Market analysis

AUSTRALIAN ENERGY REGULATOR

19–25 November 2006

Spot prices for the week averaged between $41/MWh in Queensland and $55/MWh in New South Wales. High temperatures across the country saw high demand in most regions with New South Wales recording over 12 000 MW of demand on Tuesday and Wednesday.

Turnover in the energy market was $198 million. The total cost of ancillary services for the week was $540 000, or 0.1 per cent of energy market turnover.

Significant variations between actual prices and those forecast 4 and 12 hours ahead occurred in 92, or 27 per cent of all trading intervals. Demand forecasts produced 4 and 12 hours ahead varied from actual by more than 5 per cent in a quarter of all trading intervals across the market. These variations were most frequent in South Australia, occurring in almost a half 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

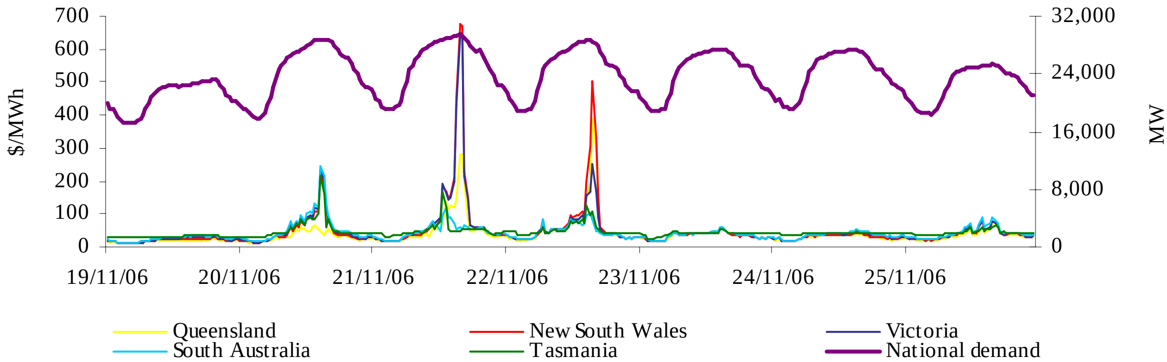


Figure 2: volume weighted average spot price for energy market ($/MWh)

	QLD	NSW	VIC	SA	TAS
Last week	41	55	53	45	46
Previous week	19	23	25	28	37
Same quarter last year	39	73	32	47	63
Financial year to date	25	35	36	39	40
% change from previous week*	▲110%	▲138%	▲112%	▲59%	▲23%
% change from same quarter last year**	▲3%	▼24%	▲66%	▼3%	▼27%
% change from year to date***	▲10%	▼15%	▲23%	▲13%	▼56%

*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

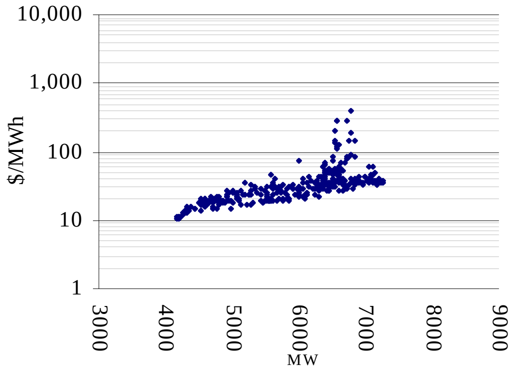


Figure 4: New South Wales

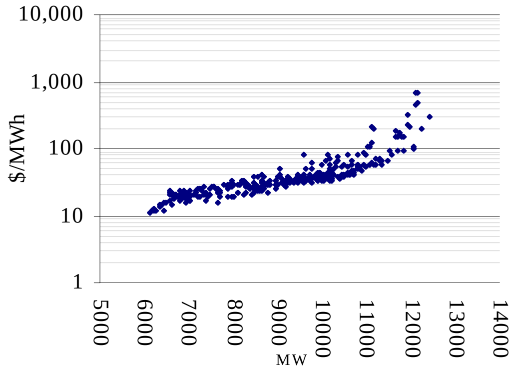


Figure 5: Victoria

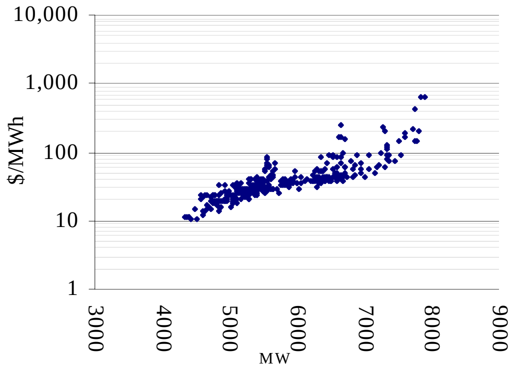


Figure 6: South Australia

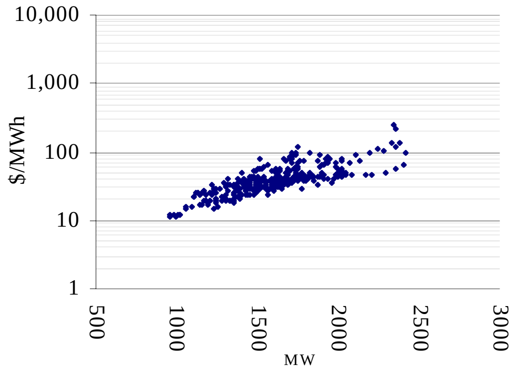
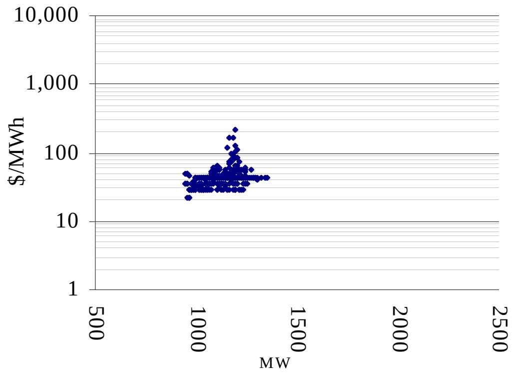


Figure 7: Tasmania



The maximum spot prices for the week ranged from $214/MWh in Tasmania to $674/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.

Figure 8: volatility index during peak periods

	QLD	NSW	VIC	SA	TAS
Last week	1.23	1.82	1.40	0.97	0.72
Previous week	0.44	0.47	0.54	0.46	0.21
Same quarter last year	1.12	1.03	0.83	0.76	0.61

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

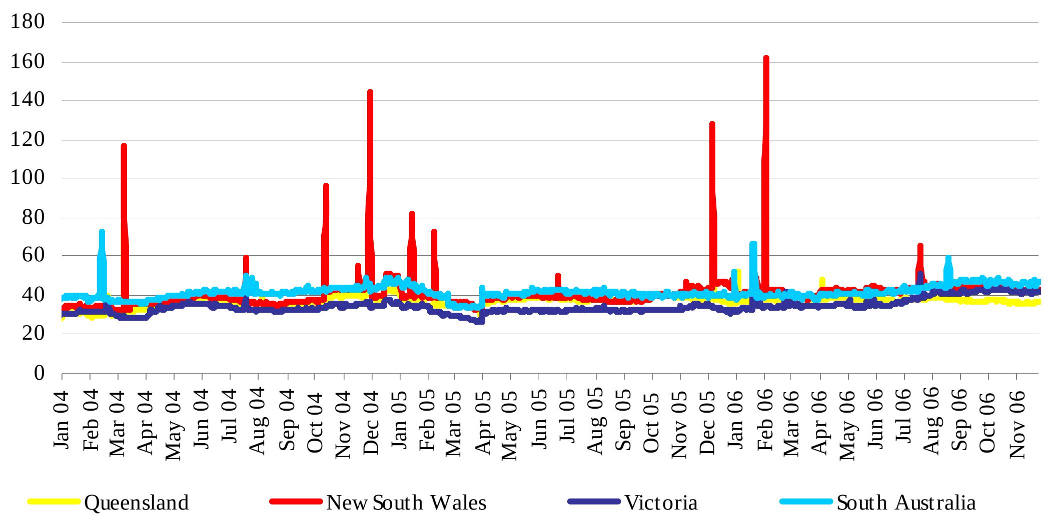
Figure 9 sets out the d-cyphaTrade wholesale electricity price index (WEPI)* for each region throughout the week excluding Tasmania. Figure 10 sets out the WEPI since 1 January 2004.

Figure 9: d-cyphaTrade WEPI for the week

	Monday	Tuesday	Wednesday	Thursday	Friday
Queensland	35.98	36.31	36.79	36.81	36.42
New South Wales	43.89	47.10	45.99	43.36	42.94
Victoria	42.81	44.24	42.12	41.97	42.03
South Australia	48.56	45.87	45.38	46.32	46.99

* 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

Figure 10: d-cyphaTrade WEPI



Reserve

There was no low reserve conditions forecast for the week.

