WEEKLY ELECTRICITY MARKET ANALYSIS

AUSTRALIAN ENERGY REGULATOR

6 November - 12 November 2011

Summary

Weekly average spot prices ranged from $30/MWh in Victoria to $58/MWh in New South Wales.

The spot price exceeded $5000/MWh for one trading interval in New South Wales on 9 November. In accordance with clause 3.13.7(d) of the National Electricity Rules, the AER is required to publish reports 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 6 November to 12 November 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 6 Nov - 12 Nov 2011	42	58	30	37	41
% change from previous week*	54	104	29	30	11
11/12 financial YTD	29	31	28	38	31
% change from 10/11 financial YTD **	39	13	16	39	-10

*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 14 November 2011. 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.

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[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 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 2012	44*	-1%	50*	-2%	44*	-1%	56	2%
Calendar Year 2013	54	1%	60	2%	55	2%	58	0%
Calendar Year 2014	56	0%	59	0%	58	0%	69	0%
Three year average	51	0%	56	0%	53	0%	61	1%

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

* denotes trades in the product.

Figure 3 shows the $300 cap contract price for Q1 2012 and calendar year 2012 and the percentage change[4] from the previous week.

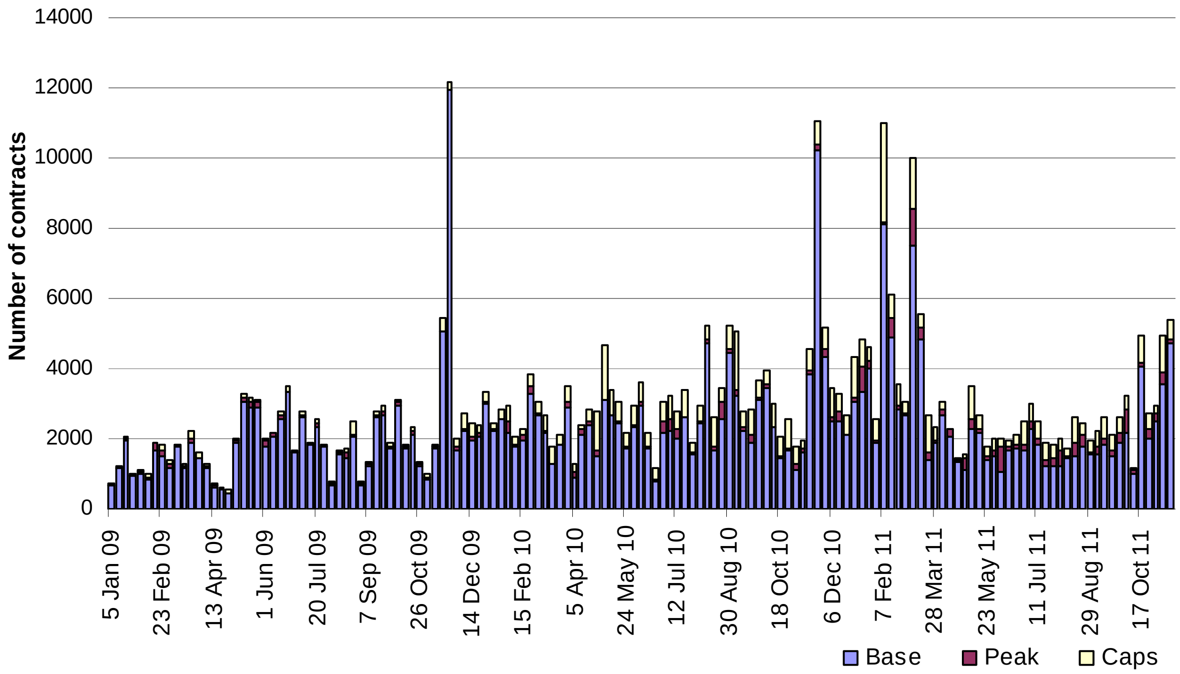
Figure 3: $300 cap contract prices ($/MWh)

