Market analysis

AUSTRALIAN ENERGY REGULATOR

8 July – 14 July 2007

Summary

Spot prices for the week averaged between $94/MWh in Queensland and $111/MWh in Tasmania.

Turnover in the energy market in the week ended 14 July was $445 million. The total cost of ancillary services for the week was $485 000, or 0.1 per cent of energy market turnover.

Significant variations between actual prices and those forecast 4 and 12 hours ahead occurred in 126, 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 13 per cent of all trading intervals across the market. These variations were most frequent in Tasmania, occurring in almost a third 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

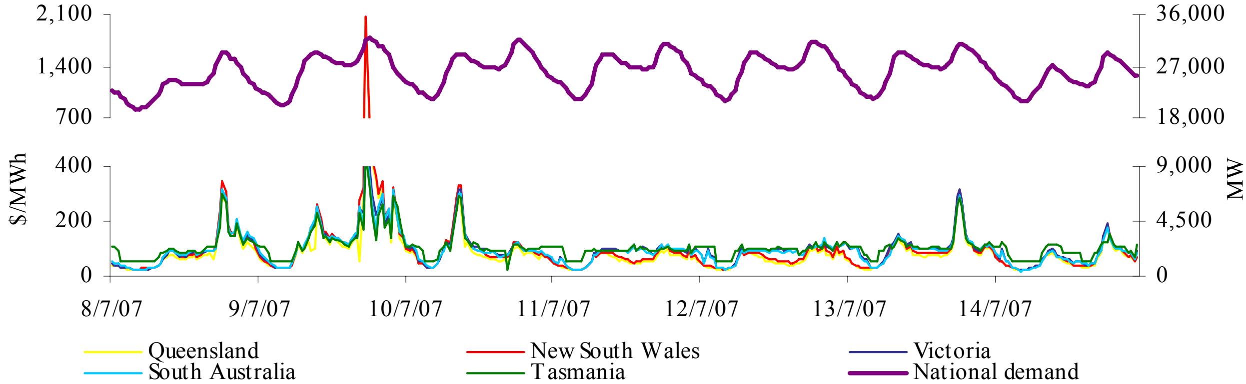


Figure 2: volume weighted average spot price for energy market ($/MWh)

	QLD	NSW	VIC	SA	TAS
Last week	94	105	104	104	111
Previous week	59	69	84	95	99
Same quarter last year	26	39	39	43	43
Financial year to date	77	88	94	100	105
% change from previous week*	▲57%	▲52%	▲24%	▲9%	▲12%
% change from same quarter last year**	▲260%	▲171%	▲165%	▲141%	▲162%
% change from year to date***	▲194%	▲112%	▲123%	▲96%	▲141%

*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

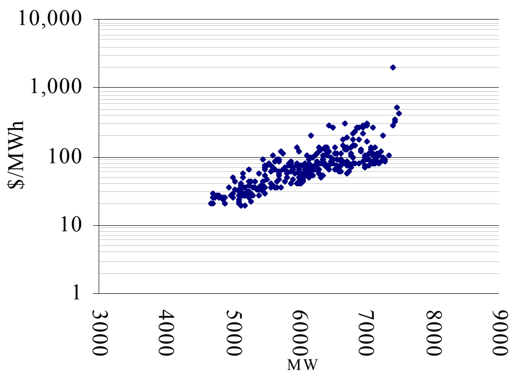


Figure 4: New South Wales

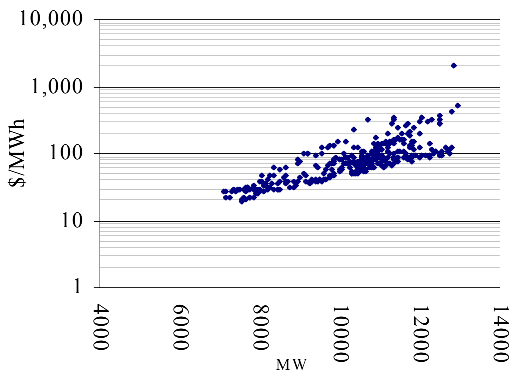


Figure 5: Victoria

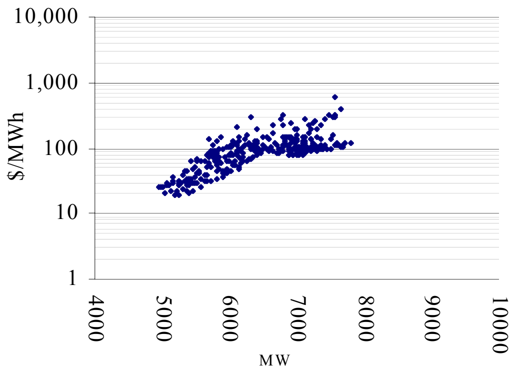


Figure 6: South Australia

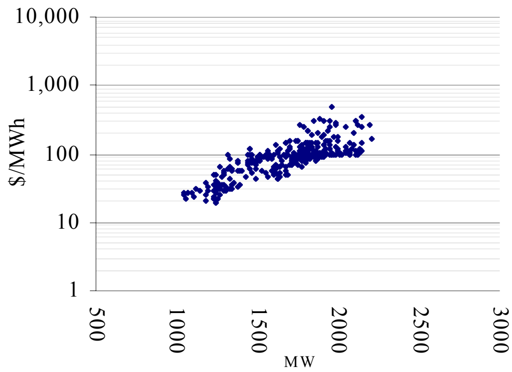
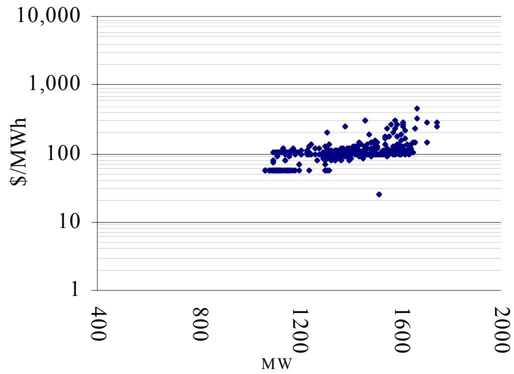


Figure 7: Tasmania



Maximum spot prices for the week ranged from $446/MWh in Tasmania to $2075/MWh in New South Wales and all occurred on Monday evening. 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	1.06	1.34	0.86	0.88	0.55
Previous week	0.67	0.55	0.33	0.48	0.21
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

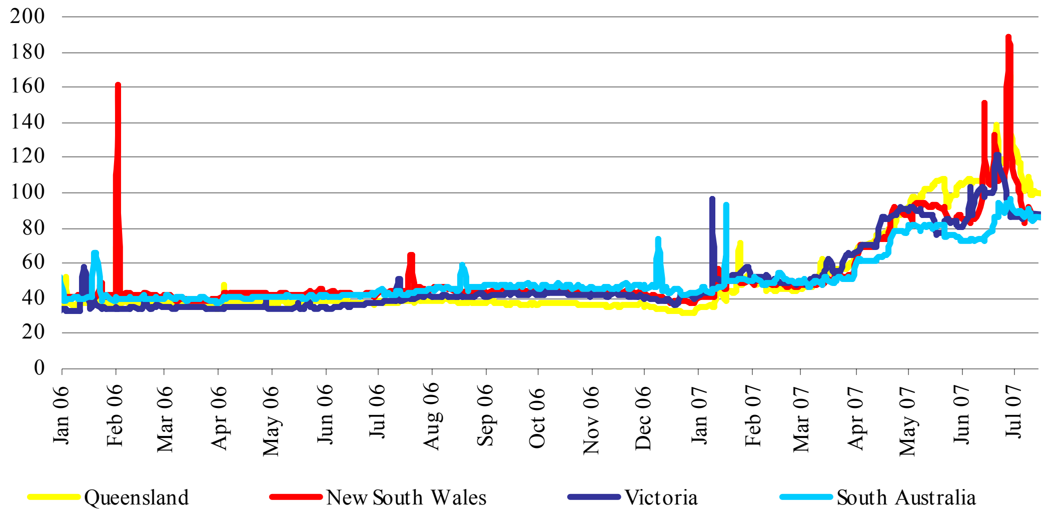
Figure 9 sets out the d-cyphaTrade wholesale electricity price index (WEPI)* for each region throughout the week excluding Tasmania. Figure 10 sets out the WEPI since 1 January 2006.

