WEEKLY ELECTRICITY MARKET ANALYSIS

AUSTRALIAN ENERGY REGULATOR

19 August – 25 August 2012

Summary

The weekly average price in South Australia of $67/MWh was driven by a $2054/MW spot price at midnight on Sunday. Weekly average spot prices ranged from $50/MWh to $57/MWh in the remaining regions.

Spot market prices

Figure 1 sets out the volume weighted average (VWA) prices for the week 19 August to 25 August 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 19 August - 25 August 2011	54	57	56	67	50
% change from previous week*	-7	-6	-7	3	-2
12/13 financial YTD	62	65	70	78	57
% change from 11/12 financial YTD **	120	106	122	117	70

*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 Monday 27 August 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 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	57*	0%	60*	-1%	55*	-2%	60	-1%
Calendar Year 2014	55	-1%	58	-1%	54	-1%	55	0%
Calendar Year 2015	55	0%	53	0%	52	0%	69	0%
Three year average	55	0%	57	-1%	54	-1%	61	0%

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 change[4] from the previous week.

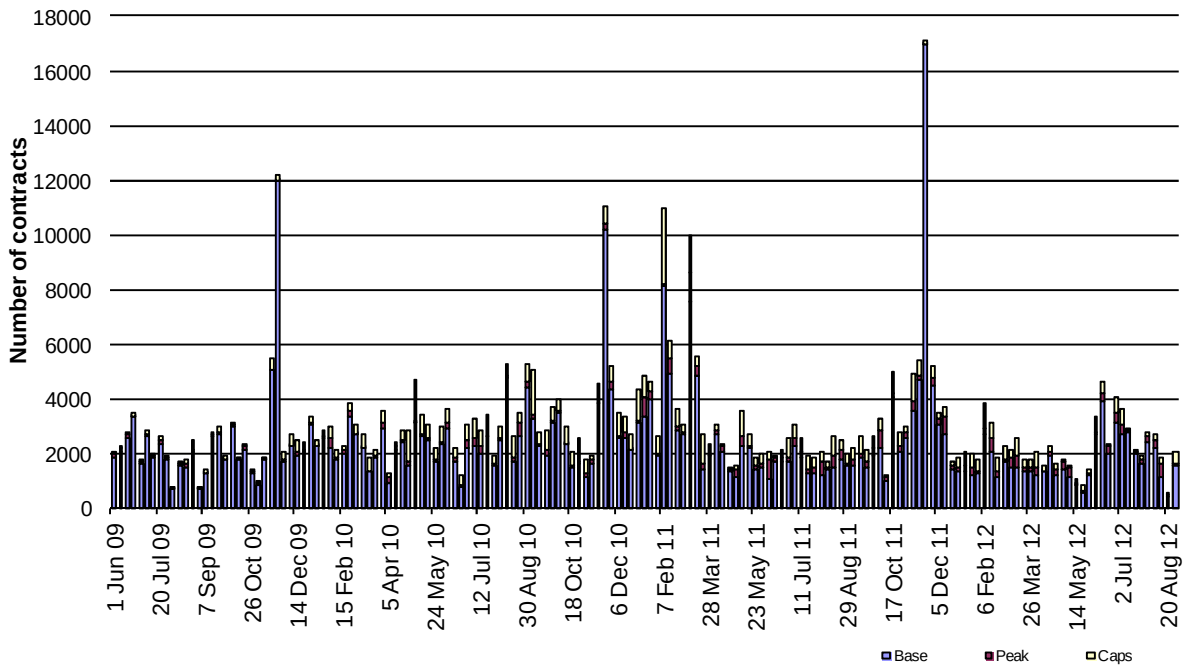
Figure 3: $300 cap contract prices ($/MWh)

	QLD		NSW		VIC		SA	
Q1 2013 (% change)	13*	-2%	12	-9%	12*	-8%	19	-4%
2013 (% change)	6	-1%	7	-5%	5	-8%	8	-2%

