Market analysis

AUSTRALIAN ENERGY REGULATOR

15 July – 21 July 2007

Summary

Spot prices for the week averaged between $97/MWh and $119/MWh across all regions. New record demands were reached on Tuesday in New South Wales and nationally on Wednesday.

Turnover in the energy market in the week ended 21 July was $479 million. The total cost of ancillary services for the week was $418 000, or 0.1per cent of energy market turnover.

Significant variations between actual prices and those forecast 4 and 12 hours ahead occurred in 192, or 57 per cent of all trading intervals. Demand forecasts produced 4 and 12 hours ahead varied from actual by more than 5 per cent in 14 per cent of all trading intervals across the market. These variations were most frequent in Tasmania, occurring in over 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 previous financial year.

Figure 1: national demand and spot prices

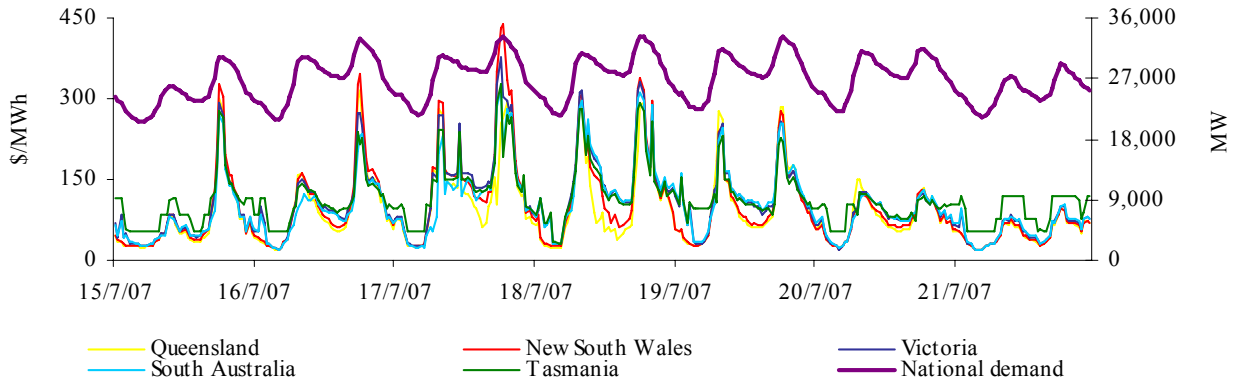


Figure 2: volume weighted average spot price for energy market ($/MWh)

	QLD	NSW	VIC	SA	TAS
Last week	97	107	112	109	119
Previous week	94	105	104	104	111
Same quarter last year	26	39	39	43	42
Financial year to date	84	94	100	103	110
% change from previous week*	▲3%	▲2%	▲7%	▲4%	▲7%
% change from same quarter last year**	▲273%	▲179%	▲186%	▲153%	▲181%
% change from year to date***	▲143%	▲52%	▲73%	▲71%	▲91%

*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.

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

Figure 3: Queensland

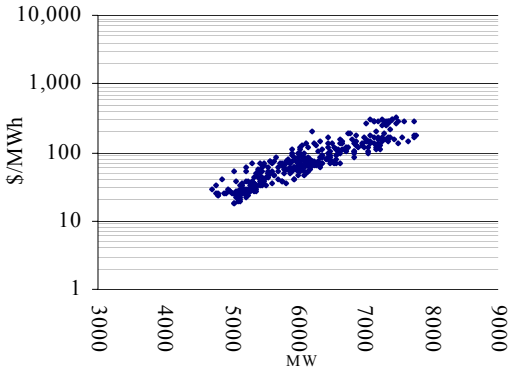


Figure 4: New South Wales

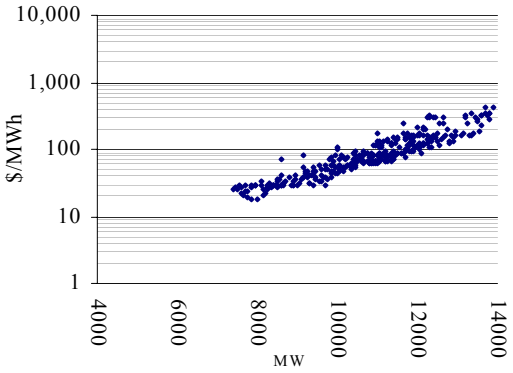


Figure 5: Victoria

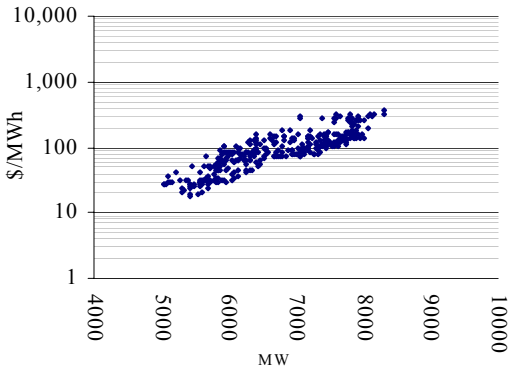


Figure 6: South Australia

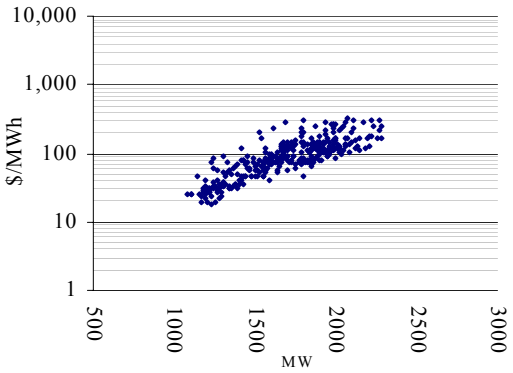
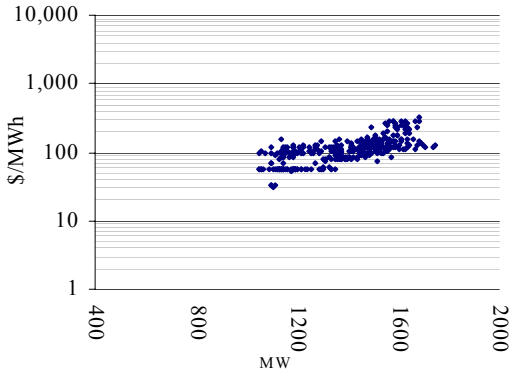


Figure 7: Tasmania



Maximum spot prices for the week ranged from $317/MWh in Queensland to $437/MWh in New South Wales. Figure 8 compares the weekly price volatility index with the averages for the previous week and the same quarter last year. It highlights the increase in spot price volatility.

Figure 8: volatility index during peak periods

	QLD	NSW	VIC	SA	TAS
Last week	1.36	1.46	1.22	1.11	0.95
Previous week	1.06	1.34	0.86	0.88	0.55
Same quarter last year	1.07	0.96	0.96	0.94	0.29

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

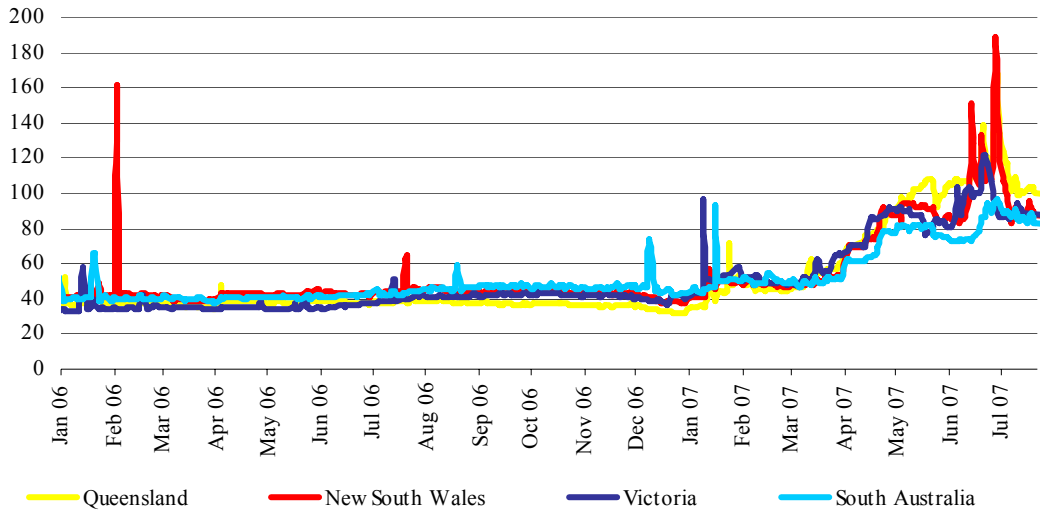
Figure 9 sets out the d-cyphaTrade wholesale electricity price index (WEPI)* for each region throughout the week excluding Tasmania. Figure 10 sets out the WEPI since 1 January 2006.

Figure 9: d-cyphaTrade WEPI for the week

	Monday	Tuesday	Wednesday	Thursday	Friday
Queensland	102.50	103.84	102.80	103.20	88.99
New South Wales	89.77	94.94	90.98	89.75	100.08
Victoria	89.63	94.34	91.98	90.59	83.25
South Australia	83.43	85.27	89.12	86.80	83.25

* 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.

