

16 JULY – 22 JULY 2006

Spot prices for the week averaged between \$51/MWh in Queensland and \$104/MWh in New South Wales. These prices are around double those of the previous week with prices exceeding \$4000/MWh on Wednesday and \$5000/MWh on Thursday over the evening peak. National peak demand exceeded 31 000 MW on both days, and was within 300 MW of the highest ever. Macquarie Generation, mostly through rebids made close to dispatch, presented a third of its capacity at prices above \$5000/MWh during these peak demand periods.

A separate report detailing the significant contributing factors that resulted in the spot price exceeding \$5000/MWh on Thursday will be published in accordance with clause 3.13.7 of the Rules.

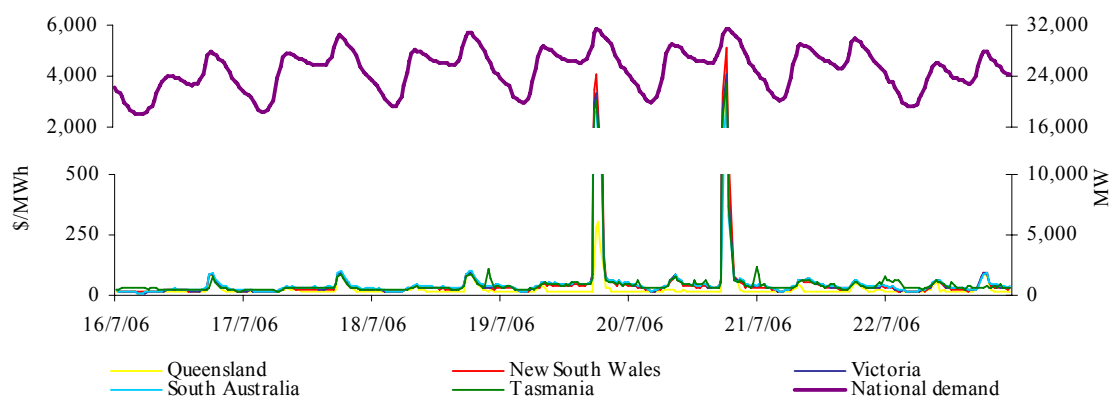
Turnover in the energy market was \$359 million. The total cost of ancillary services for the week was \$1.5 million, or 0.4 per cent of energy market turnover, with the majority of this accruing over two hours on Wednesday and Thursday evening for local services in Tasmania.

Significant variations between actual prices and those forecast 4 and 12 hours ahead occurred in 87, or a quarter of all trading intervals. Demand forecasts produced 4 and 12 hours ahead varied from actual by more than 5 per cent in 12 per cent of all trading intervals across the market. These variations were most frequent in South Australia, occurring in around a quarter of all 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 financial year to date.

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



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

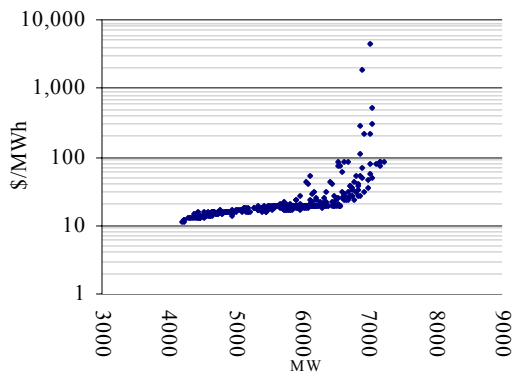
	QLD	NSW	VIC	SA	TAS
Last week	51	104	89	79	86
Previous week	26	43	45	52	42
Same quarter last year	22	29	30	34	100
Financial year 2005 - 06	31	43	36	44	59
% change from previous week*	▲ 95%	▲ 143%	▲ 99%	▲ 53%	▲ 105%
% change from same quarter last year**	▲ 137%	▲ 264%	▲ 199%	▲ 133%	-

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

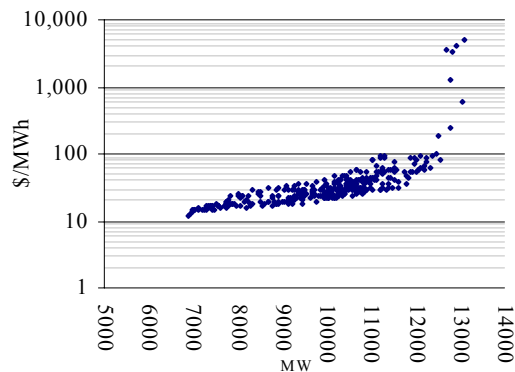
\*\*The percentage change between last week's average spot price and the average price for the same quarter last year.

Figures 3 to 7 show the weekly correlation between spot price and demand.

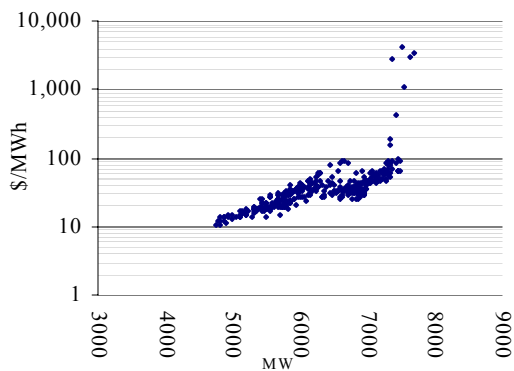
**Figure 3: Queensland**



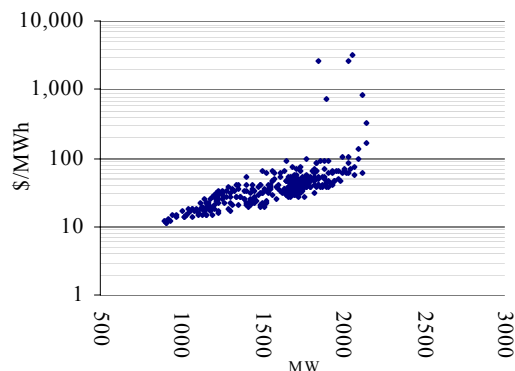
**Figure 4: New South Wales**



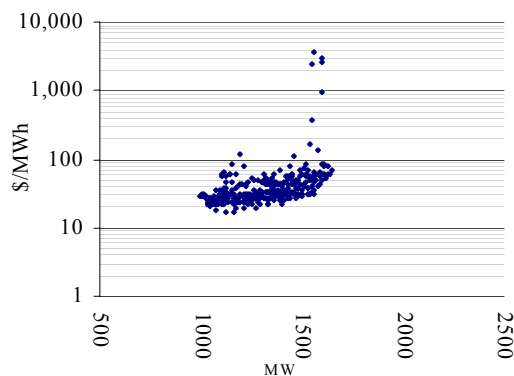
**Figure 5: Victoria**



**Figure 6: South Australia**



**Figure 7: Tasmania**



Maximum spot prices for the week were \$4499/MWh in Queensland, \$5120/MWh in New South Wales, \$4101/MWh in Victoria, \$3208/MWh in South Australia and \$3672/MWh in Tasmania, all occurring on Thursday during the evening peak. 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	1.43	1.12	0.90	0.80	0.81
Previous week	1.43	1.02	0.86	0.97	0.82
Same quarter last year	0.64	0.86	0.86	0.83	0.81

A definition of the price volatility index is available on the AER website.  
<http://www.aer.gov.au/content/index.phtml/tag/MarketSnapshotLongTermAnalysis>

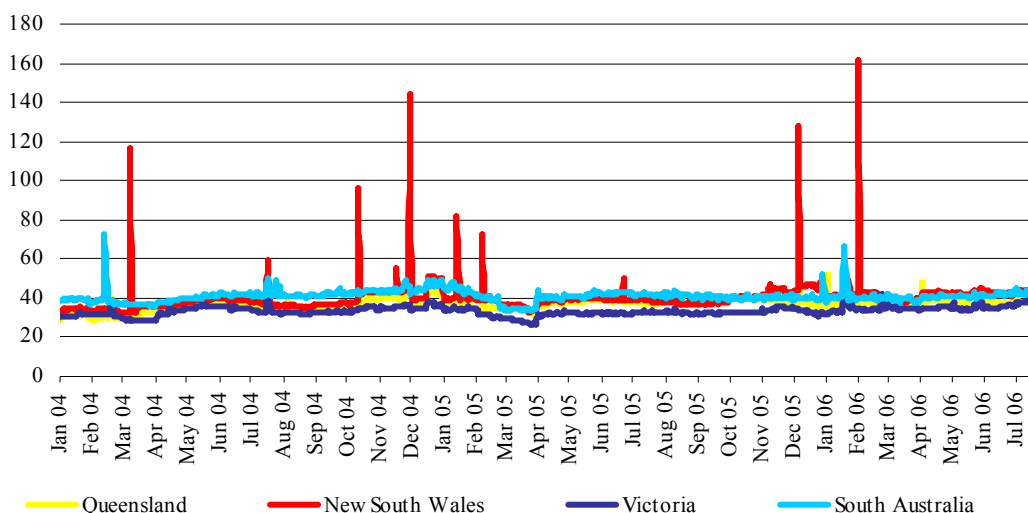
Figure 9 sets out the d-cyphaTrade wholesale electricity price index (WEPI)\* for each region throughout the week excluding Tasmania. Figure 10 sets out the WEPI since 1 January 2004.