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

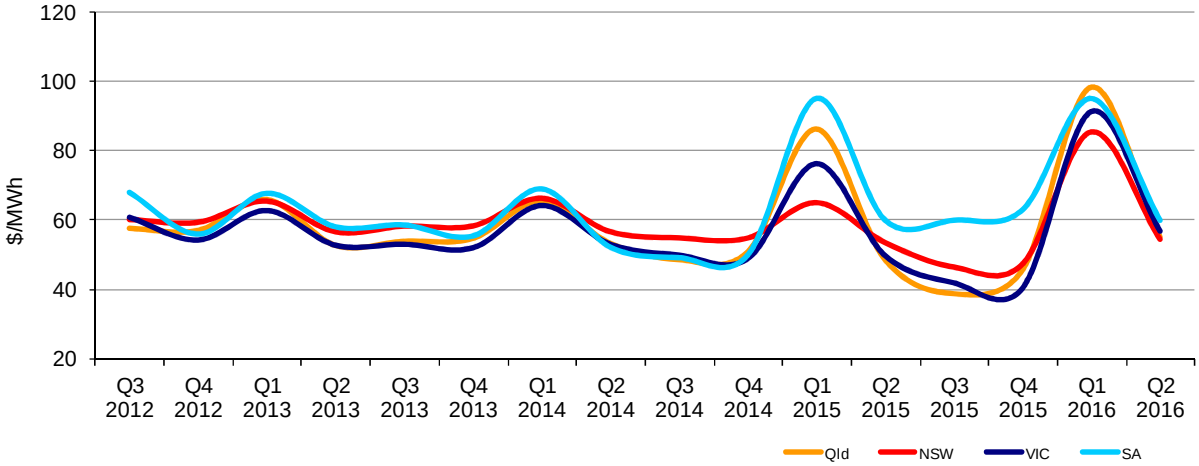


Source: d-cyphaTrade www.d-cyphatrade.com.au

[4] Calculated on prices prior to rounding.

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

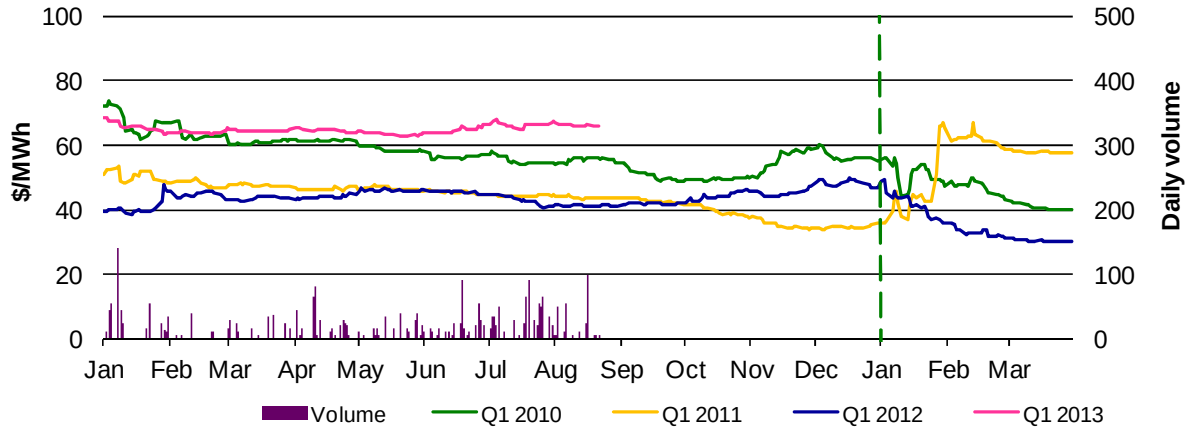
Figure 5: Quarterly base future prices Q3 2012 – Q2 2016



