Market analysis

AUSTRALIAN ENERGY REGULATOR

7 Jan 2007 – 13 Jan 2007

Spot prices for the week averaged between $44/MWh in South Australia and $125/MWh in New South Wales. High temperatures throughout the mainland saw demand reach near record levels in all mainland states, with the spot price in New South Wales peaking above $5000/MWh on Thursday. The AER will be issuing a separate report into the events of that day.

Turnover in the energy market was $374 million. The total cost of ancillary services for the week was $466 000, or 0.1 per cent of energy market turnover.

Significant variations between actual prices and those forecast 4 and 12 hours ahead occurred in 164 or a half of all trading intervals. Demand forecasts produced 4 and 12 hours ahead varied from actual by more than 5 per cent in around a quarter all trading intervals across the market.

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

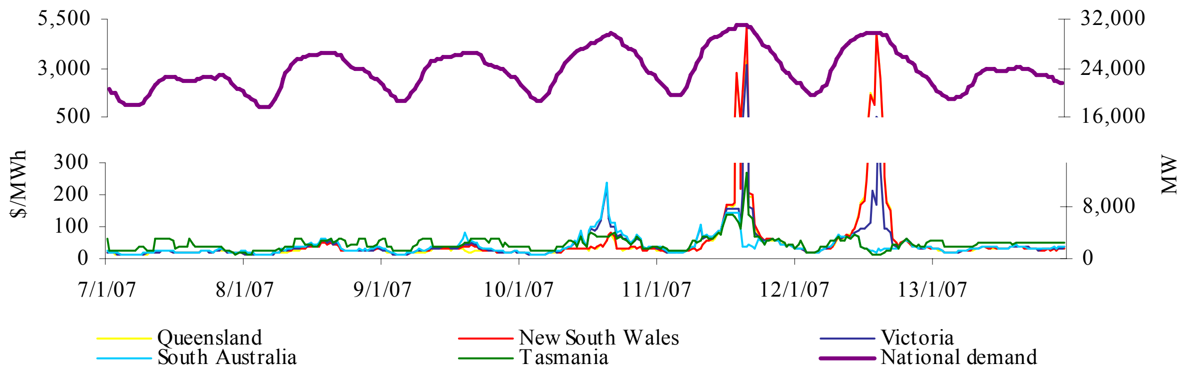


Figure 2: volume weighted average spot price for energy market ($/MWh)

	QLD	NSW	VIC	SA	TAS
Last week	105	125	60	44	48
Previous week	20	25	34	41	44
Same quarter last year	39	46	53	58	33
Financial year to date	28	36	35	42	40
% change from previous week *	▲418%	▲401%	▲74%	▲6%	▲10%
% change from same quarter last year **	▲172%	▲173%	▲12%	▼24%	▲46%
% change from year to date ***	▼12%	▼25%	▲16%	▲6%	▼50%

*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

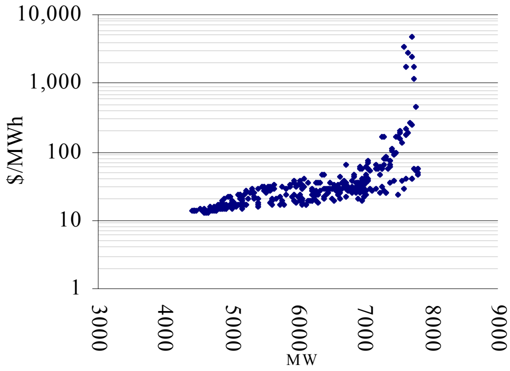


Figure 4: New South Wales

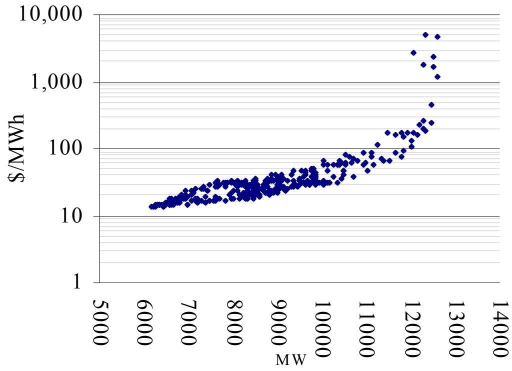


Figure 5: Victoria

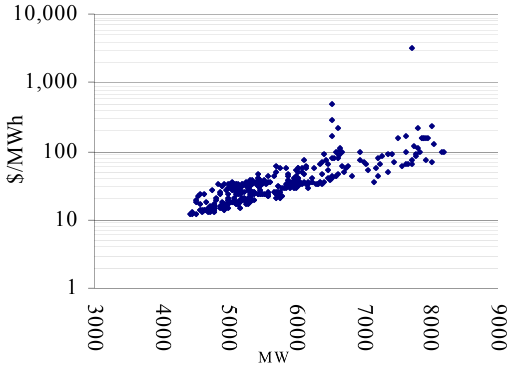


Figure 6: South Australia

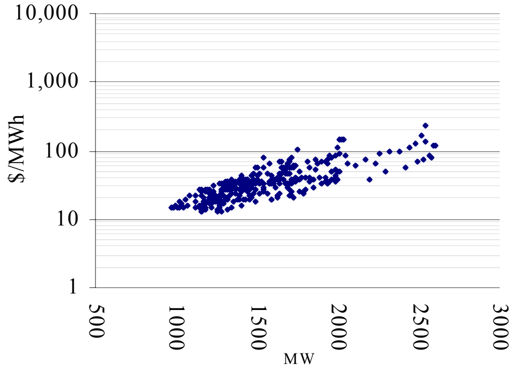
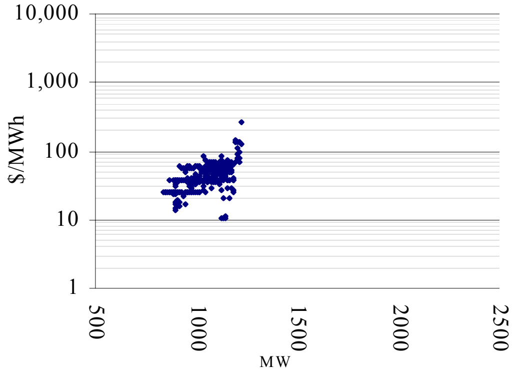


Figure 7: Tasmania



The maximum spot prices for the week ranged from \$238/MWh in South Australia to \$5092/MWh in New South Wales. High temperatures and subsequent demands were the main contributing factors. 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	3.51	3.23	1.61	1.41	0.60
Previous week	0.72	0.66	1.64	1.61	0.74
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

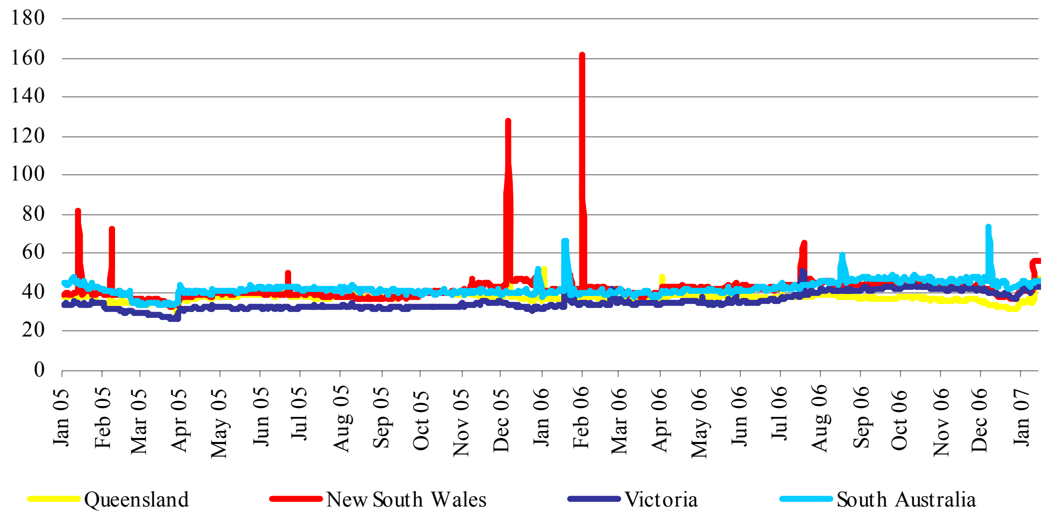
Figure 9 sets out the d-cyphaTrade wholesale electricity price index (WEPI)* for each region throughout the week excluding Tasmania. Figure 10 sets out the WEPI since 1 January 2005.

Figure 9: d-cyphaTrade WEPI for the week

	Monday	Tuesday	Wednesday	Thursday	Friday
Queensland	36.37	35.45	35.21	40.31	47.54
New South Wales	41.09	41.06	41.25	48.67	56.55
Victoria	40.25	41.80	43.31	43.32	42.86
South Australia	43.44	45.36	45.21	45.21	46.08

* 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



Reserve

No low reserves were forecast.