**Figure 9: d-cyphaTrade WEPI for the week**

	Monday	Tuesday	Wednesday	Thursday	Friday
Queensland	38.43	38.34	38.55	45.41	38.05
New South Wales	43.91	44.59	62.79	65.30	44.14
Victoria	38.23	38.66	51.40	47.33	38.47
South Australia	41.99	43.29	43.68	43.56	43.47

\* A 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](http://www.d-cyphatrade.com.au/products/wholesale_electricity_price_i)

**Figure 10: d-cyphaTrade WEPI**

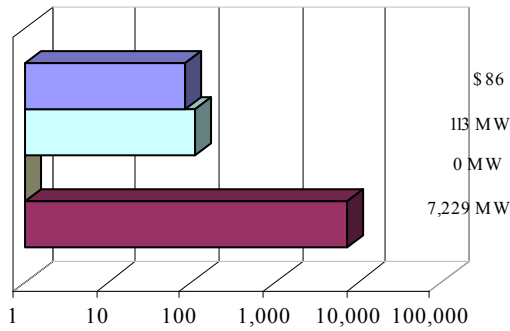


## Reserve

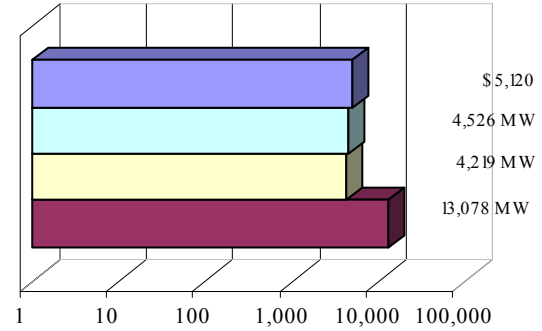
There were no low reserve conditions forecast.

Figures 11 to 15: spot price, net import and limit at time of weekly maximum demand

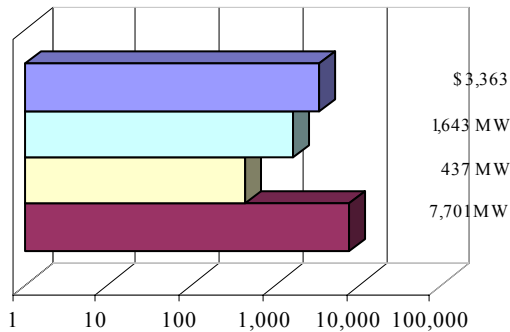
**Figure 11: Queensland**



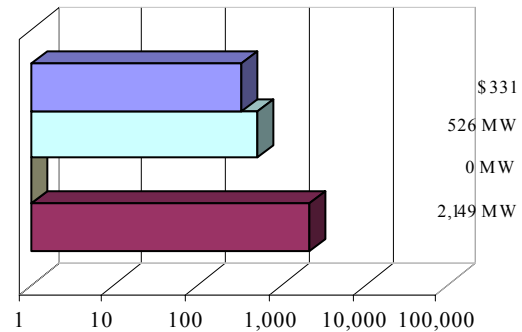
**Figure 12: New South Wales**



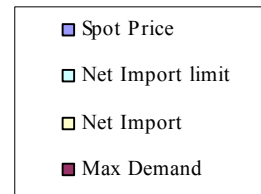
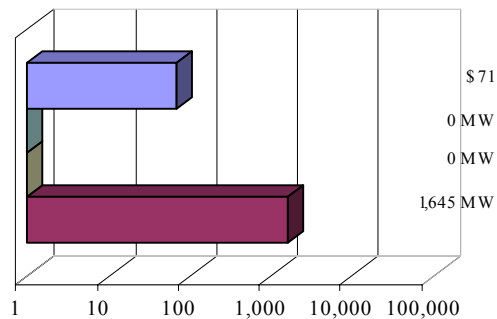
**Figure 13: Victoria**



**Figure 14: South Australia**



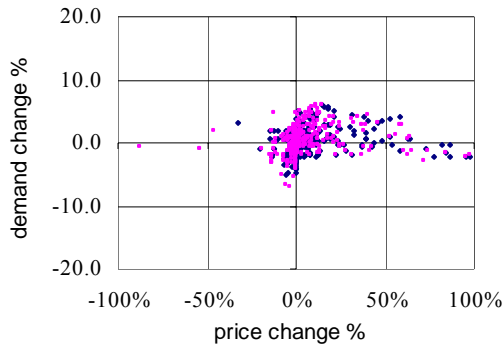
**Figure 15: Tasmania**



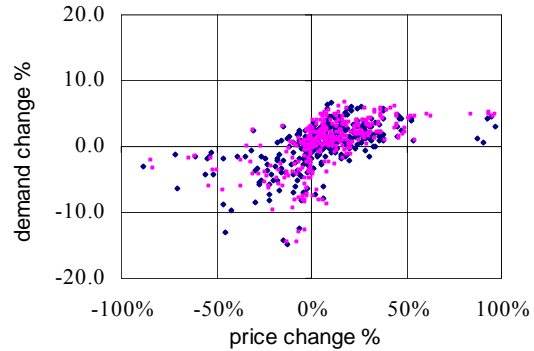
## Price variations

There were 87 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 versus 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.

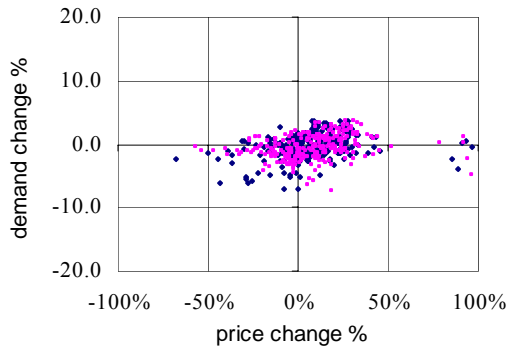
**Figure 16: Queensland**



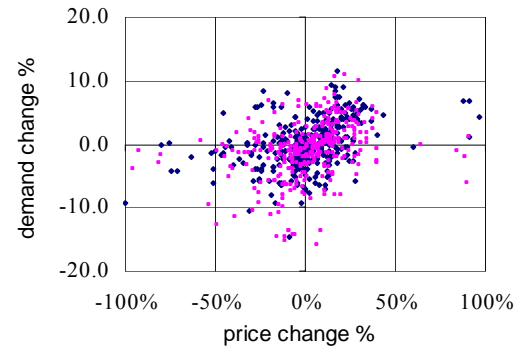
**Figure 17: New South Wales**



**Figure 18: Victoria**



**Figure 19: South Australia**



**Figure 20: Tasmania**

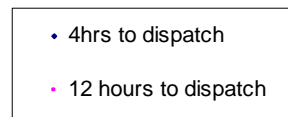
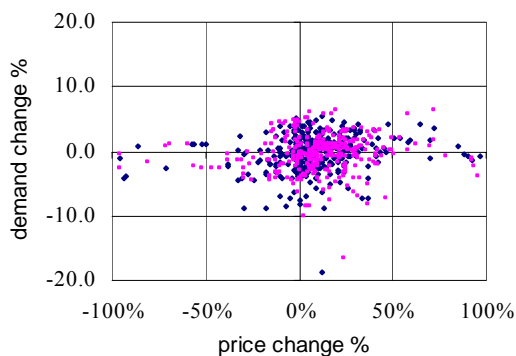
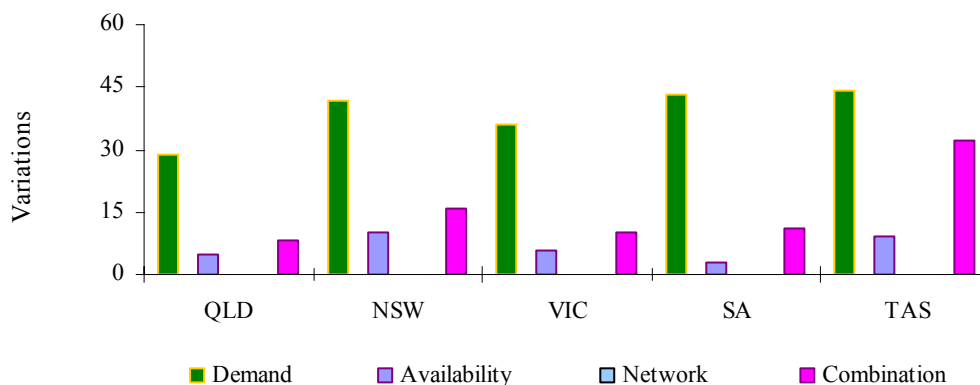


Figure 21 summarises the number and most probable reason for variations between forecast and actual prices.