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

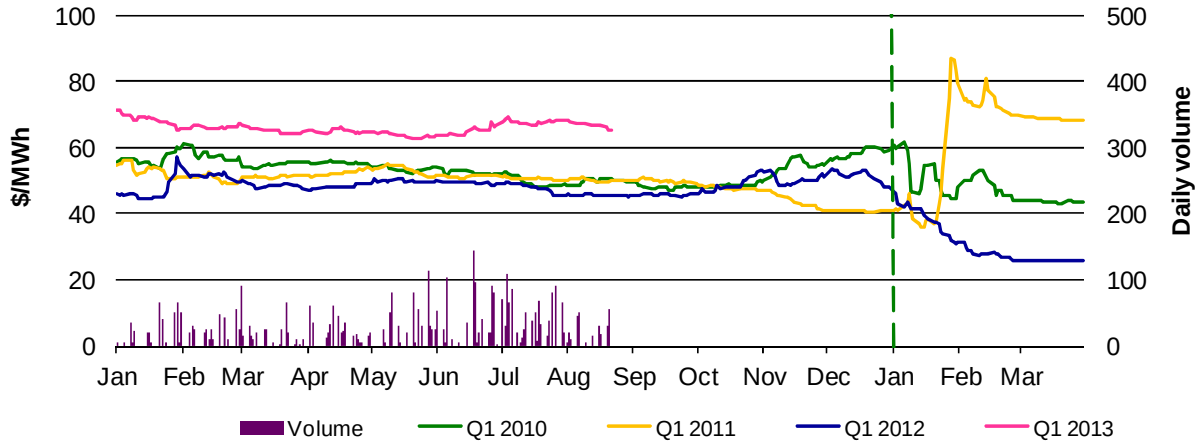
Figures 6-9 compare for each region the closing daily base contract prices for the first quarter of 2010, 2011, 2012 and 2013. Also shown is the daily volume of Q1 2013 base contracts traded. The vertical dashed line signifies the start of the Q1 period for which the contracts are being purchased.

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



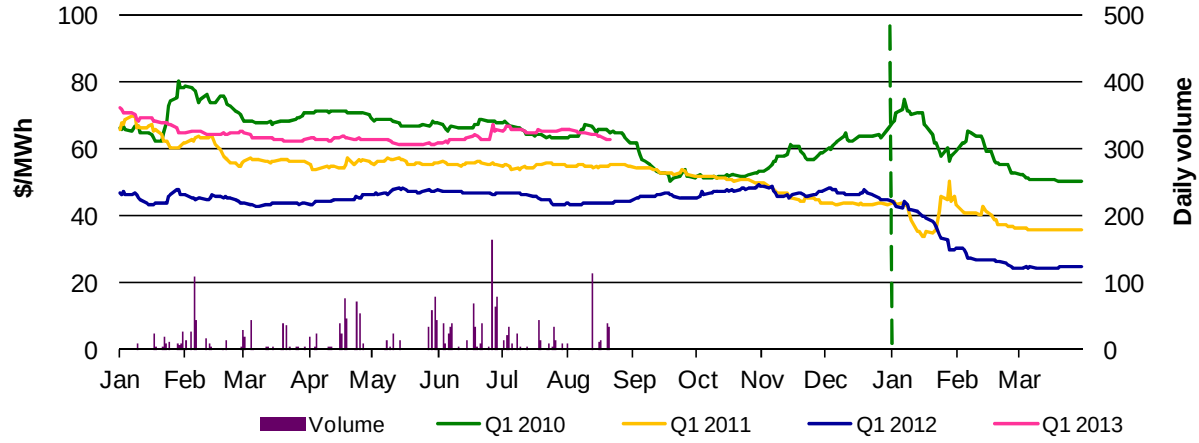
Source: d-cyphaTrade www.d-cyphatrade.com.au