Figure 9: d-cyphaTrade WEPI for the week

	Monday	Tuesday	Wednesday	Thursday	Friday
Queensland	108.94	99.44	99.20	100.77	88.36
New South Wales	91.93	87.80	87.74	86.38	99.74
Victoria	85.87	87.45	88.13	85.69	85.90
South Australia	90.94	85.55	84.29	85.60	85.90

* 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 Monday 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

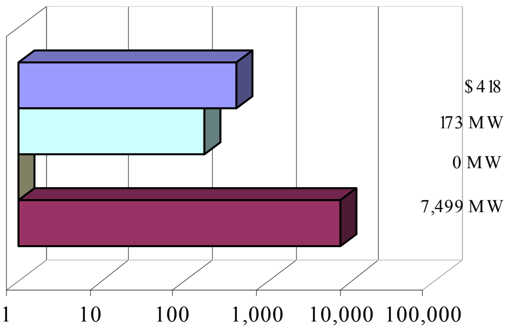


Figure 12: New South Wales

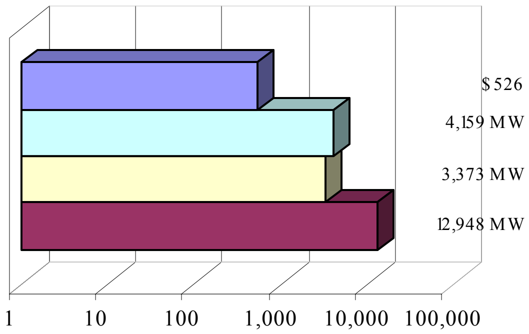


Figure 13: Victoria

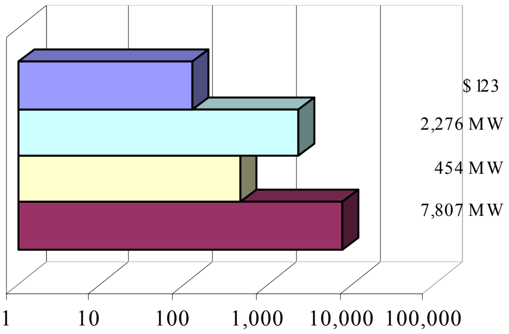


Figure 14: South Australia

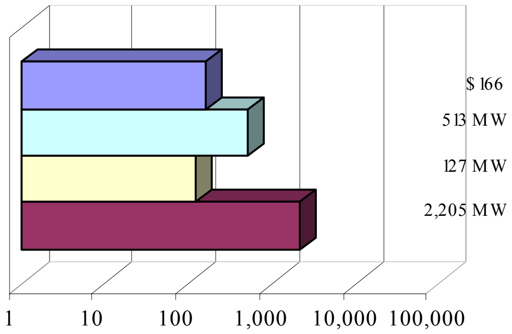
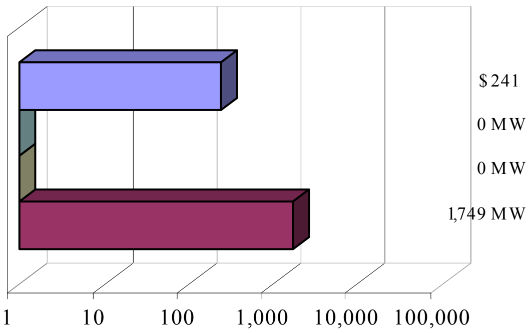


Figure 15: Tasmania



Price variations

There were 126 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

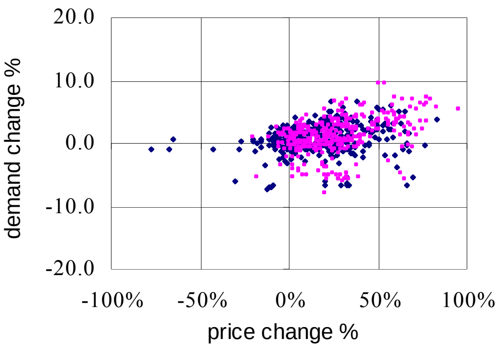


Figure 17: New South Wales

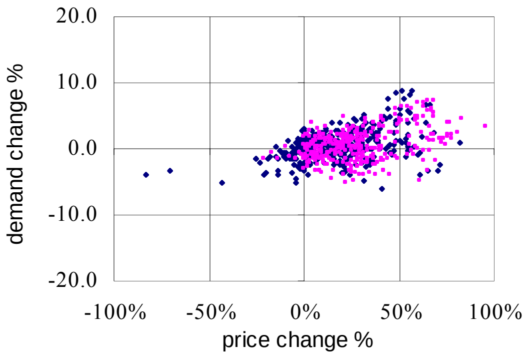
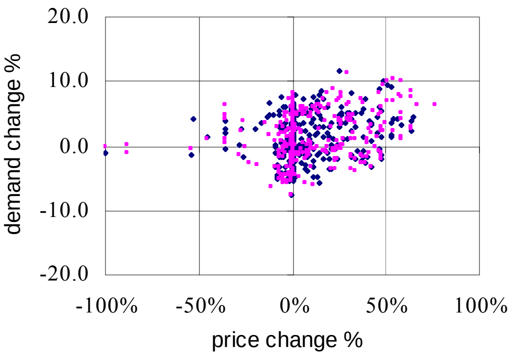


Figure 18: Victoria

Figure 19: South Australia

Figure 20: Tasmania



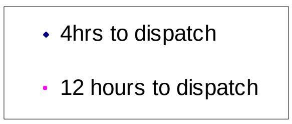
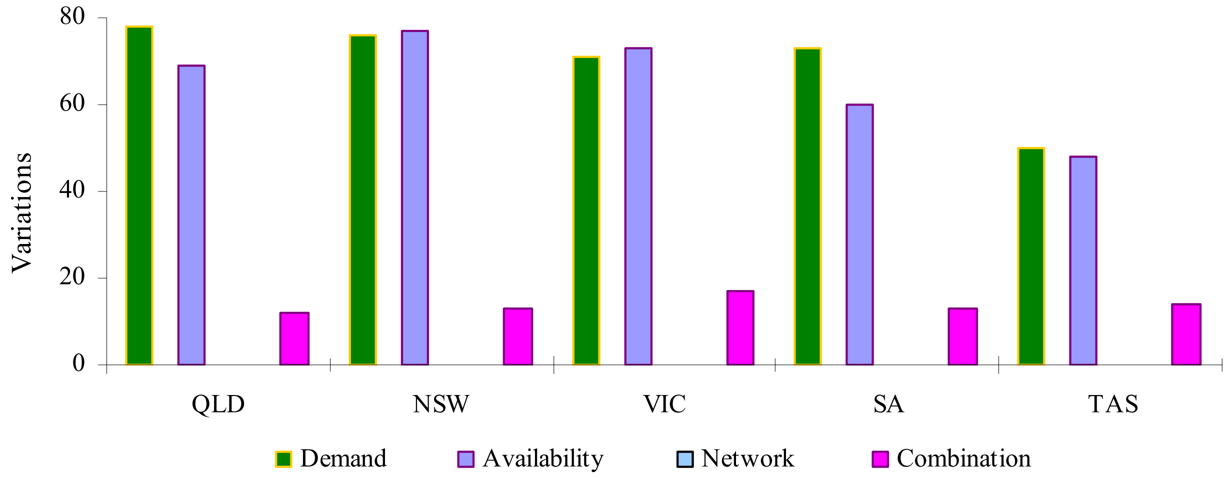


Figure 21 summarises the number and most probable reason for variations between forecast and actual prices.

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.

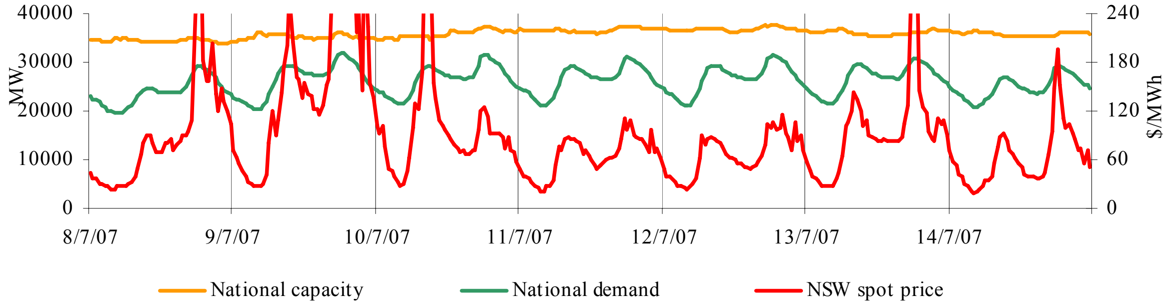
On a regional basis the differences between the maximum temperature and the temperature forecast at around 6.00 pm the day before are also included.

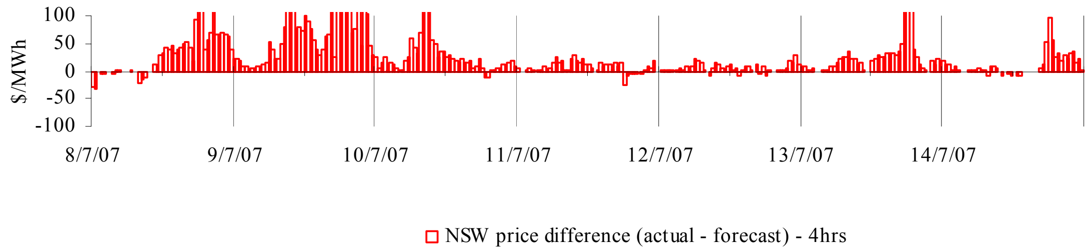
In each section, all prices for the week greater than three times the average have been presented. This threshold is used to filter the material price outcomes for the week. The actual price, demand and generator availability is compared with the forecasts made 4 and 12 hours ahead, with significant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

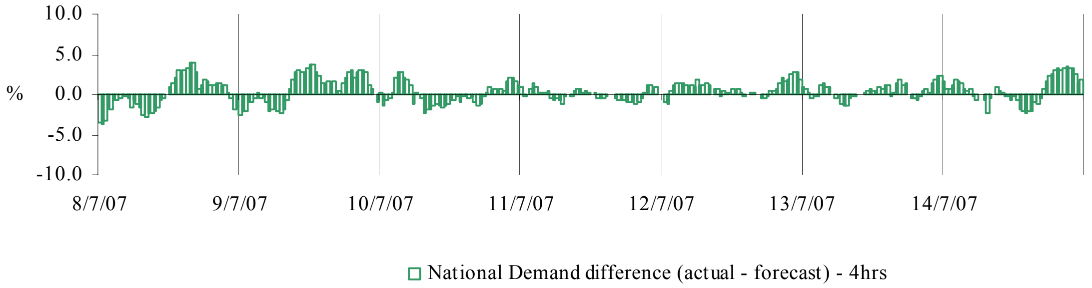
National Market

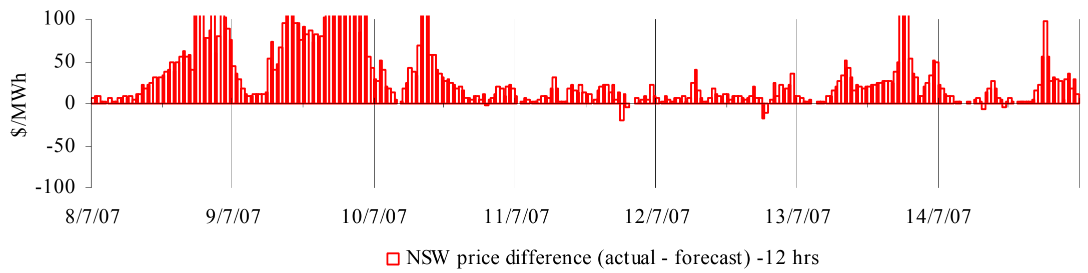
Spot prices within the national market are regularly aligned with conditions in one region reflected across all others. Figures 22-26 shows pricing events that occurred when spot prices were generally aligned across all regions of the national electricity market – the New South Wales spot price has been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