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

Figure 11: Queensland

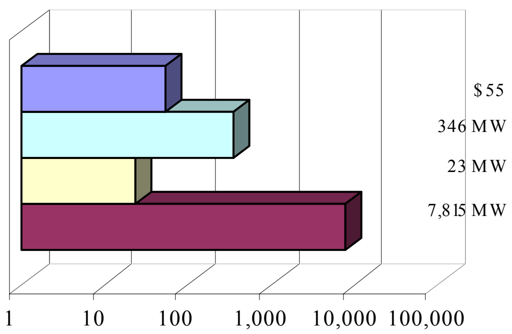


Figure 12: New South Wales

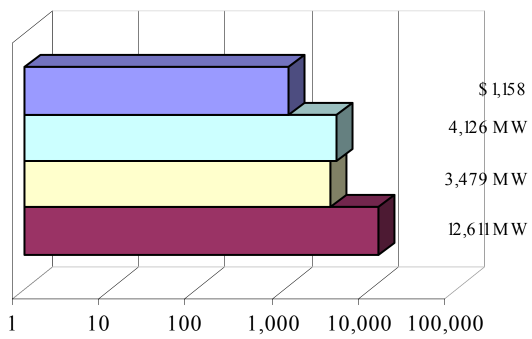


Figure 13: Victoria

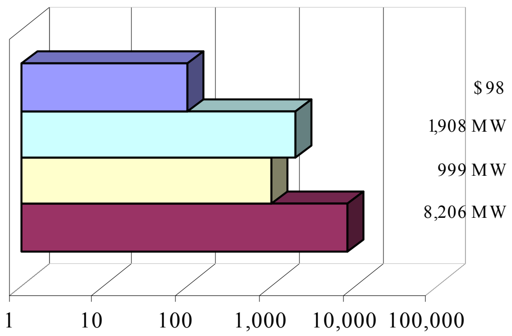


Figure 14: South Australia

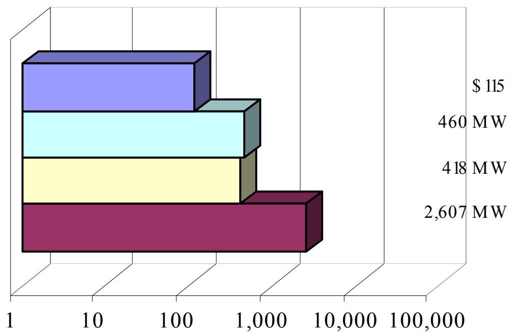
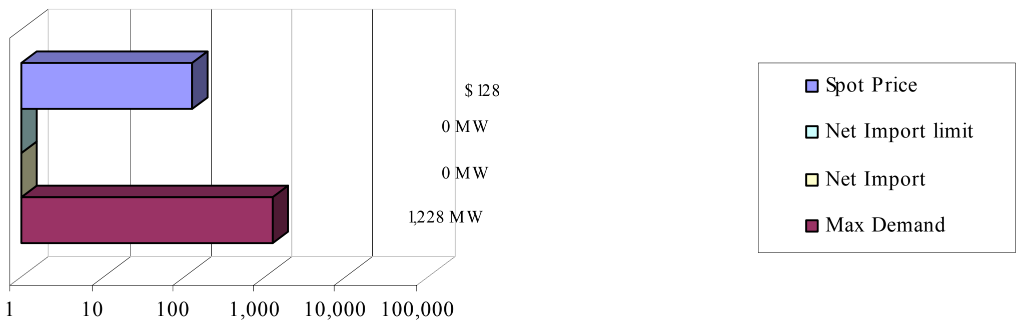


Figure 15: Tasmania



Price variations

There were 164 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

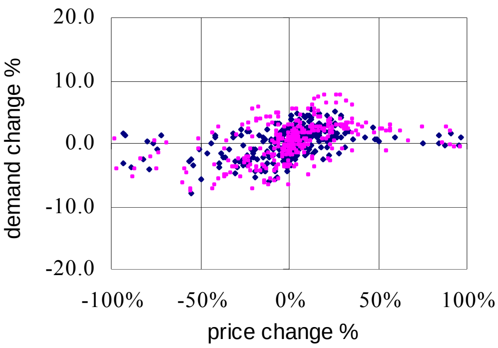


Figure 17: New South Wales

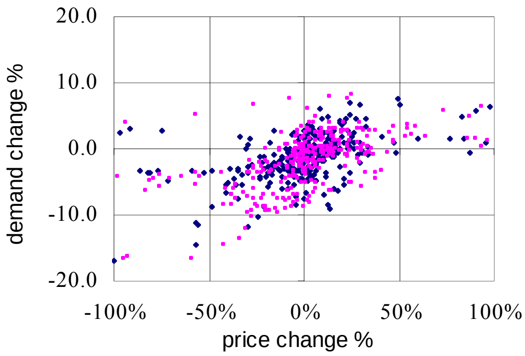


Figure 18: Victoria

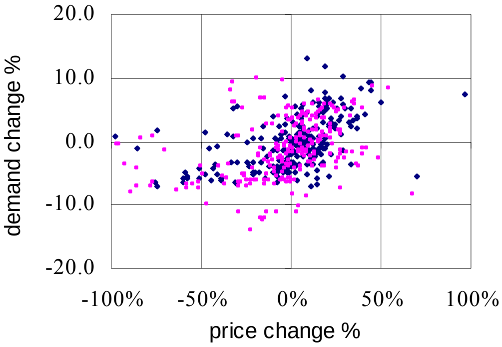


Figure 19: South Australia

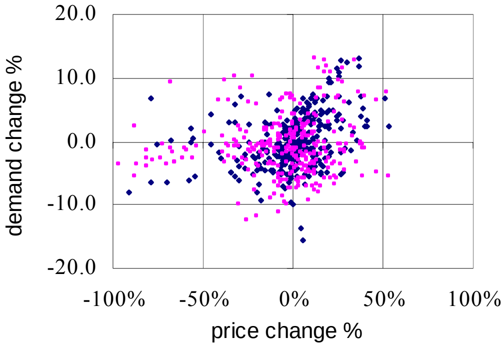
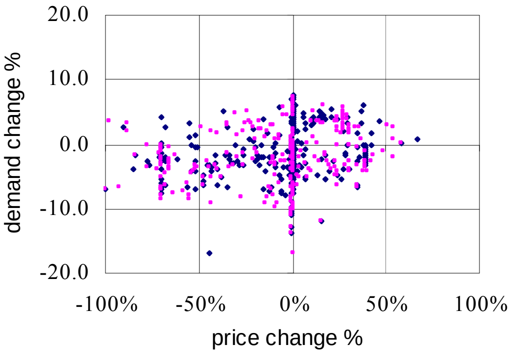


Figure 20: Tasmania



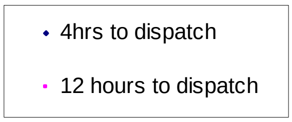


Figure 21 summarises the number and most probable reason for variations between forecast and actual prices.

Figure 21: reasons for variations between forecast and actual prices

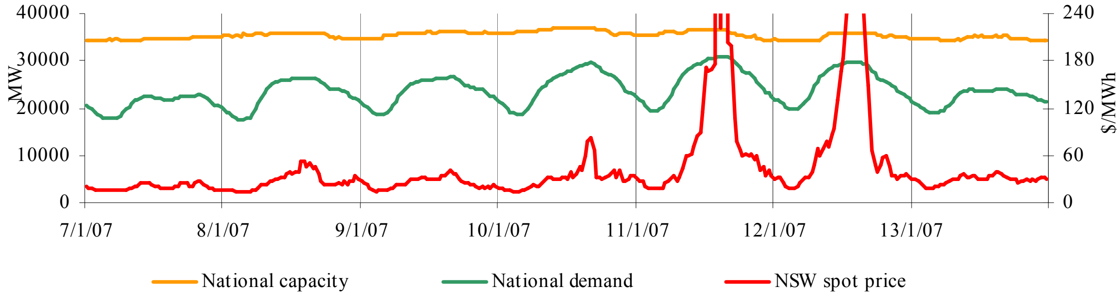
Price and demand

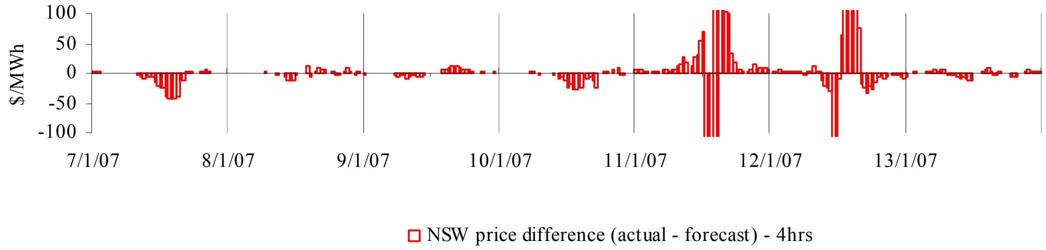
Figures 22 – 56 set out details of spot prices and demand on a national and regional basis. They include the actual spot price, actual demand and variation from forecasts made 4 and 12 hours ahead of dispatch.

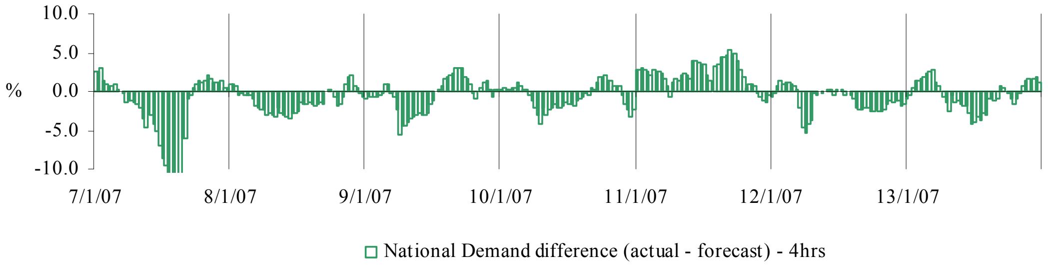
Spot prices within the national market are regularly aligned, with conditions in one region reflected across all others. The national market outcomes section highlights pricing events that occurred when spot prices were generally aligned across all regions of the national electricity market – the New South Wales spot price has been used to represent a pseudo national price under these conditions.