Figure 10: d-cyphaTrade WEPI



Reserves

Low reserves were forecast for New South Wales on Tuesday evening.

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 11: Queensland

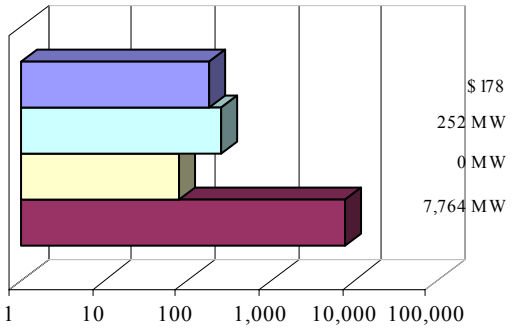


Figure 12: New South Wales

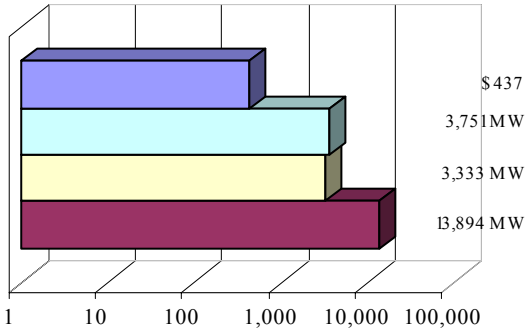


Figure 13: Victoria

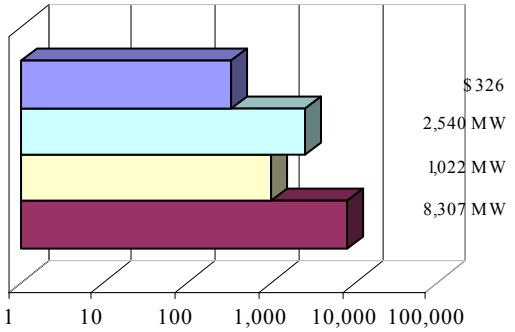


Figure 14: South Australia

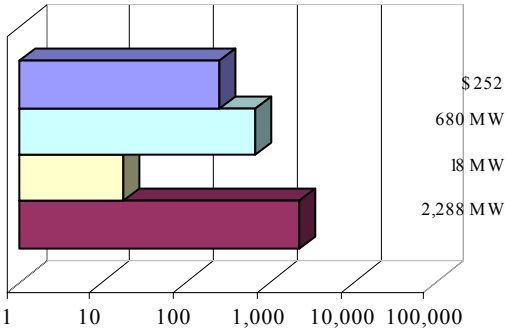
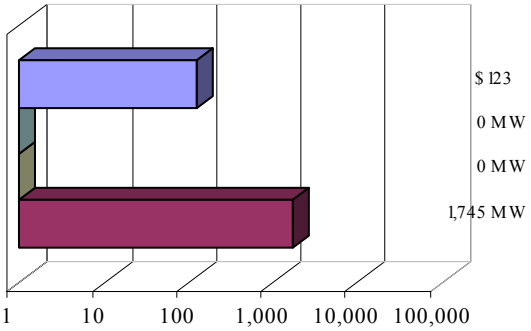


Figure 15: Tasmania



Price variations

There were 192 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 16: Queensland

Figure 17: New South Wales

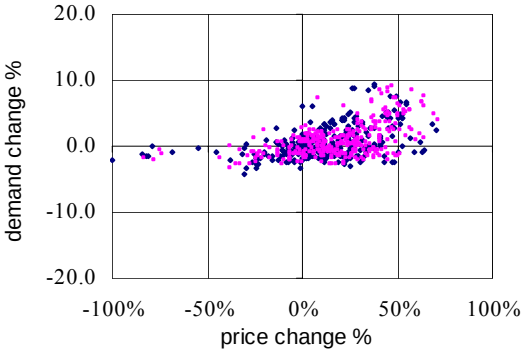


Figure 18: Victoria

Figure 19: South Australia

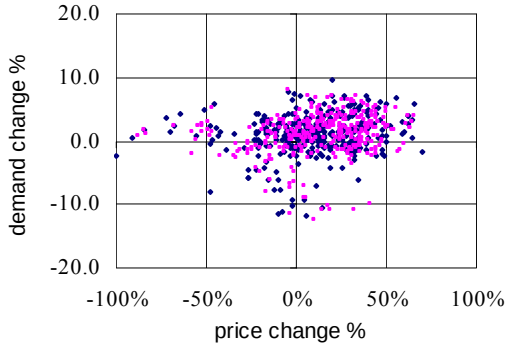
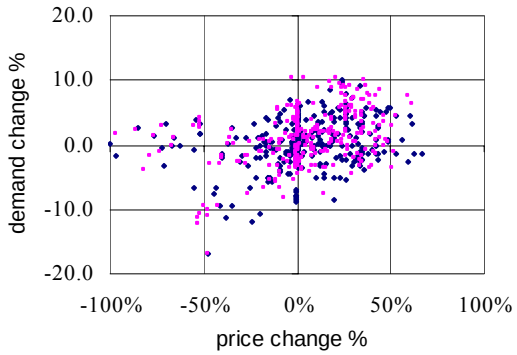


Figure 20: Tasmania



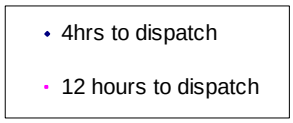
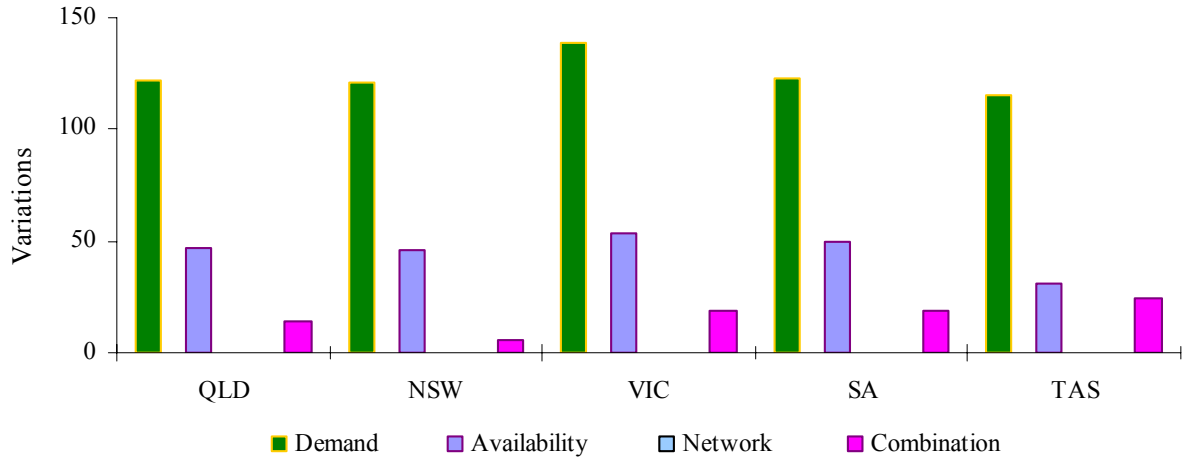


Figure 21 summarises the number and most probable reason for variations between forecast and actual prices.

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.

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 were four occasions 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 $107/MWh.

Sunday, 15 July

6:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	328.72	96.00	92.00
Demand (MW)	30 074	29 223	28 984
Available capacity (MW)	35 550	36 899	37 191

Conditions at the time saw national demand up to 850 MW higher than forecast four hours ahead. Available capacity was up to 1300 MW lower than forecast four hours ahead and 1600 MW lower than forecast 12 hours ahead.

At 8.56 am Delta Electricity delayed the return to service of Munmorah unit three reducing available capacity by 280 MW priced below $30/MWh. A rebid at 2.35 pm reduced capacity by 300 MW at Mount Piper priced below $60/MWh. The reason given was "Condenser tube leak:capacity limit change".

At 4.46 pm Macquarie Generation reduced available capacity by 1020 MW across its portfolio. A majority of this capacity was priced below $140/MWh. The reasons given were "Coal management", "Milling limit" and "FF limit".

There was no other significant rebidding.

Monday, 16 July

6:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	326.92	156.41	120.60
Demand (MW)	32 326	31 120	30 750
Available capacity (MW)	37 004	37 425	38 145
6:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	345.69	156.55	121.96
Demand (MW)	32 856	31 443	31 137
Available capacity (MW)	37 041	37 398	38 160

Conditions at the time saw demand up to 1400 MW higher than forecast four hours ahead and 1700 MW higher than forecast 12 hours ahead. Available capacity was up to 1100 MW lower than forecast four and 12 hours ahead.

Over two rebids at 12.09 pm and 2.44 pm Delta Electricity reduced available capacity by 290 MW at Munmorah unit four priced below $30/MWh. The reasons given were "FF::Capacity limit change" and "Taken out of service::capacity limit change".

At around 10.30 am Enertrade's Gladstone unit three tripped. At 12.45 pm Enertrade delayed the return to service of the unit reducing capacity by 275 MW. This capacity was priced below $80/MWh. The unit came back online the following morning.