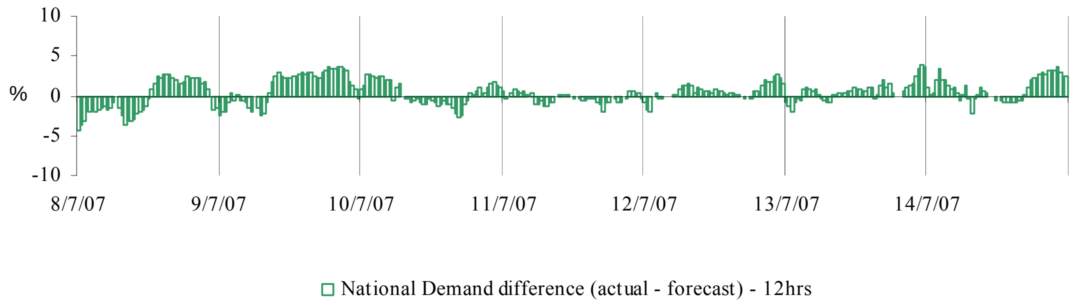
Figures 22-26: National market outcomes











There were 10 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 $105/MWh.

Sunday, 8 July

6:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	342.47	158.14	120.50
Demand (MW)	29 394	28 840	28 890
Available capacity (MW)	35 085	35 433	37 114

Conditions at the time saw demand 500 MW higher than forecast four and 12 hours ahead. Available capacity was 350 MW below forecast four hours ahead and 2000 MW below forecast 12 hours ahead.

Import capability into New South Wales across QNI was reduced from around 1100 MW to 800 MW between 6 pm and 6.45 pm, as a result of a normal network constraint.

From 6.32 am Macquarie Generation reduced the available capacity of its four Bayswater units by a total of 200 MW, all of which was priced below $100/MWh. The rebid reasons given were “FF DP limit” and “Milling then FF DP limit”.

From 8.56 am Delta Electricity delayed the return to service of both Vales Point units, reducing available capacity by 1320 MW. All of this capacity was priced below $20/MWh.

At 3.02 pm as a result of a delay in the return to service International Power reduced the available capacity of Hazelwood unit four by 200 MW all priced below $20/MWh. The reason given was “Revised synch time”. At 3.09 pm 50 MW of capacity at Hazelwood was shifted from prices above $9000/MWh to below $20/MWh. The reason given was “Portfolio management”.

At around 6 pm Loy Yang A unit three tripped from 580 MW. All of this capacity was priced below $10/MWh.

At 6.02 pm, effective from 6.10 pm Eraring Energy rebid 120 MW of available capacity at Shoalhaven priced at $305/MWh to prices above $500/MWh. The reason given was “Avoid stop/start Shgen”.

At 6.03 pm, effective 6.10 pm TRU Energy rebid 120 MW of capacity at Hallett from prices below $300/MWh to above $550/MWh. The reason given was “Fin opt::bandshift up:: uneconomic start”.

There was no other significant rebidding.

Monday, 9 July

5:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	326.30	300.00	79.35
Demand (MW)	29 976	29 811	29 279
Available capacity (MW)	35 822	35 686	38 072
6:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	2075.44	363.45	94.26
Demand (MW)	31 528	31 102	30 570
Available capacity (MW)	36 214	35 698	38 073
6:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	526.19	363.52	97.51
Demand (MW)	31 918	31 234	30 932
Available capacity (MW)	36 158	35 719	37 944

7:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	428.31	318.33	96.00
Demand (MW)	31 759	30 853	30 629
Available capacity (MW)	35 772	35 719	37 944
7:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	362.18	165.76	87.34
Demand (MW)	31 236	30 315	30 136
Available capacity (MW)	35 617	36 009	37 944
8:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	345.76	276.25	82.03
Demand (MW)	30 377	29 518	29 257
Available capacity (MW)	35 189	35 677	37 919
10:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	324.14	151.51	136.89
Demand (MW)	26 829	26 545	26 368
Available capacity (MW)	35 005	35 477	35 766

Conditions at the time saw demand up to 900 MW higher than that forecast four hours ahead and up to 1100 MW higher than forecast 12 hours ahead. Available capacity was up to 500 MW below forecast four hours ahead and up to 2700 MW below forecast 12 hours ahead.

At 5.40 pm exports from Snowy to New South Wales reached its limit of just over 3000 MW. As a result prices in Queensland and New South Wales diverged from the rest of the market for two dispatch intervals reaching just over $4000/MWh.

At 8.48 am CS Energy reduced its capacity at Kogan Creek by 300 MW due to commissioning issues.

Rebids from 9.26 am by Delta Electricity delayed the return to service of Vales Point unit six, reducing available capacity by 660 MW, all of which was priced below $20/MWh. The reason given was “Return to service::capacity change”. From 11.25 am the availability of Munmorah unit four was reduced by 60 MW all priced below $20/MWh. The rebid reason given was “CW pump::capacity limit change”. A rebid at 4.28 pm during the return to service of Vales Point unit five saw a reduction in capacity by 410 MW, all priced below $20/MWh. The reason given was “Stator water::capacity limit change”.

From 9.45 am over several rebids Macquarie Generation reduced capacity across its portfolio by 1000 MW, with 940 MW of this capacity priced below $230/MWh. The reasons given related to milling and coal issues. At 5.00 pm the availability of Liddell was increased by 800 MW. Half of this capacity was priced below $450/MWh. The reason given was “forecast LRC – increase avail for evening peak”.

At 3.21 pm International Power increased capacity at Pelican Point by 240 MW all of which was priced below $50/MWh. The reason given was “Fuel management”. At 5.17 pm capacity was reduced by 187 MW with the rebid reason given “Recently advised plant condition”. Effective from 5.40 pm capacity was increased by 107 MW all of which was priced below $50/MWh. The reasons given were “Updated RTS conditions” and “Updated RTS profile”.

There was no other significant rebidding.

Tuesday, 10 July

9:00 am	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	333.21	96.84	122.09
Demand (MW)	29 161	29 688	29 393
Available capacity (MW)	35 551	37 247	36 282
9:30 am	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	331.98	93.64	101.09
Demand (MW)	29 121	29 547	29 300
Available capacity (MW)	34 735	37 282	36 282

Conditions at the time saw demand up to 520 MW lower than that forecast four hours ahead. Available capacity was up to 2500 MW below that forecast four hours ahead and up to 1500 MW below forecast 12 hours ahead.

From 3.35 am Delta Electricity delayed the return to service of Munmorah unit four reducing available capacity by 210 MW all of which was priced below zero. From 5.20 am the return to service of Vales Point unit six was also delayed reducing available capacity by 660 MW all of which was priced below $20/MWh. The reason given was "Return to service::capacity limit change". At 8.51 am available capacity at Vales Point unit five was reduced by 340 MW all of which was priced below $20/MWh. Effective from 9.20 am the availability of Vales Point unit five increased by 80 MW priced at zero. The reason given for each rebid was "Plant condition::capacity limit change".

From 2.42 am Macquarie Generation reduced available capacity across Liddell units one, two and three by a total of 545 MW, the majority of which was priced below $250/MWh. The rebid reasons were "Milling limit wet and sloppy coal", "Milling limit", PA fan failure" and "revised PA fan limit". From 5.22 am available capacity across Bayswater units one, three and four was reduced by a total of 980 MW all priced below $100/MWh. The rebid reasons given were "Milling limit wet and sloppy coal", "Milling limit" and "revised milling limit".

At 8.42 am CS Energy reduced its capacity at Kogan Creek by 290 MW. Effective at 9.25 am capacity at Kogan Creek was increased by 70 MW. The reason given for both rebids was "Kogan commissioning".

There was no other 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 10 occasions where the spot price in Queensland was greater than three times the Queensland weekly average price of $94/MWh. Eight of these occurred when prices were generally aligned across all regions and are detailed in the national market outcomes section. The remaining two occasions are presented below.

Monday, 9 July

8:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	287.62	144.79	75.38
Demand (MW)	7415	6984	6946
Available capacity (MW)	9574	9953	9947

Conditions at the time saw demand 450 MW higher than that forecast four and 12 hours ahead. Available capacity was 350 MW below that forecast four and 12 hours ahead.

The spot price in Queensland for the 8.00 pm trading interval was marginally greater than three times the Queensland weekly average price. Prices were generally aligned across all regions for this trading period. Conditions at the time are detailed in the National Market section.

Friday, 13 July

6:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	287.32	116.56	94.22
Demand (MW)	7016	7143	7045
Available capacity (MW)	9443	9450	9889

Conditions at the time saw demand close to that forecast four and 12 hours ahead. Available capacity was close to that forecast four hours ahead but 450 MW below forecast 12 hours ahead. Prices were aligned nationally with significant reductions in available generation in Victoria.