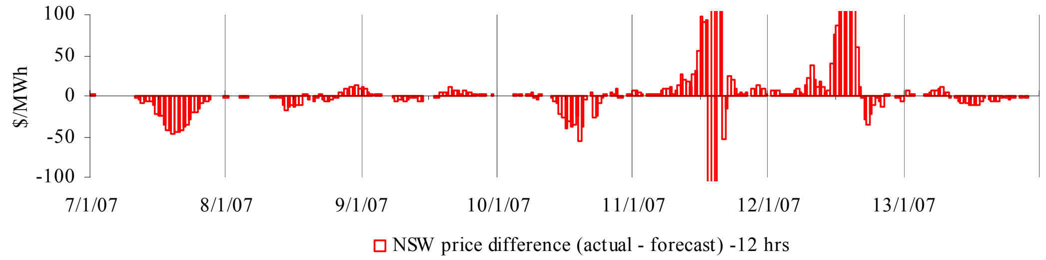
On a regional basis the differences between the maximum temperature and the temperature forecast at around 6.00 pm the day before are also included. In each section, the occurrences of all prices for the week greater than three times the average have been presented. The price forecast is compared to the demand and availability forecasts made 4 and 12 hours ahead, with significant changes to these forecasts explained.

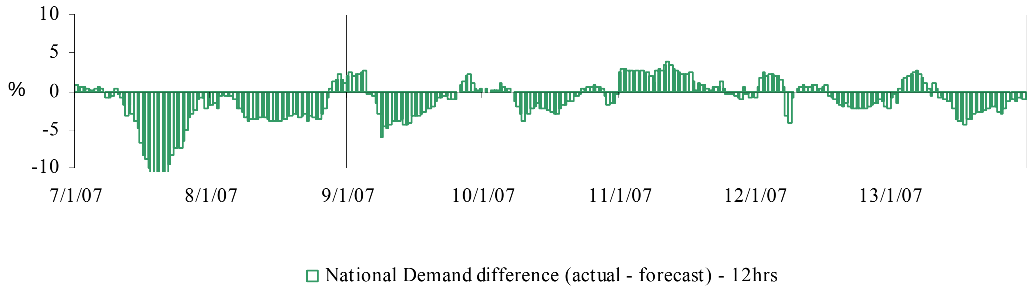
Figures 22-26: National market outcomes











There were eight occasions where spot prices were nationally aligned and the New South Wales price[1] was greater than three times the New South Wales weekly average price of $125/MWh.

Thursday, 11 January

2:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	2779.14	459.90	342.39
Demand (MW)	30 896	29 858	30 569
Available capacity (MW)	36 575	36 700	37 011
3:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	1795.64	163.63	472.32
Demand (MW)	30 960	29 607	30 730
Available capacity (MW)	36 600	36 553	37 011
4:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	5091.95	109.44	327.05
Demand (MW)	30 864	29 497	30 742
Available capacity (MW)	36 513	36 556	37 011

Conditions at the time saw national demand as much as 1370 MW higher than forecast four hours ahead with demand reaching within 150 MW of the national summer record and 625 MW of the highest ever.

The AER is preparing a report into the events of the day as required under clause 3.13.7 of the National Electricity Rules.

Friday, 12 January

1:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	448.25	180.14	160.07
Demand (MW)	29 789	29 958	29 947
Available capacity (MW)	35 734	36 207	36 652
2:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	1667.14	257.00	161.07
Demand (MW)	29 808	29 822	30 067
Available capacity (MW)	35 749	35 927	36 652
2:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	1157.95	272.60	162.09
Demand (MW)	29 807	29 975	30 138
Available capacity (MW)	35 710	35 905	36 638
3:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	4769.03	182.82	163.16
Demand (MW)	29 762	30 031	30 187
Available capacity (MW)	35 768	36 170	36 638

[1] The New South Wales spot price has been used to represent a pseudo national price under these conditions.

Friday, 12 January (cont)

3:30 pm	Actual	4 hr forecast	12 hr forecast
Price ($/MWh)	2437.19	296.30	163.19
Demand (MW)	29 629	30 229	30 136
Available capacity (MW)	35 877	36 120	36 668

Conditions at the time saw high demand that was close to forecast. Queensland and New South Wales prices diverged above those in the other regions with exports from the Snowy region at the nominal limit.

CS Energy's Callide B unit two, which was out of service from the previous Monday, was due to return to service on the Friday morning but was delayed. As a result, 350 MW of capacity priced below $100/MWh was not available.

Millmerran Energy Trader's Millmerran unit two, which was out of service from the previous night was also due to return to service but was delayed. 410 MW of capacity priced below zero was not available for dispatch..

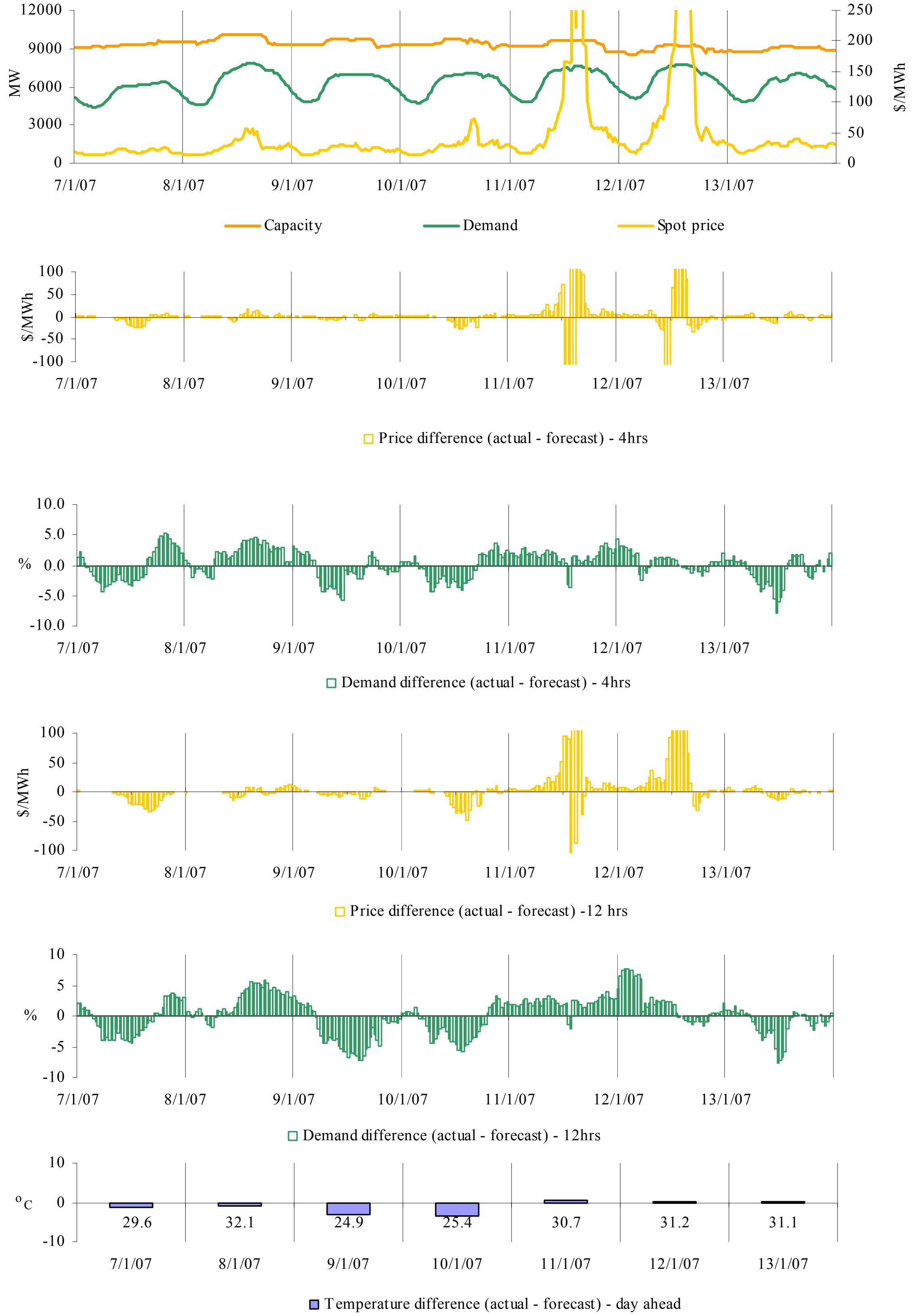
At 6.38 am Macquarie Generation shifted 520 MW of capacity across its portfolio from prices below $100/MWh to above $5000/MWh. The rebid reason given was "Sensitivities have changed". A further rebid at 2.21 pm shifted 160 MW of capacity across the Bayswater units from prices below $15/MWh to above $9000/MWh. The rebid reason given was "Prices lower than predispatch".

At 10.54 am Eraring Energy shifted 100 MW of capacity at Eraring from prices below $100/MWh to above $7200/MWh. The rebid reason given was "Increased likelihood of increased profit".

Over two rebids at 1.53 pm and 2.23 pm Stanwell Corporation shifted 220 MW of capacity across its Stanwell units from prices below $55/MWh to above $9000/MWh. The rebid reasons given were "Changed predispatch" and "Manage transmission constraints".