	QLD		NSW		VIC		SA	
Q1 2012 (% change)	14*	-2%	19*	-8%	19*	-6%	38	0%
2012 (% change)	7	-3%	10	-4%	7	-4%	13	0%

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

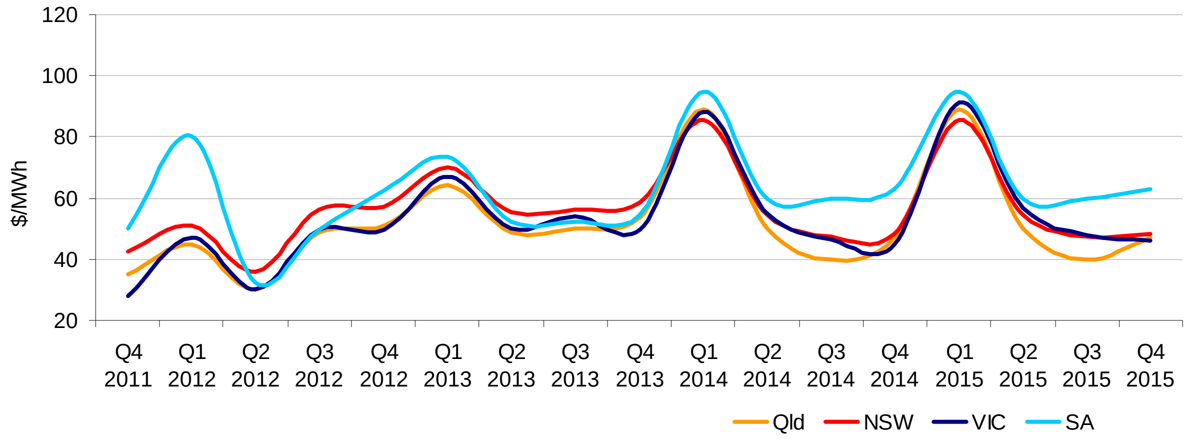


Source: d-cyphaTrade www.d-cyphatrade.com.au

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

[4] Calculated on prices prior to rounding.

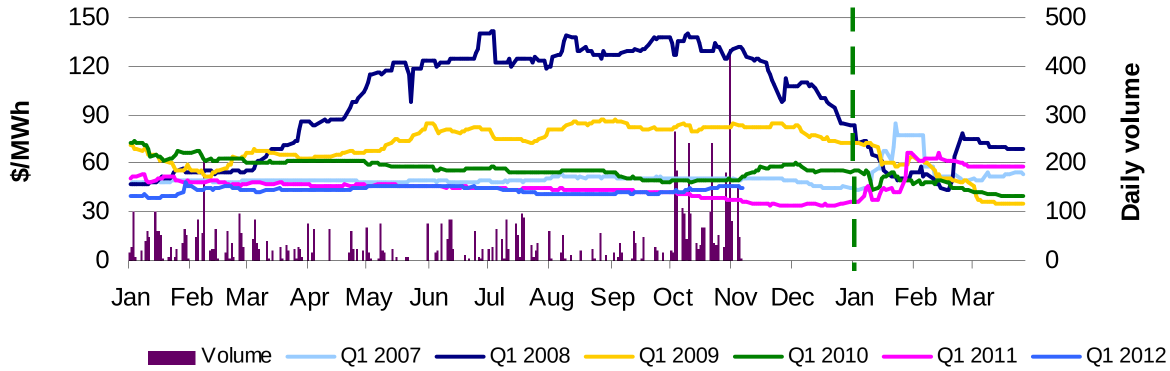
Figure 5: Quarterly base future prices Q4 2011 – Q4 2015