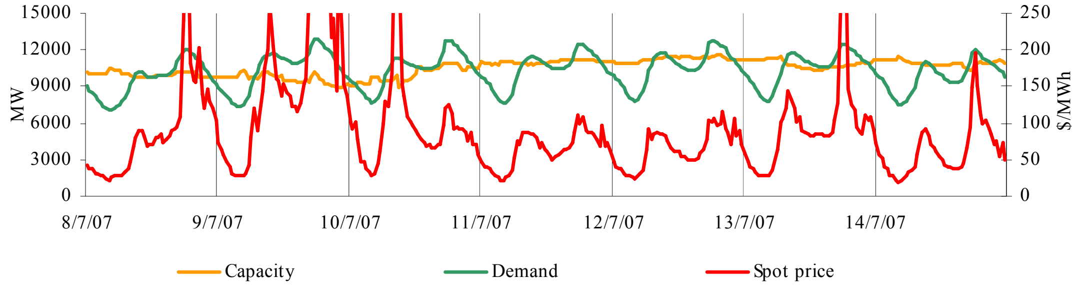
At 8.14 am Millmerran Energy’s unit one tripped, reducing available capacity by 435 MW which was all priced below $10/MWh. The rebid reason given was “Changed plant conditions”.

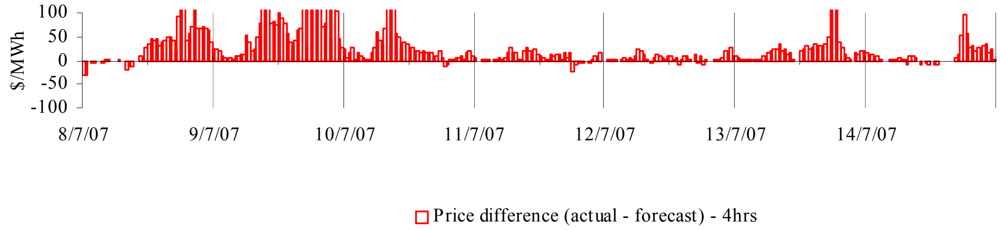
There was no other significant rebidding.

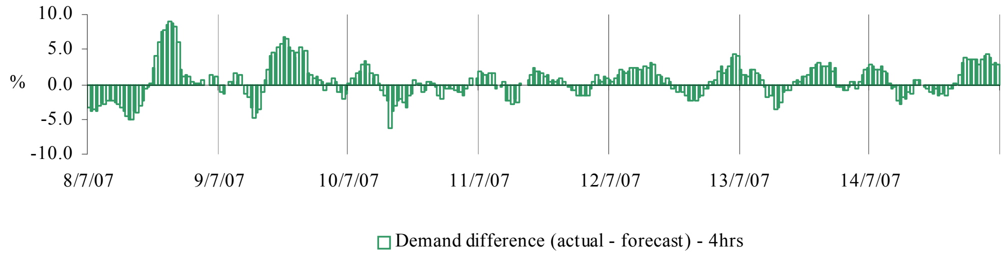
New South Wales

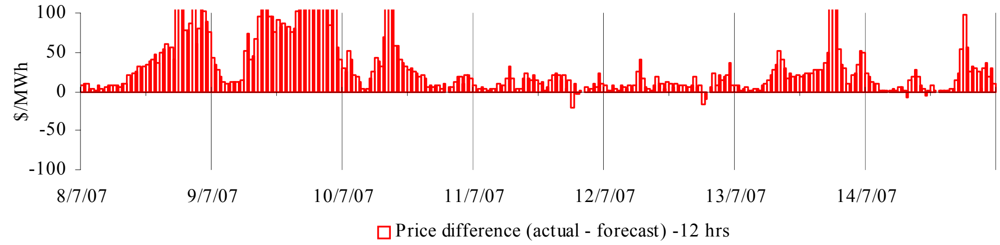
Figures 33-38 show spot market prices in New South Wales over the week along with actual demand and differences between actual and forecast demand and prices.

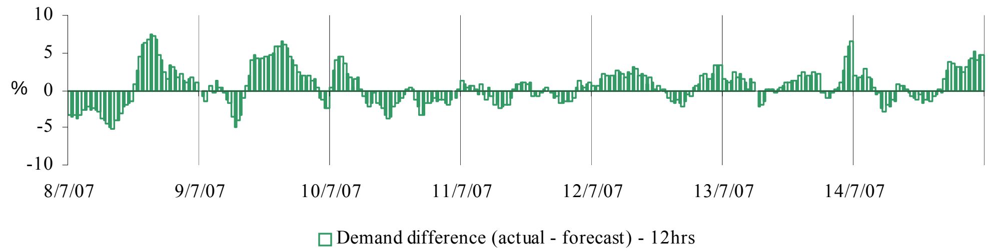
Figures 33-38 New South Wales actual spot price, demand and forecast differences

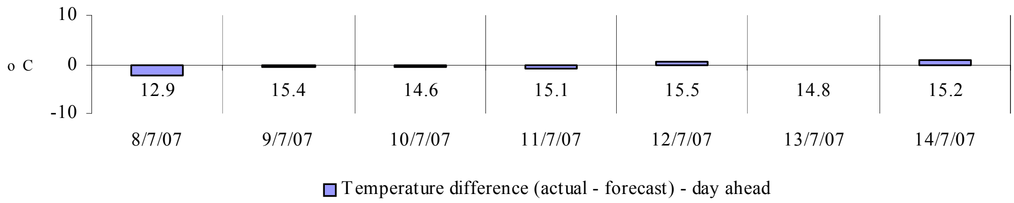










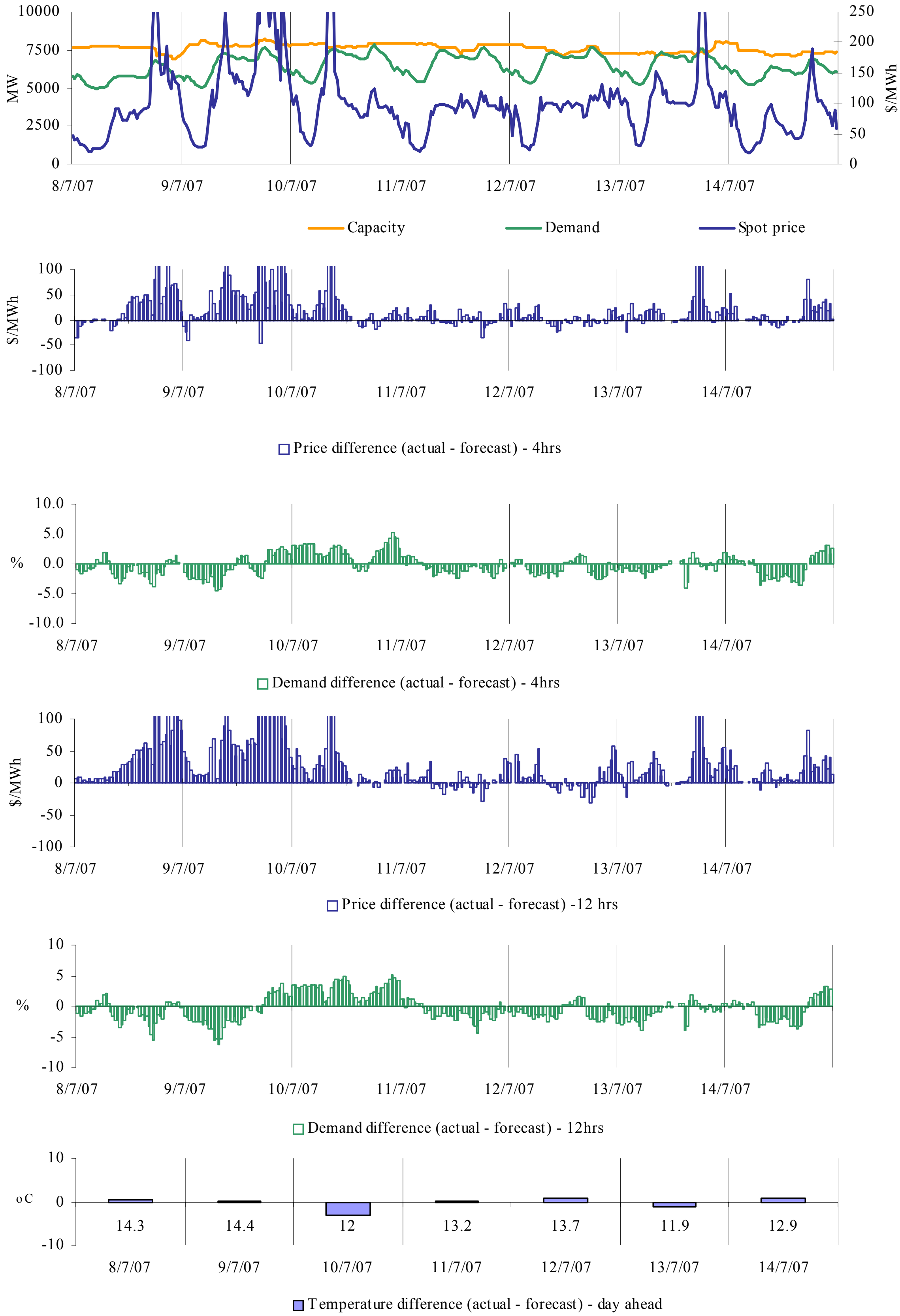


There were ten occasions where the spot prices in New South Wales were greater than three times the New South Wales weekly average price of $105/MWh. All of these occurred when prices were generally aligned across all regions and are detailed in the national market outcomes section.

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 were six occasions where the spot price in Victoria was greater than three times the Victoria weekly average price of $104/MWh. Five of these occurred when prices were generally aligned across all regions and are detailed in the national market outcomes section. The remaining one occasion is presented below.