**Figure 21: reasons for variations between forecast and actual prices**



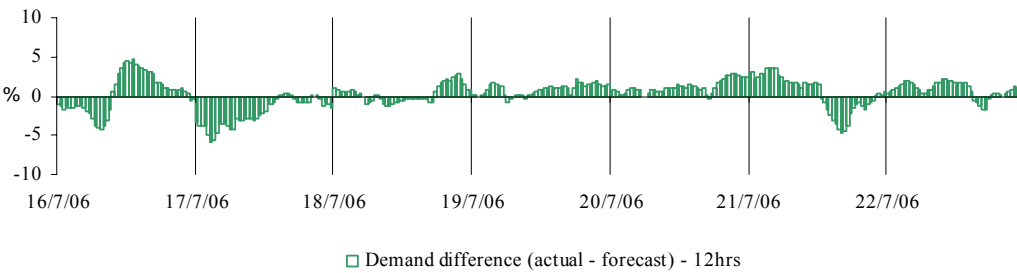
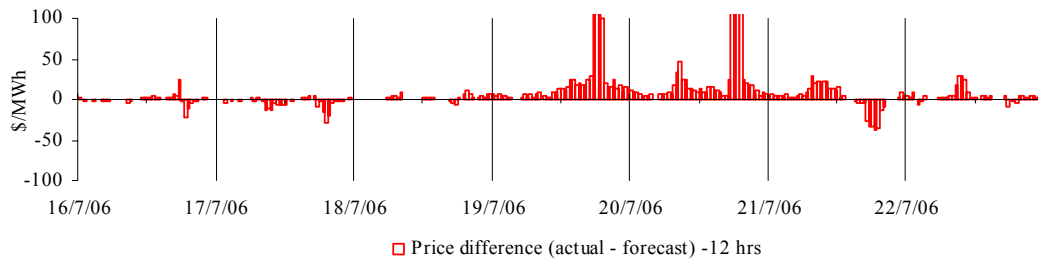
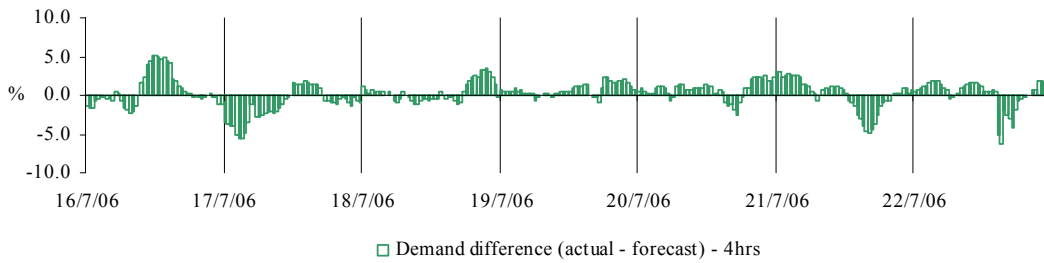
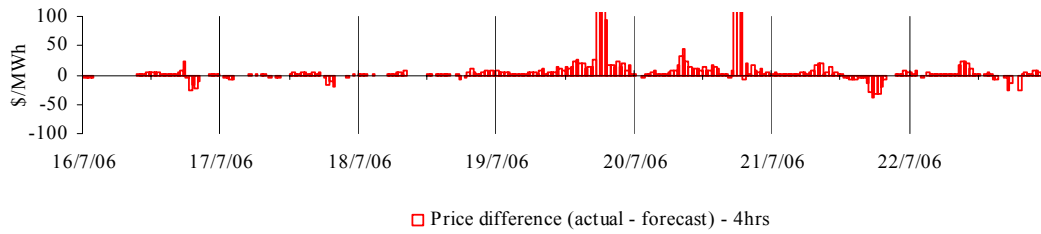
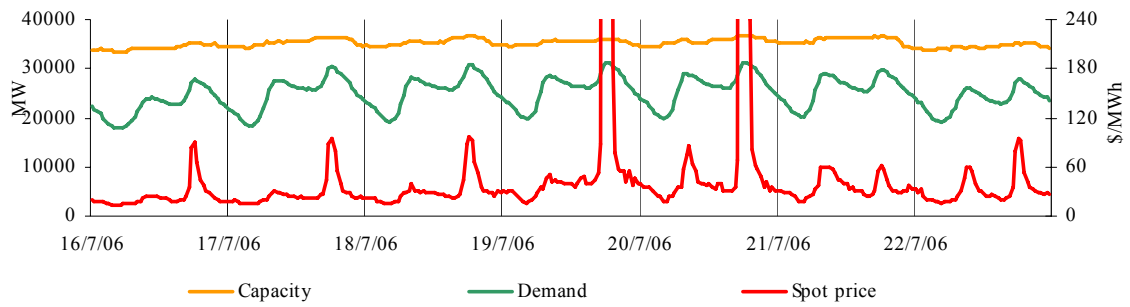
### Price and demand

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.

The regions within the national market are regularly aligned, with conditions in one region reflected across all others. The national market outcomes section highlights 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 to represent a pseudo national price under these conditions.

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, the occurrences of all prices for the week greater than three times the average have been presented. The price forecast is compared to the demand and availability forecasts made 4 and 12 hours ahead, with significant changes to these forecasts explained.

**Figures 22-26: National actual spot price, demand and forecast differences**



There were six occasions where spot prices were generally aligned nationally and the New South Wales price<sup>1</sup> was greater than three times the New South Wales weekly average price of \$104/MWh. Queensland was separated from the rest of the market for some of the time but prices in Queensland followed the rest of the market. These occasions are incorporated into the national analysis.

### Wednesday, 19 July

<b>6:00 pm</b>	<b>Actual</b>	<b>4 hr forecast</b>	<b>12 hr forecast</b>
Price (\$/MWh)	3467.96	96.84	207.77
Demand (MW)	30674	30373	30328
Available capacity (MW)	35959	36137	36663
<b>6:30 pm</b>	<b>Actual</b>	<b>4 hr forecast</b>	<b>12 hr forecast</b>
Price (\$/MWh)	4070.15	227.55	237.06
Demand (MW)	31369	30628	30719
Available capacity (MW)	36029	36097	36700
<b>7:00 pm</b>	<b>Actual</b>	<b>4 hr forecast</b>	<b>12 hr forecast</b>
Price (\$/MWh)	1295.97	96.27	202.00
Demand (MW)	31125	30413	30570
Available capacity (MW)	36117	36122	36691

Conditions at the time saw national demand up to 700 MW higher than forecast four hours ahead.

Delays in the return to service of Macquarie Generation's Liddell unit 1 saw 270 MW of capacity priced below zero unavailable for the evening peak.

Over two rebids from 4 pm Macquarie Generation shifted 1040 MW of available capacity at Bayswater from prices below \$85/MWh to above \$9300/MWh. The rebid reason given was "Load expected to vary from forecast".

At around 4 pm LYMMCO shifted 85 MW at Loy Yang A from prices below \$90/MWh to above \$500/MWh. The rebid reason given was "Demand tracking ahead of forecast".

At around 6 pm Millmerran Energy shifted 140 MW of available capacity across its units from \$5/MWh to above \$9500/MWh. The rebid reason given was "Unconstrained interconnector for revenue maximisation".

There was no other significant rebidding.

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<sup>1</sup> The New South Wales spot price has been used to represent a pseudo national price under these conditions.



## Thursday, 20 July

<b>6:00 pm</b>	<b>Actual</b>	<b>4 hr forecast</b>	<b>12 hr forecast</b>
Price (\$/MWh)	3322.97	326.58	96.05
Demand (MW)	30632	30940	30525
Available capacity (MW)	36600	36872	37179
<b>6:30 pm</b>	<b>Actual</b>	<b>4 hr forecast</b>	<b>12 hr forecast</b>
Price (\$/MWh)	5120.14	659.26	239.89
Demand (MW)	31334	31418	30992
Available capacity (MW)	36711	36725	37211
<b>7:00 pm</b>	<b>Actual</b>	<b>4 hr forecast</b>	<b>12 hr forecast</b>
Price (\$/MWh)	587.32	311.62	231.65
Demand (MW)	31292	31027	30752
Available capacity (MW)	36677	36750	37212

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

At 9.58 am Tarong Energy shifted 180 MW of available capacity at Wivenhoe unit one from prices of below \$85/MWh to \$9921/MWh. The rebid reason given was “change in PRD::Adjust Profile”.

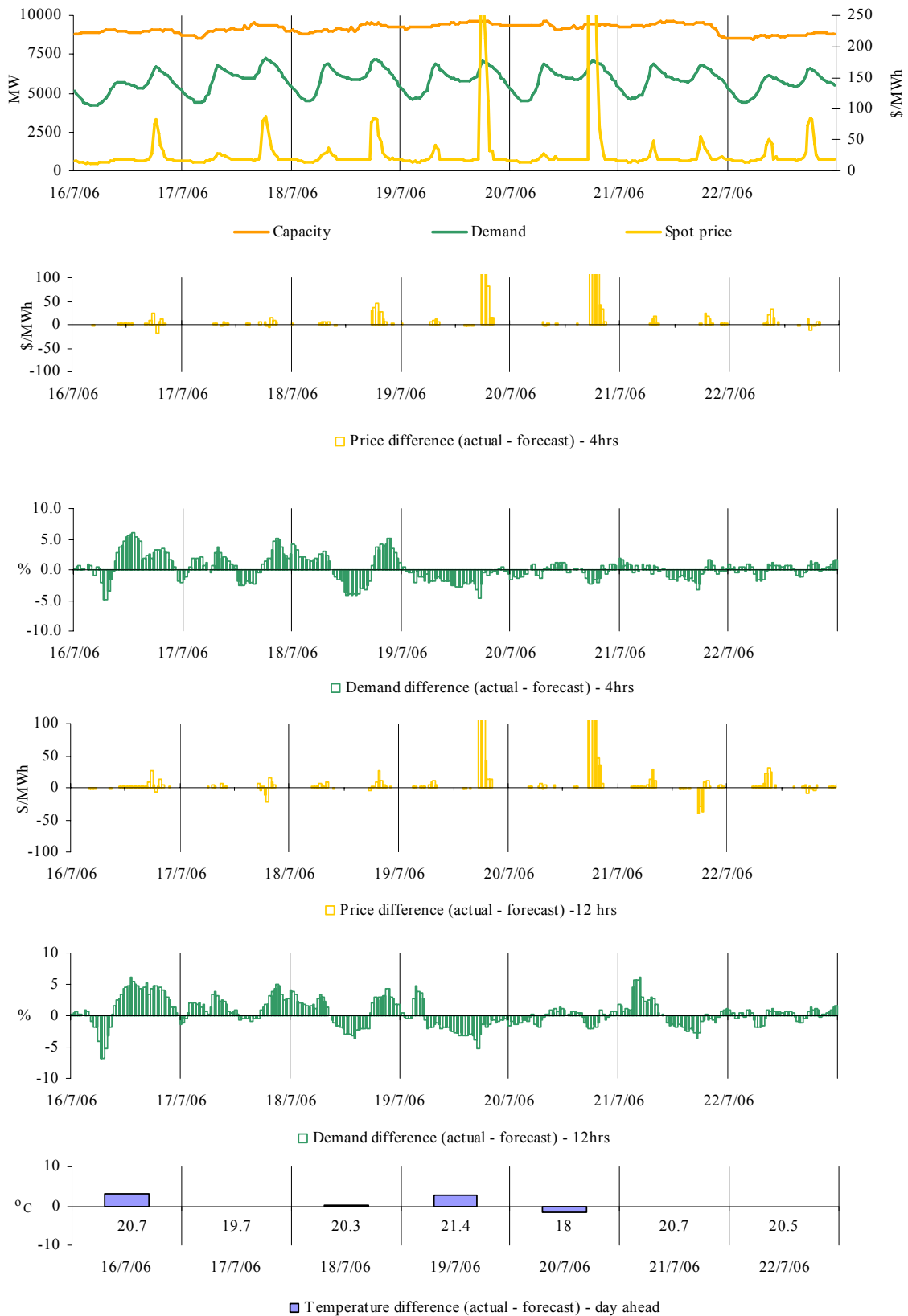
After a couple of failed attempts to return to service late the previous evening the return of Liddell unit was again delayed in returning to service for the evening peak. This saw a reduction of 270 MW in available capacity.