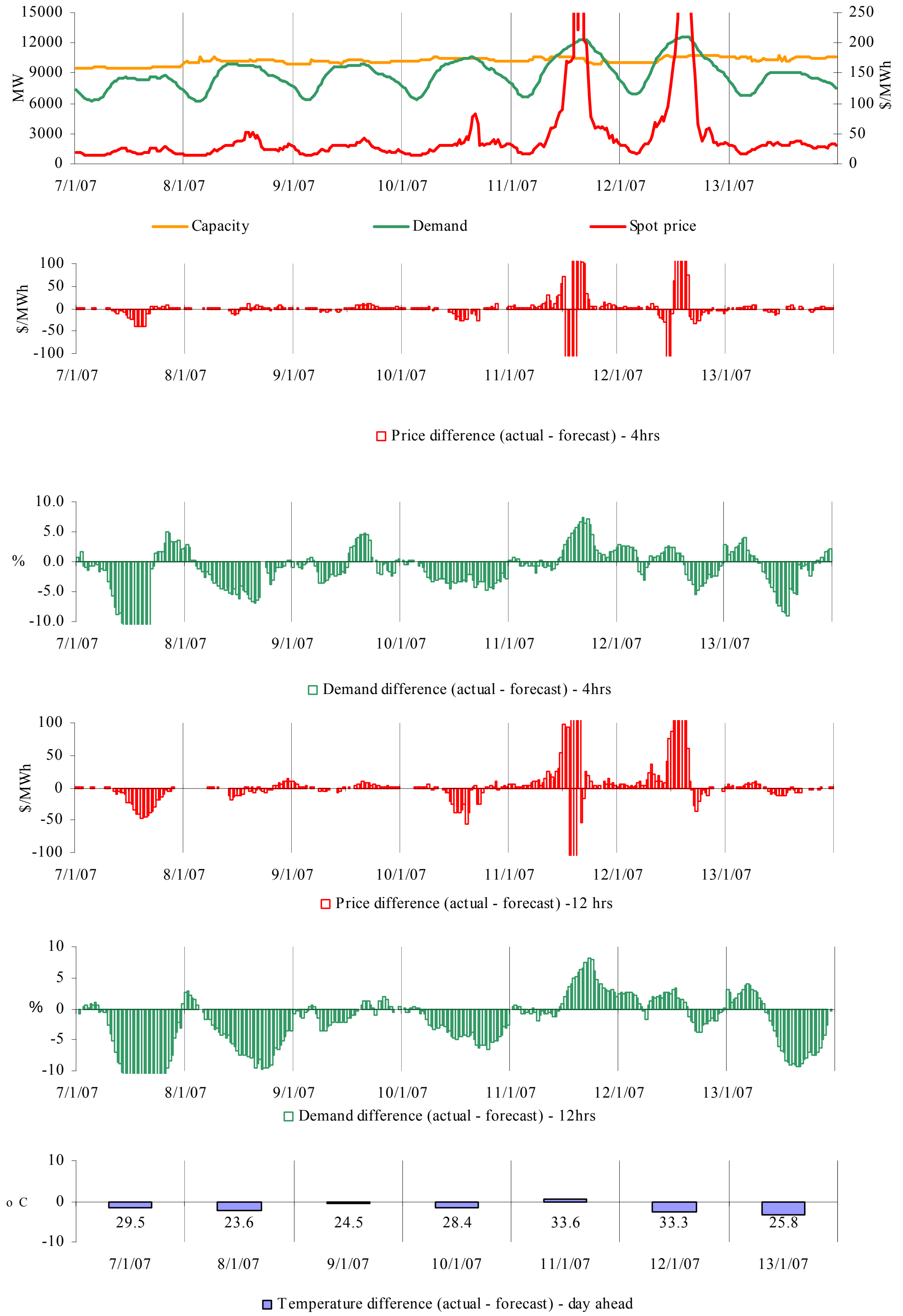
There was no other significant rebidding.

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



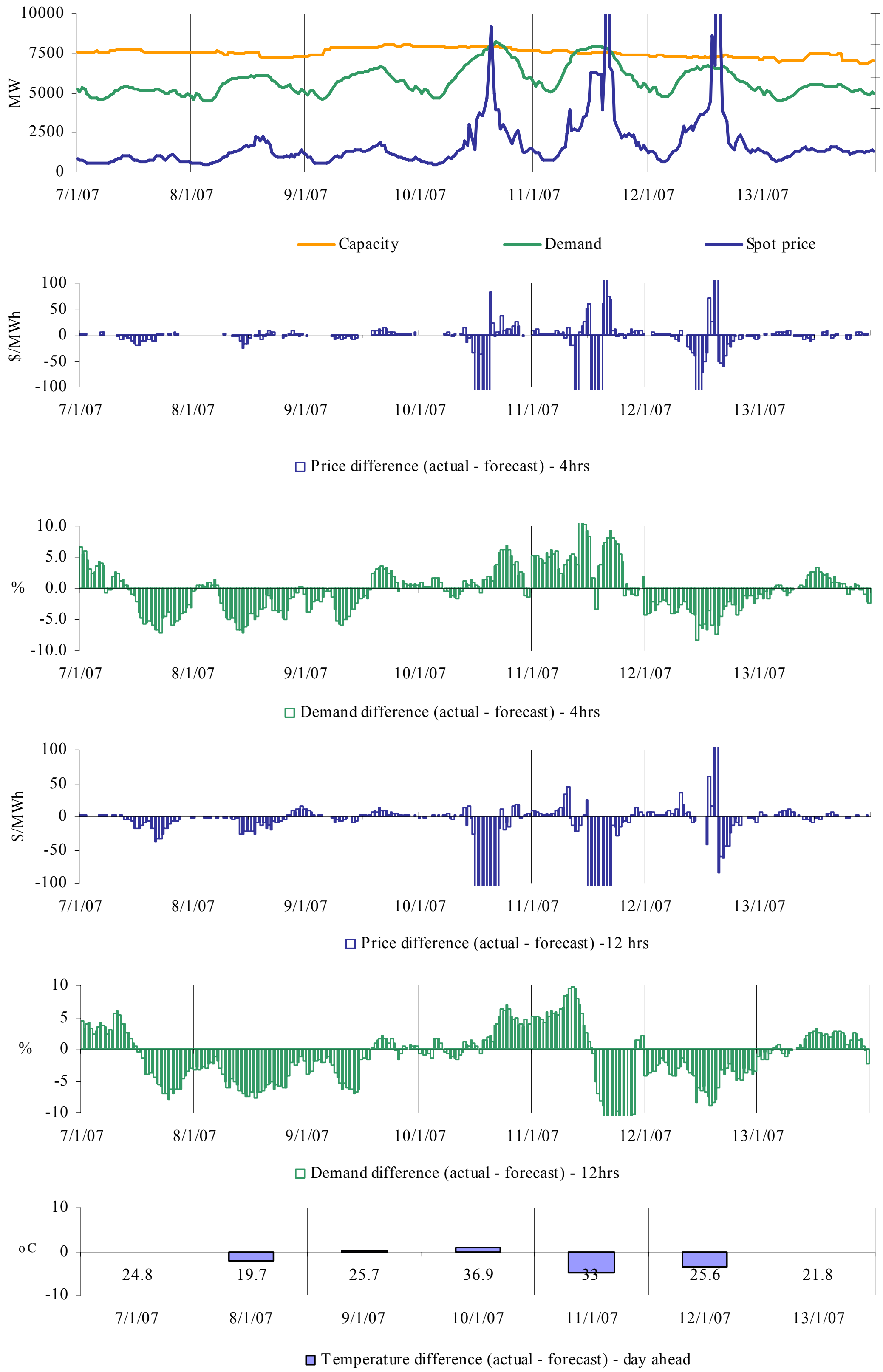
There were eight occasions where the spot price in Queensland was greater than three times the weekly average price of $105/MWh. At the time, prices were aligned across the market or across both the Queensland and New South Wales regions. The circumstances of these events are detailed under the national market outcomes section.

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



There were eight occasions where the spot price in New South Wales was greater than three times the New South Wales weekly average price of $125/MWh. At the time, prices were aligned across the market or across both the Queensland and New South Wales regions. The circumstances of these events are detailed under the national market outcomes section.

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



There were eight occasions where the spot price in Victoria was greater than three times the weekly average price of $60/MWh. Seven of these occurred when market outcomes were being driven by the conditions in New South Wales and Queensland. The circumstances of these events are detailed in the national market outcomes section. The remaining occasion is presented below.

Wednesday, 10 January

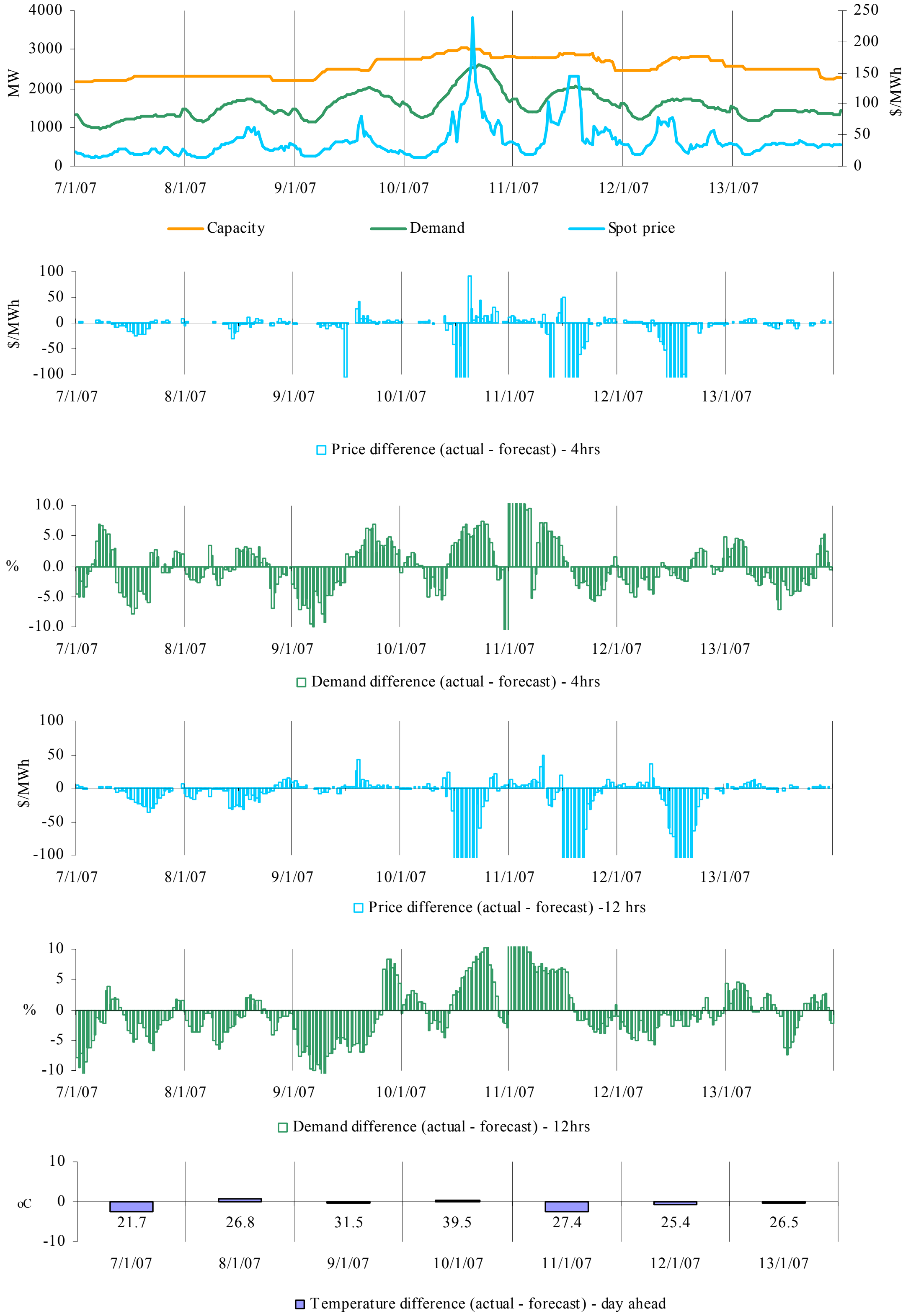
3:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	227.90	144.34	1593.40
Demand (MW)	8008	7847	7845
Available capacity (MW)	7929	7921	8018