Friday, 13 July

6:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	317.98	126.46	106.25
Demand (MW)	7577	7550	7545
Available capacity (MW)	7344	7781	8371

Conditions at the time saw demand close to that forecast four and 12 hours ahead. Available capacity was 450 MW below forecast four hours ahead and 1000 MW below forecast 12 hours ahead.

At 1.43 pm Loy Yang Marketing Management delayed the return to service of Loy Yang unit two, reducing capacity by 520 MW all priced below $20/MWh. From 3.32 pm available capacity at Loy Yang unit four was reduced by 275 MW all priced below $20/MWh. The reasons given were “Revised plant limits” and “IDF vibes”.

From 2.28 pm Hazelwood Power delayed the return to service of Hazelwood unit three, reducing available capacity by 220 MW all priced below $20/MWh. The reasons given were “Recently advised plant condition” and “Delayed RTS”.

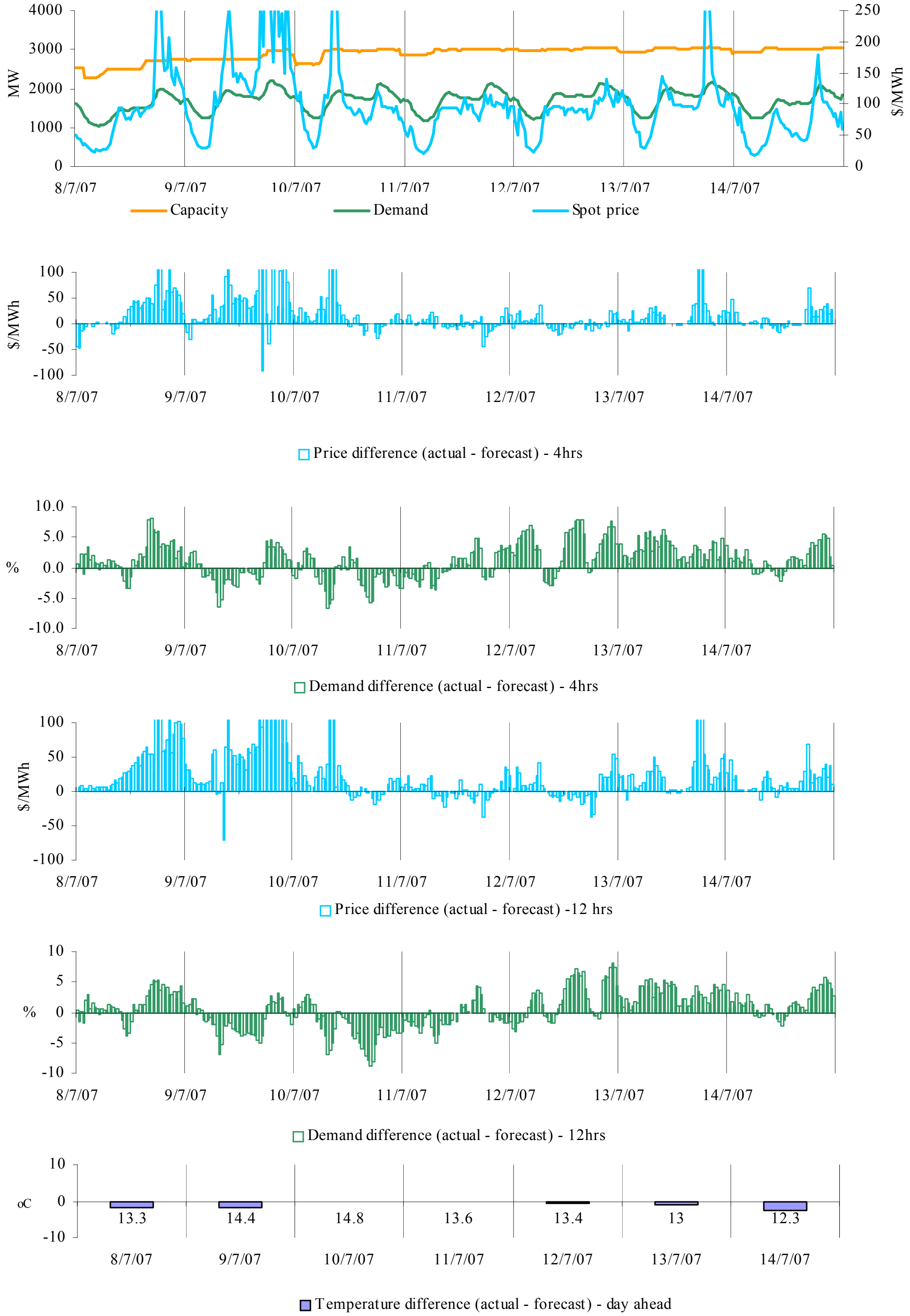
At 3.18 pm Ecogen Energy rebid 200 MW of capacity at Newport from prices below $55/MWh to above $9800/MWh. The reason given was “Band adj due to gas market risk”.

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

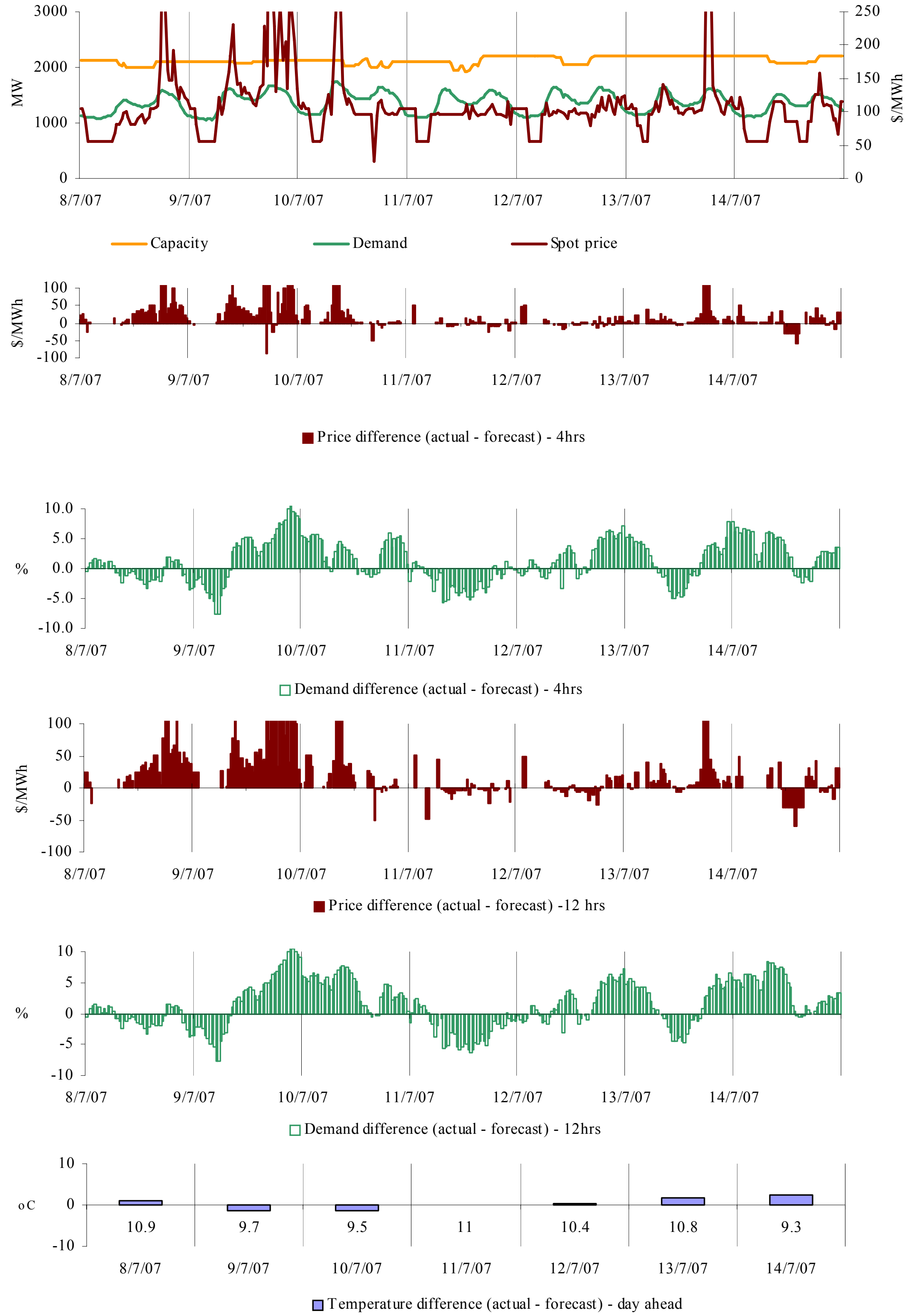


There were four occasions where the spot prices in South Australia were greater than three times the South Australia weekly average price of $104/MWh. All of these occurred when prices were generally aligned across all regions and are detailed in the national market outcomes section.

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 one occasion where the spot price in Tasmania was greater than three times the Tasmania weekly average price of $111/MWh. This occurred when prices were generally aligned across all regions and is detailed in the national market outcomes section.