At 4.47 pm Macquarie Generation shifted 800 MW of available capacity at Bayswater from prices below \$85/MWh to above \$8100/MWh. At the same time they shifted 90 MW of available capacity at Liddell units two and four priced below \$200/MWh to above \$4600/MWh. The rebid reason given was “Sensitivities have changed”.

At 4.07 pm the commissioning of Braemar unit three saw 155 MW of available capacity, priced at \$-955/MWh reduced to zero.

There was no other significant rebidding.

**Figures 27-32: Queensland actual spot price, demand and forecast differences**



There were seven occasions where the spot price in Queensland was greater than three times the weekly average price of \$51/MWh. Six of these occurred when prices were aligned nationally in all regions except Queensland and are detailed in the national market section.

### **Thursday, 20 July**

<b>7:30 pm</b>	<b>Actual</b>	<b>4 hr forecast</b>	<b>12 hr forecast</b>
Price (\$/MWh)	210.13	48.00	78.70
Demand (MW)	6927	7078	7059
Available capacity (MW)	9417	9469	9469

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

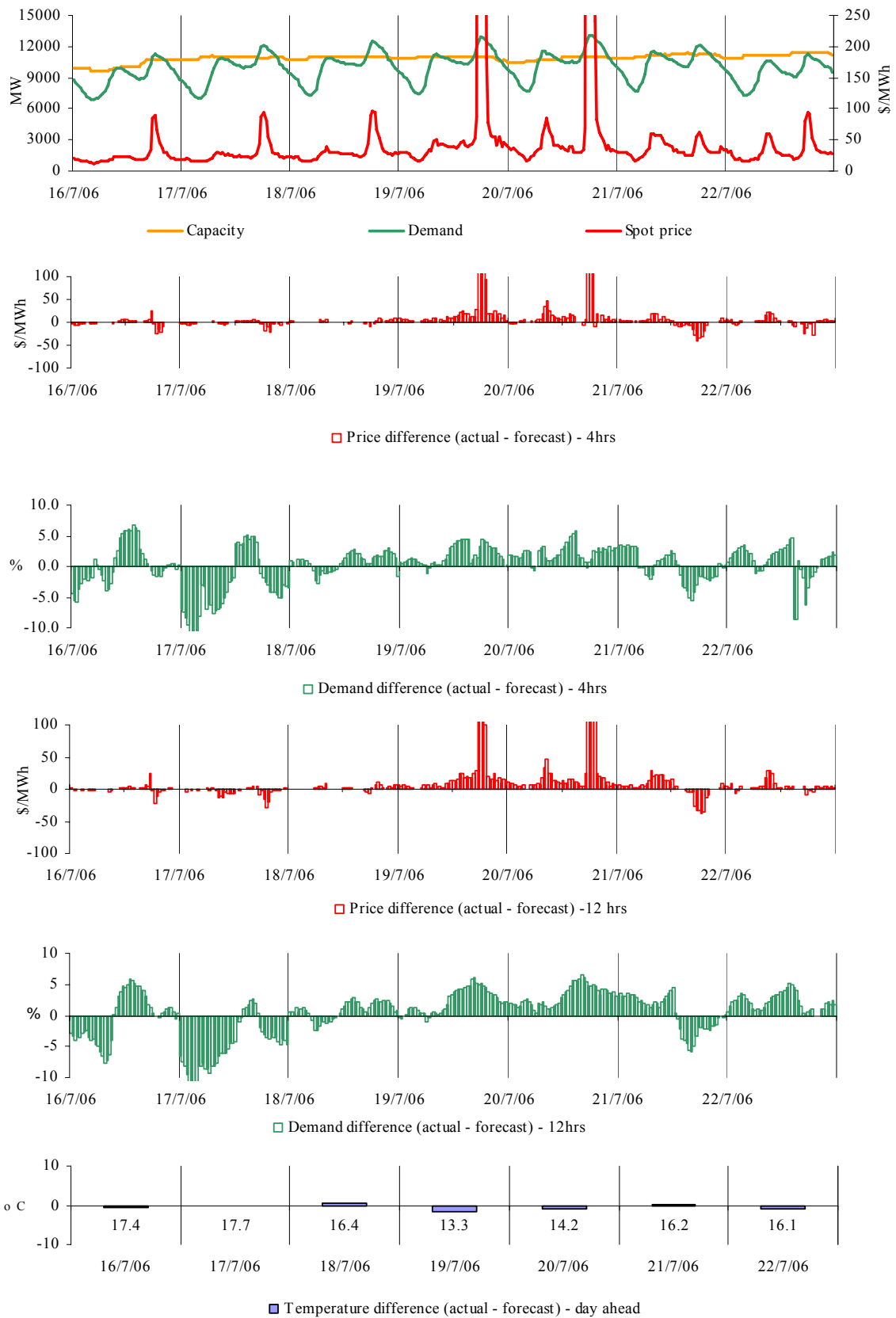
Forecasts four hours ahead saw maximum exports south leading to price separation with the other regions. Actual export capability was greater than forecast and the interconnectors were not constrained leading to price alignment with the rest of the market.

At 6.45 pm Tarong Energy shifted 180 MW of available capacity across the Tarong units from prices below \$40/MWh to above \$280/MWh. The rebid reason given was “Change in market conditions:: adjust portfolio”.

At 4.50 pm Millmerran Energy shifted 120 MW of available capacity across its portfolio from \$5/MWh to above \$9500/MWh. The rebid reason given was “Financial optimisation, changed PD”

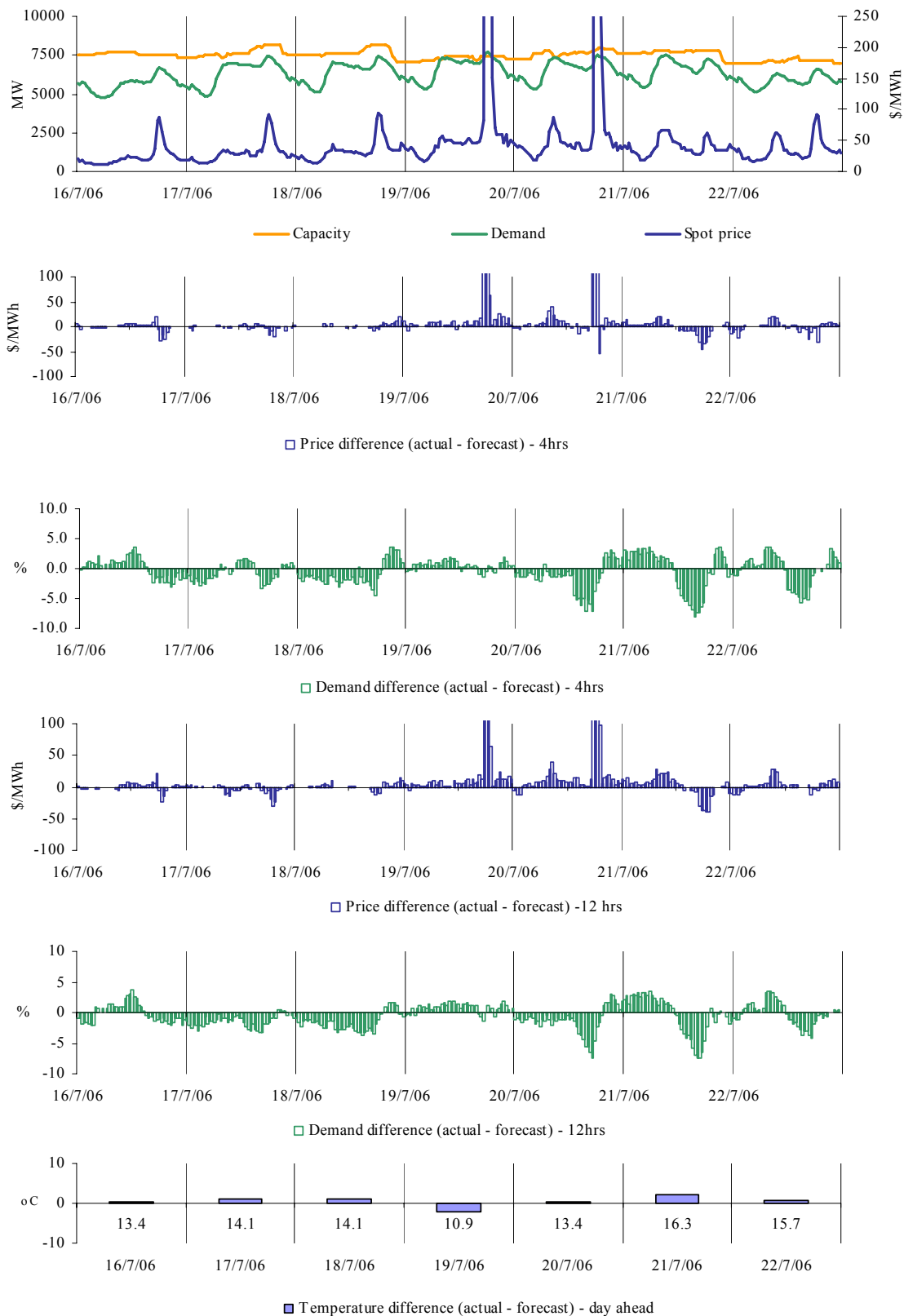
There were no other significant rebids.