From 12.29 pm over several rebids Macquarie Generation reduced capacity by 740 MW across its portfolio. A majority of this capacity was priced below $150/MWh. The reasons given included "Milling limit", "FF limit" and "Loss of F PF system due to coal hang up".

At 3.53 pm LYMMCO increased availability at Loy Yang A unit four by 215 MW priced below $20/MWh. The reason given was "Revised plant limits".

At 4.44 pm Stanwell Corporation rebid 110 MW of capacity at Stanwell from prices below $280/MWh to above $410/MWh. The reason given was “Portfolio optimisation”.

There was no other significant rebidding.

Wednesday, 18 July

6:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	337.25	331.68	329.38
Demand (MW)	33 140	33 141	33 489
Available capacity (MW)	37 286	37 544	38 357

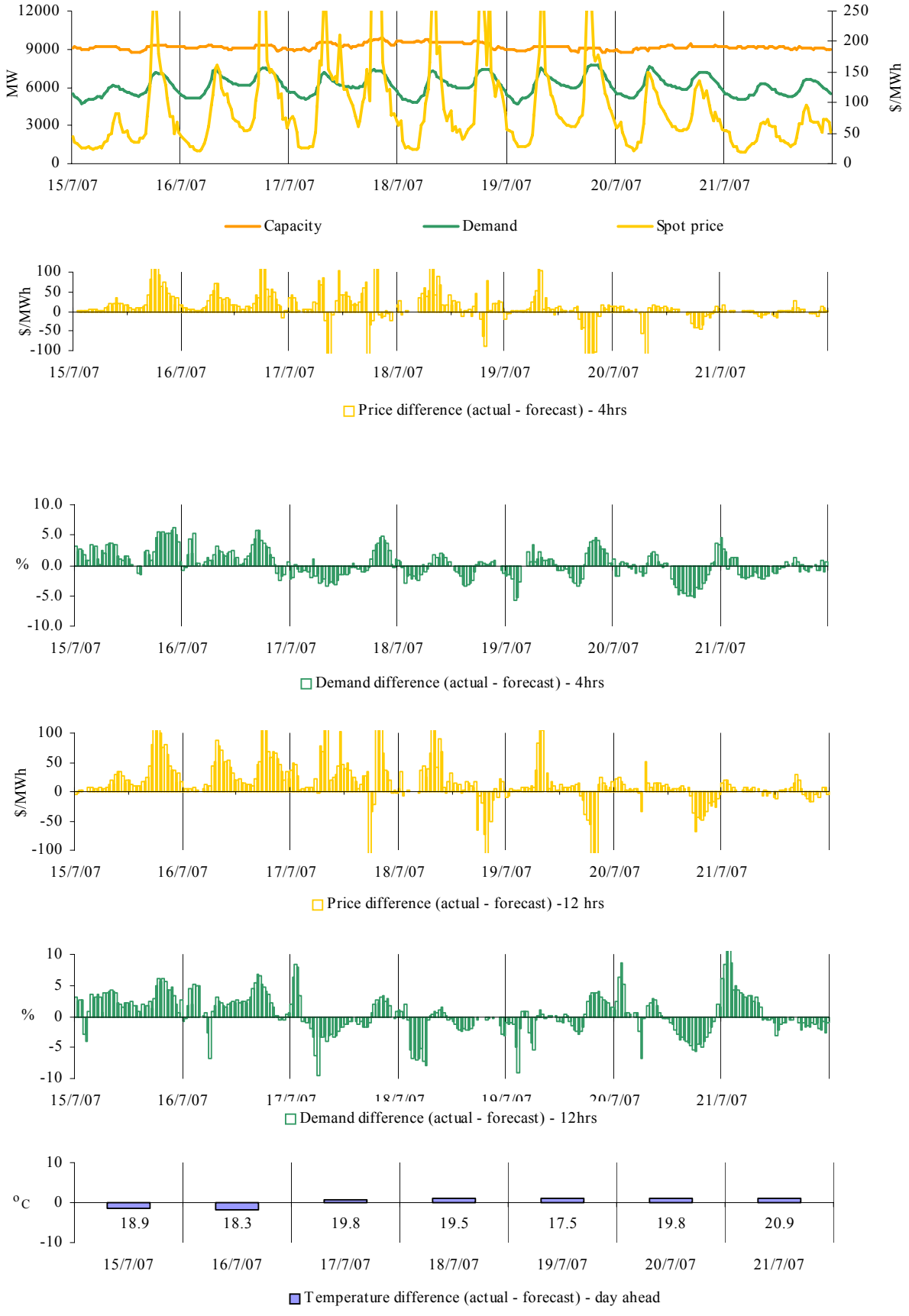
Conditions at the time saw demand, available capacity and prices close to that forecast and aligned across all regions. At 6.30 pm and 7 pm demand exceeded 33 000 MW for the first time with a new record of 33 145 MW at 7 pm.

There was no significant rebidding.

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.

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



There were seven occasions where the spot prices in Queensland were greater than three times the Queensland weekly average price of $97/MWh. Three of these occurred when prices were generally aligned across all regions and are detailed in the national market outcomes section. The remaining four occasions are presented below.

Tuesday, 17 July

7:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	292.56	60.3	152.67
Demand (MW)	7336	7094	7144
Available capacity (MW)	9756	9879	9760

Conditions at the time saw demand 240 MW higher than forecast four hours ahead and available capacity 120 MW lower than forecast four hours ahead.

At 2.53 pm Origin Energy rebid 288 MW of capacity at Mount Stuart from prices above $9000/MWh to below zero. The reason given was "Est change in PDS".

Over two rebids at 3.06 pm and 4.01 pm Millmerran Energy Traders rebid 145 MW of capacity across its units from prices below $10/MWh to above $9700/MWh. The reason given was "QNI con::change MW dist".

At 4.13 pm Callide Power Trading rebid 100 MW of capacity across its portfolio from prices below zero to above $9000/MWh. The reason given was "New IG energy bid".

At 6.29 pm Stanwell Corporation rebid 160 MW of capacity across its Stanwell units from prices below $150/MWh to above $400/MWh. The reason given was "Manage transmission constraint".

There was no other significant rebidding.

Wednesday, 18 July

8:00 am	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	294.87	155.89	151.90
Demand (MW)	7270	7263	7238
Available capacity (MW)	9537	9550	9610
8:30 am	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	290.59	151.35	147.47
Demand (MW)	7137	7013	7076
Available capacity (MW)	9560	9555	9610

Conditions at the time saw demand and available capacity close to forecast four and twelve hours ahead. At 8.30 am NEM demand reached 30 860 MW which was a new record morning peak. Prices were generally aligned across the market.

From 6.57 am over several rebids LYMMCO reduced capacity by 250 MW across its portfolio. All the capacity was priced below $20/MWh. The reasons given included "Revised plant limits" and "Coal conservation".

At 7.03 am Ecogen Energy reduced the availability of Newport by 480 MW with 200 MW of this priced below $35/MWh. The reason given was "Capacity adj due to ambient temperature".

At 7.35 pm TRU Energy reduced the availability of Yallourn unit one by 100 MW, all priced below zero. The reason given was "Boiler problem::capacity limit".

There was no other significant rebidding.

Wednesday, 18 July

7:00 pm	Actual	4 hr forecast	12 hr forecast
Price ($/MWh)	293.38	312.95	312.70
Demand (MW)	7414	7373	7417
Available capacity (MW)	9551	9631	9808