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

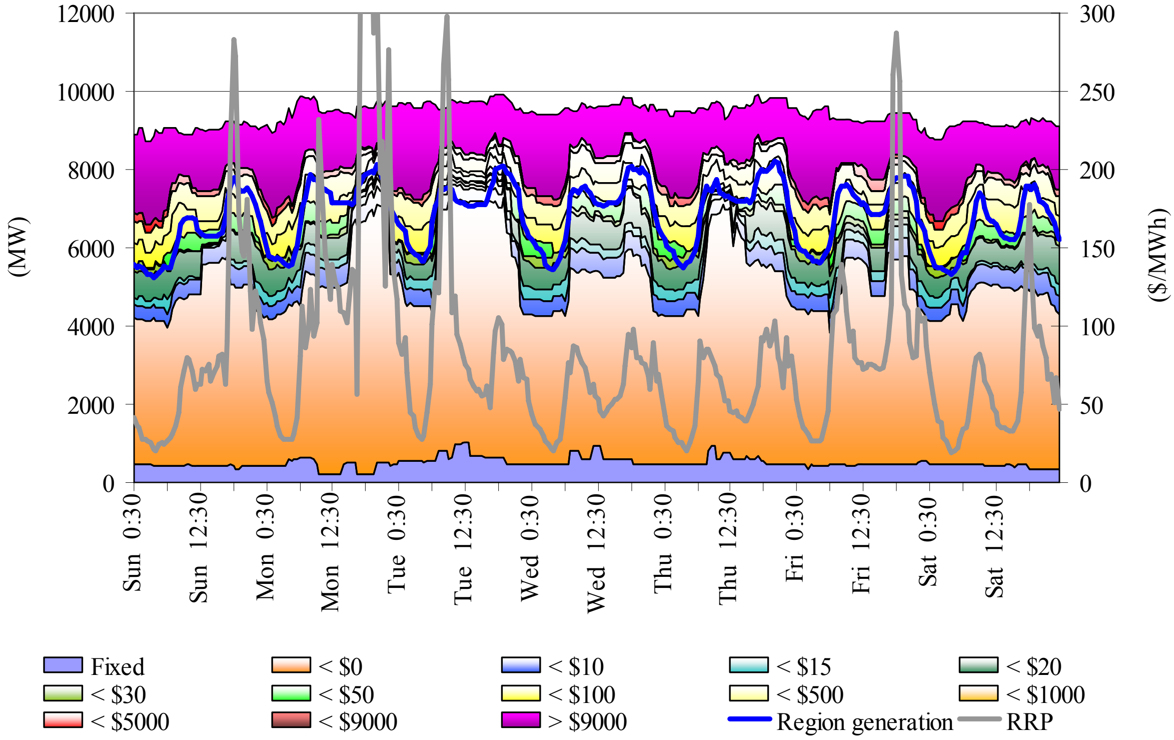


Figure 58: New South Wales closing bid prices, dispatched generation and spot price

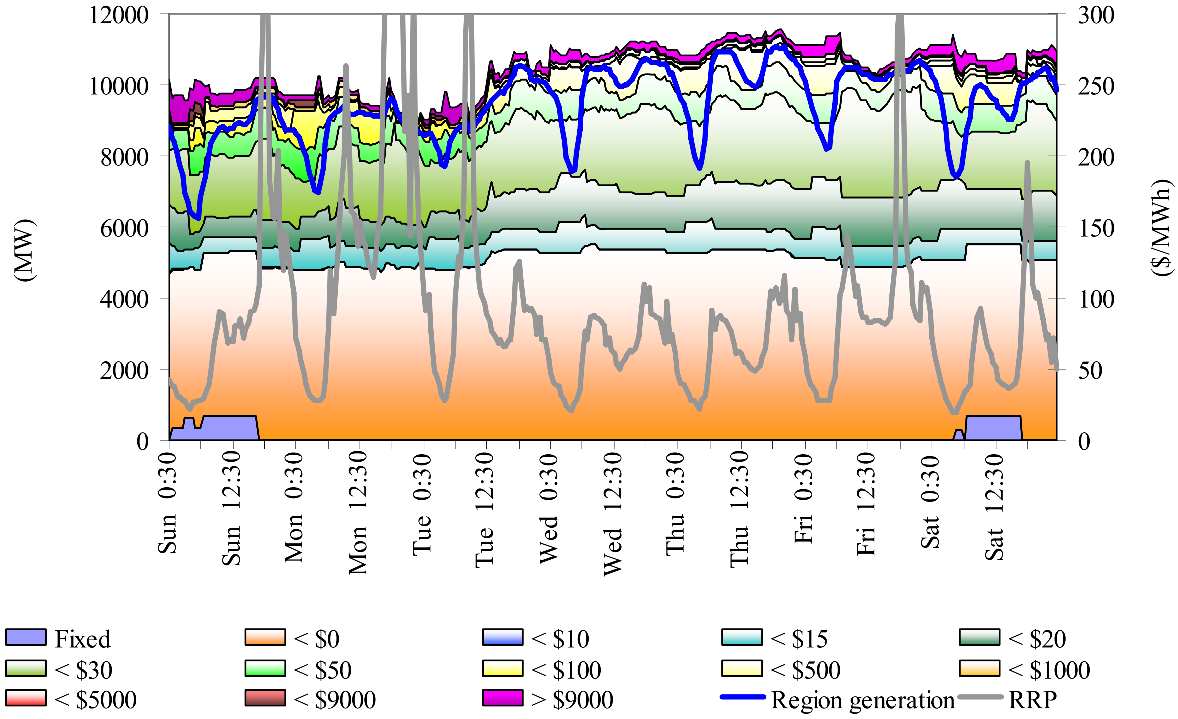


Figure 59: Victoria closing bid prices, dispatched generation and spot price

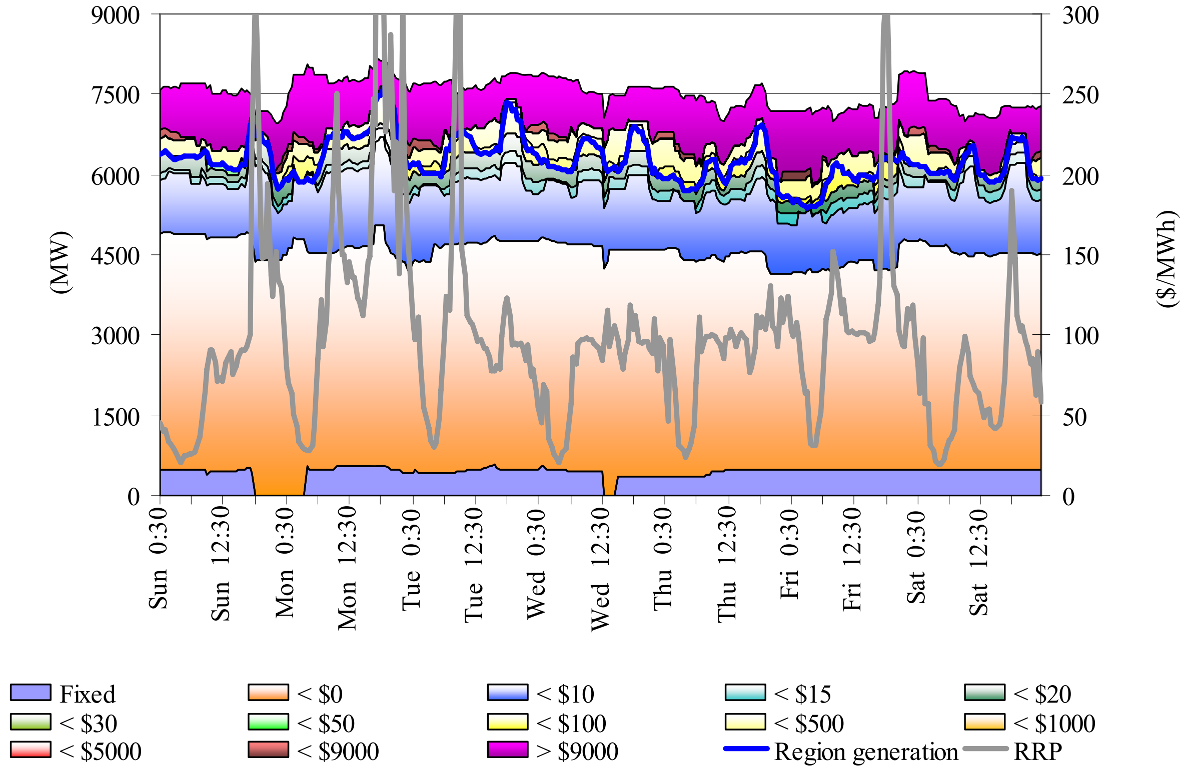


Figure 60: South Australia closing bid prices, dispatched generation and spot price