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

Figure 11: Queensland

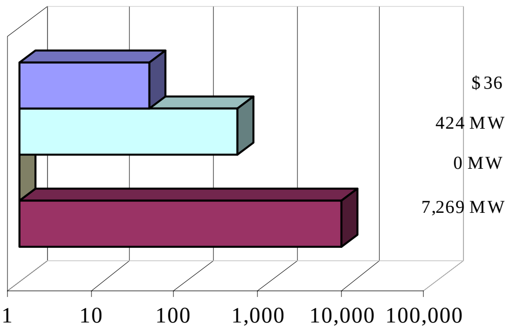


Figure 12: New South Wales

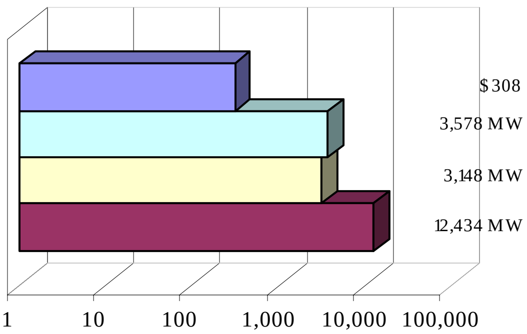


Figure 13: Victoria

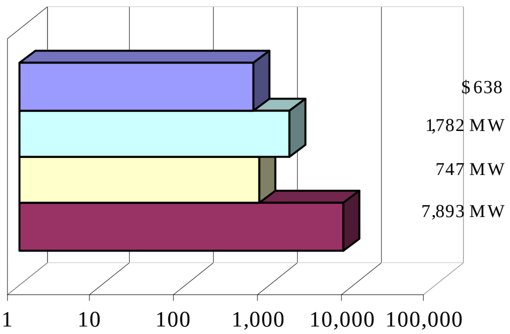


Figure 14: South Australia

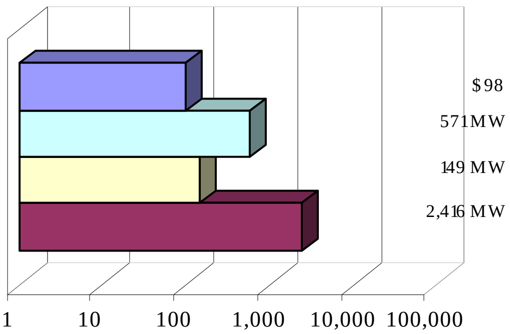
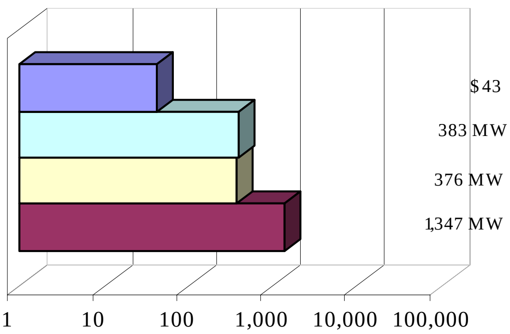
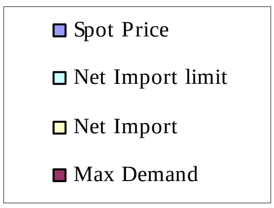


Figure 15: Tasmania





Price variations

There were 92 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

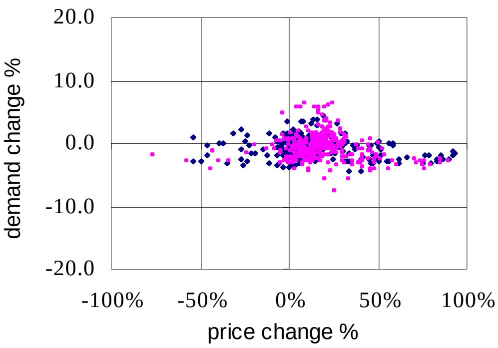


Figure 17: New South Wales

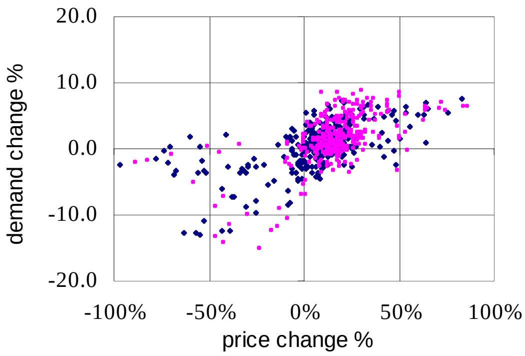


Figure 18: Victoria

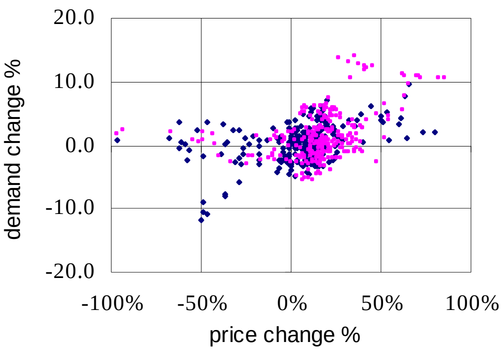


Figure 19: South Australia

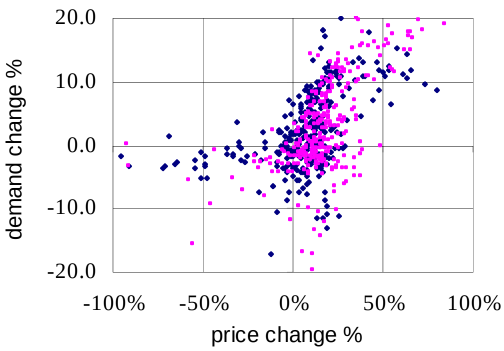


Figure 20: Tasmania

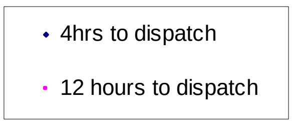
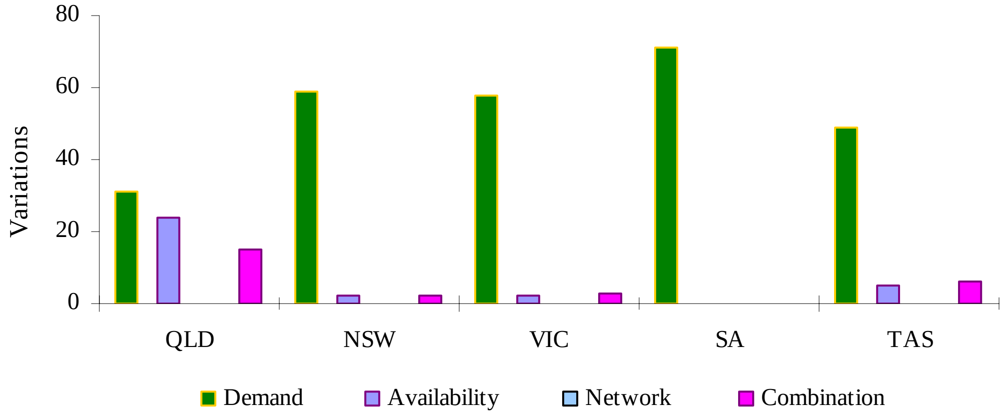


Figure 21 summarises the number and most probable reason for variations between forecast and actual prices.