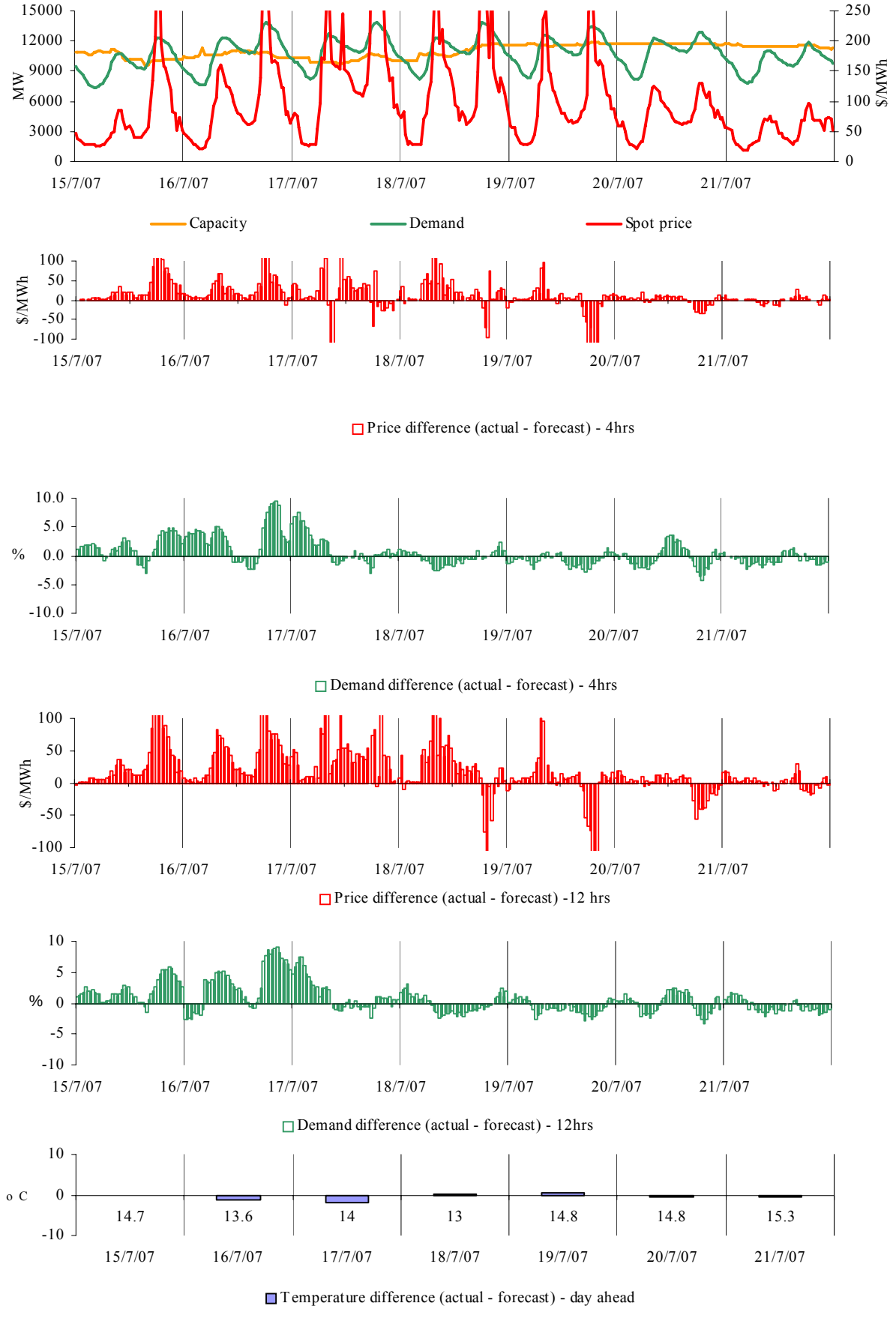
Conditions at the time saw price, demand and available capacity close to that forecast four hours ahead and aligned across all regions. NEM demand at the time reached a new record.

There was no 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 were eight occasions where the spot prices in New South Wales were greater than three times the New South Wales weekly average price of $107/MWh. Four of these occurred when prices were generally aligned across all regions and are detailed in the national market outcomes section. The remaining four occasions are presented below.

Tuesday, 17 July

6:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	351.73	355.6	352.22
Demand (MW)	13363	13790	13688
Available capacity (MW)	10707	10775	10835
6:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	430.39	497.68	356.78
Demand (MW)	13698	13999	13812
Available capacity (MW)	10618	10875	10835
7:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	436.81	363.19	354.59
Demand (MW)	13894	13875	13741
Available capacity (MW)	10585	10875	10835
7:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	336.17	351.8	340.58
Demand (MW)	13675	13669	13523
Available capacity (MW)	10585	10875	10835

Conditions at the time saw demand close to forecast. At 7 pm demand reached a new record for New South Wales. Available capacity was up to 300 MW lower than forecast. Prices were close to that forecast.

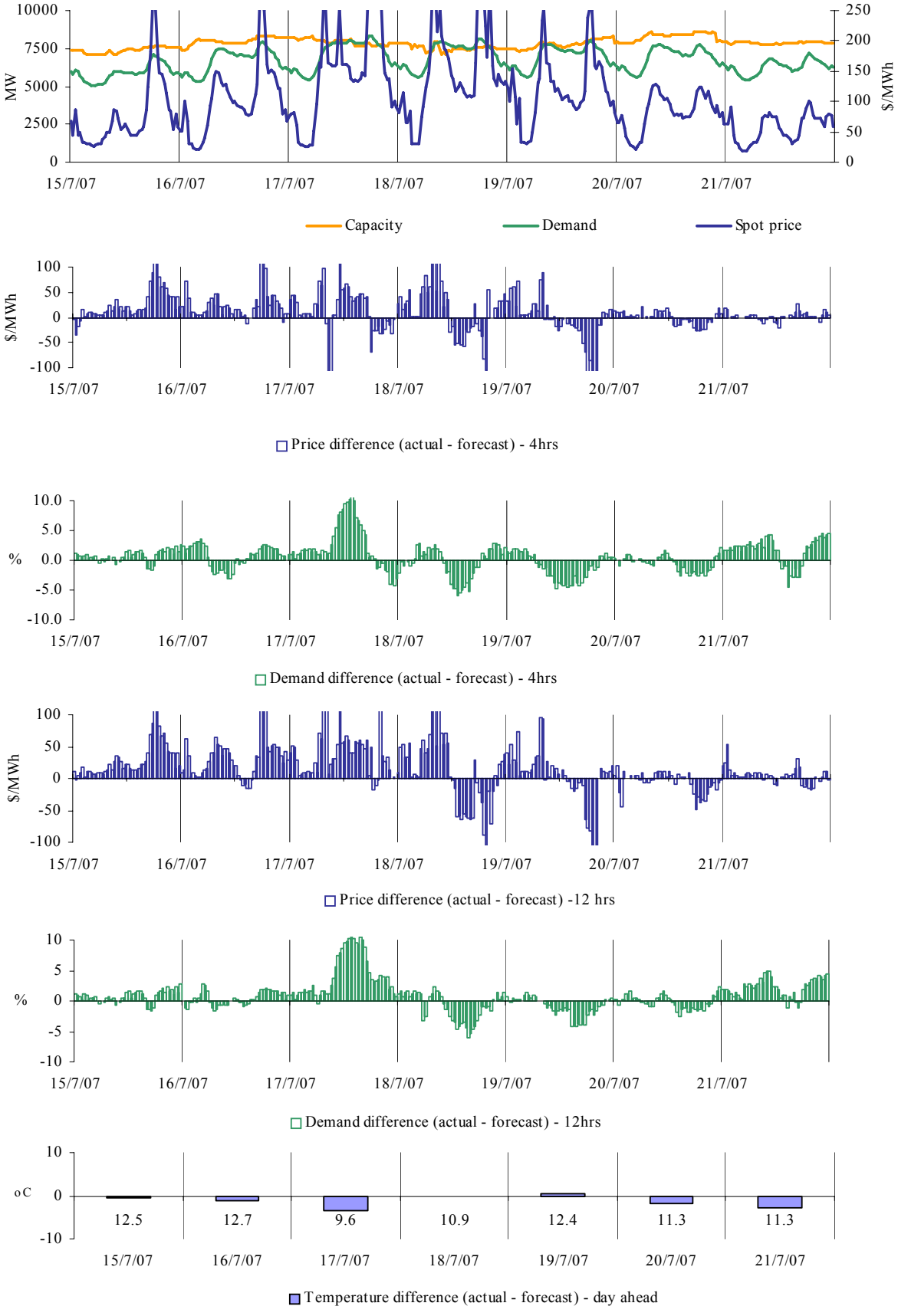
From 5.38 pm over several rebids Macquarie Generation reduced the availability of its Liddell units by 300 MW, with 180 MW priced below $60/MWh. The reason given was “Milling limit”.

There was no other significant rebidding.

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 one occasion where the spot price in Victoria was greater than three times the Victoria weekly average price of $112/MWh. This occurred when prices were generally aligned across all regions and is detailed in the national market outcomes section.

Tuesday, 17 July

6:30 pm	Actual	4 hr forecast	12 hr forecast
Price ($/MWh)	375.99	444.53	327.16
Demand (MW)	8294	8227	8008
Available capacity (MW)	7705	8367	8347

Conditions at the time saw price and demand close to that forecast four and 12 hours ahead. Available capacity was around 650 MW lower than forecast four and 12 hours ahead.