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



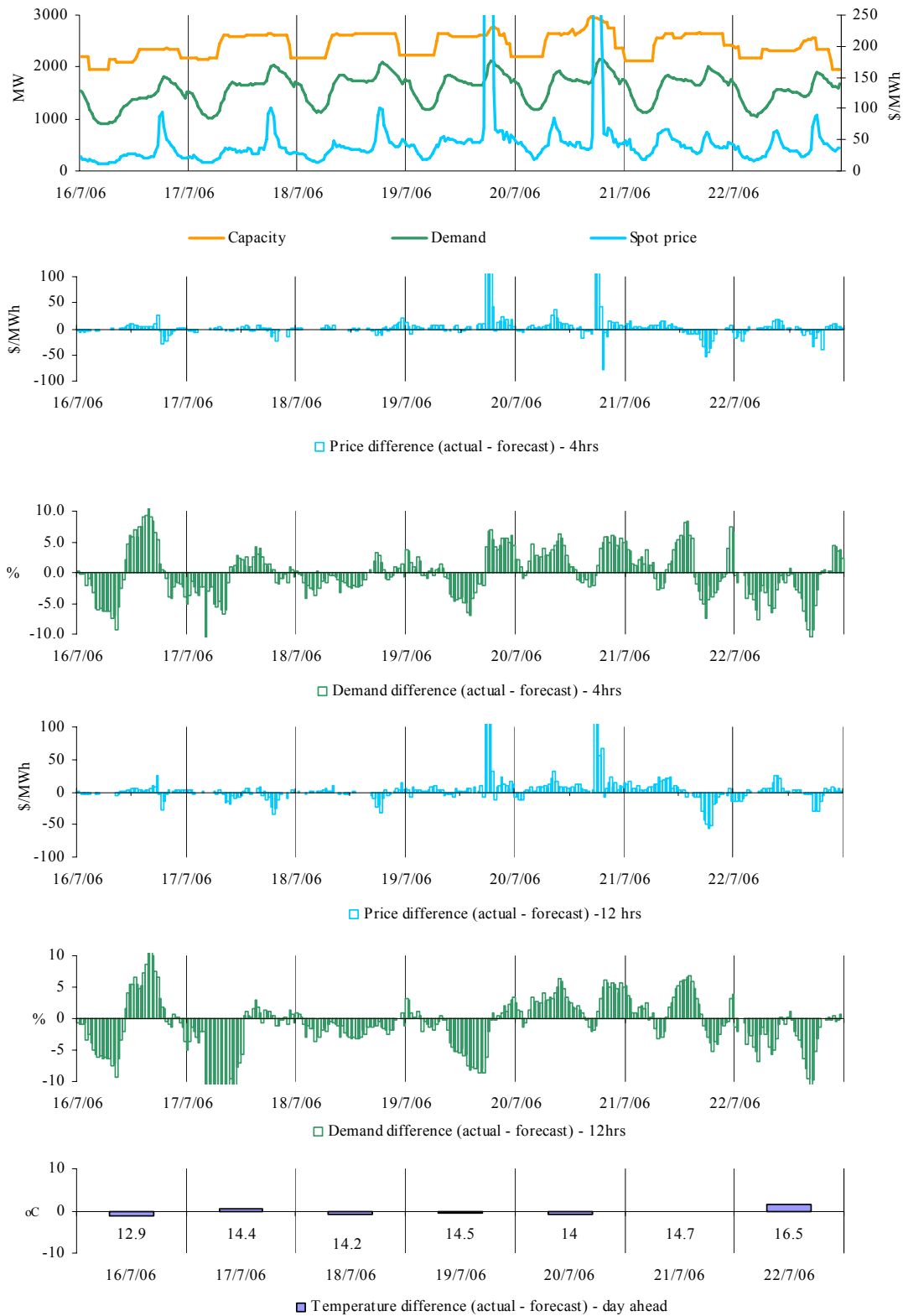
There were six occasions where the spot price in New South Wales was greater than three times the weekly average price of \$104/MWh. These prices all occurred with prices aligned across the market and are detailed under the national analysis section above.

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



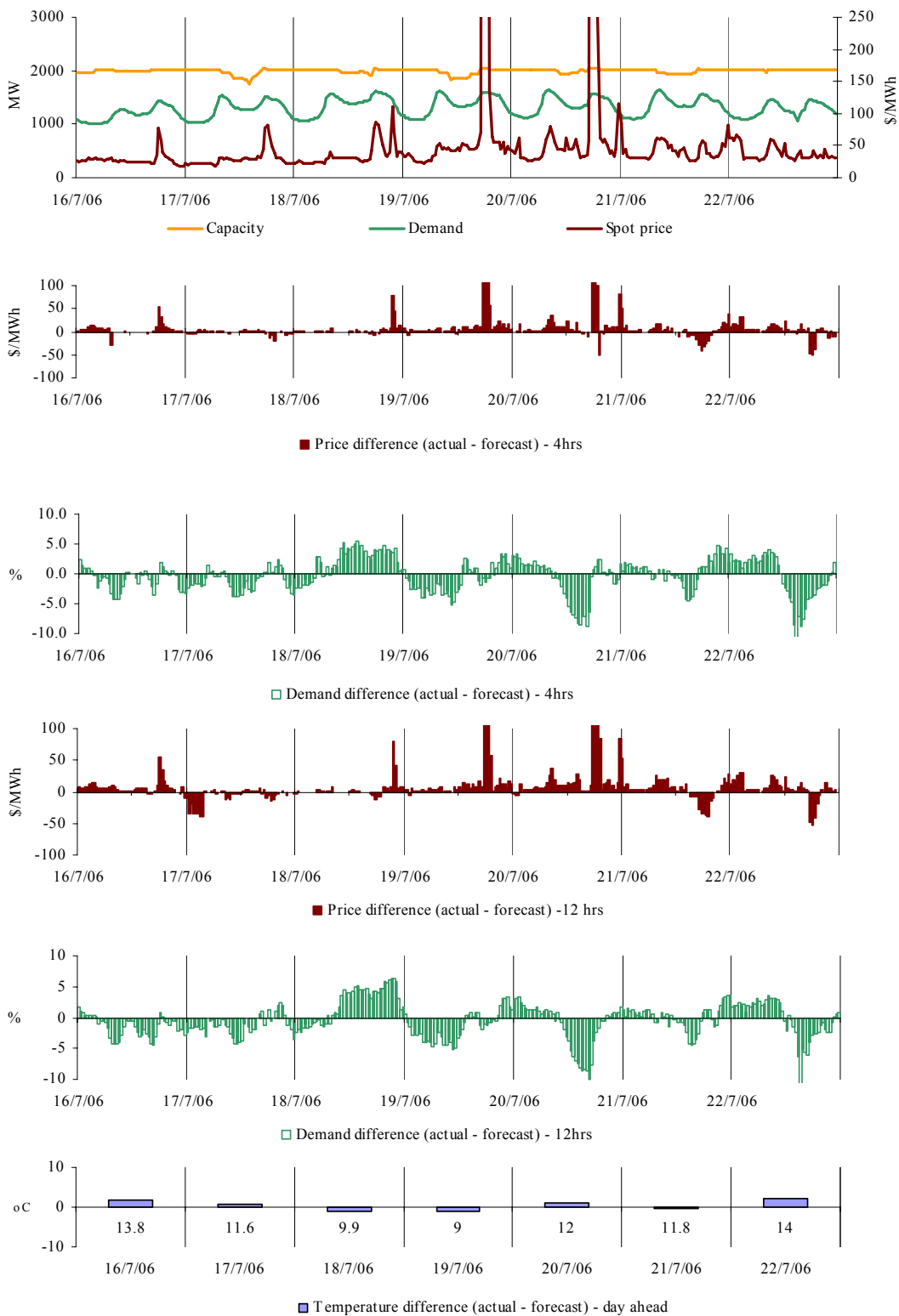
There were six occasions where the spot price in Victoria was greater than three times the weekly average price of \$89/MWh. These prices all occurred with prices aligned across the market and are detailed under the national analysis section above.