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



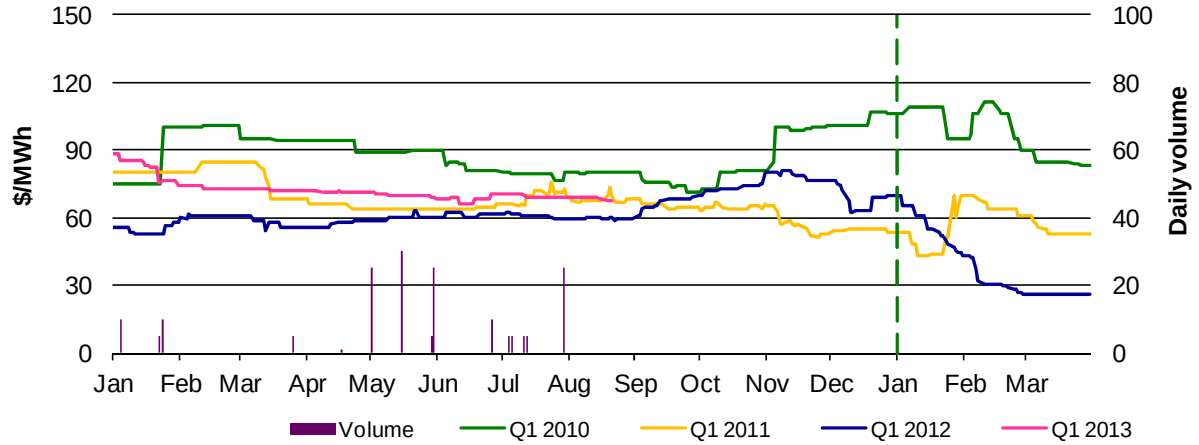
Source: d-cyphaTrade www.d-cyphatrade.com.au

Figure 8: Victoria 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 26 trading intervals throughout the week where actual prices varied significantly from forecasts[5]. 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 10[6].

Figure 10: Reasons for variations between forecast and actual prices

	Availability	Demand	Network	Combination
% of total above forecast	11	21	3	5
% of total below forecast	12	19	25	4

[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 150 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	-150	-13	-293	80
NSW	-73	-268	-525	-397
VIC	66	93	345	-268
SA	-37	-8	-75	-40
TAS	34	-21	-27	-66
TOTAL	-160	-217	-575	-691

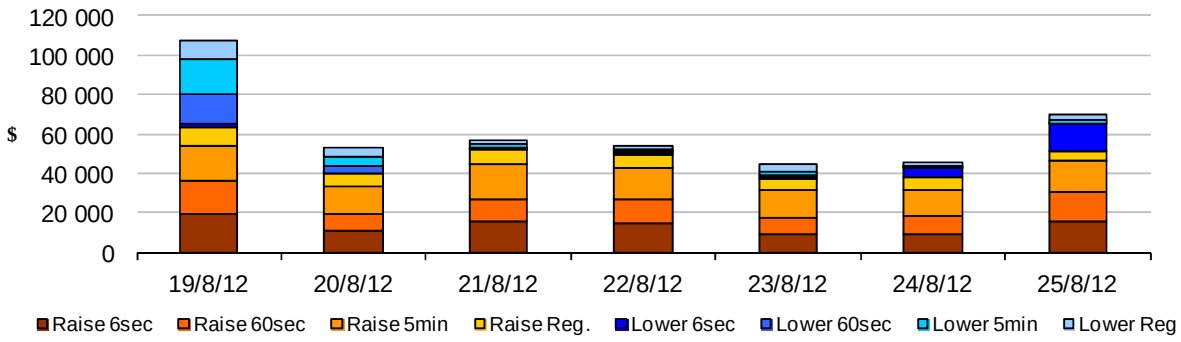
Ancillary services market

The total cost of frequency control ancillary services (FCAS) on the mainland for the week was $376 000 or less than one per cent of energy turnover on the mainland.

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



Australian Energy Regulator
September 2012

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

Appendix A

AUSTRALIAN ENERGY REGULATOR

19 August – 25 August 2012

South Australia

There was one occasion where the spot price in South Australia was greater than three times the South Australia weekly average price of $67/MWh and above $250/MWh.

Sunday, 19 August

12 midnight	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	2054.81	70.17	65.17
Demand (MW)	1712	1682	1683
Available capacity (MW)	2155	2164	2180

An outage of the Heywood to Moorabool No. 1 line from 6 am Sunday saw imports limited to 250 MW.

The demand in South Australia increased rapidly from 1532 MW at 11.30 pm to 1771 MW at 11.40 pm. This sharp increase in demand was related to off peak hot water load. As the ramp up rate capability from a number of generators was limited, high-priced capacity had to be dispatched to meet the increase in demand. As a result, the 5-minute price increased from $71/MWh at 11.30 pm to $11 947/MWh at 11.35 pm, before reducing to previous levels.

There was no significant rebidding.

