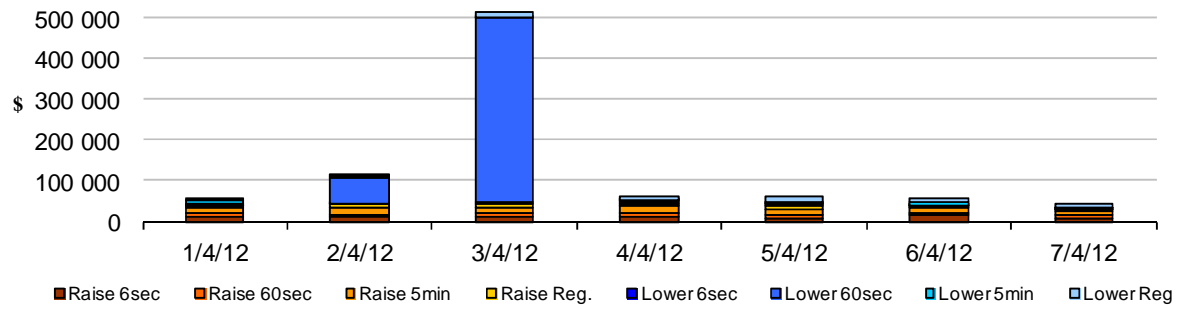
⁸ At 2.36 pm, effective from 2.45 pm, Origin Energy rebid 281 MW of capacity at Mortlake from prices above \$90/MWh to zero. The reason given was "1430P change in fcast – inc NSW dem 5PD 9794-> 30PD 9590@ 1435 SL". Mortlake was receive a dispatch target of 27 MW at 2.50 pm. Mortlake remained on until 3.30 pm.

On the day, Mortlake was generating above its target from 3 pm to 3.30 pm.

The constraint used to manage the outage of the Heywood to Moorabool line violated from 3 pm to 3.25 pm (inclusive).

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
April 2012**

Detailed Market Analysis


 AUSTRALIAN ENERGY
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1 – 7 April 2012

South Australia:

There were six occasions where the spot price in South Australia was less than \$-100/MWh.

Monday, 2 April

11 AM	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	-324.19	31.69	29.64
Demand (MW)	1542	1525	1469
Available capacity (MW)	2281	2244	2240
11:30 AM	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	-995.7	31.77	30.80
Demand (MW)	1493	1547	1517
Available capacity (MW)	2284	2225	2274
Noon	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	-995.08	35	31.50
Demand (MW)	1501	1621	1627
Available capacity (MW)	2297	2239	2299
12:30 PM	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	-220.4	35	31.51
Demand (MW)	1559	1669	1627
Available capacity (MW)	2302	2212	2364
1 PM	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	-201.62	31.77	31.69
Demand (MW)	1580	1689	1655
Available capacity (MW)	2351	2301	2421
1:30 PM	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	-350.31	32.56	31.77
Demand (MW)	1602	1751	1711
Available capacity (MW)	2392	2300	2428

Conditions on the day saw demand up to 149 MW less than that forecast four hours ahead and available capacity close to forecast.

Over three rebids at 7.22 am, 8.54 am and 11.25 am, effective from 7.25 am, 9 am and 11.30 am respectively, AGL rebid 420 MW of capacity at Torrens Island from prices above \$30/MWh to close to the price floor. This saw all 600 MW of capacity at Torrens Island priced at the price floor from 7.25 am to 4 pm. The reasons given were “07:25A chg in dispatch::demand decrease vs PD SA 150MW”, “08:55 chg in dispatch::demand decrease vs pd SA 125 MW” and “11:16A Unfcast network constraint:: ML Zero revoke”.

During the time of low prices up to 1750 MW of generation in South Australia was priced below -\$959/MWh and the average wind generation dispatched was 530 MW (280 MW of which was owned by AGL).

Constraints managing a planned outage of one of the Heywood to South East lines limited exports from South Australia to Victoria across Heywood to around 100 MW from 7.30 am.