Conditions at the time saw demand 160 MW higher than forecast 4 hours ahead. There was no capacity in Victoria priced between $100/MWh and $250/MWh. The Snowy to Victoria and Basslink interconnectors were at their limits and flows were close to forecast.

Prices were lower than forecast 12 hours ahead. From 7.41 am, Alinta shifted as much as 88 MW of capacity at Bairnsdale from prices above $9000/MWh to below $250/MWh over a number of rebids. The rebid reasons given were “Market expectations-Price/Demand expectation”.

At 12.54 pm, AGL shifted 135 MW of capacity from prices above $9000/MWh to zero at Somerton. The rebid reason given was “Price change in market:: prices lower than ex”.

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



There were eight occasions where the spot price in South Australia was greater than three times the weekly average price of $44/MWh. One of these occurred as a result of market conditions in New South Wales and Queensland. The circumstance of this event is detailed in the national market outcomes section. The remaining seven occasions are presented below.

Wednesday, 10 January

3:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	161.86	289.00	1699.98
Demand (MW)	2523	2350	2358
Available capacity (MW)	3025	3059	2952
3:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	237.50	145.00	1699.98
Demand (MW)	2542	2408	2365
Available capacity (MW)	3024	3059	2952
4:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	134.78	107.89	464.58
Demand (MW)	2545	2420	2380
Available capacity (MW)	3024	3050	2952

Conditions at the time saw demand around 170 MW higher than forecast four hours ahead.

At 9.57 am AGL Hydro committed Hallett shifting 140 MW of capacity from prices above $9000/MWh to zero. The rebid reason given was "Amended contract position::generate to meet".

Over several rebids starting from 8.30 am TRUenergy shifted 310 MW of capacity at Torrens Island priced above $9500/MWh and 90 MW priced above $285/MWh to below $150/MWh. The rebid reasons given were "Market conditions-SA demand forecast", "Market conditions-redist of MWs across units" and Market conditions-adj to commitment".

There was no other significant rebidding.

Thursday, 11 January

12:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	145.00	96.05	436.95
Demand (MW)	2013	1981	1880
Available capacity (MW)	2904	2911	3053
1:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	145.00	298.05	443.86
Demand (MW)	2015	1999	1889
Available capacity (MW)	2898	2911	3043
1:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	144.94	417.40	468.12
Demand (MW)	2026	2014	1973
Available capacity (MW)	2895	2907	3043
2:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	144.91	298.05	7312.69
Demand (MW)	2038	2040	1999
Available capacity (MW)	2871	2907	3043

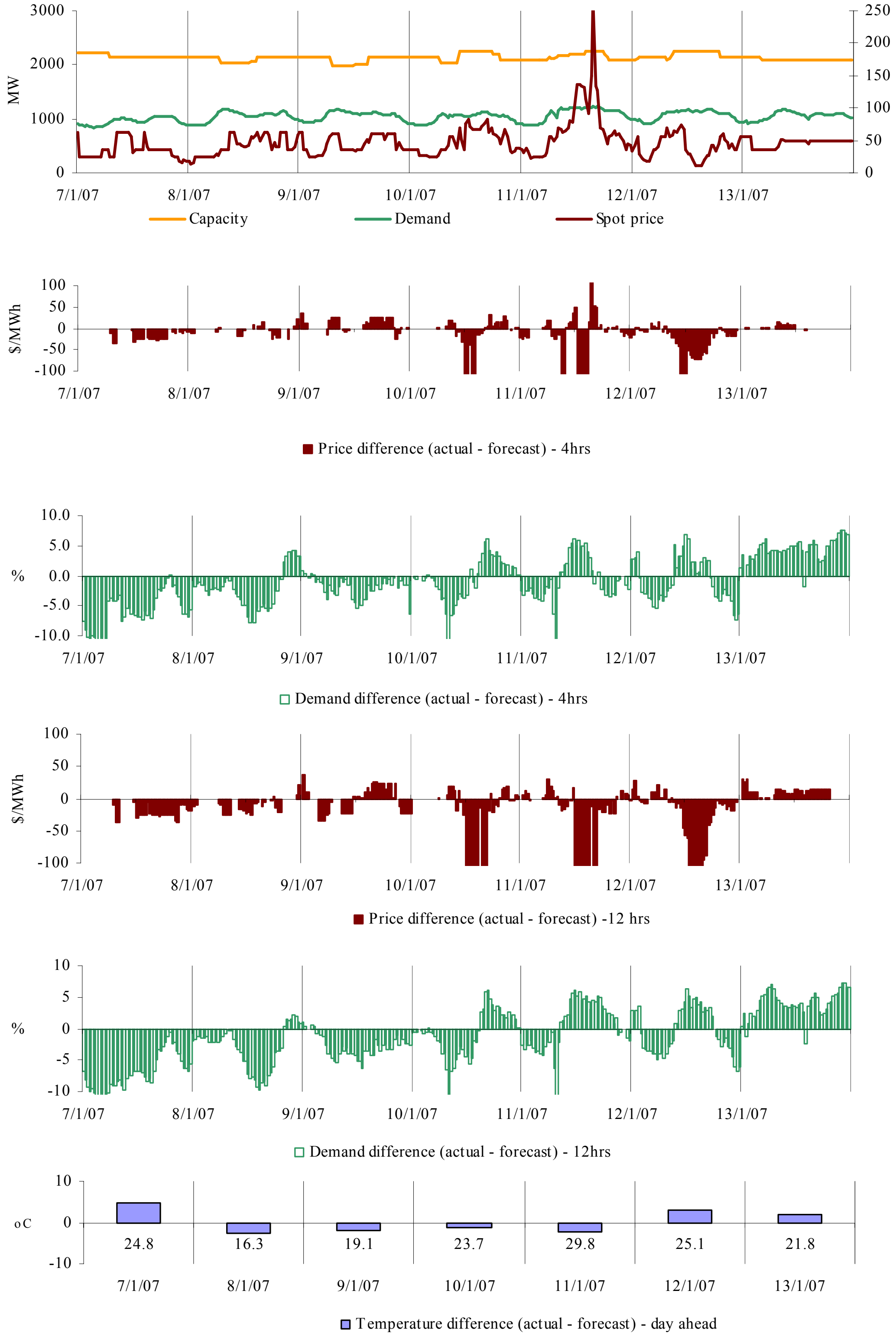
Thursday, 11 January (cont)

2:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	145.00	298.05	8800.59
Demand (MW)	2036	2052	2014
Available capacity (MW)	2871	2907	3043

Conditions at the time saw demand close to forecast four hours ahead. Prices were aligned with, and following the conditions of, the rest of the mainland during this period. Forecasts were fluctuating with the changing conditions across the mainland. Prices in South Australia were much lower than forecast as a result. From 3 pm, exports across the Heywood interconnector reached the nominal limit of 300 MW, with prices separating, and reducing from this time on.

There was no significant rebidding.

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



There were two occasions where the spot price in Tasmania was greater than three times the weekly average price of $48MWh. These occurred when market outcomes were being driven by the conditions in New South Wales and Queensland. The circumstances of these events are detailed under the national market outcomes section.