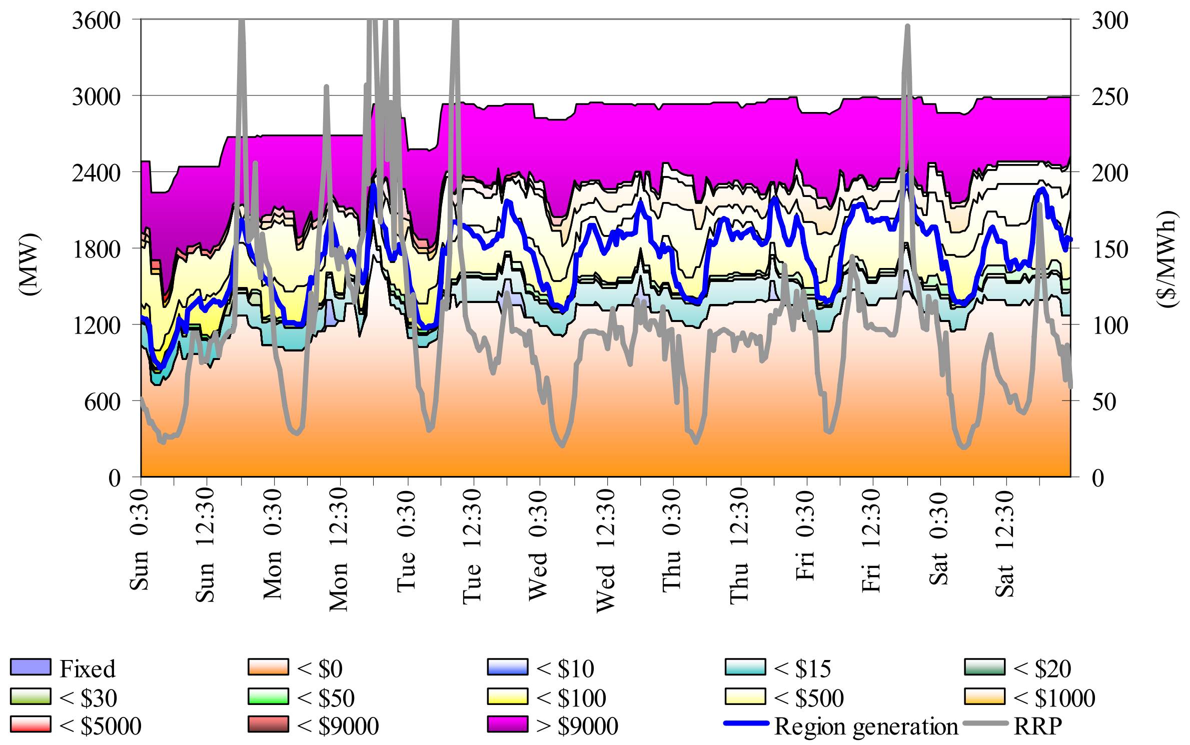
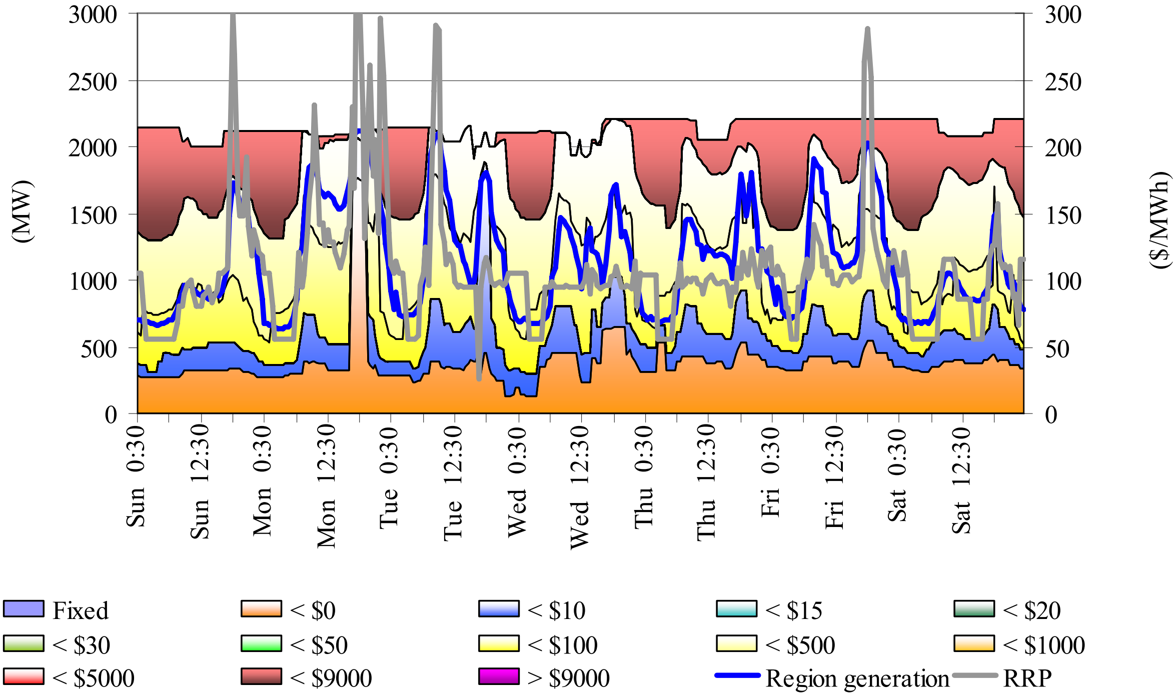


Figure 61: Tasmania closing bid prices, dispatched generation and spot price



Ancillary service market

The total cost of ancillary services on the mainland for the week was $255 000 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 ($/MW)	0.67	0.25	1.00	6.00	0.07	0.21	0.47	1.76
Previous week ($/MW)	0.72	0.30	0.83	4.82	0.09	0.17	0.37	1.93
Last quarter ($/MW)	1.76	0.73	1.15	1.54	0.39	2.28	5.00	1.93
Market Cost ($1000s)	$25	$7	$57	$128	$0	$2	$9	$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 $231 000 or 0.9 per cent of turnover in the Tasmanian energy market. On Tuesday raise 6 second service reached $10 000/MW at 2.50 am when the only available capacity was priced at $10 000/MW. Between 8.30 am and 9.30 am limited availability of lower 6 second services resulted in a trade off between energy and this service, and prices increased to above $300/MW. 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 ($/MW)	15.53	1.99	2.76	5.07	16.89	1.92	1.51	1.43
Previous week ($/MW)	6.54	2.00	2.11	3.79	4.05	1.91	1.43	1.90
Last quarter ($/MW)	4.97	0.49	2.93	3.00	12.67	0.43	0.82	0.45
Market Cost ($1000s)	$66	$28	$33	$25	$37	$21	$13	$8
% of energy market	0.26%	0.11%	0.13%	0.10%	0.14%	0.08%	0.05%	0.03%

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

Figure 64: daily frequency control ancillary service cost

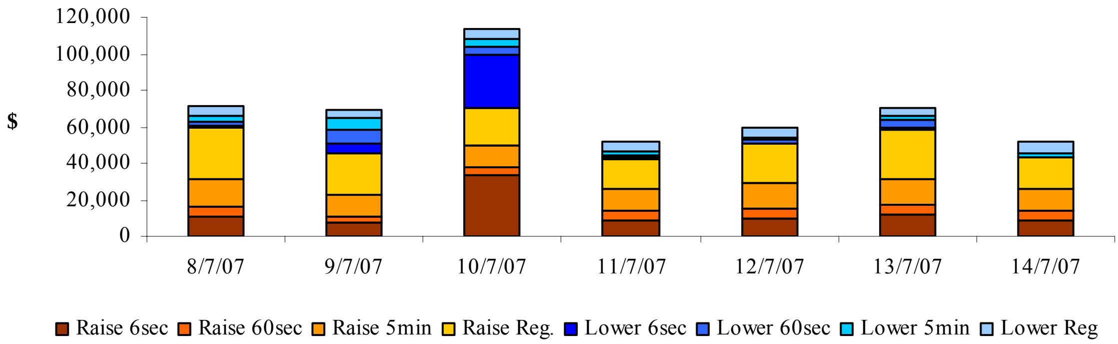
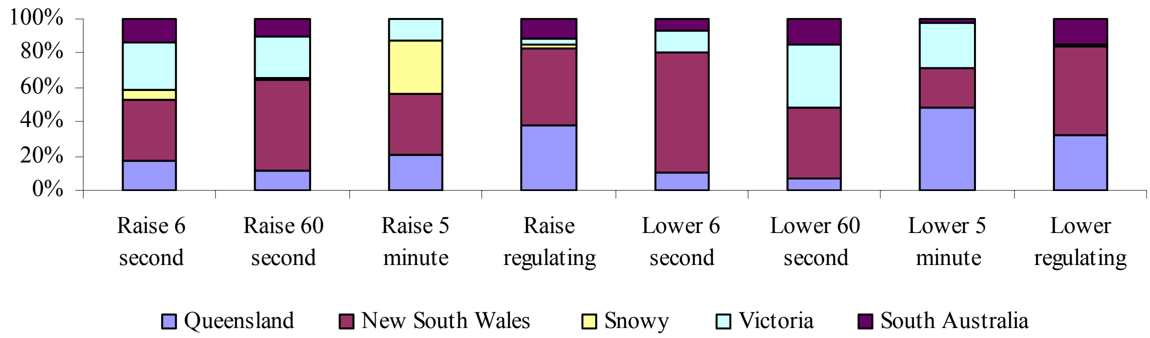


Figure 65 shows the contribution, on a percentage basis, that frequency control ancillary service providers are utilised (in each mainland region) to satisfy the total requirement for each service.