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

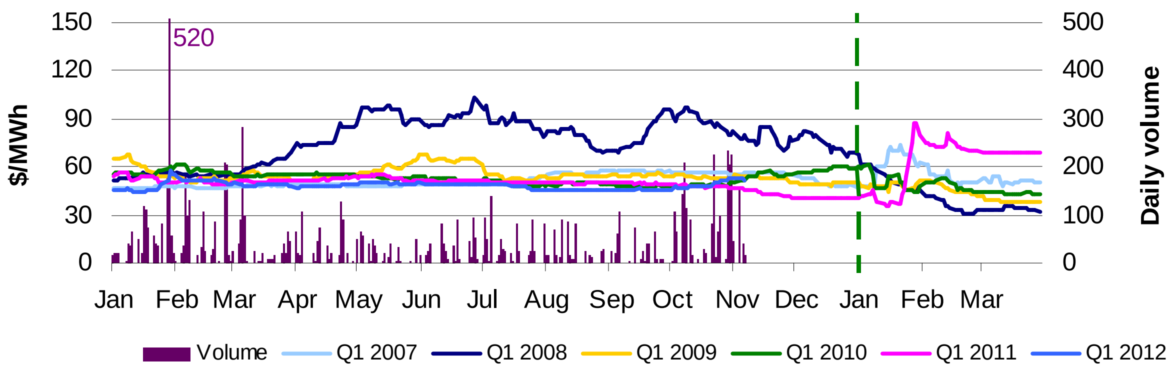
Figures 6-9 compare for each region the closing daily base contract prices for the first quarter of 2007, 2008, 2009, 2010, 2011 and 2012. Also shown is the daily volume of Q1 2012 base contracts traded. The vertical dashed line signifies the start of the Q1 period for which the contracts are being purchased. To understand the diagrams, the dark-blue line in figure 6 demonstrates that throughout the middle of 2007, the market had an expectation of very high spot prices in the first quarter of 2008.

Figure 6: Queensland Q1 2007, 2008, 2009, 2010, 2011 and 2012



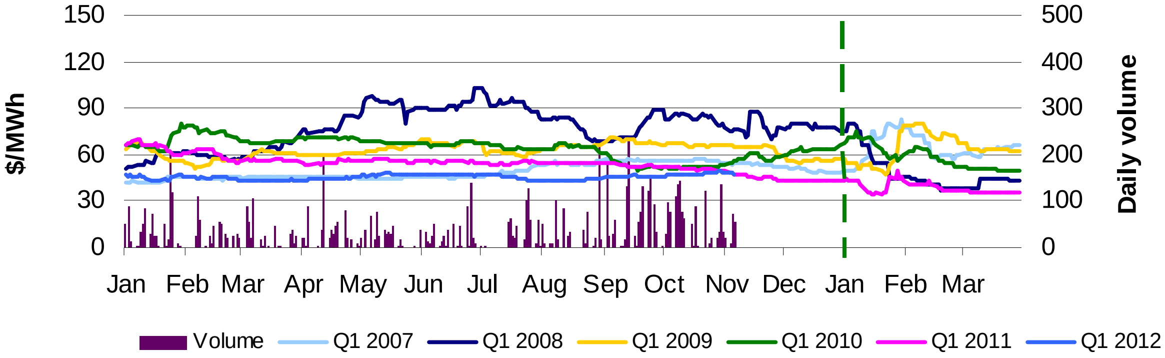
Source: d-cyphaTrade www.d-cyphatrade.com.au