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

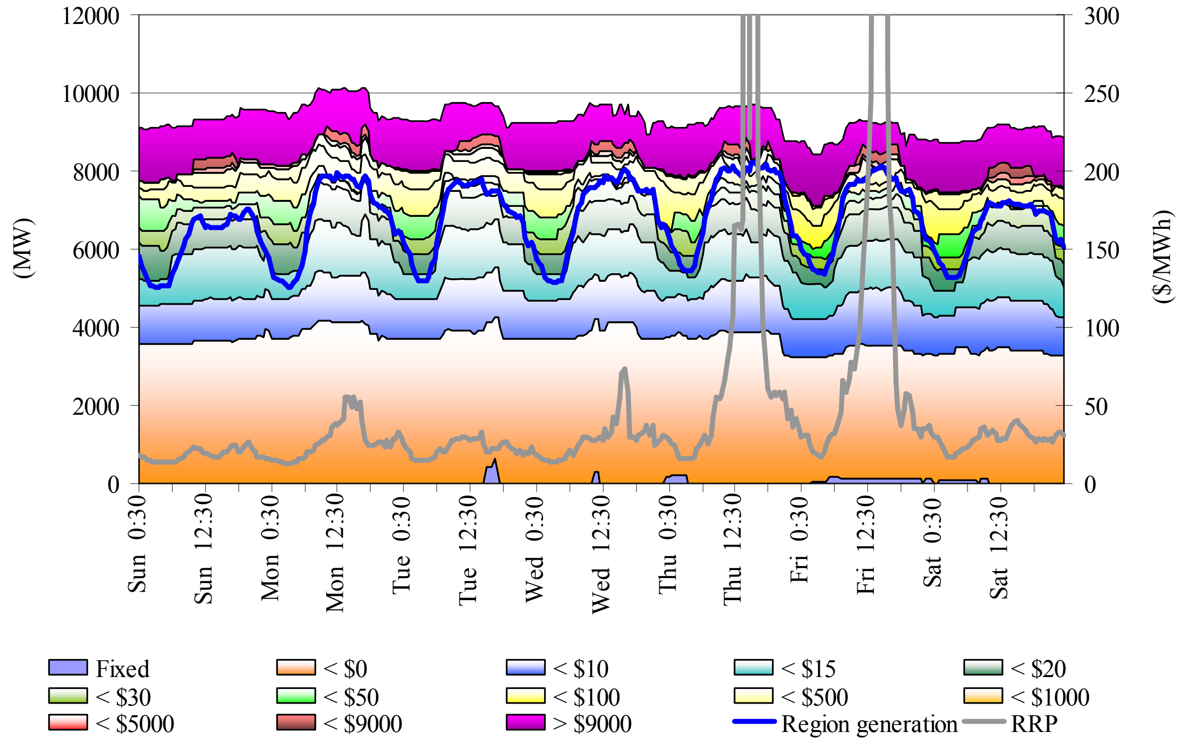


Figure 58: New South Wales closing bid prices, dispatched generation and spot price

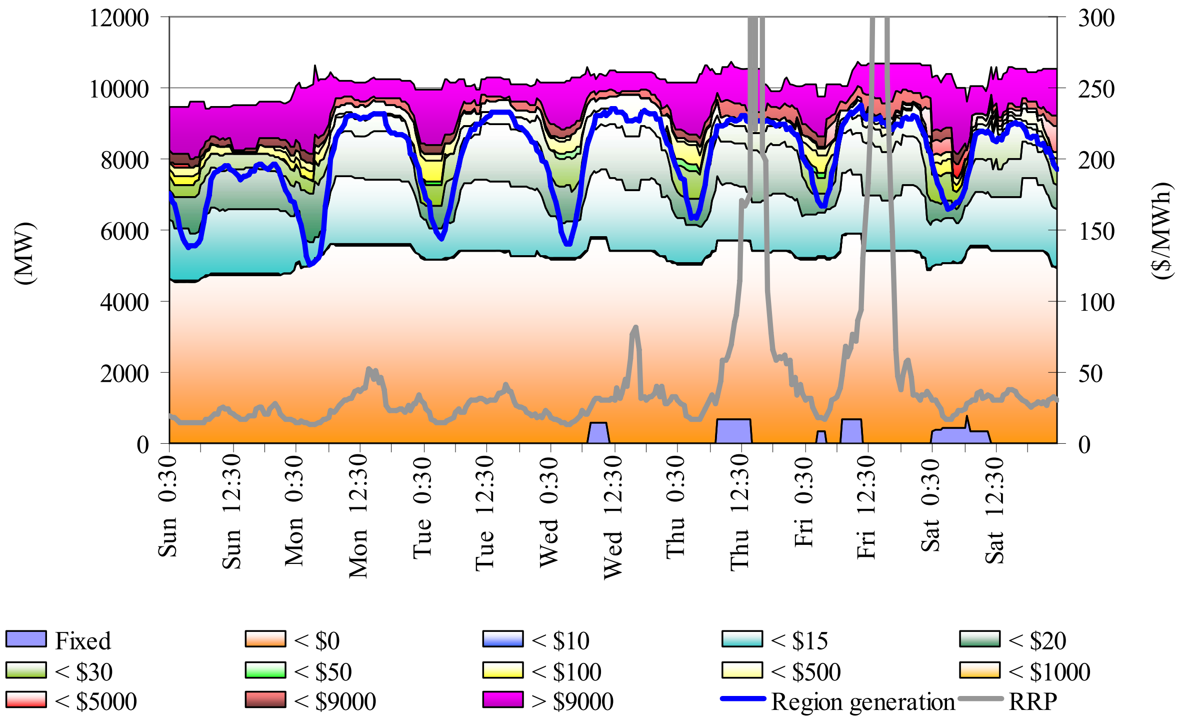


Figure 59: Victoria closing bid prices, dispatched generation and spot price

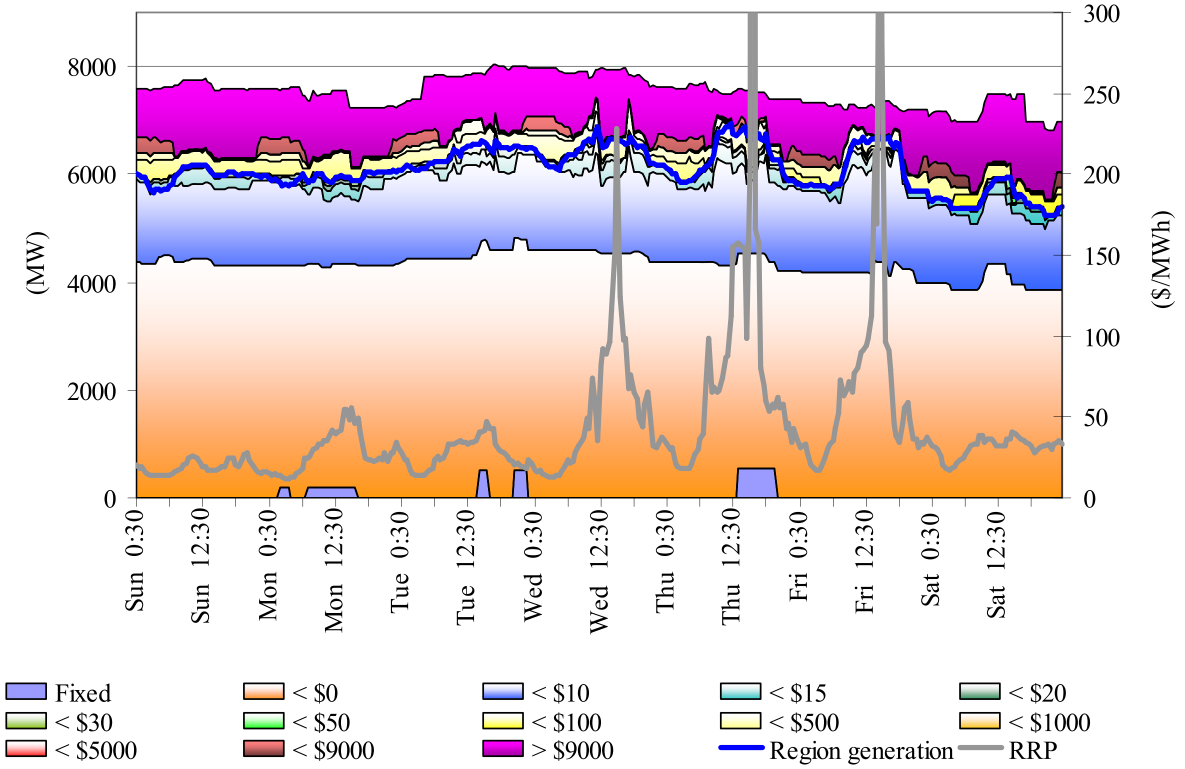


Figure 60: South Australia closing bid prices, dispatched generation and spot price