Figure 21: reasons for variations between forecast and actual prices



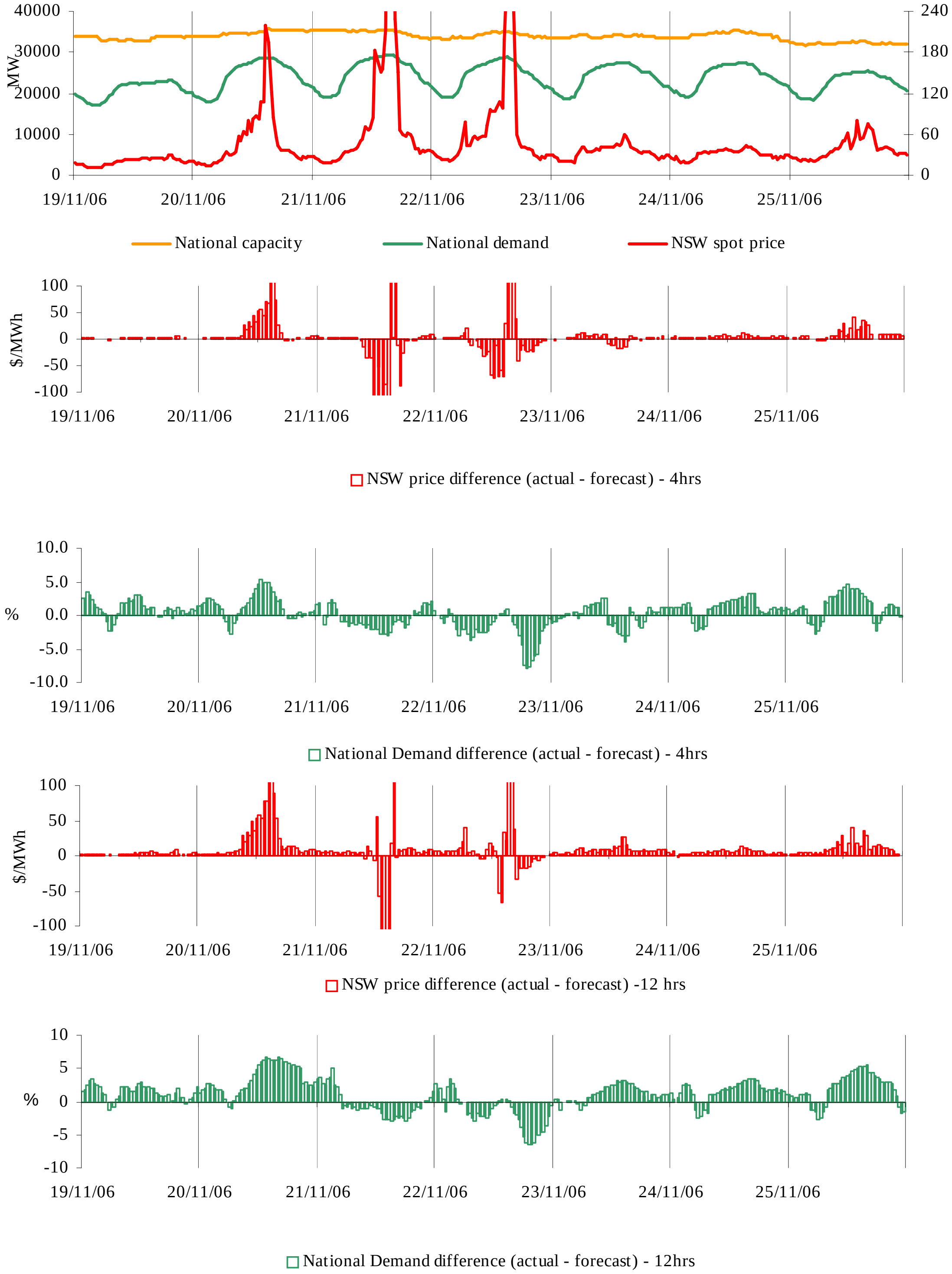
Price and demand

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 market outcomes



There were 13 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 $55/MWh.

Monday, 20 November

3:00 pm	Actual	4 hr forecast	12 hr forecast
Price ($/MWh)	220.09	38.05	30.48
Demand (MW)	28619	27404	26807
Available capacity (MW)	35546	35782	35386
3:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	193.95	46.56	30.75
Demand (MW)	28645	27654	26834
Available capacity (MW)	35629	35969	35522

Conditions at the time saw demand 1200 MW higher than forecast four hours ahead.

From 7.19 am, and over a number of subsequent rebids of the rest of the day, Ecogen Energy committed 500 MW of capacity at Newport. All of this capacity was priced below $80/MWh. The rebid reasons included "Adj to unit commitment due to PD conditions" and "Band adj due to P plant and PD market conditions".

At 9.33 am Wivenhoe unit one had 180 MW of capacity shifted from above $9000/MWh to $55/MWh. The rebid reason given was "Contract position::adjust profile".

At 9.57 pm Braemar Power Projects shifted 146 MW at Braemar unit three from prices above $9000/MWh to below $25/MWh. The rebid reason given was "optomizing dispatch".

At 11.52 am Macquarie Generation shifted 450 MW of capacity across its Bayswater units from prices below $30/MWh to above $240/MWh. The rebid reason given was "Load expected to vary from forecast".`

From 1.22 pm AGL Hydro shifted 113 MW of capacity at Hallett from prices above $9000/MWh to zero, the rebid reason given was "Portfolio optimisation – water value::".

At 1.27 pm Macquarie Generation shifted another 320 MW of capacity across its portfolio from prices below $15/MWh to above $185/MWh. The rebid reason given was "Revised NEMMCO demand forecast".

There was no other significant rebidding

Tuesday, 21 November

1:00 pm	Actual	4 hr forecast	12 hr forecast
Price ($/MWh)	183.42	237.48	128.87
Demand (MW)	28835	29465	29172
Available capacity (MW)	35084	35700	36253
1:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	167.74	330.79	224.44
Demand (MW)	28857	29688	29397
Available capacity (MW)	35311	35569	36231
3:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	212.01	669.99	652.70
Demand (MW)	29227	30105	29988

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

Available capacity (MW)	35428	35819	36146
3:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	452.29	271.42	652.35
Demand (MW)	29231	29971	30116
Available capacity (MW)	35432	35819	36175
4:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	673.66	669.52	656.15
Demand (MW)	29465	29871	30248
Available capacity (MW)	35460	35612	36080
4:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	670.26	237.14	301.03
Demand (MW)	29375	29653	30042
Available capacity (MW)	35247	35676	36150
5:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	229.37	240.66	231.27
Demand (MW)	29032	29253	29721
Available capacity (MW)	35212	35713	36017

Conditions at the time saw demand and available capacity close to that forecast four hours ahead. Prices were largely as forecast. High demand and temperatures were recorded across the market.

Delays in the return to service of International Power’s Hazlewood unit four and seven resulted in a 330 MW reduction in available capacity.

At around 10.40 am Tarong Energy’s Tarong unit two tripped reducing available capacity by 350 MW. It returned to service at around midday reaching full output by 4 pm.

At 12.12 pm Macquarie Generation shifted 660 MW of capacity at Bayswater units one, two and three from prices below $30/MWh with 540 MW shifted to prices above $8000/MWh. The remaining 120 MW was shifted to prices above $240/MWh. The rebid reason given was “QNI limits higher than forecast”.

Over several rebids from 12.16 pm Ecogen Energy shifted as much as 400 MW of capacity across its Jeeralang units from prices above $9000/MWh to $200/MWh. The rebid reasons included “Capacity adj due to soot level” and “Band adj due to PD market conditions”.

At 3.10 pm Macquarie Generation shifted 210 MW of capacity at Bayswater unit one and three from prices below $245/MWh to above $9000/MWh. The rebid reason given was “SA to VIC limit higher than forecast”.

From around 3 pm both interconnectors from Queensland to New South Wales were at their limits, separating Queensland from the rest of the market.

There was no other significant rebidding.

Wednesday, 22 November

3:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	199.53	170.75	167.16
Demand (MW)	28734	28546	28643
Available capacity (MW)	35062	35307	35366
3:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	307.71	171.89	286.37
Demand (MW)	28812	28543	28765

Available capacity (MW)	35214	35383	35365
4:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	500.20	291.22	357.27
Demand (MW)	28522	28506	28767
Available capacity (MW)	34881	35387	35342
4:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	331.05	169.56	168.24
Demand (MW)	28121	28373	28647
Available capacity (MW)	34606	35405	35574

Conditions at the time saw demand and available capacity close to forecast four hours ahead. Around 1300 MW of load in New South Wales was shed from 3.30 pm. It is believed this was caused by bush fires affecting the distribution network.

At 1.24 pm Snowy Hydro shifted 220 MW of capacity at Lower Tumut from prices below $155/MWh to above $450/MWh. The rebid reason given was "M:Dispatch higher than expected:bandshift up".

At 3.11 pm Macquarie Generation shifted 240 MW of capacity at Bayswater from prices below $30/MWh to above $9000/MWh. The rebid reason given was "VIC to Snowy limit higher than PD".

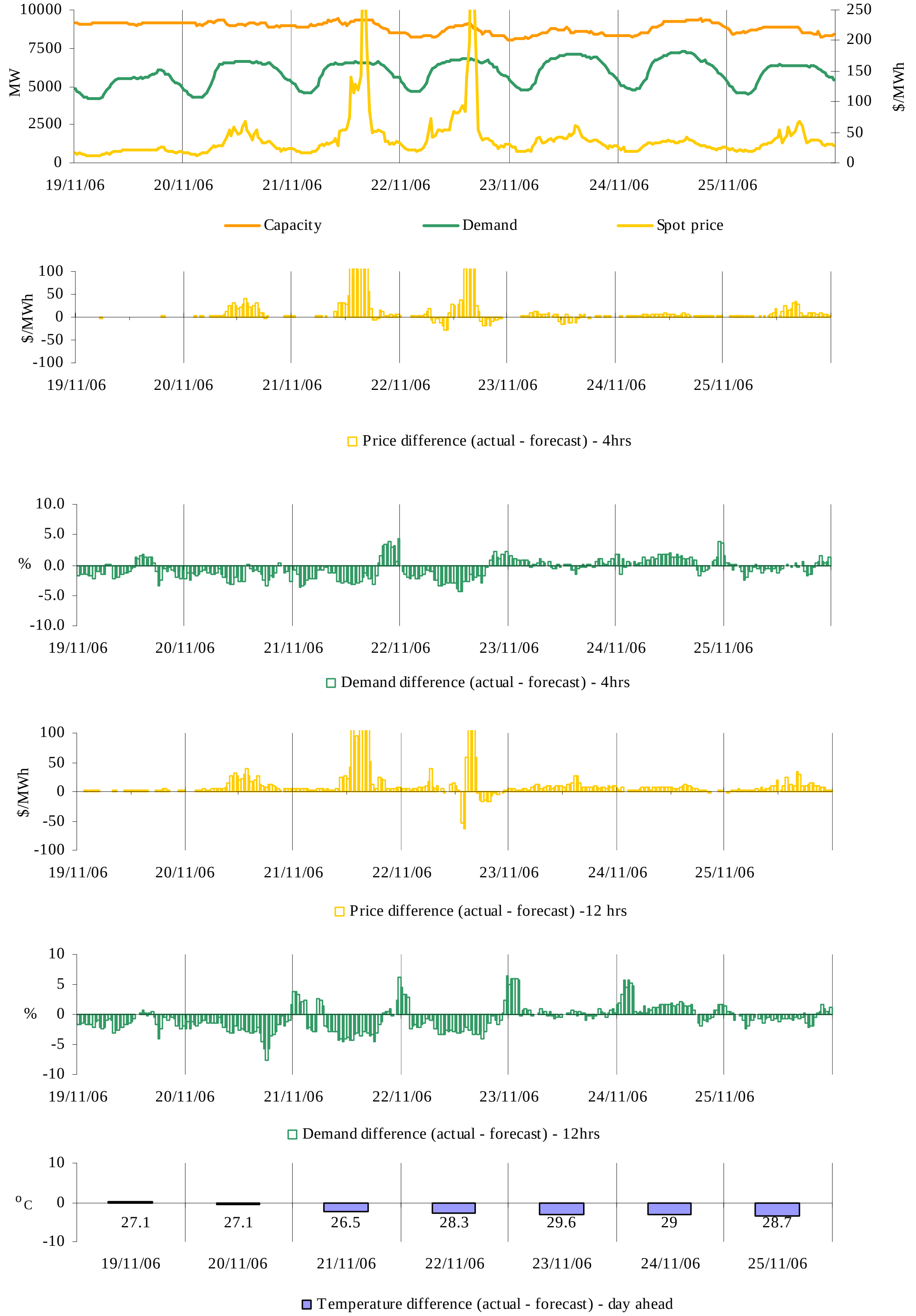
At 3.29 pm Stanwell Corporation shifted 180 MW of capacity at Stanwell units two and four from prices below $275/MWh to above $9200/MWh. The rebid reason given was "Manage transmission constraint".