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



There were six occasions where the spot price in South Australia was greater than three times the weekly average price of \$79/MWh. These prices all occurred with prices aligned across the market and are detailed under the national analysis section above.

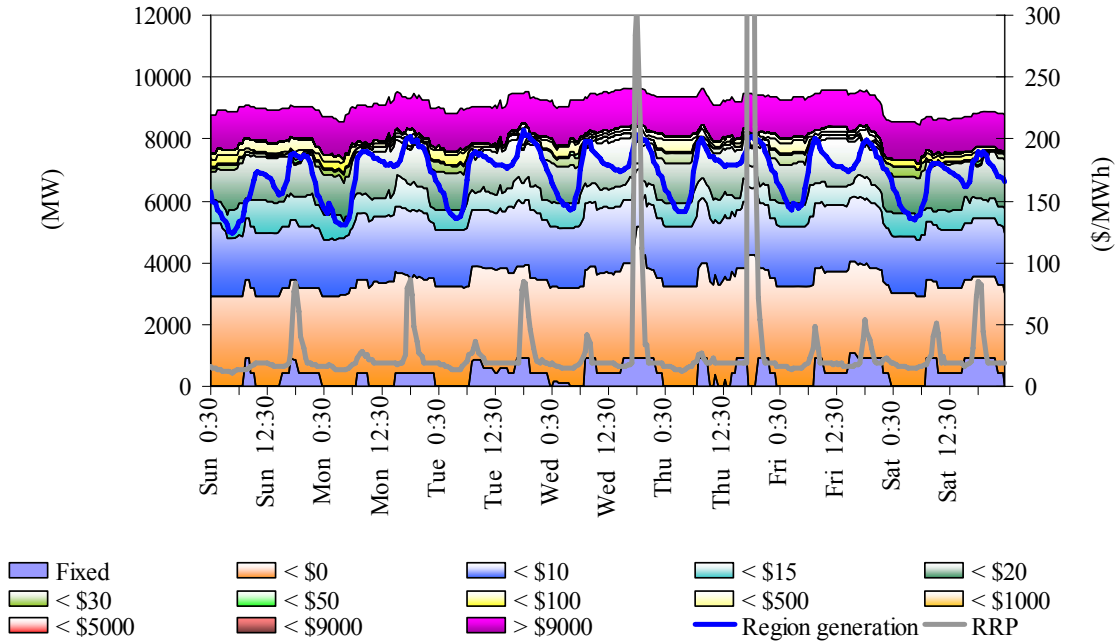
**Figures 51-56: Tasmania actual spot price, demand and forecast differences**



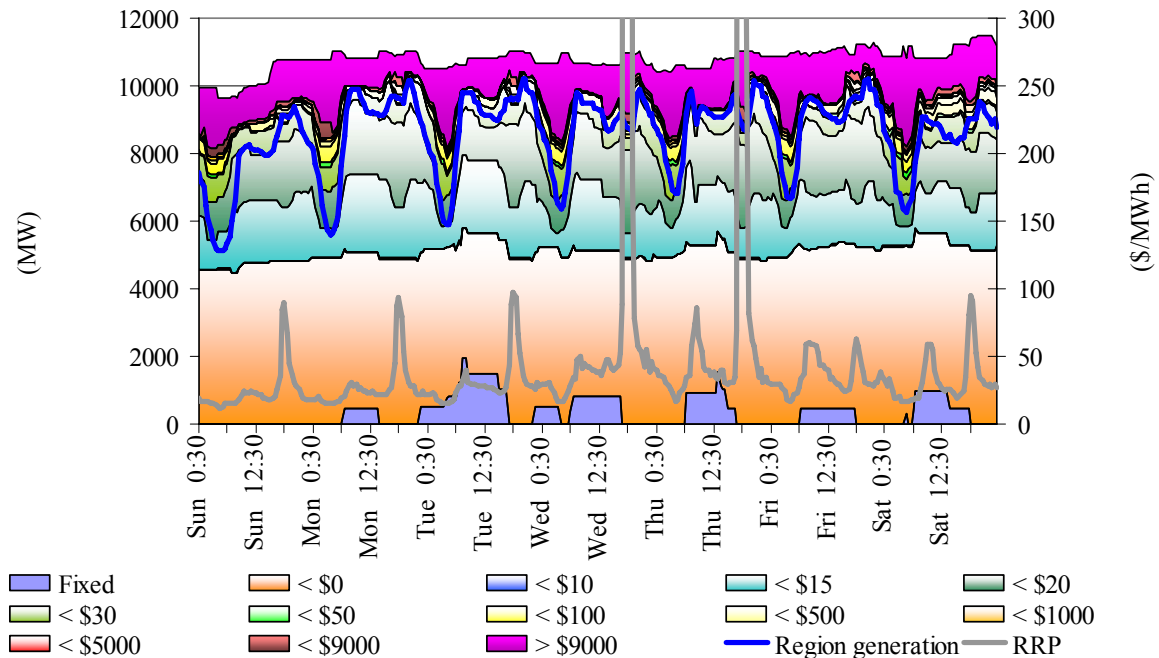
There were six occasions where the spot price in Tasmania was greater than three times the weekly average price of \$86/MWh. These prices all occurred with prices aligned across the market and are detailed under the national analysis section above.

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 57: Queensland closing bid prices, dispatched generation and spot price**