Figure 7: New South Wales Q1 2007, 2008, 2009, 2010, 2011 and 2012



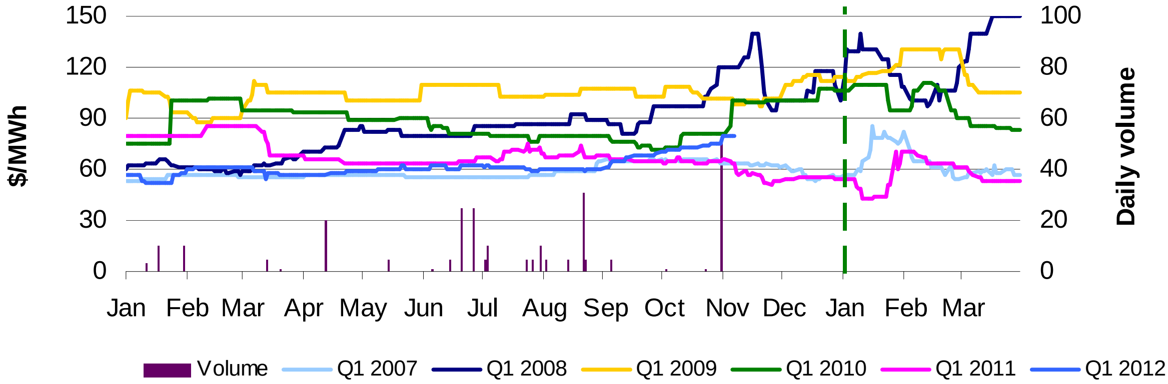
Source: d-cyphaTrade www.d-cyphatrade.com.au

Figure 8: Victoria Q1 2007, 2008, 2009, 2010, 2011 and 2012



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

Figure 9: South Australia Q1 2007, 2008, 2009, 2010, 2011 and 2012



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 120 trading intervals throughout the week where actual prices varied significantly from forecasts[5]. 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 10[6].

Figure 10: Reasons for variations between forecast and actual prices

	Availability	Demand	Network	Combination
% of total above forecast	2	6	1	2
% of total below forecast	79	9	1	0

[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 18 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.

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	18	235	171	292
NSW	498	180	57	1023
VIC	-695	120	-314	382
SA	101	147	219	60
TAS	-325	483	-97	-41
TOTAL	-403	1,165	36	1716

Ancillary services market

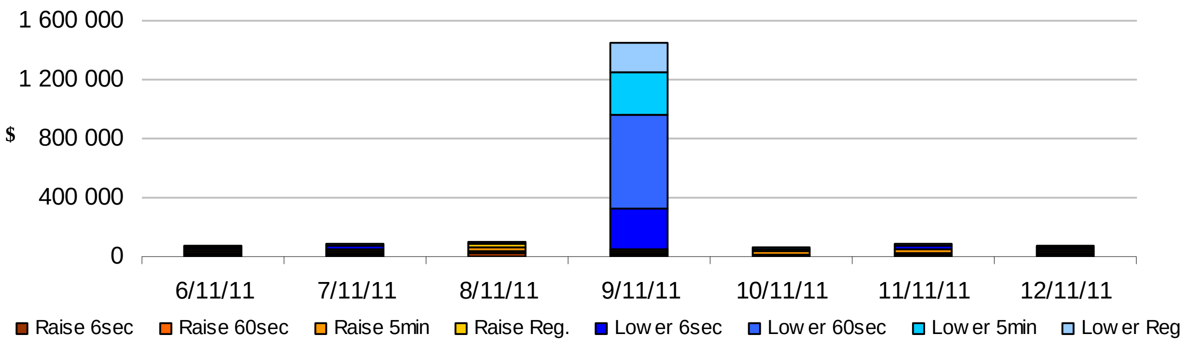
The total cost of frequency control ancillary services (FCAS) on the mainland for the week was $1 782 000 or just over one per cent of energy turnover on the mainland.

The total cost of FCAS in Tasmania for the week was $148 000 or two per cent of energy turnover in Tasmania.

The high cost of FCAS on the mainland was driven by high FCAS costs in South Australia on 9 November. The total cost of all lower services in South Australia on the day was around $1.4 million. The events that led to the high prices are explained 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



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

Detailed Market Analysis

AUSTRALIAN ENERGY REGULATOR

6 – 12 November 2011

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 $37/MWh and above $250/MWh.