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

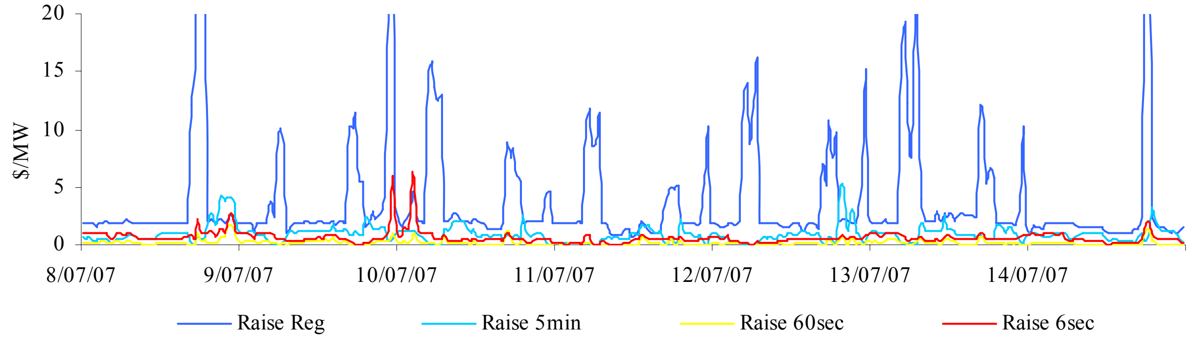


Figure 66A: prices for raise services – Tasmania

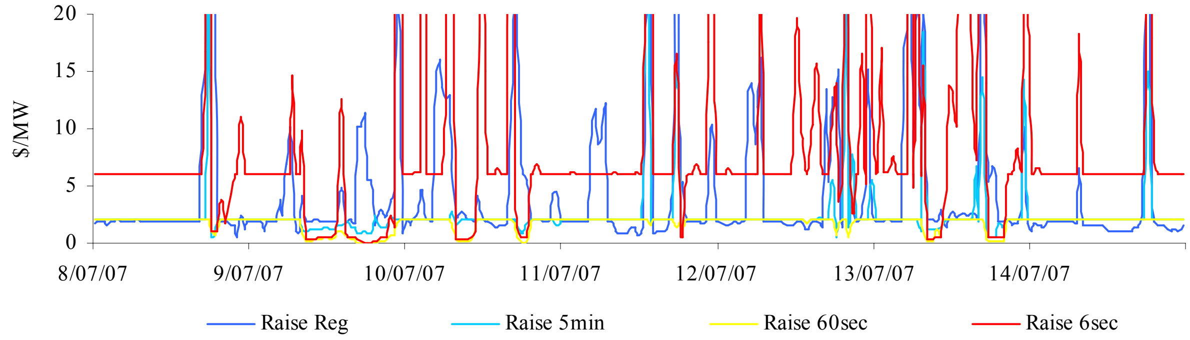


Figure 67: prices for lower services

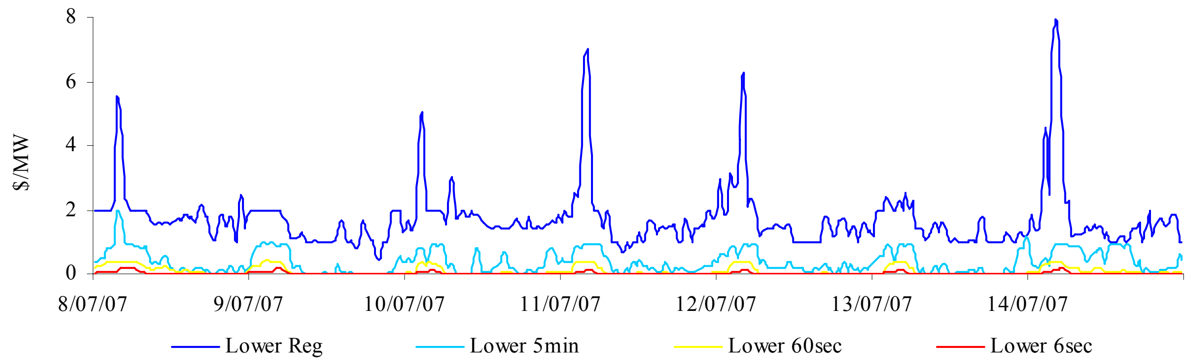
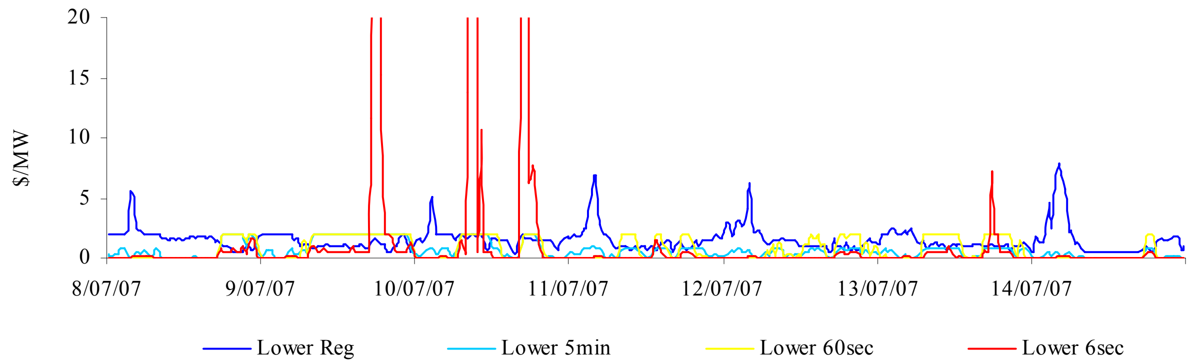


Figure 67A: prices for lower services – Tasmania



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

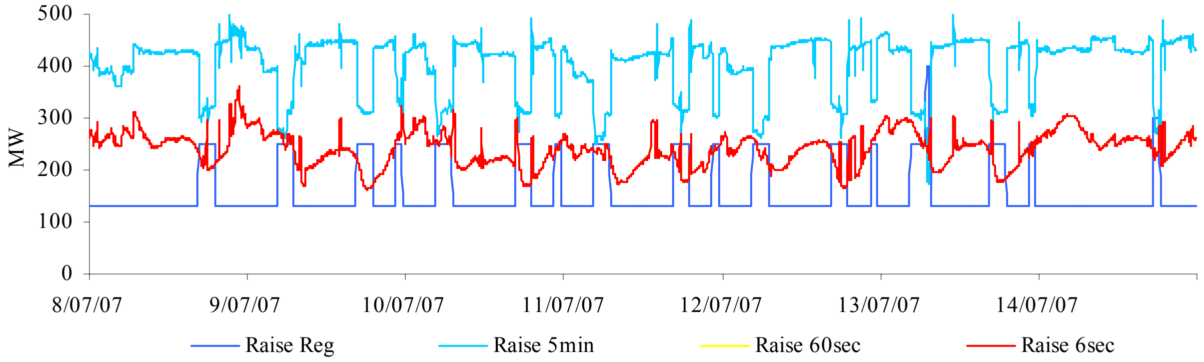


Figure 68A: raise requirements – Tasmania

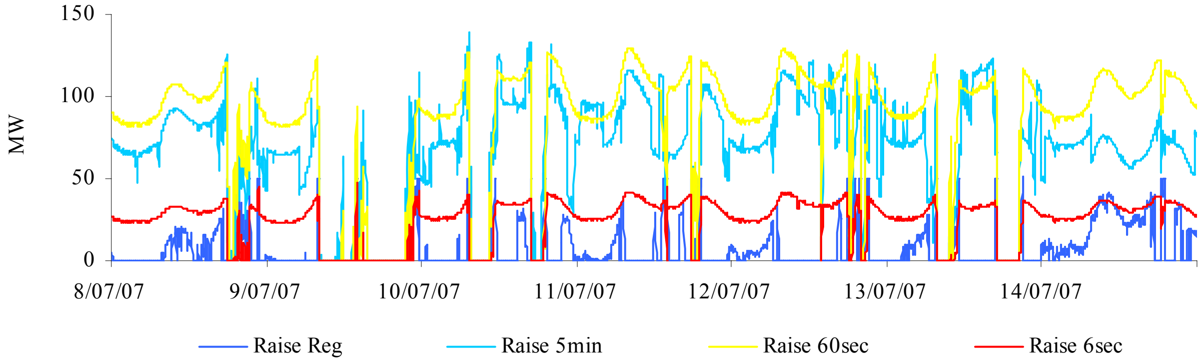


Figure 69: lower requirements

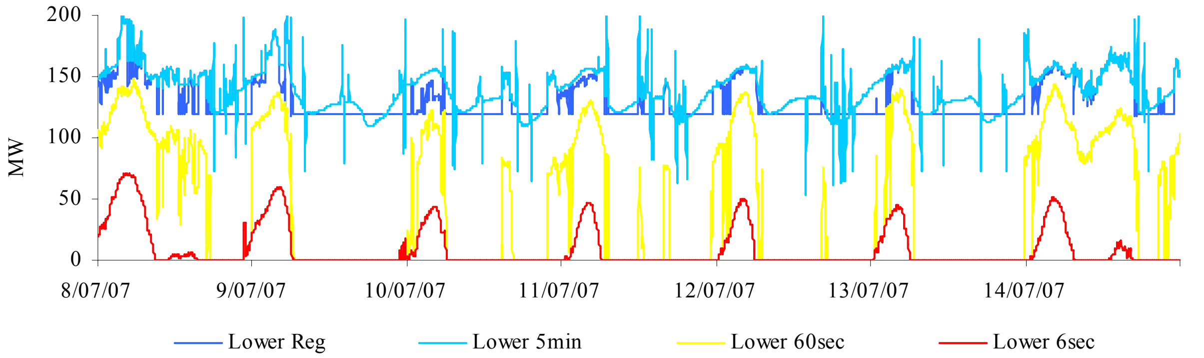
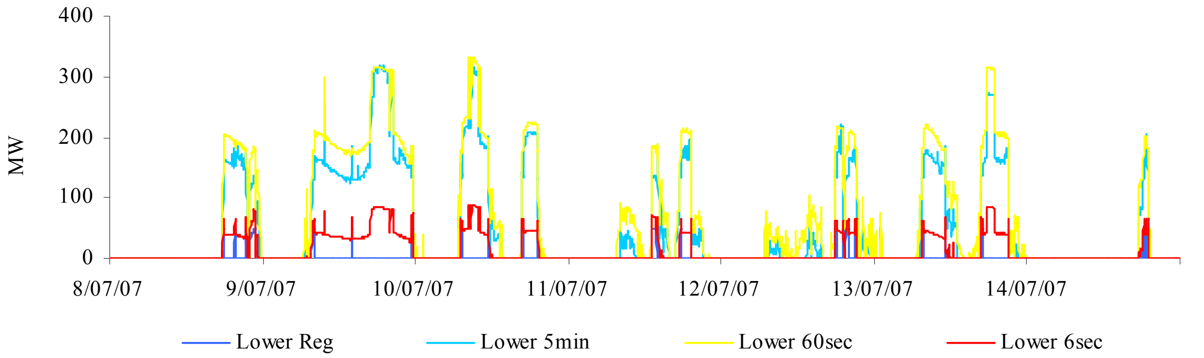


Figure 69A: lower requirements – Tasmania



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