# **Market analysis**

#### 28 October – 3 November 2007

#### Summary

Spot prices for the week averaged around \$33/MWh in all regions except Queensland where the price average \$61/MWh.

AUSTRALIAN ENERGY

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Turnover in the energy market in the week ended 3 November was \$159 million. The total cost of ancillary services for the week was \$2.3 million or 1.5 per cent of energy market turnover.

Significant variations between actual prices and those forecast 4 and 12 hours ahead occurred in 127, or 38 per cent, of all trading intervals. Demand forecasts produced 4 and 12 hours ahead varied from actual by more than 5 per cent in 17 per cent of all trading intervals across the market. These variations were most frequent in Tasmania, occurring in over a third of trading intervals.

#### **Energy prices**

Figure 1 sets out the national demand and spot prices in each region for each trading interval. Figure 2 compares the volume weighted average price with the averages for the previous week, the same quarter last year and for the previous financial year.

#### Figure 1: national demand and spot prices



Figure 2: volume weighted average spot price for energy market (\$/MWh)

	QLD	NSW	VIC	SA	TAS
Last week	61	34	33	34	33
Previous week	64	72	50	50	44
Same quarter last year	23	27	29	40	37
Financial year to date	59	55	54	55	58
% change from previous week*	▼5%	▼53%	▼33%	▼32%	▼25%
% change from same quarter last year**	▲162%	▲25%	▲14%	<b>▼</b> 15%	<b>▼</b> 10%
% change from year to date***	<b>▲</b> 140%	▲55%	▲49%	▲39%	▲44%

\*The percentage change between last week's average spot price and the average price for the previous week.

\*\*The percentage change between last week's average spot price and the average price for the same quarter last year.

\*\*\*The percentage change between the average spot price for the current financial year to date and the average spot price over the similar period for the previous financial year.



Figure 4: New South Wales

Figure 3: Queensland





Maximum spot prices for the week were around \$61/MWh in all regions except Queensland where the maximum price was \$3374/MWh. Figure 8 compares the weekly price volatility index with the averages for the previous week and the same quarter last year.

## Figure 8: volatility index during peak periods

	QLD	NSW	VIC	SA	TAS
Last week	1.37	0.37	0.33	0.32	0.39
Previous week	0.88	0.61	0.53	0.55	0.48
Same quarter last year	0.79	0.78	0.78	0.75	0.70

The definition of the price volatility index is available on the AER website.

http://www.aer.gov.au/content/index.phtml/tag/MarketSnapshotLongTermAnalysis

Figure 9 sets out the d-cyphaTrade wholesale electricity price index (WEPI)\* for each region throughout the week excluding Tasmania. Figure 10 sets out the WEPI since 1 January 2006.

Figure 9: d-cyphaTrade WEPI for the week

	Monday	Tuesday	Wednesday	Thursday	Friday
Queensland	95.66	94.26	95.93	96.23	96.41
New South Wales	70.40	68.90	69.46	70.20	69.59
Victoria	65.20	65.48	65.71	66.15	64.87
South Australia	73.94	75.95	76.47	76.66	76.49

\* The definition of the wholesale electricity price index is available on the d-cyphaTrade website http://www.d-cyphatrade.com.au/products/wholesale\_electricity\_price\_i The WEPI applies for working days only

The WEPI applies for working days only.



#### Figure 10: d-cyphaTrade WEPI

# Reserves

No low reserve conditions were forecast.

On Monday, 29 October, NEMMCO issued a direction to a Queensland participant to maintain power system security. The direction was issued at 5.50 am and cancelled at 6.35 am.

# Imports at time of maximum demand

Figures 11 to 15 show spot price, net imports and limits at the time of weekly maximum demand.





Figure 13: Victoria



Figure 15: Tasmania



Figure 12: New South Wales



Figure 14: South Australia





#### **Price variations**

There were 127 trading intervals where actual prices significantly varied from forecasts made 4 and 12 hours ahead of dispatch. Figures 16 to 20 show the difference in actual and forecast price against the difference in actual and forecast demand. The figures highlight the relationship between price variation and demand forecast error. The information is presented in terms of the percentage difference from actual. Price differences beyond 100 per cent have been capped.



Figure 17: New South Wales











Figure 19: South Australia





Figure 21 summarises the number and most probable reason for variations between forecast and actual prices.

Figure 21: reasons for variations between forecast and actual prices



#### Price and demand

Figures 22 - 56 set out details of spot prices and demand on a national and regional basis. They include the actual spot price, actual demand and variation from forecasts made 4 and 12 hours ahead of dispatch.

On a regional basis the differences between the maximum temperature and the temperature forecast at around 6.00 pm the day before are also included.