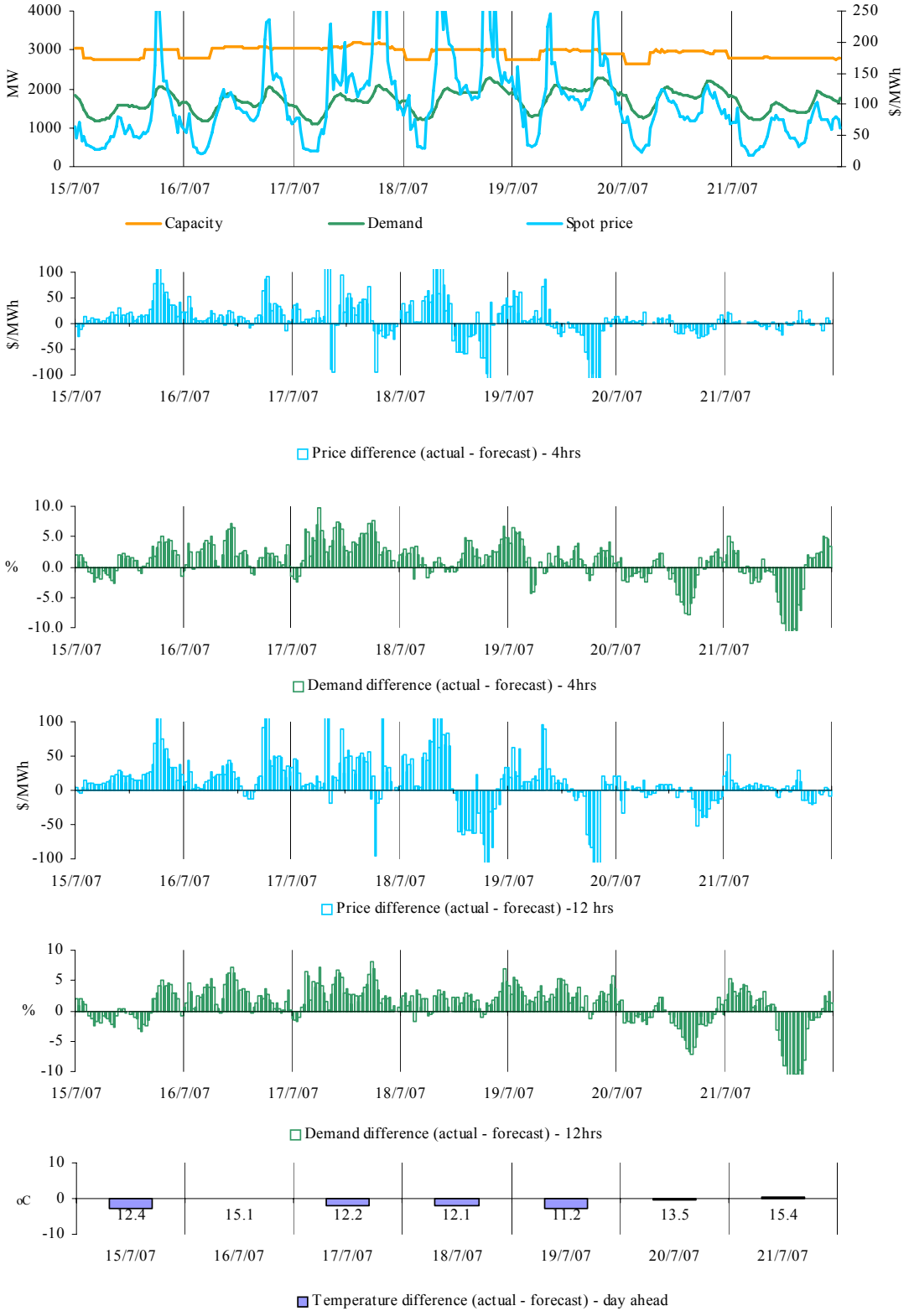
At 2.11 pm Ecogen Energy reduced the availability of Newport by 510 MW, with 400 MW priced below $55/MWh. The reason given was “ROC adj due to plant limitations”.

There was no other significant rebidding.

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

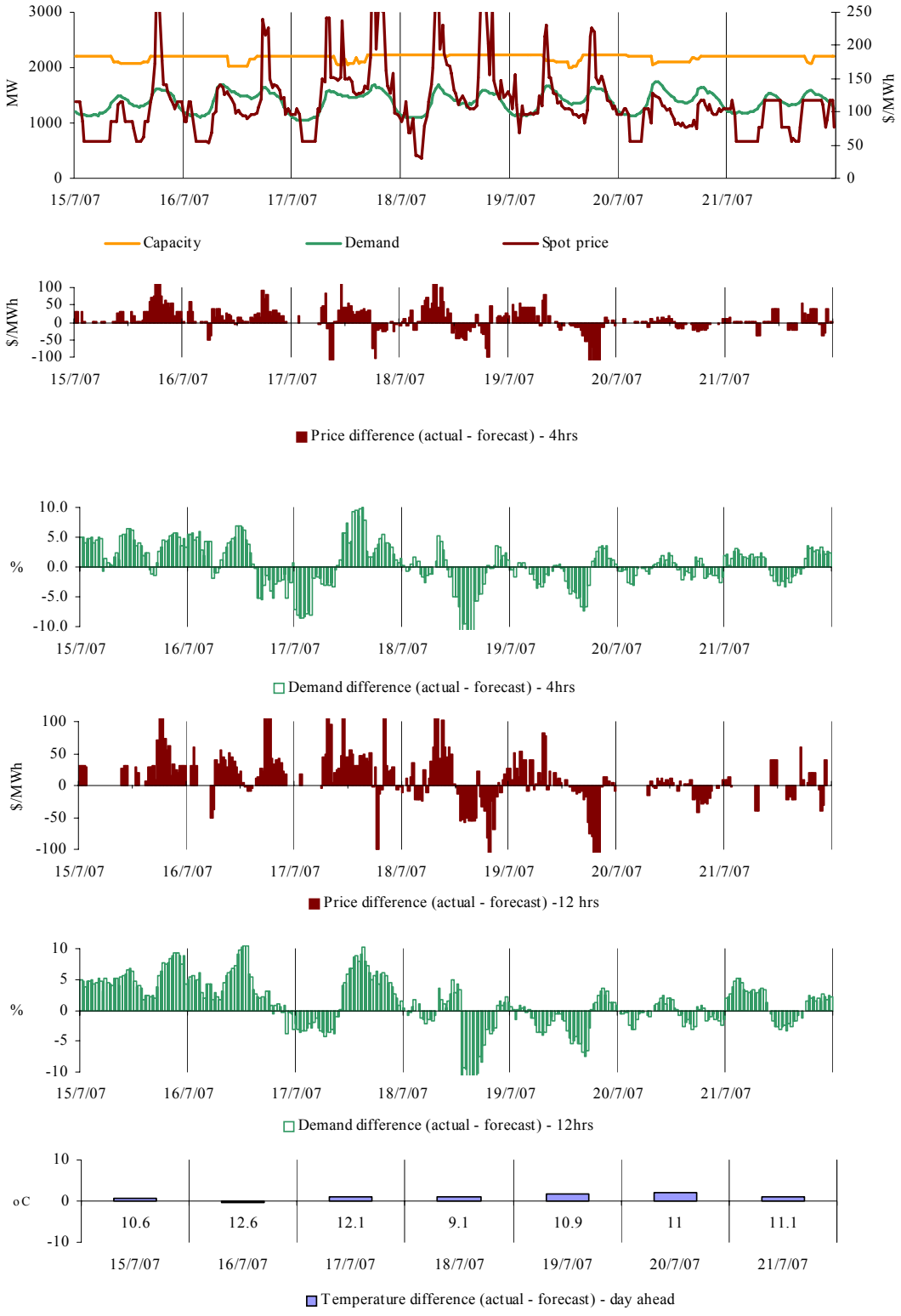


There were no occasions where the spot price in South Australia was greater than three times the South Australia weekly average price of $109/MWh.

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 were no occasions where the spot price in Tasmania was greater than three times the Tasmania weekly average price of $119/MWh.

Bidding patterns

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

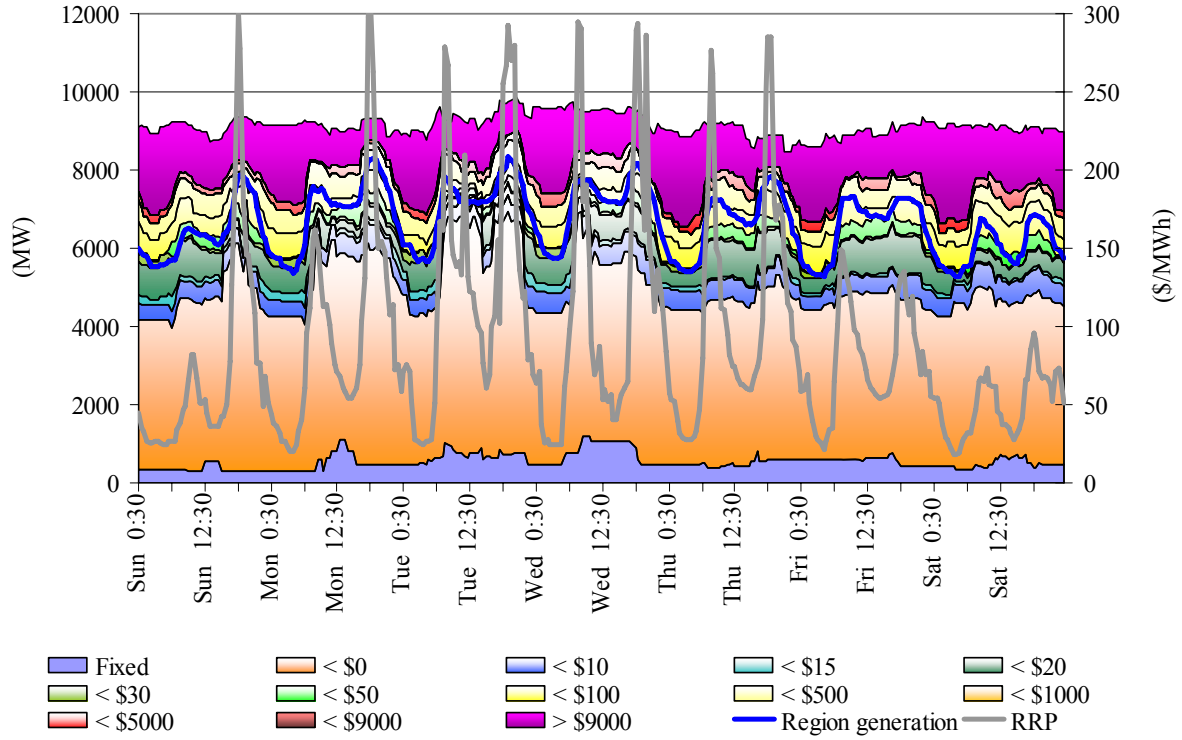


Figure 58: New South Wales closing bid prices, dispatched generation and spot price