From 1 pm AGL Hydro shifted around 140 MW of capacity at Hallett from prices above $9400/MWh to zero. The rebid reason given was "Predispatch-forecast price change::sustain".

At 3.44 pm Millmerran Energy Traders' Millmerran unit two tripped reducing available capacity by 435 MW, all priced below $10/MWh.

There was no other significant rebidding.

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



There were 11 occasions where the spot price in Queensland was greater than three times the weekly average price of $41/MWh. Nine of these occurred when prices were generally aligned across all regions and is detailed in the national market outcomes section. The remaining two occasions are presented below.

Tuesday, 21 November

2:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	127.65	19.96	32.90
Demand (MW)	6594	6768	6792
Available capacity (MW)	9302	9431	9405

Conditions at the time saw demand and available capacity below forecast four hours ahead. Prices were following New South Wales, where high temperatures were leading to high demand.

At 12.45 pm Millmerran Energy Trader shifted 140 MW of capacity from prices below $10/MWh to above $9000/MWh. The rebid reason given was "Changed PD::adjust MW dist:.

At 1.06 pm Enertrade shifted 120 MW of capacity across its Gladstone units from prices below $55/MWh to above $185/MWh. The rebid reason given was "Material change in market conditions::change MW distrib."

There were no other significant rebids.

Wednesday, 22 November

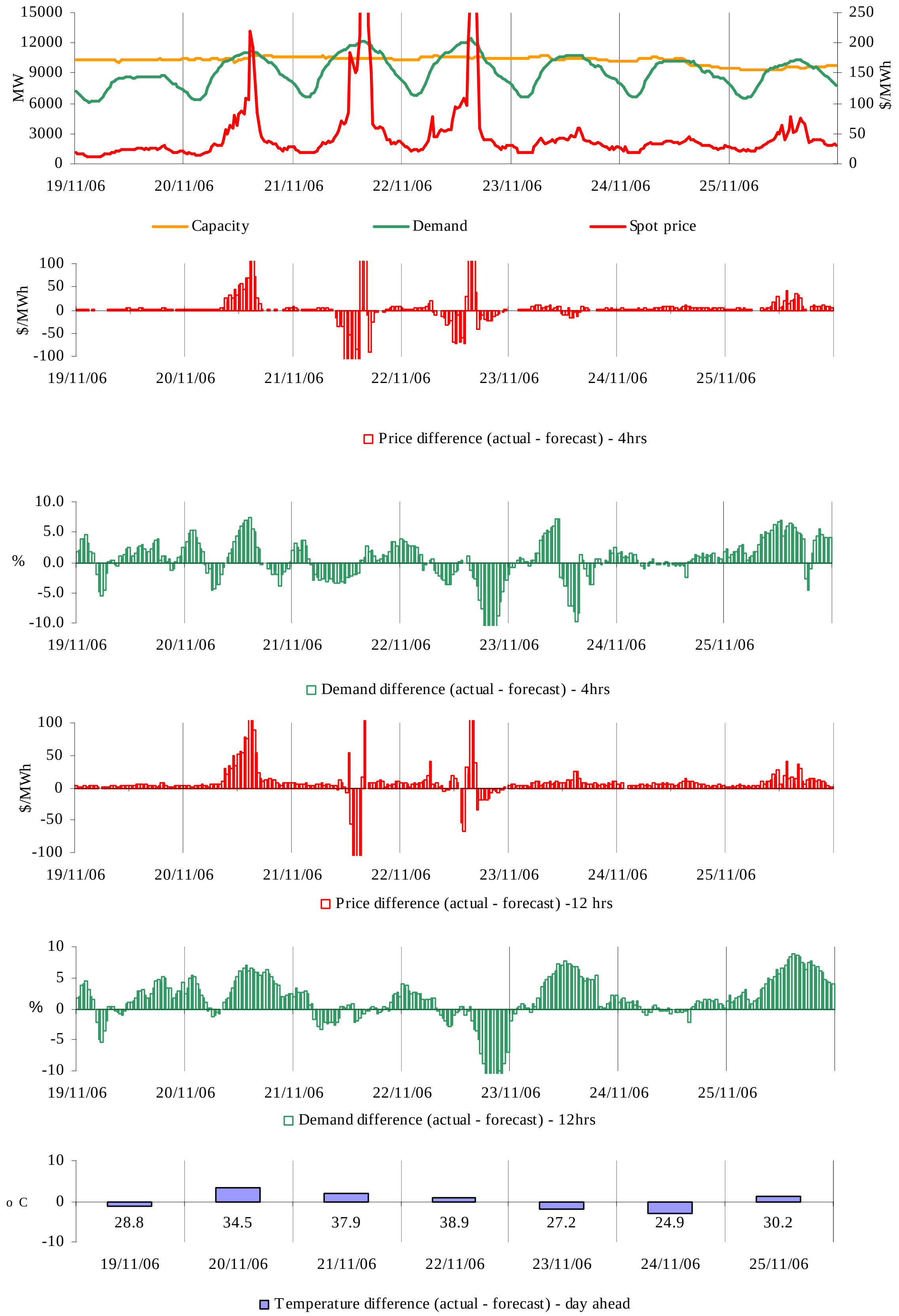
5:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	140.02	29.99	81.50
Demand (MW)	6737	6870	6921
Available capacity (MW)	8775	9189	9060

Conditions at the time saw demand close to forecast but available capacity 400 MW below forecast. Prices were following the conditions in New South Wales at the time.

At 3.44 pm Millmerran Energy Traders' Millmerran unit two tripped reducing available capacity by 435 MW, all priced below $10/MWh.

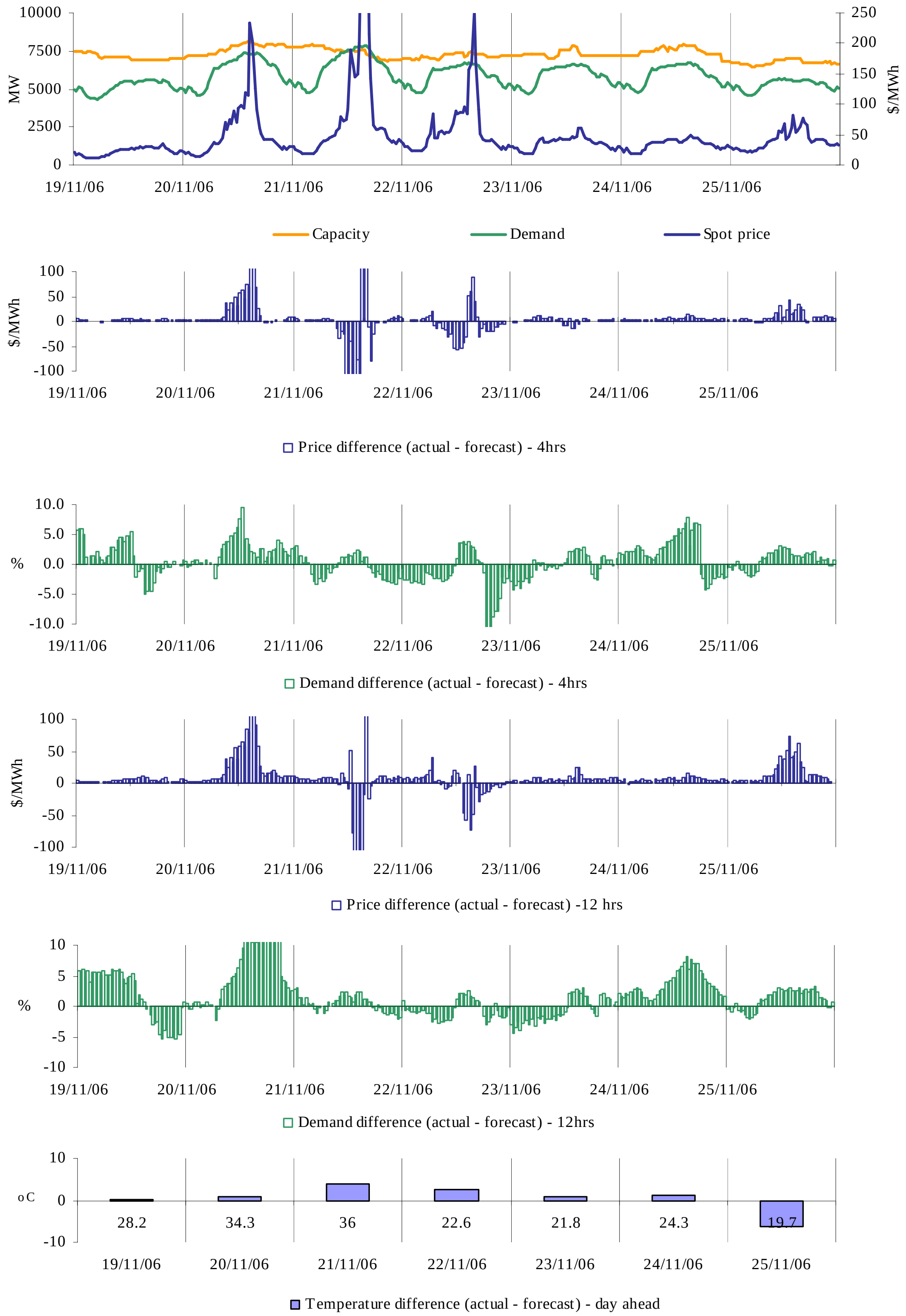
There were no other significant rebids.