In each section, all prices for the week greater than three times the average have been presented. This threshold is used to filter the material price outcomes for the week. The actual price, demand and generator availability is compared with the forecasts made 4 and 12 hours ahead, with significant changes to these forecasts explained.

# National Market

Spot prices within the national market are regularly aligned with conditions in one region reflected across all others. Figures 22-26 shows pricing events that occurred when spot prices were generally aligned across all regions of the national electricity market – the New South Wales spot price has been used as a proxy national price under these conditions as New South Wales is located in the centre of the NEM.



Figures 22-26: National market outcomes



There was no occasion where the spot prices aligned nationally and the New South Wales price was greater than three times the New South Wales weekly average price of \$34/MWh.

## Queensland

Figures 27-32 show spot market prices in Queensland over the week along with actual demand and differences between actual and forecast demand and prices.





There were three occasions where the spot price in Queensland was greater than three times the Queensland weekly average price of \$61/MWh.

# Monday, 29 October

4:30 pm	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	3374.43	45.99	47.11
Demand (MW)	7103	7092	6949
Available capacity (MW)	9232	9274	9365

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

At 4.15 pm, the loss of QNI was reclassified as a credible contingency as a result of lightning in the vicinity of the Braemar to Tarong lines.<sup>1</sup> NEMMCO invoked a constraint to manage the coincident loss of both Braemar to Tarong lines effective from the dispatch interval ending 4.20 pm. The constraint caused a step change in limits across QNI from 15 MW north at 4.15 pm to 668 MW south at 4.20 pm. Actual flows across QNI changed from 15 MW north at 4.15 pm to 334 MW south at 4.20 pm. This resulted in a violation of the interconnector limits by 334 MW. The constraint also reduces the dispatch of generation in south west Queensland, although in this instance there was little effect on those generators.

By forcing flow out of Queensland NEMDE dispatched more expensive generation and the five minute dispatch price rose from \$80/MWh to \$10 000/MWh at 4.20 pm and \$9995/MWh at 4.25 pm, before returning to \$70/MWh at 4.30 pm.

At 3.52 pm, prior to the reclassification of the Braemar to Tarong lines, Stanwell Corporation rebid 325 MW of capacity across its Gladstone and Stanwell units from prices below \$32/MWh to above \$9000/MWh. The reason given was "Portfolio rebalancing::change MW distrib". At 4 pm the availability of Stanwell unit four, which came online at 2 pm, was reduced by 130 MW with the reason "Ramp up unit (RTS)::change availability". The Gladstone units set the price at 4.25 pm to \$9995/MWh.

At 4.12 pm, plant issues saw Tarong Energy reduce the availability of Tarong unit one by 90 MW from 4.20 pm. A second rebid first used at 4.25 pm increased the availability by 100 MW. The reason given was "Mill RTS::adjust availability".

There was no other significant rebidding.

<sup>&</sup>lt;sup>1</sup> Earlier in the day, from 11 am to 12.50 pm, the loss of QNI was reclassified as a credible contingency as a result of lightning between Armidale and Dumaresq and between Dumaresq and Bulli Creek. This is on the New South Wales side of the south west Queensland generation. As a result this caused a reduction in export capability from Queensland to New South Wales.

# Tuesday, 30 October

4:00 pm	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	201.82	67.91	58.84
Demand (MW)	7062	7094	7083
Available capacity (MW)	8659	9418	9597
4:30 pm	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	186.95	50.07	48.31
Demand (MW)	7054	6999	7004
Available capacity (MW)	8652	0370	0507

Conditions at the time saw demand close to forecast. Available capacity was 900 MW lower than forecast 12 hours ahead and 750 MW lower than forecast four hours ahead.

At 11.37 pm CS Energy delayed the return to service of Swanbank B unit three, reducing 120 MW of capacity available at prices below \$155/MWh. The reason given was "Swan\_B\_3 delayed RTS". At 2.50 pm the availability of Kogan Creek was reduced by 730 MW to zero. The reason given was "Kogan commissioning". At the time of the rebid the unit was operating at 320 MW, but was forecast to be dispatched at 650 MW by 4 pm and 680 MW by 4.30 pm.

Over two rebids from 3.27 pm Stanwell Corporation rebid around 100 MW of capacity at Gladstone power station from prices below \$100/MWh to above \$9000/MWh. The reason given was "Price materially different to PD::change MW distrib".

There was no other significant rebidding.

## New South Wales

Figures 33-38 show spot market prices in New South Wales over the week along with actual demand and differences between actual and forecast demand and prices.

Figures 33-38 New South Wales actual spot price, demand and forecast differences



There was no occasion where the spot price in New South Wales was greater than three times the New South Wales weekly average price of \$34/MWh.