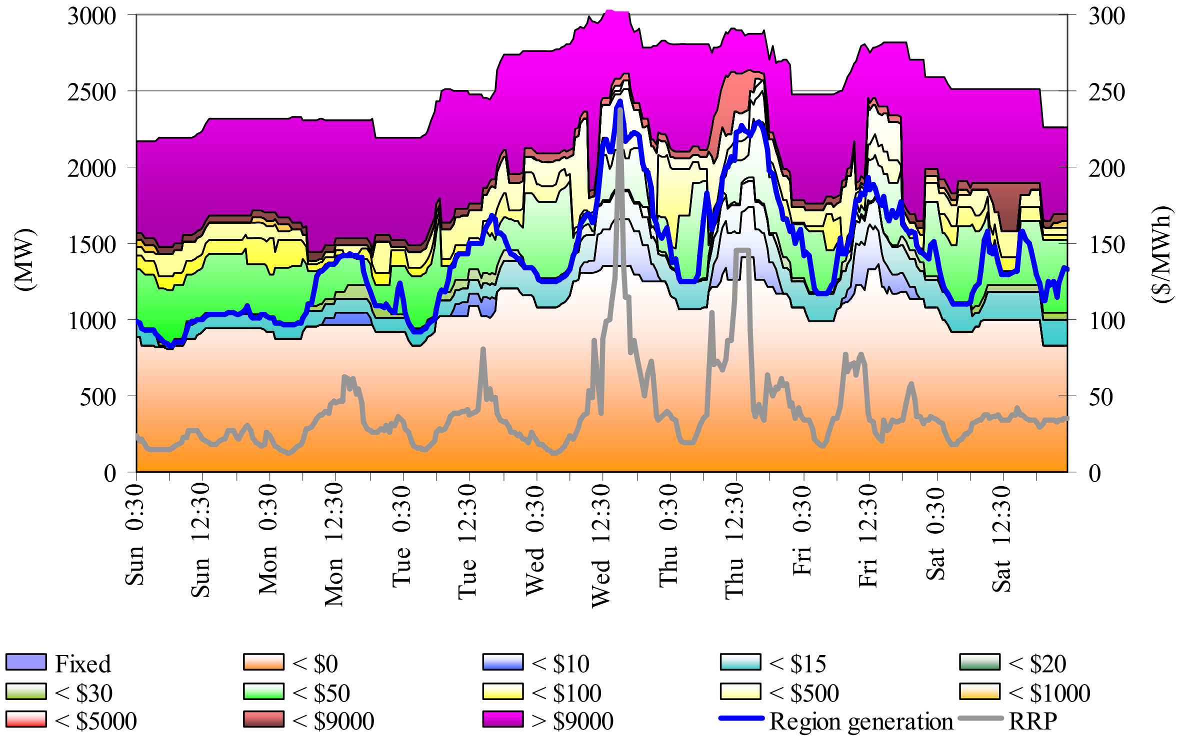
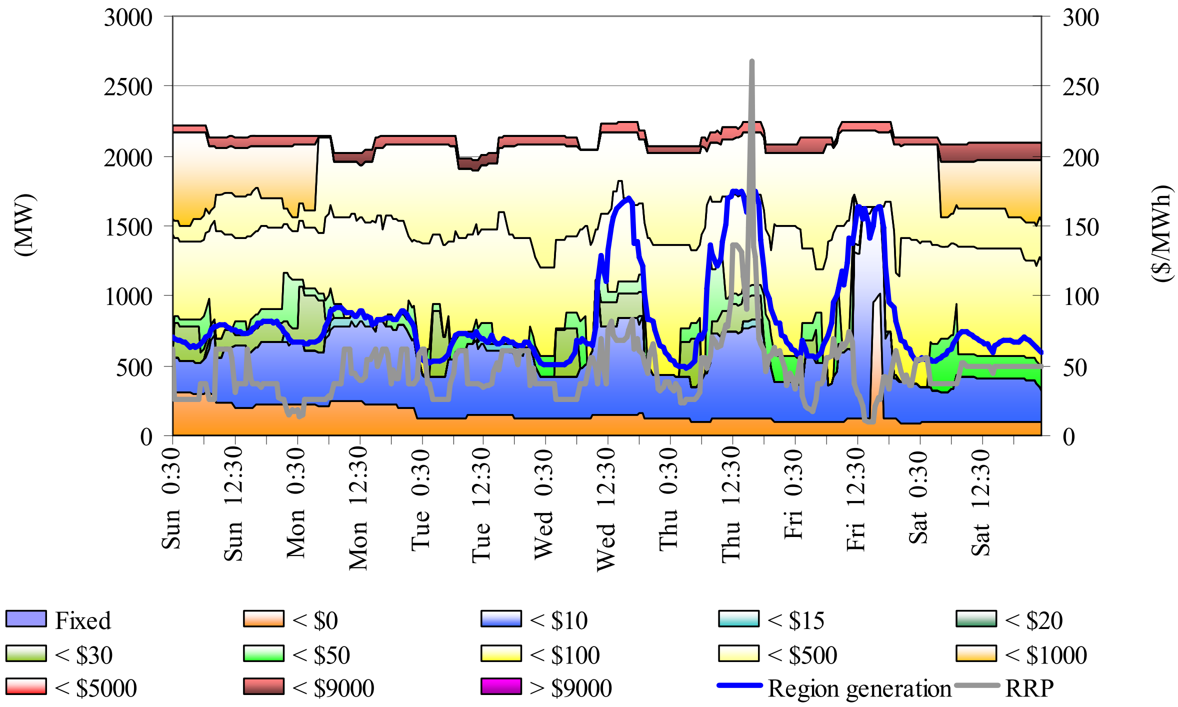


Figure 61: Tasmania closing bid prices, dispatched generation and spot price



Ancillary service market

The total cost of ancillary services on the mainland for the week was $378 000 or 0.1 per cent of the energy market. Locally sourced lower services were required in Queensland on Tuesday following the reclassification of the loss of lines around Armidale as a result of lightning in the vicinity. The cost for locally sourced ancillary services was around $100 000 during this event. High prices for energy on Thursday were reflected into the global price of raise ancillary services, particularly the raise 5 minute 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 ($/MW)	0.61	0.25	3.31	1.96	21.33	0.39	4.12	1.22
Previous week ($/MW)	0.67	0.28	0.88	1.81	0.12	0.14	0.47	1.12
Last quarter ($/MW)	1.76	0.73	1.15	1.54	0.39	2.28	5.00	1.93
Market Cost ($1000s)	$23	$8	$179	$33	$32	$3	$82	$18
% of energy market	0.01%	0.01%	0.05%	0.01%	0.01%	0.01%	0.02%	0.01%

The total cost of ancillary services in Tasmania for the week was $88 000 or 1 per cent of the total turnover in the energy market in Tasmania. 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 ($/MW)	1.42	1.00	1.02	1.65	3.34	2.25	0.59	1.15
Previous week ($/MW)	3.26	1.00	1.01	1.32	0.26	0.74	0.81	1.14
Last quarter ($/MW)	4.97	0.49	2.93	3.00	12.67	0.43	0.82	0.45
Market Cost ($1000s)	$6	$12	$9	$15	$18	$18	$4	$6
% of energy market	0.07%	0.14%	0.11%	0.18%	0.22%	0.22%	0.05%	0.08%

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

Figure 64: daily frequency control ancillary service cost

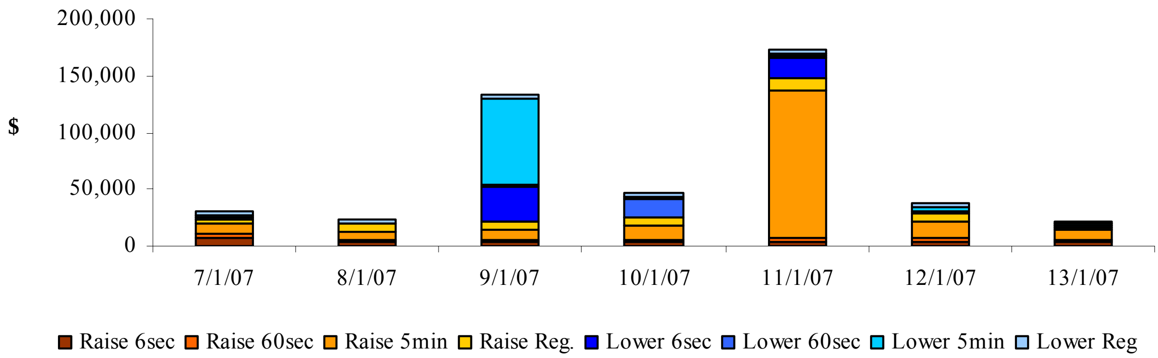
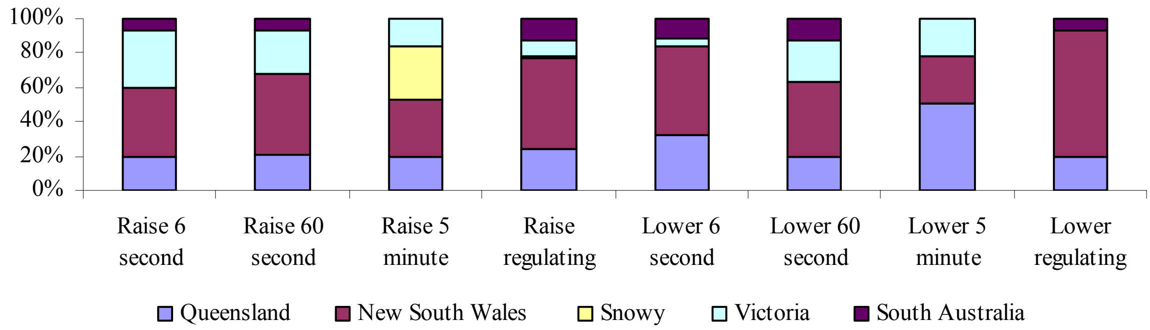


Figure 65 shows the contribution, on a percentage basis, that frequency control ancillary service providers are utilised (in each mainland region) to satisfy the total requirement for each service.