Queensland

There was one occasion when the spot price in Queensland was greater than three times the Queensland weekly average price of $52/MWh and above $250/MWh. There were four occasions when the spot price was less than -$100/MWh.

Saturday, 25 August

10 AM	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	646.29	53.94	52.88
Demand (MW)	5454	5583	5502
Available capacity (MW)	9359	9522	9537

10:30 AM	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	-194.80	53.29	53.97
Demand (MW)	5386	5532	5470
Available capacity (MW)	9016	9528	9530
11 AM	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	-509.45	52.94	53.21
Demand (MW)	5407	5507	5393
Available capacity (MW)	9401	9523	9525
2 PM	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	-224.07	76.44	49.34
Demand (MW)	5159	5305	5219
Available capacity (MW)	9455	9510	9508
2:30 PM	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	-127.47	76.39	48.72
Demand (MW)	5220	5203	5231
Available capacity (MW)	9510	9510	9508

Between 9 am and 2.30 pm (and for a further dispatch interval at 4.55 pm), the Queensland 5-minute prices were extremely volatile, fluctuating between $1493/MWh and-$1000/MWh. The 5-minute price exceeded $900/MWh on nine occasions and fell below-$300/MWh on 21 occasions.

The volatile prices were driven by network congestion in central Queensland (on the 855 Calvale to Stanwell and 871 Calvale to Wurdong lines). The Q>>NIL_855_871 and Q>>NIL_871_855 constraints manage post contingent flows on the 855 and 871 lines. The constraints contain the majority of Queensland generation and the Queensland to New South Wales interconnector (QNI) on the left hand side, which means that when either binds there is a significant effect on dispatch and price outcomes. During the high price period, QNI was forced to export into New South Wales at up to 1040 MW, sometimes counter-price.

At 9.30 am, the dynamic ratings for both the 855 and 871 lines reduced by 50 MVA, which had the effect of reducing the right hand side value of the Q>>NIL_855_871 constraint[8]. This made the constraint more restrictive and resulted in the need for a number of low priced generating units in Queensland to be "constrained off" for the 9.30 am dispatch interval (including Darling Downs Power station, Braemar unit 5, Yarwun, Callide B, Callide C units 3 and 4). As a result, a high priced generating unit was the marginal unit for the 9.30 am

[8] The right hand side value of the Q>>NIL_855_871 constraint reduced from 566 at 9.25 am to 413 at 9.30 am.

dispatch interval. A similar outcome occurred for a number of 5-minute intervals during the volatile price period.

This is similar to events reported in 9 weekly reports during the 2011-12 summer.

A number of participants rebid in response to the binding network constraint. At times, this had the effect of exacerbating the congestion in central Queensland and contributed to the severity of the volatile pricing.

Over two rebids at 7.47 am and 9.01 am, effective for the 8.30 am to 2 pm trading intervals, Stanwell rebid up to 1780 MW at Tarong from prices above $20/MWh to prices close to the price floor. At the same time, up to 423 MW of capacity at Stanwell and Kareeya was rebid from prices below $60/MWh to above $2 400/MWh (384 MW of which was priced close to the price cap). The reason given was “Manage transmission constraint 855_871”.

In general, during the period of volatile pricing, units that were “constrained on” rebid capacity into higher prices or rebid unavailable to avoid being dispatched. Conversely, units that were “constrained off”, rebid their capacity into prices close to the price floor to ensure dispatch.

Over 11 rebids between 8.25 am and 2.17 pm, effective for various times between the 9 am and 3 pm trading intervals, Arrow Energy shifted up to 304 MW of capacity at Braemar 5 and 7, from prices above zero to less than -$945/MWh. Some of the reasons given were “0820A change in 5Min PD: Network constraint SL”, “0945A Qld price higher than fcast SL”, “1005A maintain minimum operating level sl”, “1215A change in 5min pd: Qld price inc sl” and “1312P ambient conditions: adjust bid to match output”.

Over two rebids at 8.39 am and 8.45 am, first effective for the 9 am trading interval, Callide Power Trading rebid 393 MW of capacity at Callide unit 3 and unit 4 from prices above $30/MWh to close to the price floor. The reasons given were “0838A intraconnector constraint – units constrained down” and “0845F 855-871 manage constraint – SL”.