### Victoria

Figures 39-44 show spot market prices in Victoria over the week along with actual demand and differences between actual and forecast demand and prices.

Figures 39-44: Victoria actual spot price, demand and forecast differences



There was no occasion where the spot price in Victoria was greater than three times the Victoria weekly average price of \$33/MWh.

## South Australia

Figures 45-50 show spot market prices in South Australia over the week along with actual demand and differences between actual and forecast demand and prices.

Figures 45-50: South Australia actual spot price, demand and forecast differences



There was no occasion where the spot price in South Australia was greater than three times the South Australia weekly average price of \$34/MWh.

# Tasmania

Figures 51-56 show spot market prices in Tasmania over the week along with actual demand and differences between actual and forecast demand and prices.

Figures 51-56: Tasmania actual spot price, demand and forecast differences



There was no occasion where the spot price in Tasmania was greater than three times the Tasmania weekly average price of \$33/MWh.

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Figures 57 - 61 set out for each region the extent of capacity offered into the market within a series of price thresholds. Actual price and generation dispatched in a region are overlaid.





Figure 58: New South Wales closing bid prices, dispatched generation and spot price





Figure 59: Victoria closing bid prices, dispatched generation and spot price

Figure 60: South Australia closing bid prices, dispatched generation and spot price







#### Ancillary service market

The total cost of ancillary services on the mainland for the week was \$2 million or 1.3 per cent of turnover in the energy market. On Monday just after midnight the loss of the Armidale to Dumaresq and Dumaresq to Bulli Creek lines were reclassified as credible as a result of lightning in the vicinity. At 5.20 am the loss of the Braemar to Tarong lines were also reclassified as credible. These reclassifications saw a 280 MW change in southerly flows at 5.20 am across QNI and resulted in the need for local lower services in Queensland. However, there was insufficient availability of those services at times during the period until the reclassification of Braemar to Tarong was cancelled at 6.35 am. The price of lower 6 second services reached \$9998/MW while the price of lower five minutes services reached \$4700/MW at a total cost of around \$1 million. Figure 62 summarises the volume weighted average prices and costs for the eight frequency control ancillary services across the mainland.

	Raise	Raise	Raise	Raise	Lower	Lower	Lower	Lower
	6 sec	60 sec	5 min	reg	6 sec	60 sec	5 min	reg
Last week (\$/MW)	4.57	1.01	3.28	2.76	215.68	1.05	20.08	2.00
Previous week (\$/MW)	13.89	2.12	5.37	5.75	0.05	0.05	0.44	2.27
Last quarter (\$/MW)	1.76	0.73	1.15	1.54	0.39	2.28	5.00	1.93
Market Cost (\$1000s)	\$242	\$41	\$213	\$64	\$1,084	\$7	\$345	\$39
% of energy market	0.16%	0.03%	0.14%	0.04%	0.71%	0.01%	0.23%	0.03%

Figure 62:	freauencv	control	ancillarv	service	prices	and	costs f	for th	e mainl	and
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The total cost of ancillary services in Tasmania for the week was \$310 000 or 5 per cent of the turnover in the Tasmanian energy market. Figure 63 summarises for Tasmania the prices and costs for the eight frequency control ancillary services.

	Raise	Raise	Raise	Raise	Lower	Lower	Lower	Lower
	6 sec	60 sec	5 min	reg	6 sec	60 sec	5 min	reg
Last week (\$/MW)	31.95	0.96	5.52	6.43	0.79	1.92	5.76	2.63
Previous week (\$/MW)	18.70	1.69	4.80	7.18	1.20	1.93	5.44	2.90
Last quarter (\$/MW)	4.97	0.49	2.93	3.00	12.67	0.43	0.82	0.45
Market Cost (\$1000s)	\$113	\$16	\$69	\$23	\$2	\$21	\$63	\$3
% of energy market	1.84%	0.26%	1.12%	0.38%	0.03%	0.34%	1.02%	0.04%

Figure 63: frequency control ancillary service prices and costs for Tasmania

Figure 64 shows the daily breakdown of cost for each frequency control ancillary service.

Figure 64: daily frequency control ancillary service cost





Figure 65 shows the contribution, on a percentage basis, that frequency control ancillary service providers are utilised (in each mainland region) to satisfy the total requirement for each service.





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Figures 66 and 67 show 30-minute prices for each frequency control ancillary service throughout the week.





Figure 66A: prices for raise services – Tasmania



Figure 67: prices for lower services



Figure 67A: prices for lower services – Tasmania



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Figures 68 and 69 present for both raise and lower frequency control services the requirement, established by NEMMCO, for each service to satisfy the frequency standard.





Figure 68A: raise requirements – Tasmania







Figure 69A: lower requirements – Tasmania



**Australian Energy Regulator** 

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