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



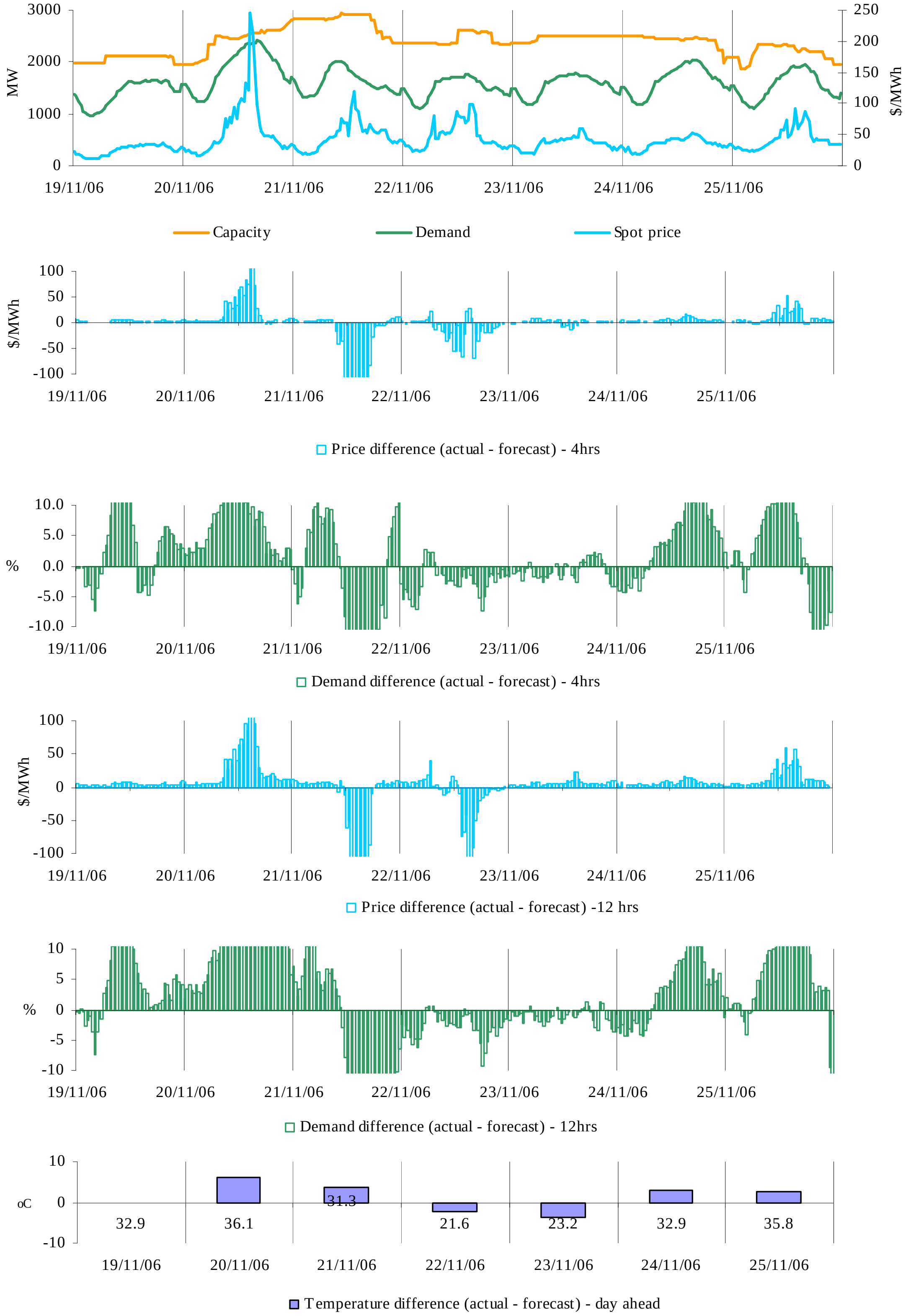
There were 13 occasions where the spot price in New South Wales was greater than three times the weekly average price of $55/MWh. At the time, prices were aligned across the market. The circumstances of these events are detailed under the national market outcomes section.

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



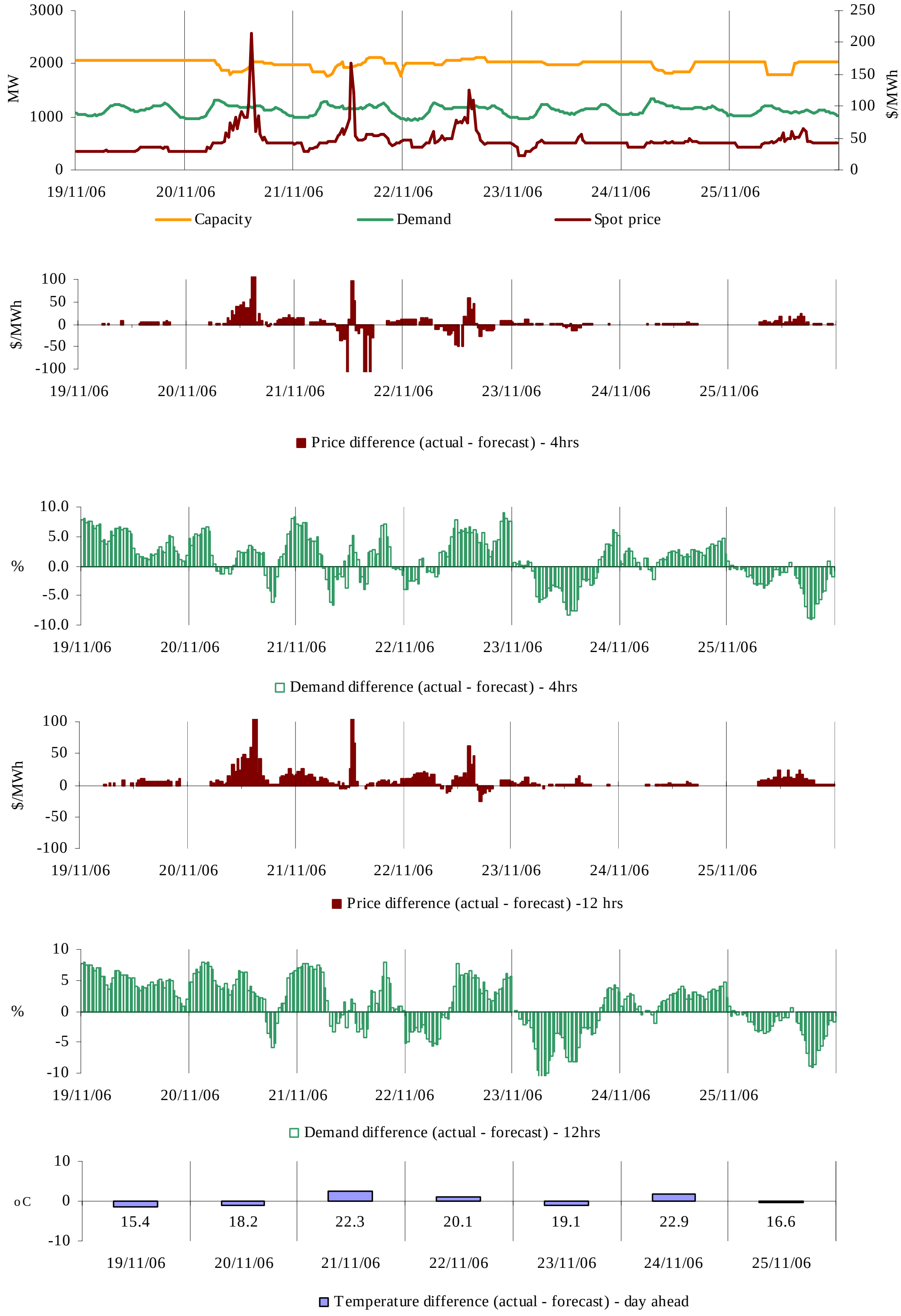
There were 12 occasions where the spot price in Victoria was greater than three times the weekly average price of $53/MWh. At the time, prices were aligned across the market. The circumstances of these events are detailed under the national market outcomes section.