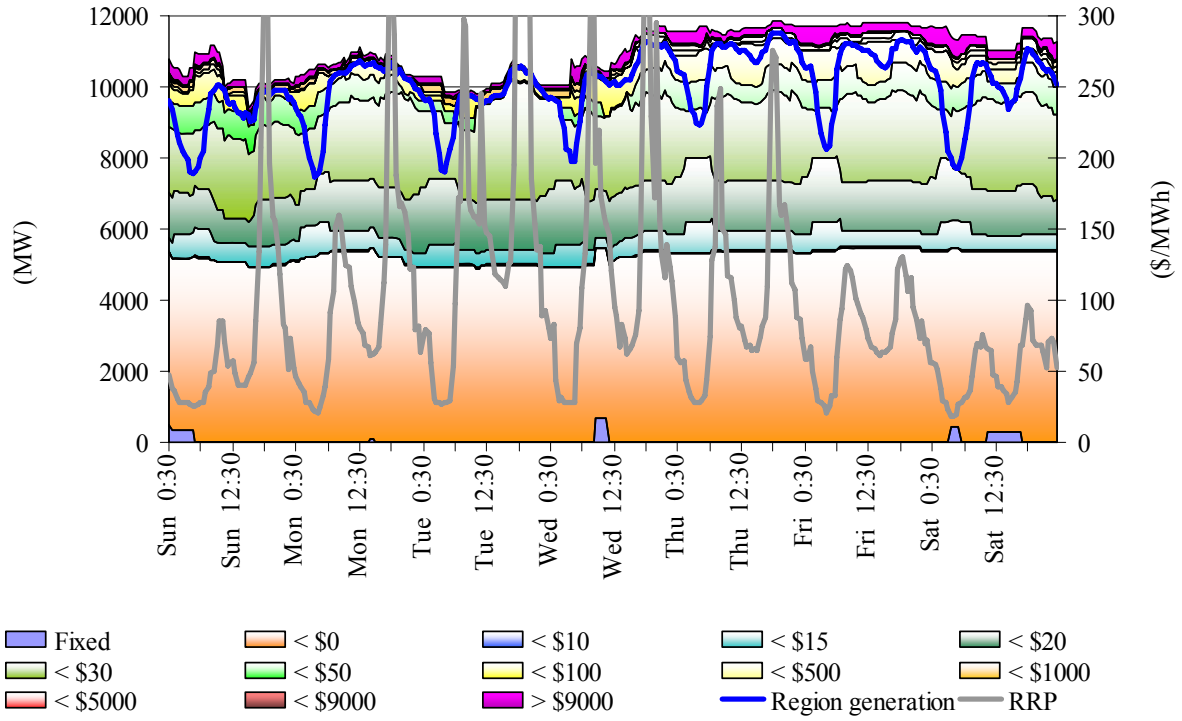


Figure 59: Victoria closing bid prices, dispatched generation and spot price

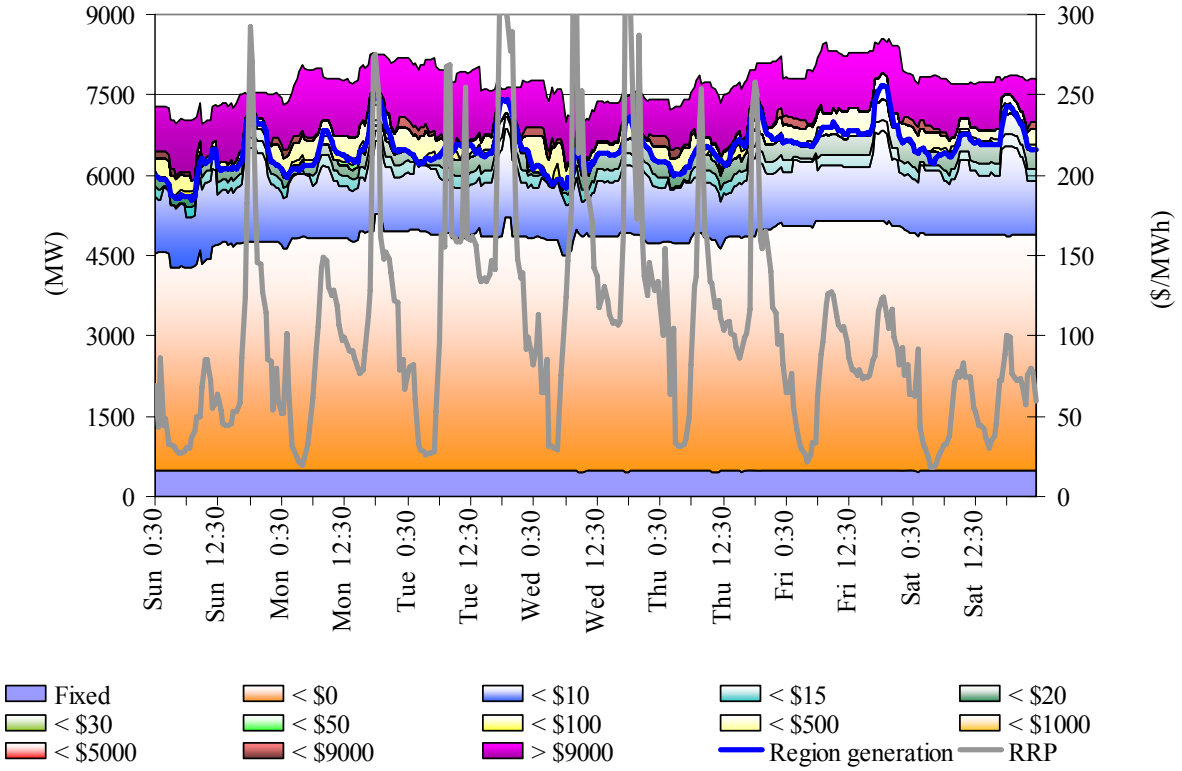


Figure 60: South Australia closing bid prices, dispatched generation and spot price

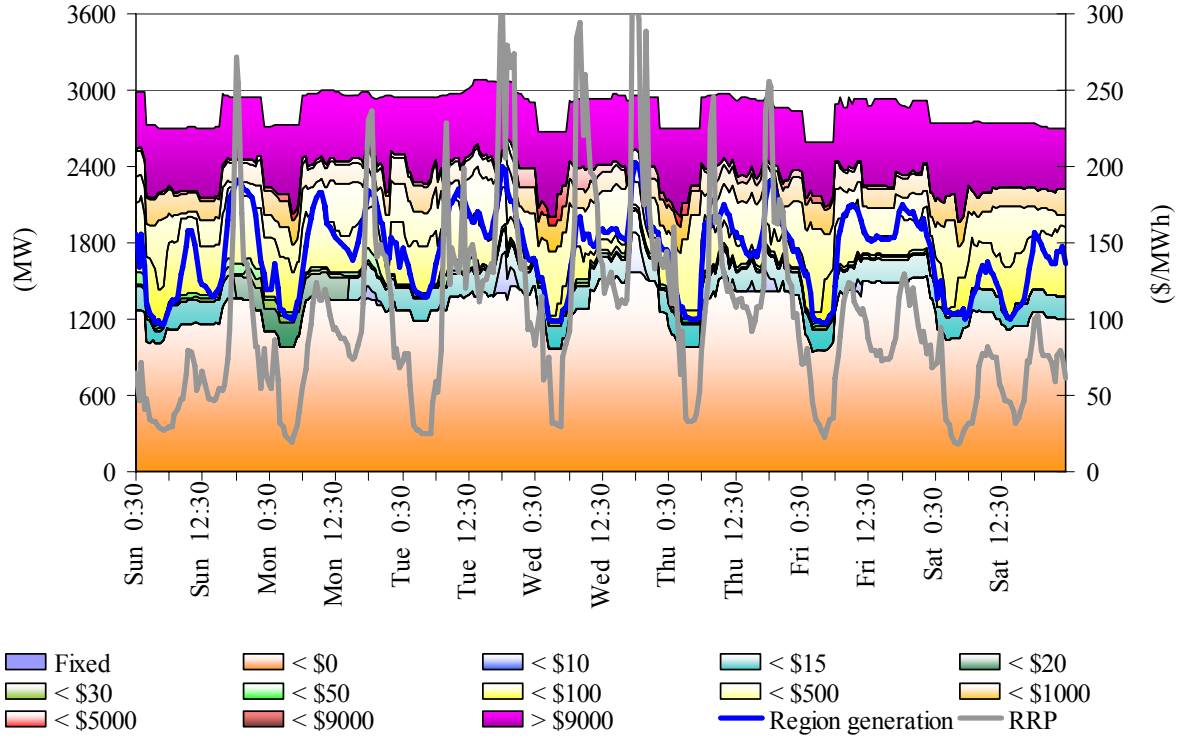
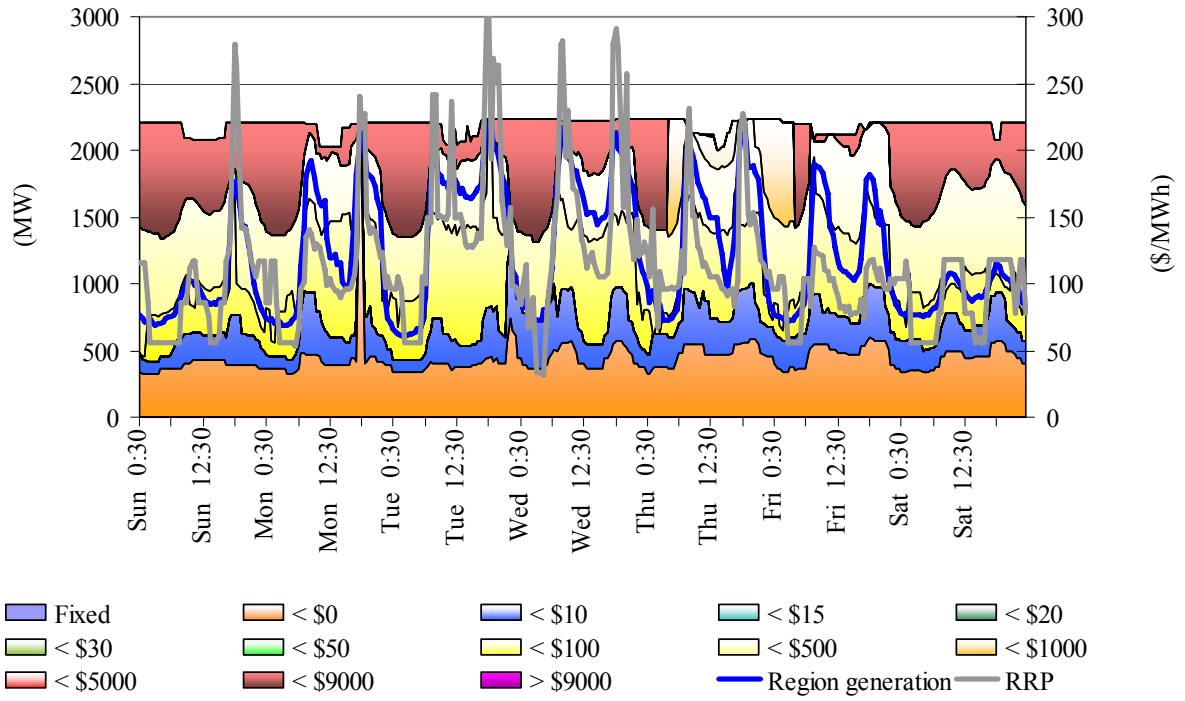