Wednesday, 9 November

12:30 PM	Actual	4 hr forecast	12 hr forecast
Price ($/MWh)	1589.33	25.77	26.19
Demand (MW)	1730	1467	1553
Available capacity (MW)	2977	2941	2923

Conditions at the time saw demand 263 MW above that forecast four hours ahead, while available capacity was close to forecast.

Origin Energy's Mortlake Power Station, located on the Heywood to Moorabool line is currently undergoing commissioning. The station was scheduled to be generating from 8 am to 12.30 pm, with both units (11 and 12) inflexible at around 270 MW from the start of the 9 am trading interval.

An outage of the Heywood to Moorabool 500 kV line was planned to commence from 12.05 pm. AEMO invoked ramping constraints (designed to reduce the impact of line outages on the network) from 11.25 am in preparation for the outage. These ramping constraints were designed to manage voltage conditions at the APD 500 kV bus.

In a rebid at 10.25 am, effective from 12.05 pm, Origin Energy shifted all available capacity at both Mortlake units (around 520 MW) into prices close to the price floor. The reason given was "1006A Constraint management – V-HYML SL". As a result, the units were no longer inflexible from 12.05 pm.

In the meantime, however, the (fixed) output from Mortlake resulted in the ramping constraints violating at 11.30 am. This resulted in exports being forced from South Australia to Victoria on both the Heywood and Murraylink interconnectors by 11.40 am. The combined export limit reached around 1350 MW at 11.45 am.

The planned outage of the Heywood to Moorabool 500 kV line commenced at 12.05 pm. The rebid by Origin Energy became effective at the same time, and the units received dispatch targets to reduce their output. However, a step change in combined exports from South Australia to Victoria of around 250 MW - required for the network outage - could not be met because a number of South Australian generators were unable to increase their output quickly enough due to ramp rate limitations. This saw the outage constraints immediately violate, causing the five-minute price to be set at the price cap at 12.05 pm.

The increase in exports to Victoria meant that there was an increase in the requirement for local lower FCAS in South Australia. However, as there was insufficient lower FCAS in South Australia a number of FCAS constraints violated and the price for lower 60 and lower 6 services reached the price cap from 12.05 pm to 12.15 pm, inclusive. The price of lower five minute and lower regulation services reached $11 000/MWh at 12.05 pm before increasing to the price cap for the 12.10 pm and 12.15 pm dispatch intervals. The price of lower 60 services also reached $11 000/MW at 12.25 pm. As a result, the total cost of all local lower services in South Australia on the day, which are paid for by South Australian customers, was close to $1.4 million.

Over a number of rebids from around 12.10 pm, generators in South Australia shifted a total of around 930 MW of available capacity at or close to the price floor. The increase in low priced capacity combined with the reduction in output at Mortlake saw the five-minute price fall to $40/MWh at 12.10 pm and -$87/MWh at 12.15 pm. The price continued to fall and reached the price floor for the 12.25 pm and 12.30 pm dispatch intervals.

There was no other significant rebidding.

<u>Victoria:</u>

There was one occasion where the spot price in Victoria was less than -$100/MWh.

Wednesday, 9 November

12:30 PM	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	-102.71	29.74	30.66
Demand (MW)	6581	6621	6654
Available capacity (MW)	9505	10047	9840

Conditions at the time saw demand close to forecast, while available capacity was 542 MW below that forecast four hours ahead.

The outcomes in Victoria were driven by the events described in the South Australia section (above). When the outage constraint violated at 12.05 pm, flows were forced from South Australia to Victoria causing the five-minute price in Victoria to fall to the price floor. Prices returned to previous levels as output at Mortlake reduced.

There was no other significant rebidding.

New South Wales:

There was one occasion where the spot price in New South Wales was greater than three times the New South Wales weekly average price of $58/MWh and above $250/MWh.

Wednesday, 9 November

3:30 PM	Actual	4 hr forecast	12 hr forecast
Price ($/MWh)	6497.76	36.05	37.08
Demand (MW)	11 519	11 012	11 077
Available capacity (MW)	12 320	12 822	12 744

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.