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



There were two occasions where the spot price in South Australia was greater than three times the weekly average price of $45/MWh. At the time, prices were aligned across the market. The circumstances of these events are detailed under the national market outcomes section.

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



There were three occasions where the spot price in Tasmania was greater than three times the weekly average price of $46/MWh. At the time, prices were aligned across the market. 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

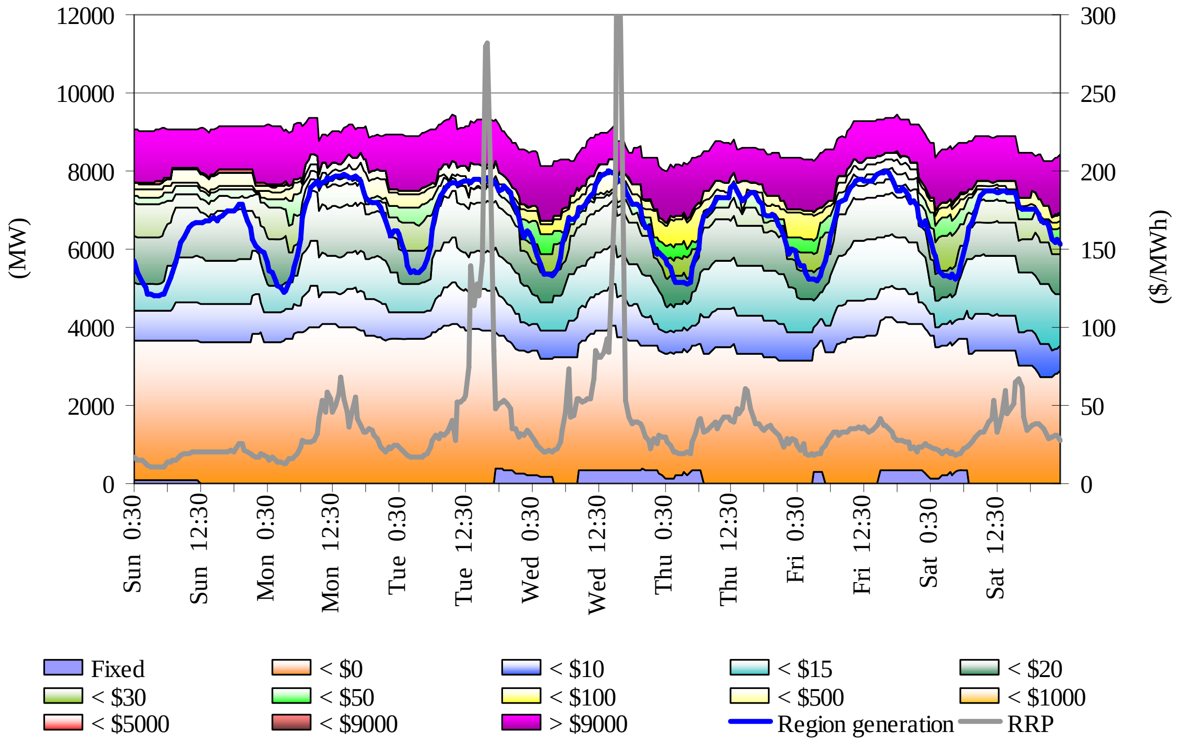


Figure 58: New South Wales closing bid prices, dispatched generation and spot price

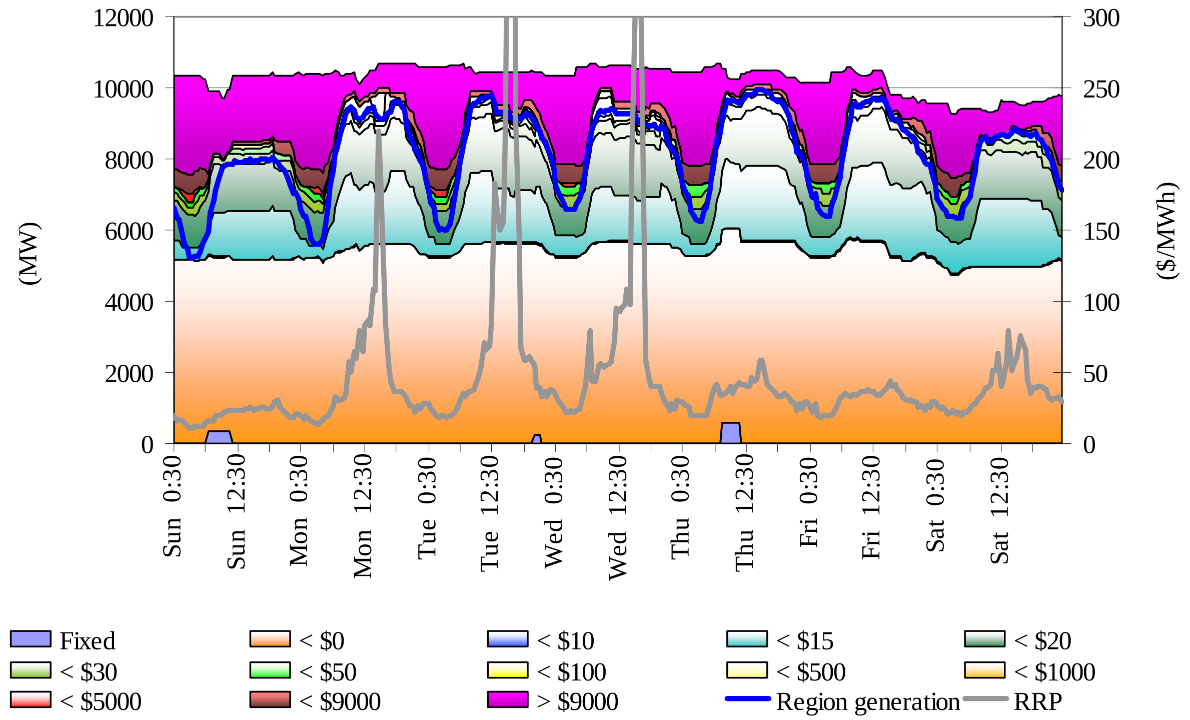


Figure 59: Victoria closing bid prices, dispatched generation and spot price

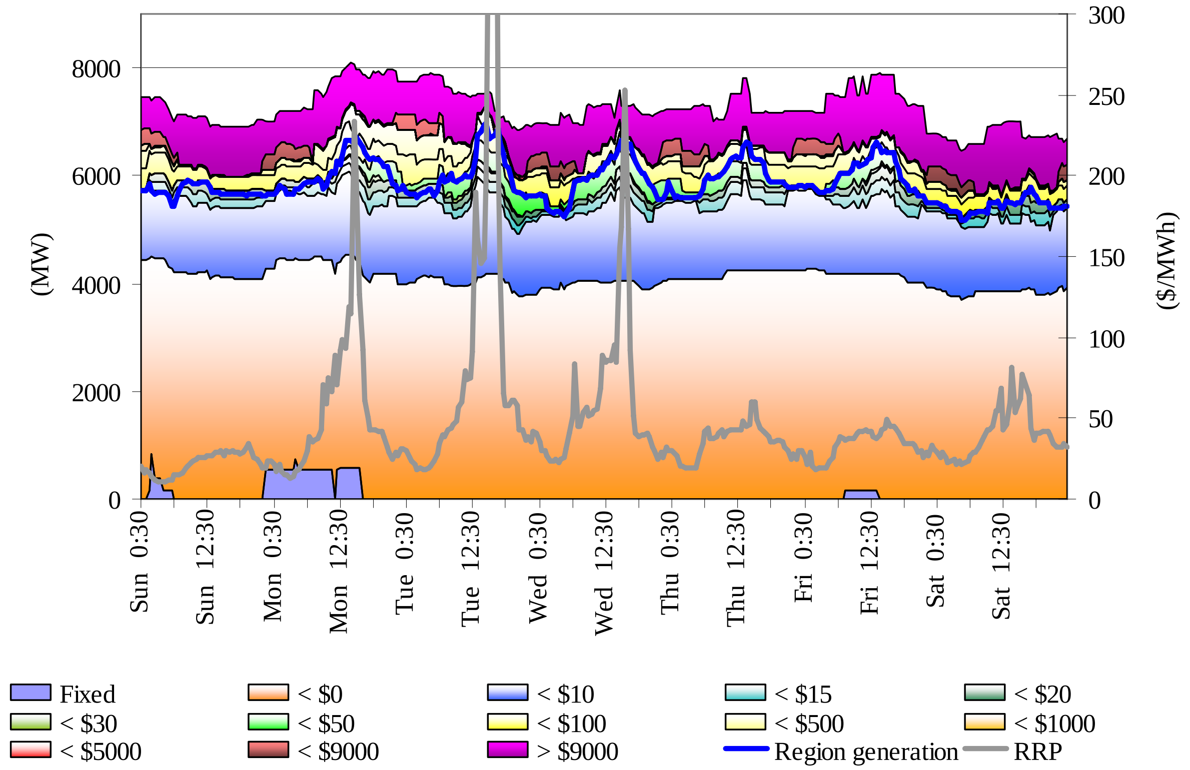


Figure 60: South Australia closing bid prices, dispatched generation and spot price