Figure 61: Tasmania closing bid prices, dispatched generation and spot price



Ancillary service market

The total cost of ancillary services on the mainland for the week was $245 000 or 0.1 per cent of turnover in the energy market. 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 ($/MW)	0.50	0.21	1.10	5.56	0.05	0.14	0.46	1.70
Previous week ($/MW)	0.67	0.25	1.00	6.00	0.07	0.21	0.47	1.76
Last quarter ($/MW)	1.76	0.73	1.15	1.54	0.39	2.28	5.00	1.93
Market Cost ($1000s)	$18	$6	$64	$121	$0	$1	$8	$26
% of energy market	0.01%	0.01%	0.01%	0.03%	0.01%	0.01%	0.01%	0.01%

The total cost of ancillary services in Tasmania for the week was $173 000 or 0.6 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.

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 ($/MW)	9.16	1.97	2.01	7.28	0.50	1.96	1.76	1.53
Previous week ($/MW)	15.53	1.99	2.76	5.07	16.89	1.92	1.51	1.43
Last quarter ($/MW)	4.97	0.49	2.93	3.00	12.67	0.43	0.82	0.45
Market Cost ($1000s)	$32	$23	$22	$35	$2	$29	$22	$8
% of energy market	0.12%	0.08%	0.08%	0.13%	0.01%	0.11%	0.08%	0.03%

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

Figure 64: daily frequency control ancillary service cost

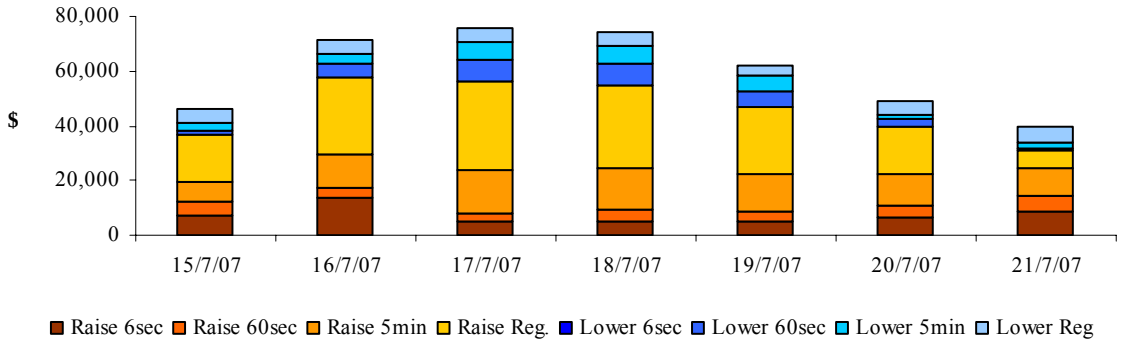
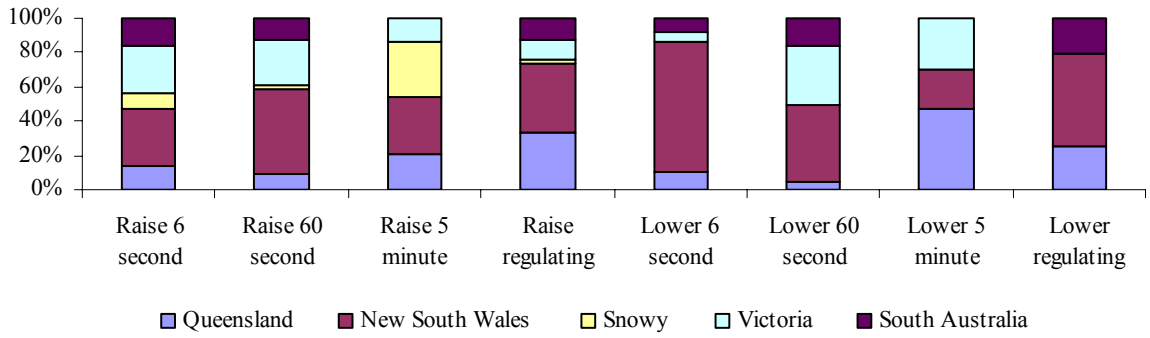


Figure 65 shows the contribution, on a percentage basis, that frequency control ancillary service providers are utilised (in each mainland region) to satisfy the total requirement for each service.