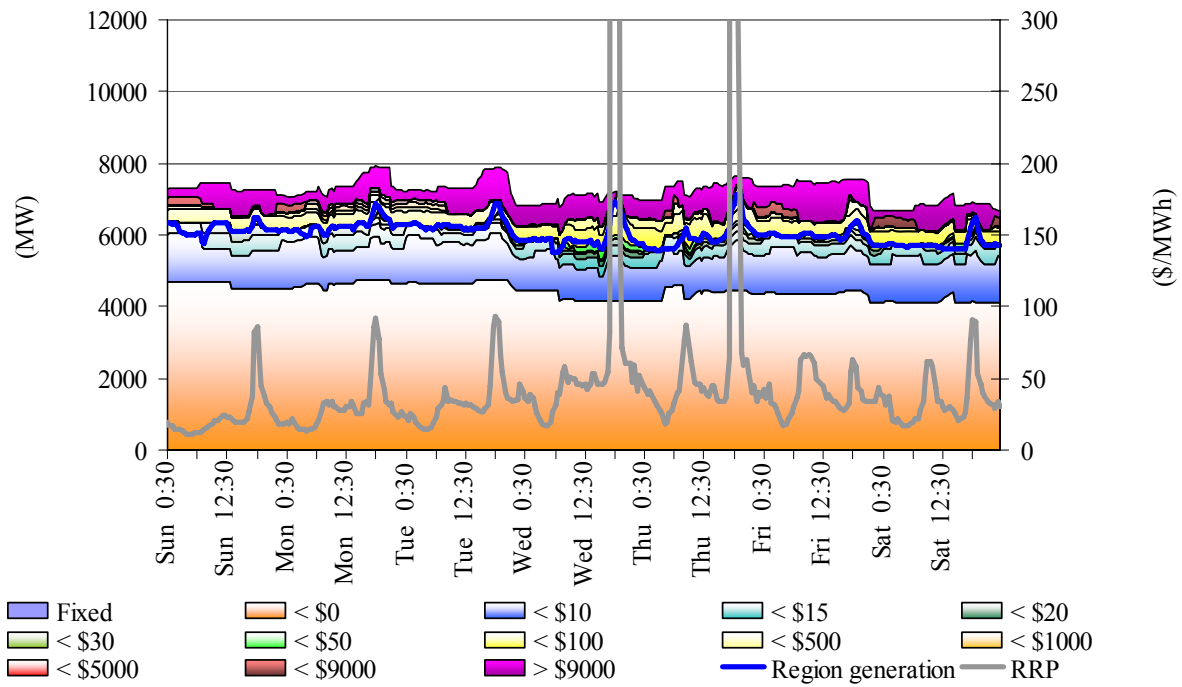


**Figure 58: New South Wales closing bid prices, dispatched generation and spot price**

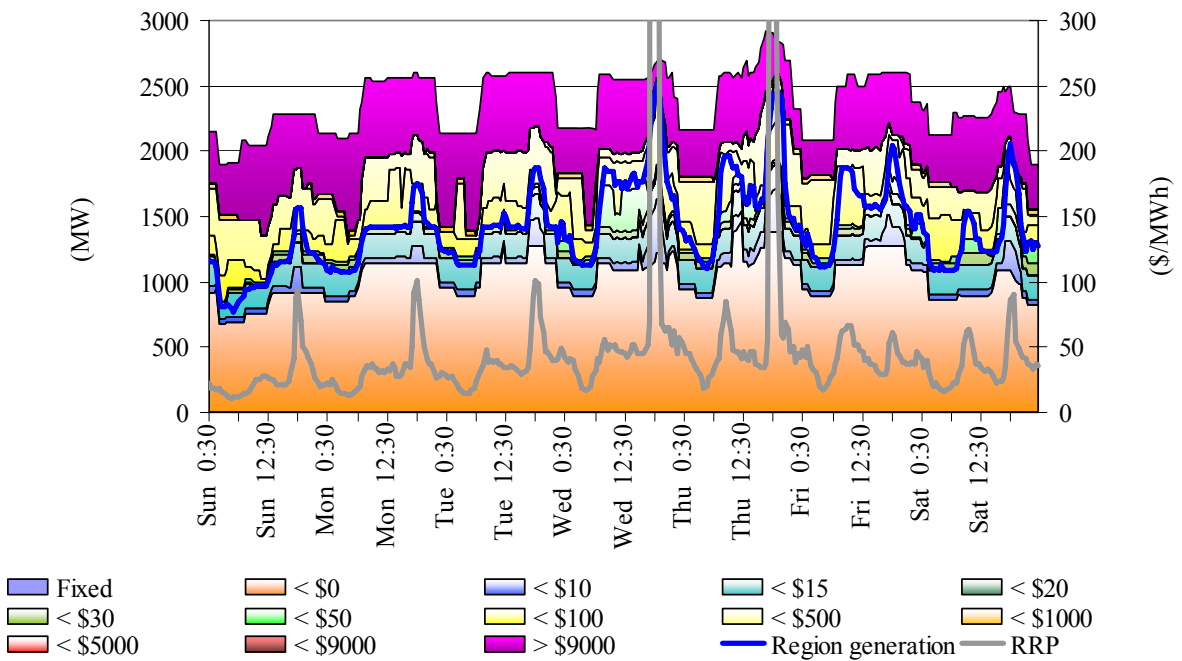




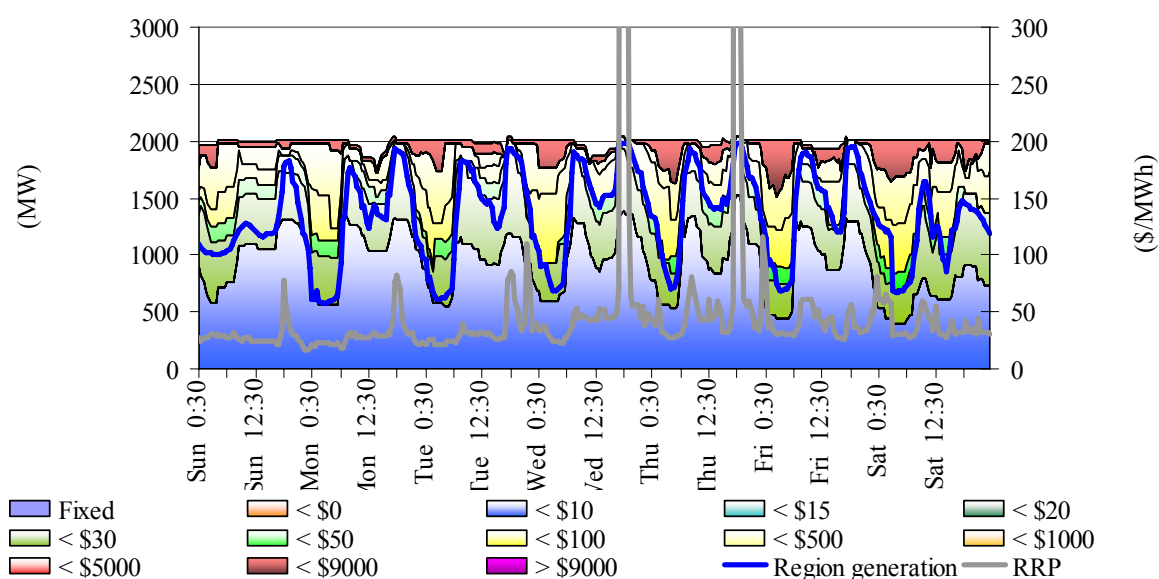
**Figure 59: Victoria closing bid prices, dispatched generation and spot price**



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



**Figure 61: Tasmania closing bid prices, dispatched generation and spot price**



### Ancillary service market

The total cost of ancillary services on the mainland for the week was \$165 000. Figure 62 summarises the volume weighted average prices and costs for the eight frequency control ancillary services across the mainland.

**Figure 62: frequency control ancillary service prices and costs for the mainland**

	Raise 6 sec	Raise 60 sec	Raise 5 min	Raise reg	Lower 6 sec	Lower 60 sec	Lower 5 min	Lower reg
Last week (\$/MW)	0.56	0.13	0.76	2.50	0.17	0.30	0.63	1.19
Previous week (\$/MW)	0.76	0.15	1.07	2.89	0.16	0.21	0.55	0.96
Last quarter (\$/MW)	1.76	0.73	1.15	1.54	0.39	2.28	5.00	1.93
Market Cost (\$1000s)	\$22	\$5	\$45	\$60	\$1	\$2	\$11	\$19
% of energy market	0.01%	0.01%	0.01%	0.02%	0.01%	0.01%	0.01%	0.01%

The total cost of ancillary services in Tasmania for the week was \$1.4 million or seven per cent of the total turnover in the energy market in Tasmania. The price for the lower 6 second service reached \$10,000/MW on Wednesday and Thursday as a result of co-optimisation with the energy market. This saw the cost for that service reach \$1.3 million over two hours. Figure 63 summarises for Tasmania the prices and costs for the eight frequency control ancillary services.

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

	Raise 6 sec	Raise 60 sec	Raise 5 min	Raise reg	Lower 6 sec	Lower 60 sec	Lower 5 min	Lower reg
Last week (\$/MW)	3.99	0.20	1.76	3.01	188.53	0.13	0.53	0.83
Previous week (\$/MW)	1.18	0.27	1.41	2.67	41.49	0.06	0.41	0.85
Last quarter (\$/MW)	7.89	1.05	1.05	1.58	4.43	1.06	1.06	1.97
Market Cost (\$1000s)	\$18	\$1	\$16	\$11	\$1,315	\$3	\$12	\$5
% of energy market	0.09%	0.01%	0.09%	0.06%	6.99%	0.02%	0.06%	0.03%

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

**Figure 64: daily frequency control ancillary service costs**

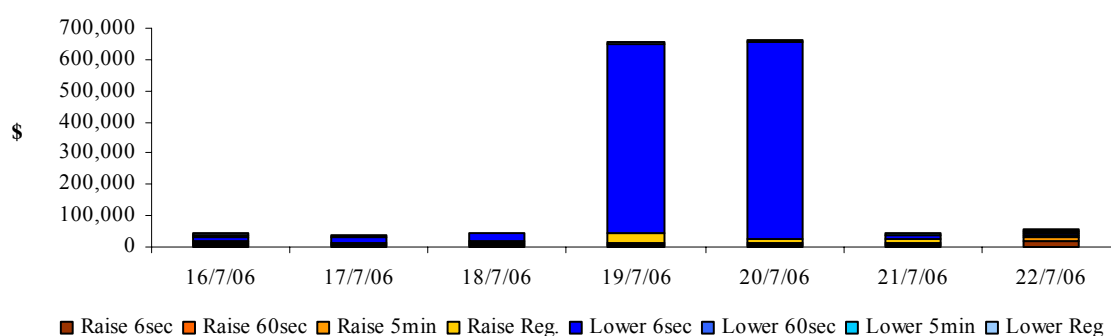
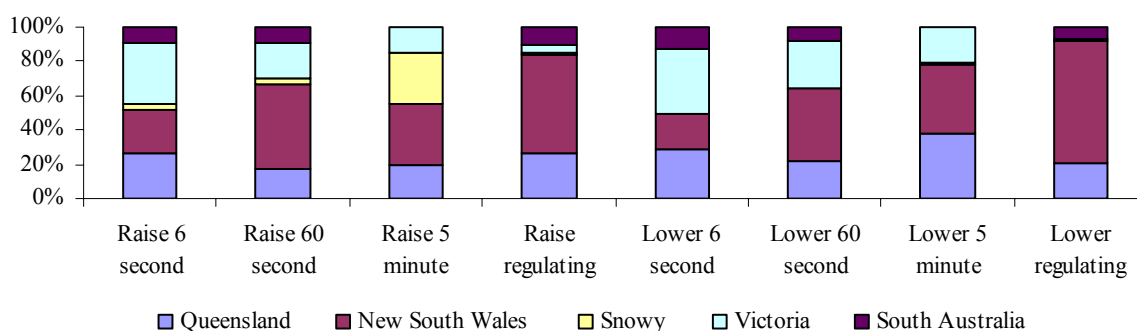


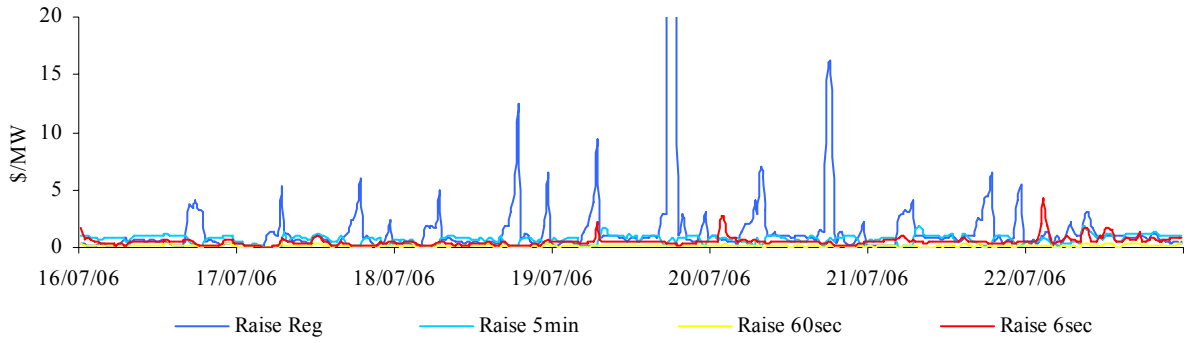
Figure 65 shows the contribution, on a percentage basis, that frequency control ancillary service providers are utilised (in each mainland region) to satisfy the total requirement for each service.