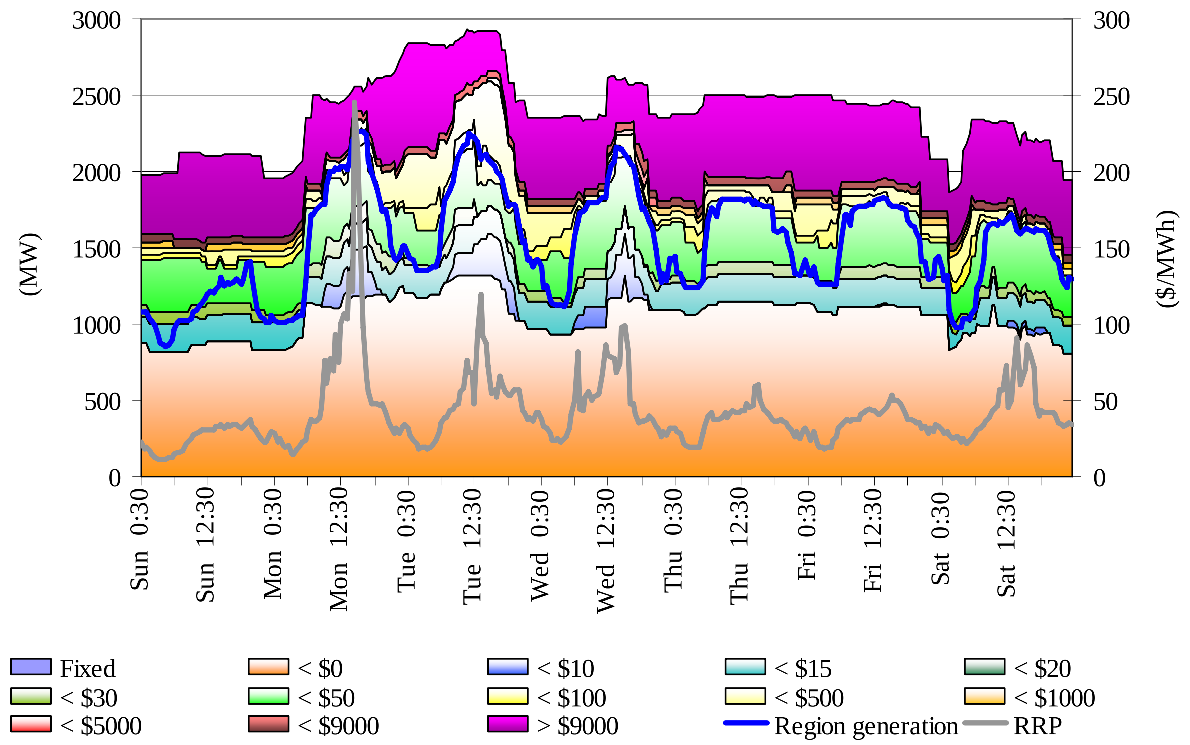
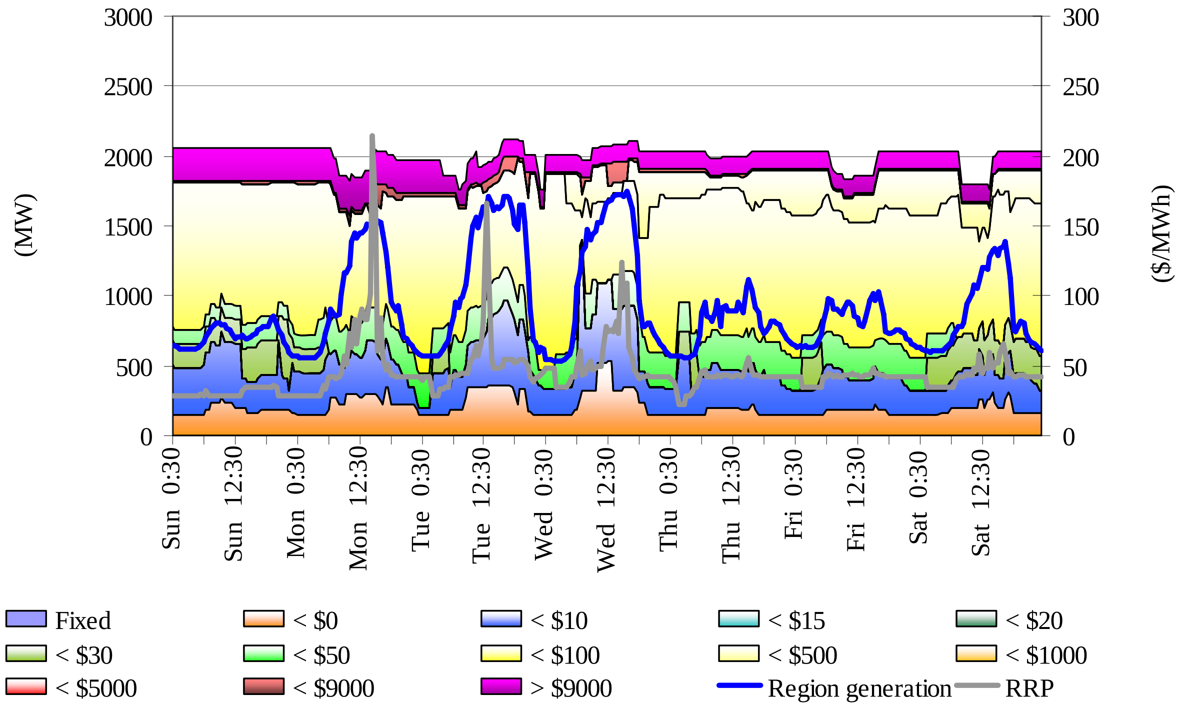


Figure 61: Tasmania closing bid prices, dispatched generation and spot price



Ancillary service market

The total cost of ancillary services on the mainland for the week was $242 000 or 0.1 per cent of 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 ($/MW)	0.52	0.22	1.17	3.11	0.13	0.50	2.05	0.97
Previous week ($/MW)	0.58	0.14	0.72	2.87	1.49	0.53	1.58	0.98
Last quarter ($/MW)	1.76	0.73	1.15	1.54	0.39	2.28	5.00	1.93
Market Cost ($1000s)	$22	$8	$67	$67	$0	$8	$58	$13
% of energy market	0.01%	0.01%	0.04%	0.04%	0.01%	0.01%	0.03%	0.01%

The total cost of ancillary services in Tasmania for the week was $302 000 or 3.5 per cent of the total turnover in the energy market in Tasmania. On Monday and Tuesday, high prices for lower 6 second services were the result of a combination of Tasmanian exports across Basslink increasing the requirement whilst Bell Bay was offline. Recently, Bell Bay has been a large provider of lower 6 second services. On Wednesday the price of the lower 5 minute FCAS spiked to $7726/MW at 12.20 pm. At the time five units were stranded from the market. Two of these units provided around 172 MW of the 206 MW required for the previous dispatch interval. In total there was around 468 MW of lower 5 minute availability stranded from this market. This event had a market cost of $131 000. 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 ($/MW)	4.65	0.73	1.89	3.98	19.73	0.68	12.13	0.92
Previous week ($/MW)	4.27	0.80	2.21	4.18	0.20	0.20	0.40	0.89
Last quarter ($/MW)	4.97	0.49	2.93	3.00	12.67	0.43	0.82	0.45
Market Cost ($1000s)	$18	$9	$21	$17	$88	$8	$136	$6
% of energy market	0.20%	0.10%	0.24%	0.20%	1.02%	0.09%	1.58%	0.07%

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

Figure 64: daily frequency control ancillary service cost

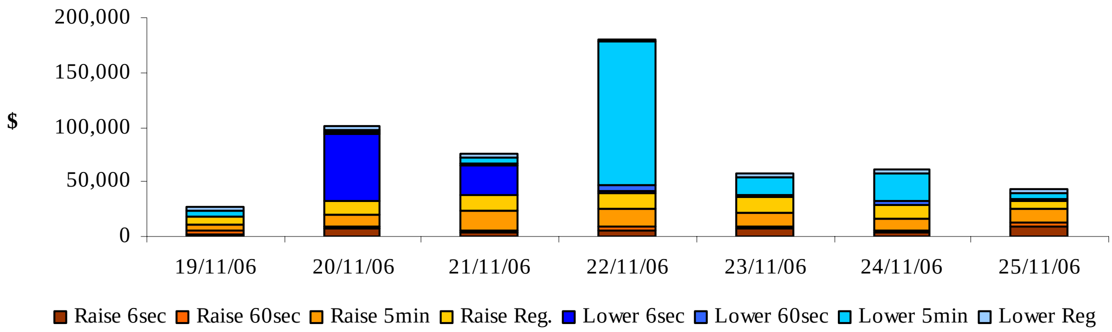
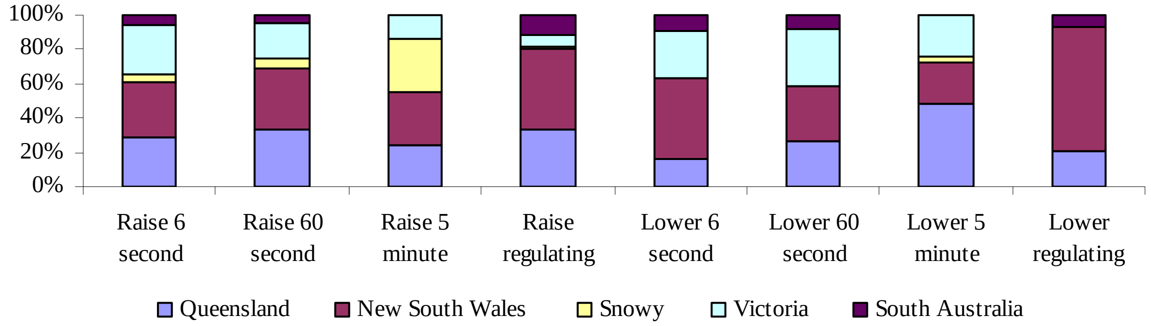


Figure 65 shows the contribution, on a percentage basis, that frequency control ancillary service providers are utilised (in each mainland region) to satisfy the total requirement for each service.