Queensland:

There was one occasion where the spot price in Queensland was greater than three times the Queensland weekly average price of $42/MWh and above $250/MWh.

Wednesday, 9 November

3:30 PM	Actual	4 hr forecast	12 hr forecast
Price ($/MWh)	3607.81	34.23	35.20
Demand (MW)	6857	6979	7001
Available capacity (MW)	9531	9845	9919

Conditions at the time saw demand around 120 MW and available capacity around 300 MW less than that forecast four hours ahead.

Events in New South Wales contributed to the high price in Queensland. Higher than forecast demand in New South Wales saw an increased requirement for exports from Queensland. With flows limited across the Victoria to New South Wales interconnector, the high prices were confined to Queensland and New South Wales.

Over 3 rebids from 2.44 pm CS Energy reduced the available capacity at Wivenhoe units one and two by 114 MW, all of which was priced below $65/MWh. The reasons given were “1443P Wivenhoe unit availability fuel limit SL”, “1448P W/HOE#1 unit availability fuel limit SL” and “1452P WIVENHOE unit availability fuel limit SL”.

At 2.46 pm, effective from 2.55 pm, RTA Yarwun reduced the available capacity at its Yarwun Power Station, a non scheduled unit, from 165 MW to 6 MW. All of this capacity was priced close to the price floor. The reason given was “Alumina refinery constraints”. Over 5 rebids between 2.57 pm and 3.34 pm, RTA Yarwun reversed its earlier rebid and increased the available capacity at its Yarwun Power Station by 159 MW), all priced close to the price floor. The reason given for all 5 rebids was “Alumina refinery constraints”.

At 3.01 pm, effective from 3.10 pm, CS Energy rebid 510 MW of capacity at Wivenhoe units one and two from prices below $70/MWh to prices around $10 800/MWh, setting the five-minute price at $10 900/MWh at 3.10 pm. The reason given was “1459A Wivenhoe interconnector constraint SL”.

Over two rebids at 3.12 pm and 3.14 pm, effective from 3.20 pm and 3.25 pm respectively, AGL Hydro rebid 171 MW of capacity from prices below $275/MWh to above $11 355/MWh at Oakey Power Station unit 2 and then reduced the unit’s availability to zero for the remainder of the 3.30 pm trading interval. The reasons given were “13.02A Chg in forecast::Price increase QLD $10,623 5MPD” and “16:03P reduction in avail cap :reset T times”.

Over two rebids from 3.15 pm, CS Energy shifted 200 MW of capacity at Wivenhoe Power Station unit one from prices above $10 000/MWh to zero. The reasons given were “1514E W/HOE#1 correct error in previous bid SL” and “1516E Wivenhoe correct error in previous bid SL”. This had the effect of repricing capacity from $55/MWh to $10 801/MWh then to zero.

There was no other significant rebidding.

<u>Tasmania:</u>

There were ten occasions where the spot price in Tasmania was greater than three times the Tasmania weekly average price of $41/MWh and above $250/MWh.

Friday, 11 November

5 AM	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	297.34	299.31	500.10
Demand (MW)	1024	1049	1076
Available capacity (MW)	2188	2228	2228
5:30 AM	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	297.34	297.34	300.30
Demand (MW)	1070	1105	1130
Available capacity (MW)	2168	2228	2228
6 AM	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	297.23	297.16	297.34
Demand (MW)	1154	1172	1195
Available capacity (MW)	2158	2228	2228

6:30 AM	Actual	4 hr forecast	12 hr forecast
Price ($/MWh)	297.17	297.16	297.34
Demand (MW)	1236	1268	1264
Available capacity (MW)	2191	2228	2228
7 AM	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	297.16	297.30	297.30
Demand (MW)	1256	1332	1326
Available capacity (MW)	2228	2228	2228
7:30 AM	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	297.22	297.30	297.30
Demand (MW)	1299	1332	1327
Available capacity (MW)	2136	2136	2136
8 AM	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	297.31	297.34	297.34
Demand (MW)	1290	1305	1303
Available capacity (MW)	2066	2026	2066

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

The majority (around 1300 MW) of generation capacity in Tasmania was offered day ahead by Hydro Tasmania at prices between $200/MWh and $500/MWh.