**Figure 65: regional participation in ancillary services on the mainland**

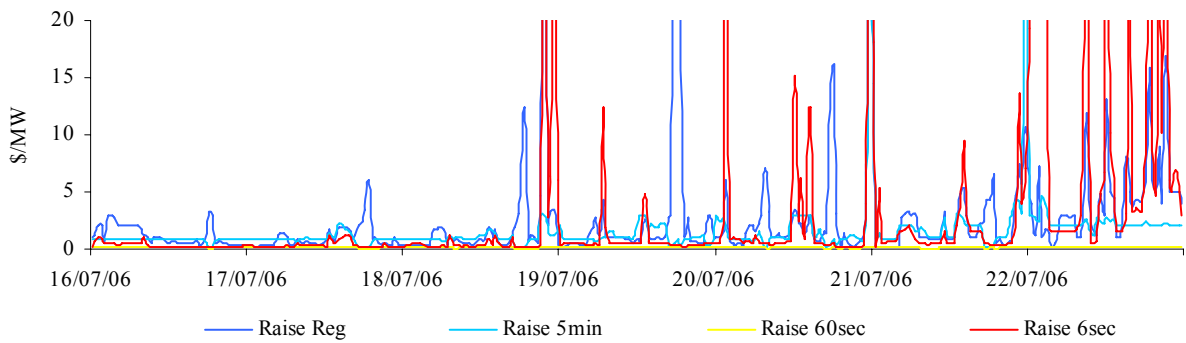


Figures 66 and 67 show 30-minute prices for each frequency control ancillary service throughout the week.

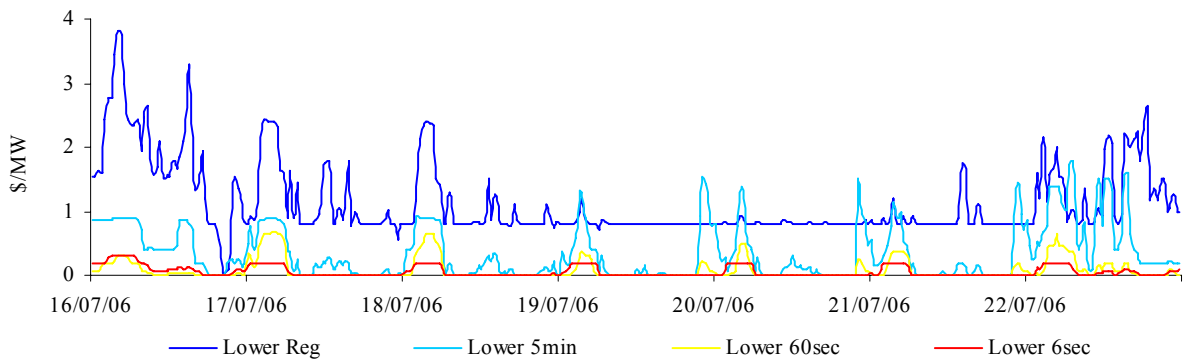
**Figure 66: prices for raise services**



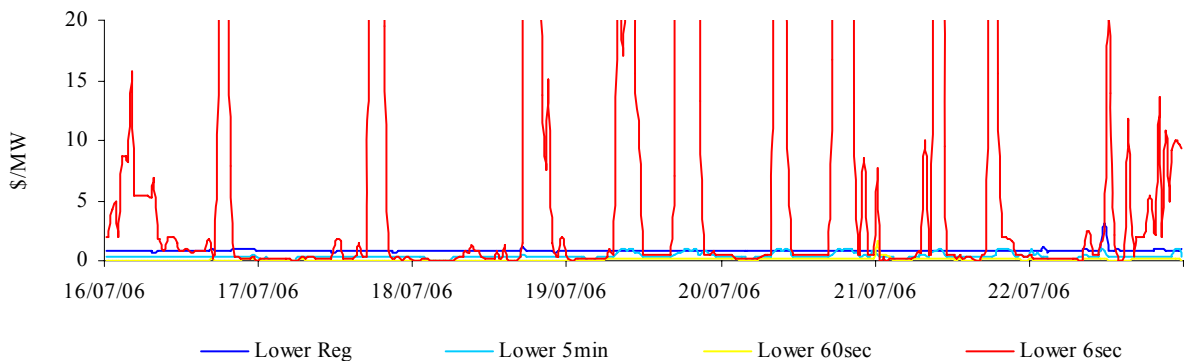
**Figure 66A: prices for raise services - Tasmania**



**Figure 67: prices for lower services**

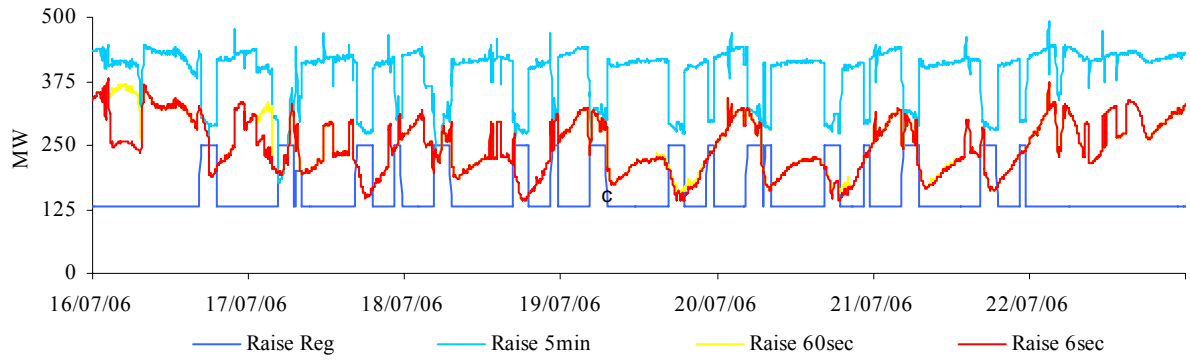


**Figure 67A: prices for lower services - Tasmania**

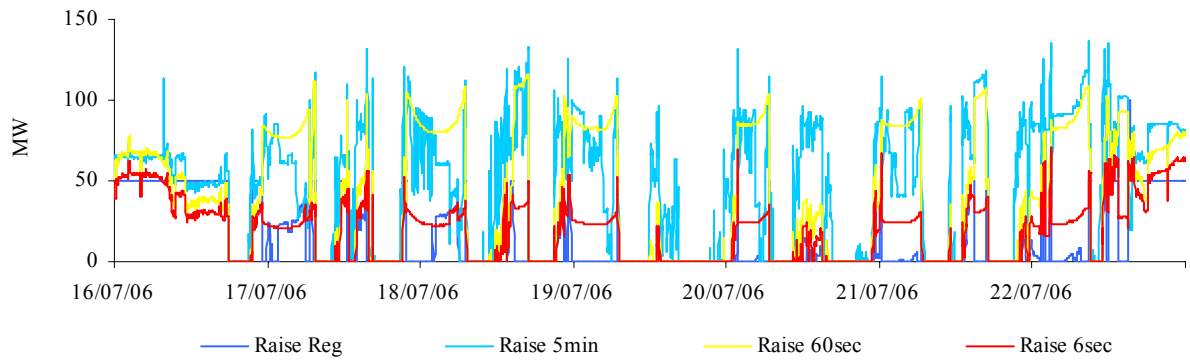


Figures 68 and 69 present for both raise and lower frequency control services the requirement, established by NEMMCO, for each service to satisfy the frequency standard.

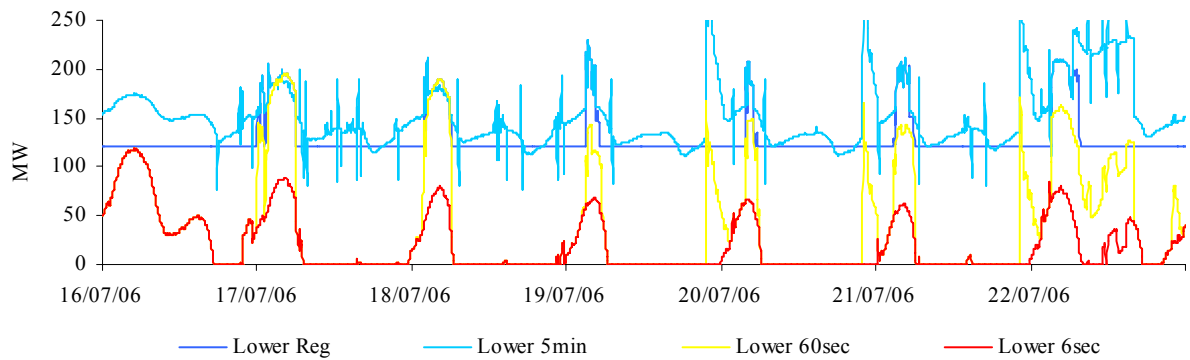
**Figure 68: raise requirements**



**Figure 68A: raise requirements - Tasmania**



**Figure 69: lower requirements**



**Figure 69A: lower requirements - Tasmania**