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

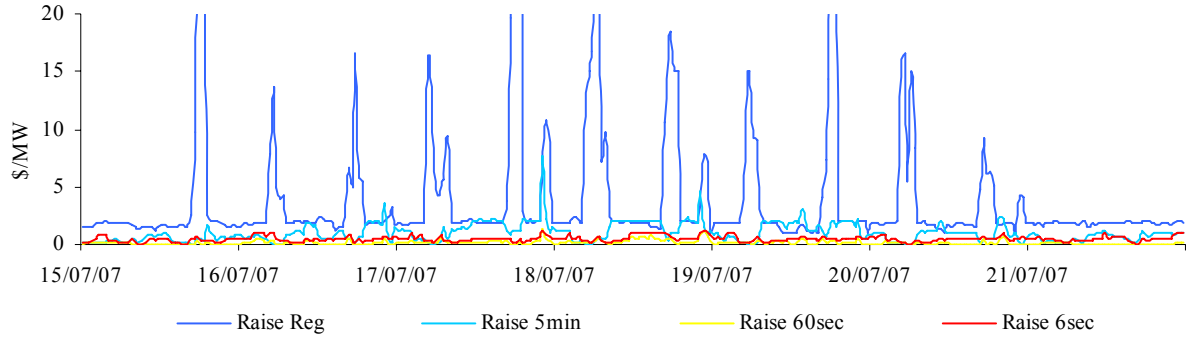


Figure 66A: prices for raise services – Tasmania

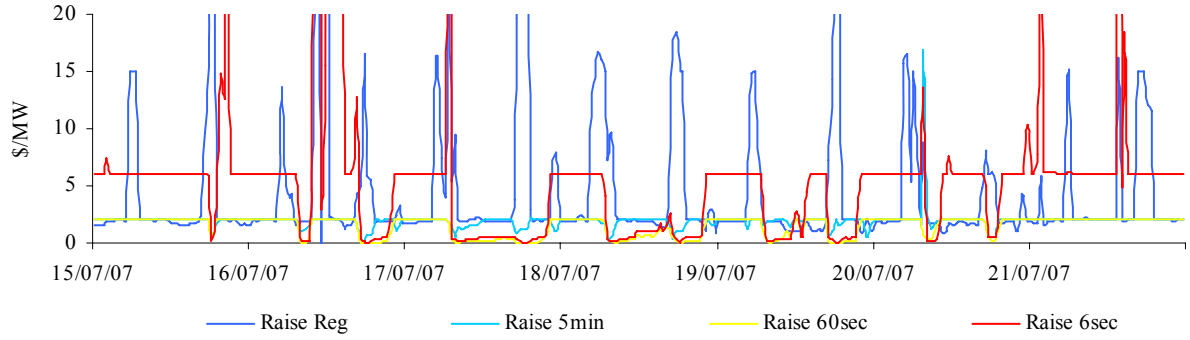


Figure 67: prices for lower services

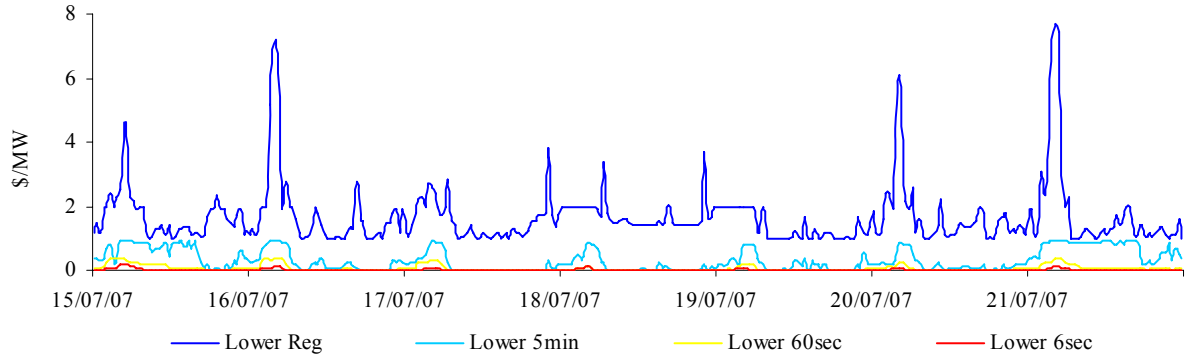
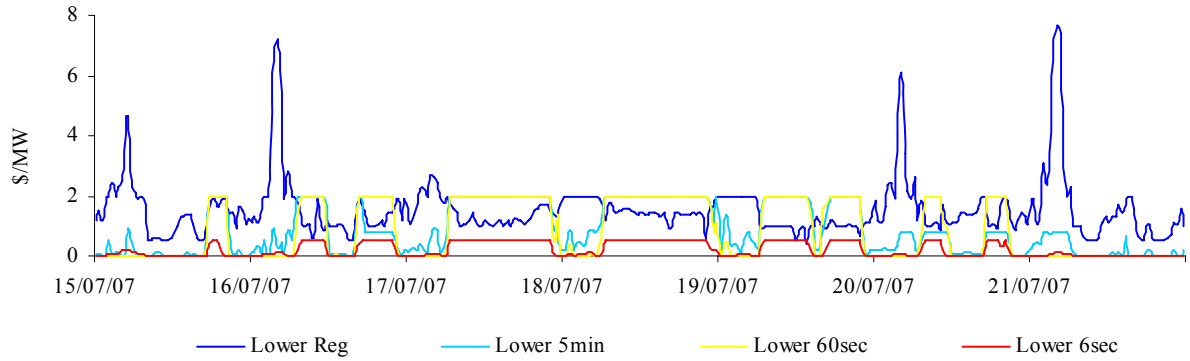


Figure 67A: prices for lower services – Tasmania



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

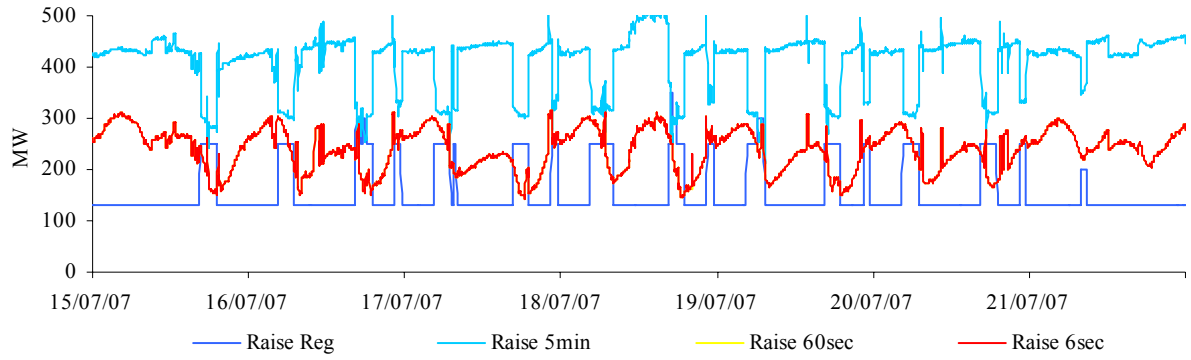


Figure 68A: raise requirements – Tasmania

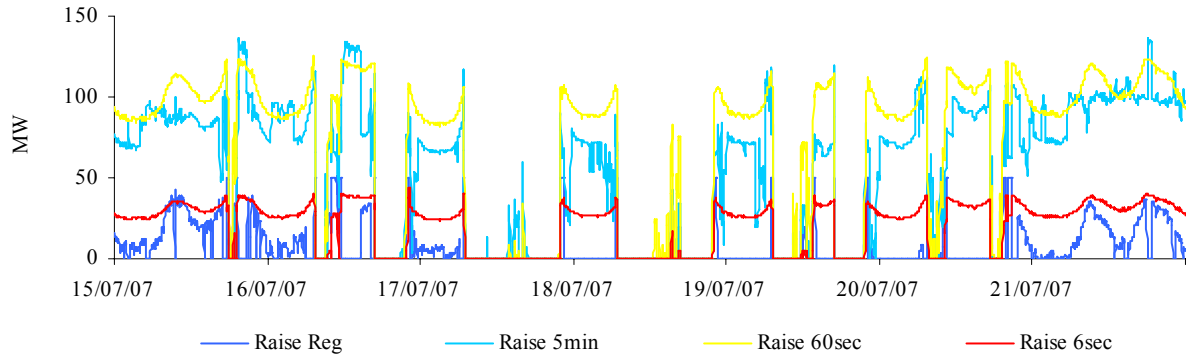


Figure 69: lower requirements

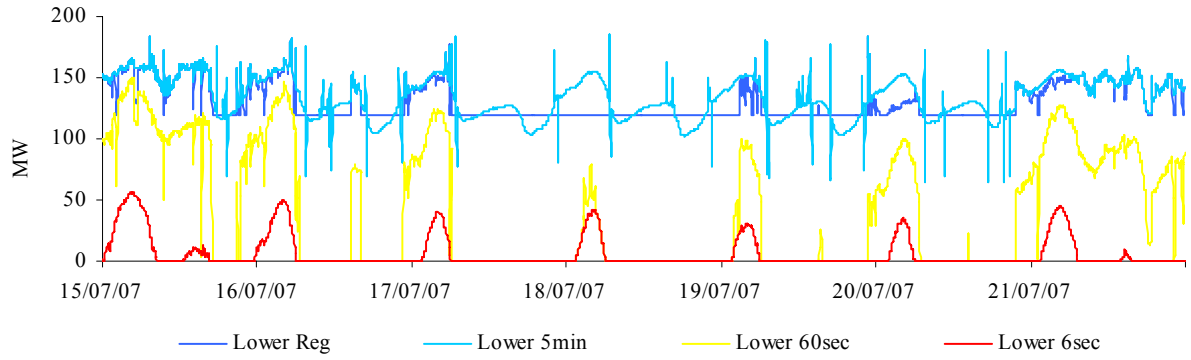
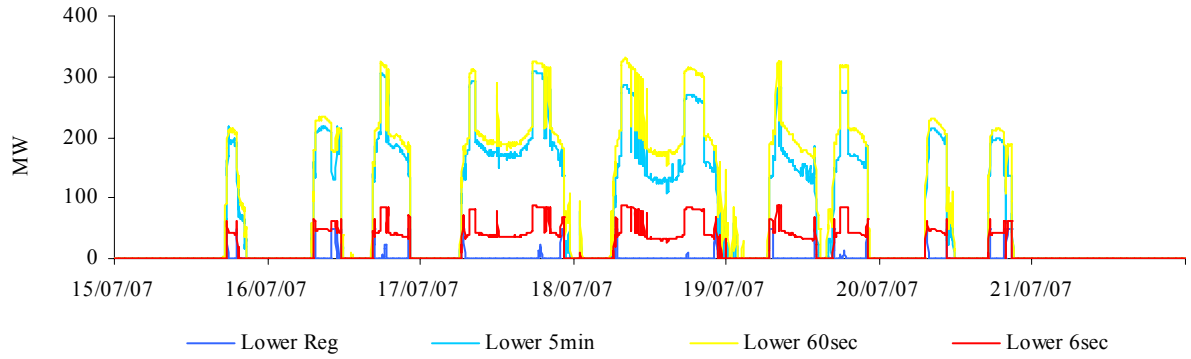


Figure 69A: lower requirements – Tasmania



Australian Energy Regulator
August 2007