There was no significant rebidding.

Saturday, 12 November

8:30 AM	Actual	4 hr forecast	12 hr forecast
Price ($/MWh)	500.21	500.30	500.34
Demand (MW)	1153	1175	1178
Available capacity (MW)	2136	2136	2136
9 AM	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	500.23	500.30	502.21
Demand (MW)	1155	1177	1183
Available capacity (MW)	2136	2136	2136
1 PM	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	379.70	550.34	550.34
Demand (MW)	1061	1049	1083
Available capacity (MW)	2204	2160	2160

Conditions at the time saw demand and available capacity close to forecast, with the high prices forecast the day ahead and prices at or close to forecast.

The majority (around 1400MW) of the generation capacity in Tasmania was offered day ahead by Hydro Tasmania at prices between $500/MWh and $1000/MWh.

At 12.48 pm, effective from 12.55 pm, a rebid by Aurora Energy increased the available capacity at its Tamar Valley Combined Cycle Power Station by 89 MW, 87 MW of which was priced close to the price floor. The reason given was “13:47 P unit start up profile - sl”.

There was no other significant rebidding.

Detailed NEM Price and Demand Trends

for Weekly Market Analysis
6 November - 12 November 2011

AUSTRALIAN ENERGY REGULATOR

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

Financial year	QLD	NSW	VIC	SA	TAS
2011-12 ($/MWh) YTD	29	31	28	38	31
2010-11 ($/MWh) YTD	21	28	24	27	35
Change*	39%	13%	16%	39%	-10%
2010-11 ($/MWh)	34	43	29	42	31

Table 2: NEM turnover

Financial year	NEM Turnover** ($, billion)	Energy (TWh)
2011-12 (YTD)	$2.264	74
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)
Jul-11	27	32	31	36	34	0.508
Aug-11	29	31	31	36	29	0.483
Sep-11	29	29	28	40	27	0.427
Oct-11	28	29	24	43	33	0.421
Nov-11 (MTD)	36	46	28	34	35	0.219
Q1 2011	65	90	41	83	27	3.484
Q1 2010	46	52	67	134	27	3.014
Change*	41%	74%	-38%	-38%	2%	15.57%

Table 4: ASX energy futures contract prices at end of 14 November

	QLD		NSW		VIC		SA	
Q1 2012	Base	Peak	Base	Peak	Base	Peak	Base	Peak
Price on 07 Nov ($/MW)	46	70	53	85	49	83	75	130
Price on 14 Nov ($/MW)	45	70	51	84	47	78	80	130
Open interest on 14 Nov	1857	175	2051	521	2244	390	221	5
Traded in the last week (MW)	723	0	485	58	193	5	50	0
Traded since 1 Jan 11 (MW)	7743	211	9632	1155	7634	727	272	5
Settled price for Q1 11($/MW)	57	96	68	118	35	51	53	93

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

Comparison:	QLD	NSW	VIC	SA	TAS	NEM
September 11 with September 10						
MW Priced <$20/MWh	-856	-1281	-424	-614	-345	-3520
MW Priced $20 to $50/MWh	-376	1085	148	175	161	1191
October 11 with October 10						
MW Priced <$20/MWh	-782	-1751	-648	-182	-724	-4086
MW Priced $20 to $50/MWh	-294	1258	449	126	465	2003
November 11 with November 10 (MTD)						
MW Priced <$20/MWh	-846	-2369	-1524	-150	-342	-5231
MW Priced $20 to $50/MWh	81	1510	1,092	205	276	3163

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