At 10.55 am, Murraylink tripped, reducing flows from around 65 MW into Victoria at 10.50 am to zero at 10.55 MW. The line returned to service at 11.20 am. Then at 11.40 am, an unplanned outage of one of the North West Bend circuit breakers forced flows across Murraylink into South Australia at around 25 MW (counter price). Flows remained at around 25 MW until the end of the outage at 2.15 pm.

The 5-minute dispatch price decreased from \$3/MWh at 10.50 am to -\$996/MWh at 10.55 am and stayed at this level until noon. The price was also close to the price floor for the 12.30 pm – 12.35 pm dispatch intervals and 1.05 pm and 1.10 pm dispatch intervals. The dispatch price returned to previous levels of around \$30/MWh at 2.30 pm, the time at which demand exceeded 1700 MW.

In response to the extreme negative prices, a number of generators rebid into higher prices to avoid uneconomic dispatch and a number of wind farms reduced output to zero.

- Over two rebids at 8.23 am and 10.24 am, Infigen rebid 175 MW of capacity at Lake Bonny from prices below zero to above zero. The reason given was “08.22 A SA gen hght than 5mdps @7.30 SL”.
- Over two rebids at 11.03 am and 11.40 am, effective 11.35 am and 11.50 am respectively, Alinta energy rebid 172 MW of capacity at Northern power station unit 2 from prices below \$65/MWh to above \$9600/MWh (112 MW of this capacity was priced below -\$950/MWh). The rebid reasons given were “1100A AEMO half hour forecast lower than planned \$31 \$-324 @11:03” and “1100A actual lower than AEMO forecast -\$996 V \$26 @11.39”.
- The output of Snowtown, Lake Bonny units 2 and 3 and Waterloo wind farms reduced to zero.

There was no other significant rebidding.

Detailed NEM Price and Demand Trends

for Weekly Market Analysis
1 April - 7 April 2012



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

Financial year	QLD	NSW	VIC	SA	TAS
2011-12 (\$/MWh) YTD	30	30	27	32	32
2010-11 (\$/MWh) YTD	36	47	29	45	31
Change*	-17%	-38%	-6%	-28%	6%
2010-11 (\$/MWh)	34	43	29	42	31

Table 2: NEM turnover

Financial year	NEM Turnover** (\$, billion)	Energy (TWh)
2011-12 (YTD)	\$4.494	153
2010-11	\$7.445	204
2009-10	\$9.643	206

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)
Dec-11	26	26	23	25	26	0.369
Jan-12	35	26	25	28	39	0.447
Feb-12	32	27	27	29	37	0.427
Mar-12	28	26	24	26	36	0.396
Apr-12 (MTD)	27	32	31	21	30	0.097
Q2 2012 (QTD)	27	32	31	21	30	0.107
Q2 2011 (QTD)	25	27	25	27	26	0.096
Change*	9%	21%	24%	-23%	16%	11.45%

Table 4: ASX energy futures contract prices at end of 10 April 2012

	QLD		NSW		VIC		SA	
	Base	Peak	Base	Peak	Base	Peak	Base	Peak
Q1 2013								
Price on 02 Apr (\$/MWh)	65	89	65	88	63	88	72	114
Price on 10 Apr (\$/MWh)	65	90	65	89	63	88	72	114
Open interest on 10 Apr	381	72	712	195	501	63	25	0
Traded in the last week (MW)	65	0	105	5	30	0	0	0
Traded since 1 Jan 12 (MW)	803	87	1218	140	621	78	30	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
February 12 with February 11						
MW Priced <\$20/MWh	-194	-460	-25	-213	154	-738
MW Priced \$20 to \$50/MWh	416	621	98	94	-404	825
March 12 with March 11						
MW Priced <\$20/MWh	-151	-49	-33	-263	95	-402
MW Priced \$20 to \$50/MWh	479	395	43	91	-540	468
April 12 with April 11 (MTD)						
MW Priced <\$20/MWh	-150	-1338	-555	-60	388	-1714
MW Priced \$20 to \$50/MWh	546	556	-397	142	-584	263

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

** Estimated value