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

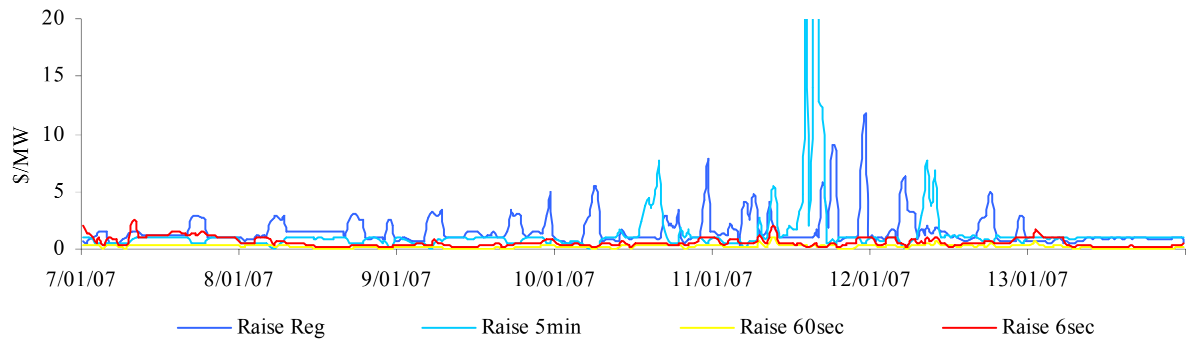


Figure 66A: prices for raise services – Tasmania

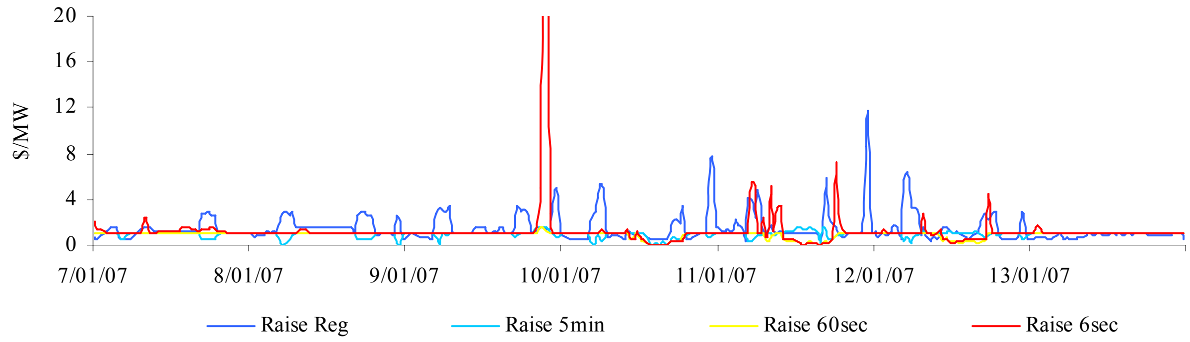


Figure 67: prices for lower services

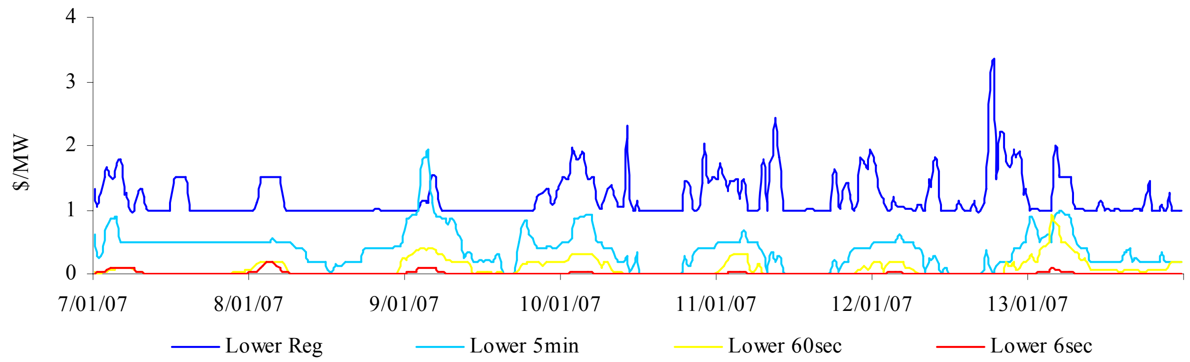
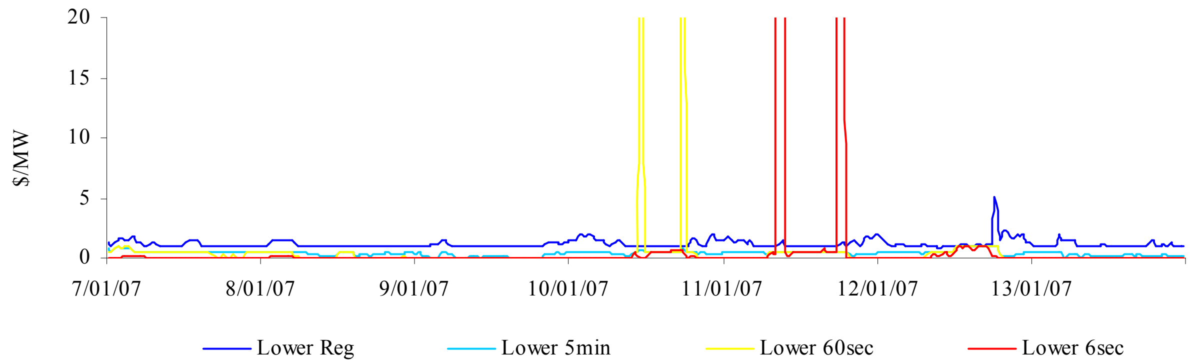


Figure 67A: prices for lower services – Tasmania



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

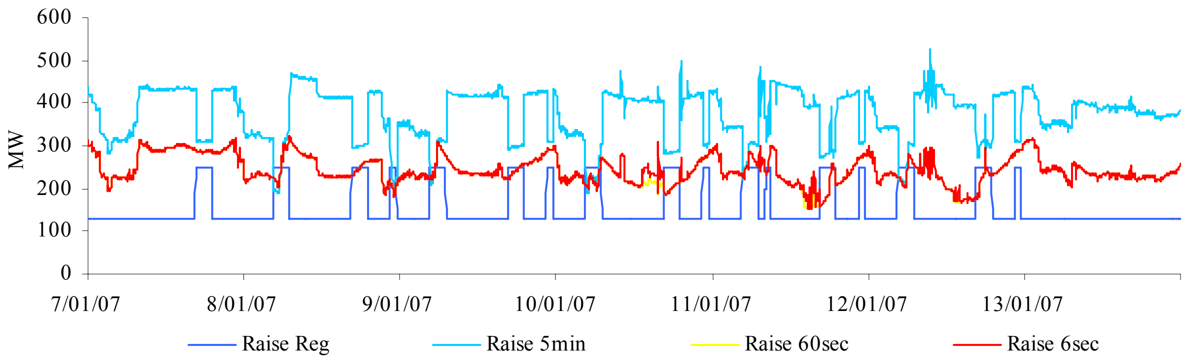


Figure 68A: raise requirements – Tasmania

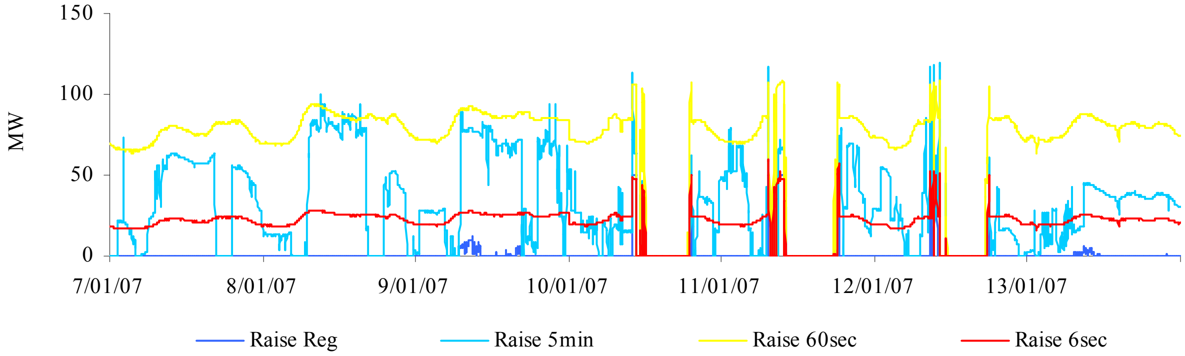


Figure 69: lower requirements

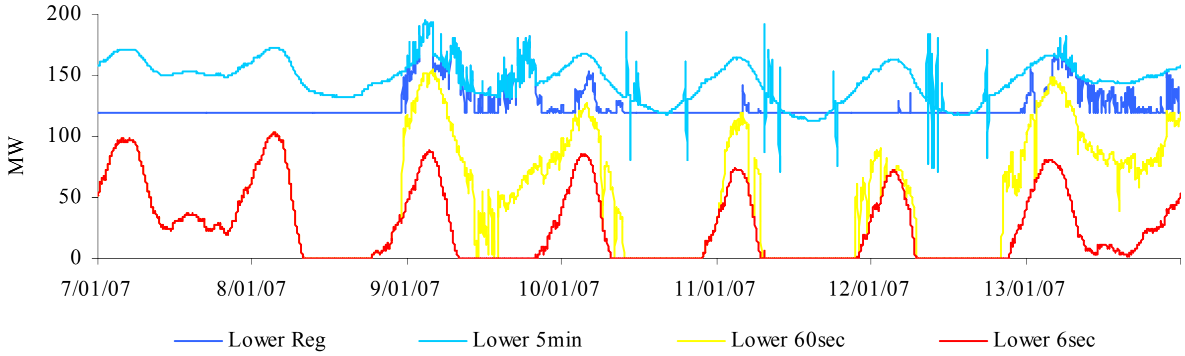
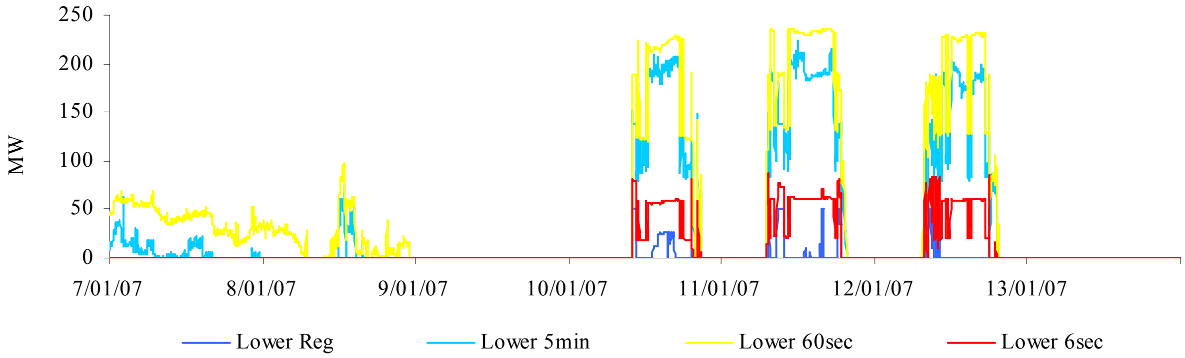


Figure 69A: lower requirements – Tasmania



Australian Energy Regulator
January 2007