Over five rebids between 9.05 am and 10.57 am[9] (effective for various intervals in the morning), Origin Energy reduced the total available capacity at Darlings Downs and Mount Stuart Power Stations by up to 405 MW, the majority of which was priced above $450/MWh. The reasons given included “0900P Change in avail – a ambient temp SL”, “0945A avoid uneconomic dispatch SL”. In addition to these rebids, Origin Energy rebid up to 330 MW of capacity from prices above $280/MWh to below -$940/MWh. The reasons given related to “A constraint management – Q>>NIL_855_871 sl” and “1140A start received – ensure dispatch avoid short run sl”.

From 9.36 am, rebids by AGL Energy reduced the available capacity (166 MW priced at $306/MWh) at Yabulu Power Station to zero. The reason given was “09:35A unfcast network constraint::constr on out of merit order”.

At 9.38 am, first effective from 9.45 am, CS Energy rebid 260 MW of capacity at Gladstone Power Station from prices below $8500/MWh (around half of which was priced below $300/MWh) to the price cap. The reasons given were “0937A intraconnector constraint – unit constrained up - SL”.

One of either the Q>>NIL_855_871 or the Q>>NIL_871_855 network constraints bound for the majority of the volatile pricing period. These constraints forced flows into New South

[9] The 9.05 am rebid first effective from the 9.15 am and the 9.47 am rebid first effective from the 10 am trading interval.

Wales during these volatile prices at up to 1000 MW. Around $347 000 of negative settlement residues accrued across QNI.

An increase in the dynamic rating of the 871 (Calvale to Wurdong) line at 2.35 pm saw the Queensland 5-minute price fall to around $45/MWh at 2.45 pm.

There was no other significant rebidding.

Detailed NEM Price and Demand Trends

for Weekly Market Analysis
19 August - 25 August 2012

AUSTRALIAN ENERGY REGULATOR

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

Financial year	QLD	NSW	VIC	SA	TAS
2012-13 ($/MWh) YTD	61	64	68	76	56
2011-12 ($/MWh) YTD	28	31	31	36	32
Change*	116%	105%	120%	114%	74%
2011-12 ($/MWh)	30	31	28	32	33

Table 2: NEM turnover

Financial year	NEM Turnover** ($, billion)	Energy (TWh)
2012-13 (YTD)	$2.037	31
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)
Apr-12	30	34	33	30	36	0.457
May-12	26	29	27	30	33	0.434
June-12	35	37	38	31	35	0.619
July-12	65	68	76	83	60	1.228
August-12 (MTD)	56	59	58	67	50	0.809
Q3 2012 (QTD)	61	64	68	76	56	2.037
Q3 2011 (QTD)	28	31	31	36	32	0.993
Change*	116%	105%	120%	114%	74%	105.16%

Table 4: ASX energy futures contract prices at end of 27 August 2012

	QLD		NSW		VIC		SA	
Q1 2013	Base	Peak	Base	Peak	Base	Peak	Base	Peak
Price on 20 Aug ($/MWh)	66	89	67	87	64	86	69	108
Price on 27 Aug ($/MWh)	66	88	65	84	63	84	68	106
Open interest on 27 Aug	908	163	1372	415	1215	78	134	0
Traded in the last week (MW)	141	20	133	5	101	0	0	0
Traded since 1 Jan 12 (MW)	2712	272	4161	408	2443	134	171	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
June 12 with June 11						
MW Priced <$20/MWh	-685	-2047	-480	66	13	-3133
MW Priced $20 to $50/MWh	238	1100	269	40	168	1814
July 12 with July 11						
MW Priced <$20/MWh	-3838	-1796	-1613	-170	-211	-7628
MW Priced $20 to $50/MWh	2,427	-1157	516	-497	110	1399
August 12 with August 11 (MTD)						
MW Priced <$20/MWh	-3206	-1200	-1279	-106	-169	-5960
MW Priced $20 to $50/MWh	2,730	-1057	729	-446	144	2101

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