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

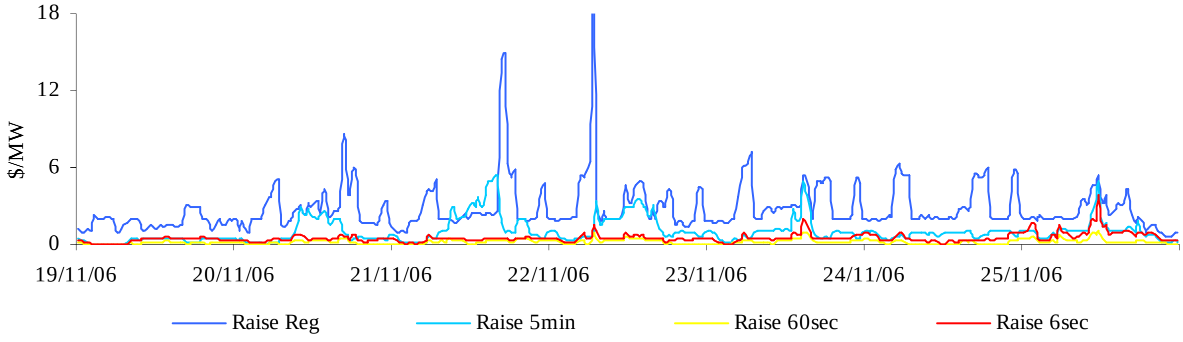


Figure 66A: prices for raise services – Tasmania

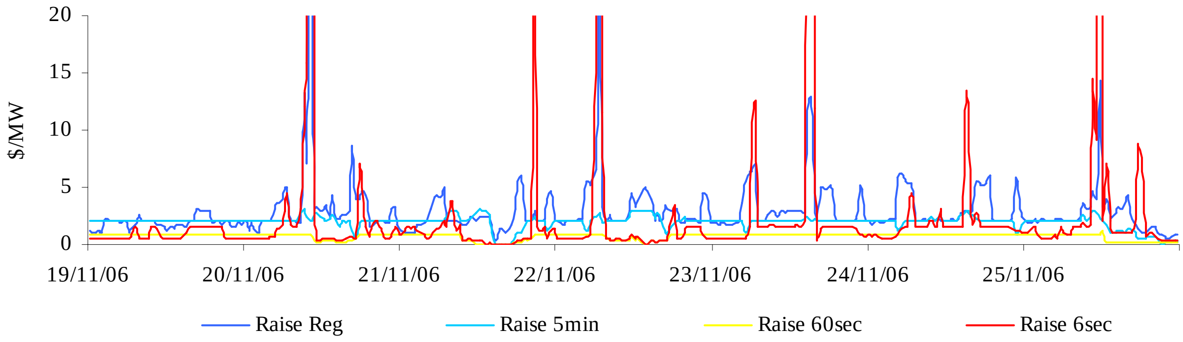


Figure 67: prices for lower services

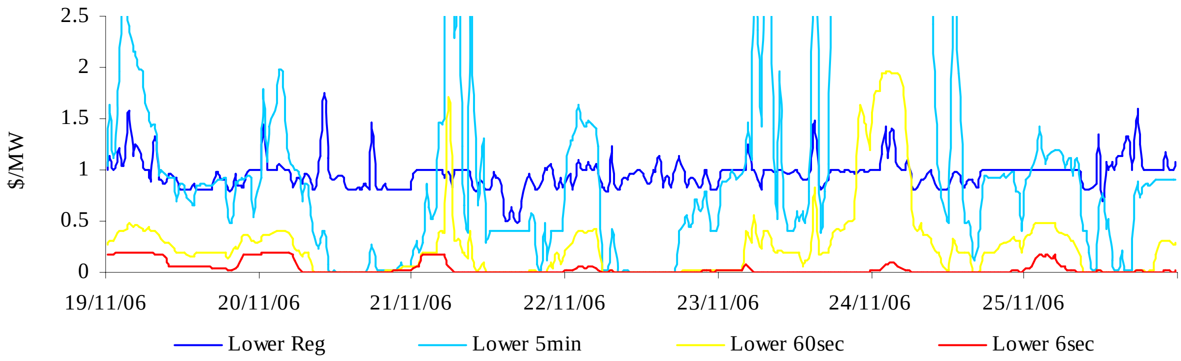
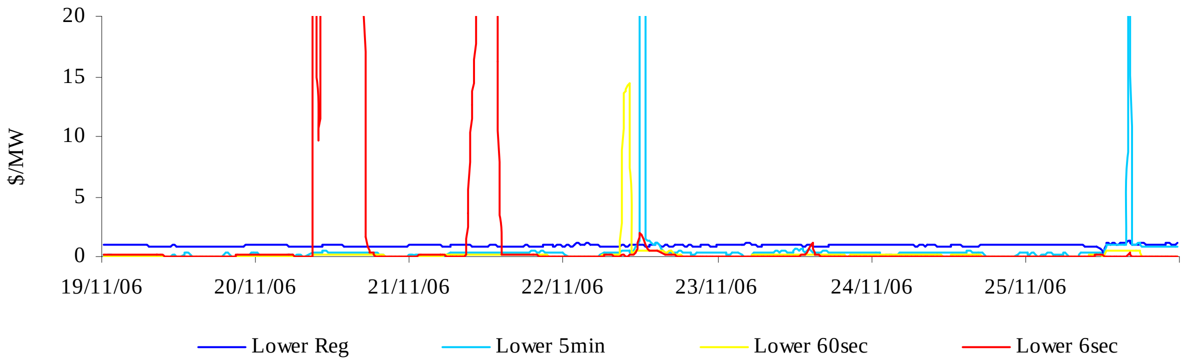


Figure 67A: prices for lower services – Tasmania



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

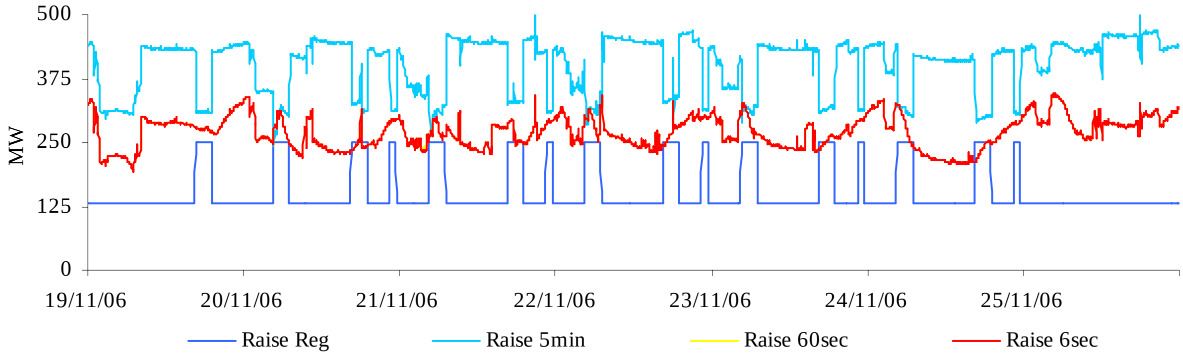


Figure 68A: raise requirements – Tasmania

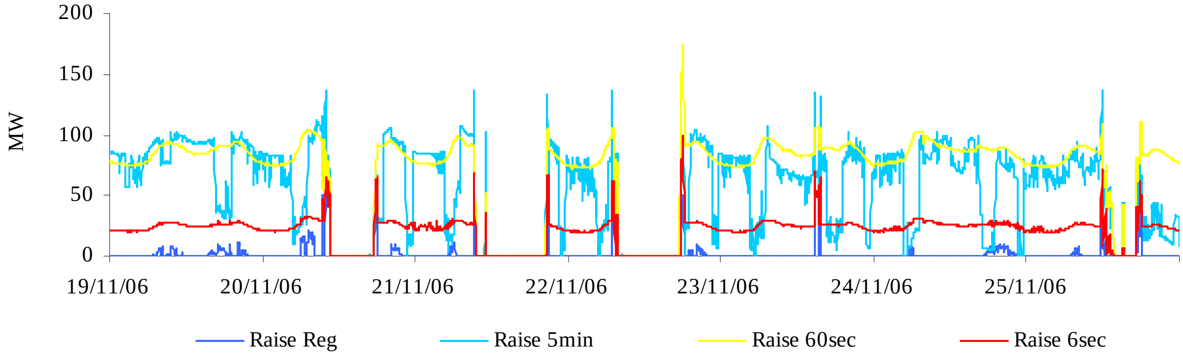


Figure 69: lower requirements

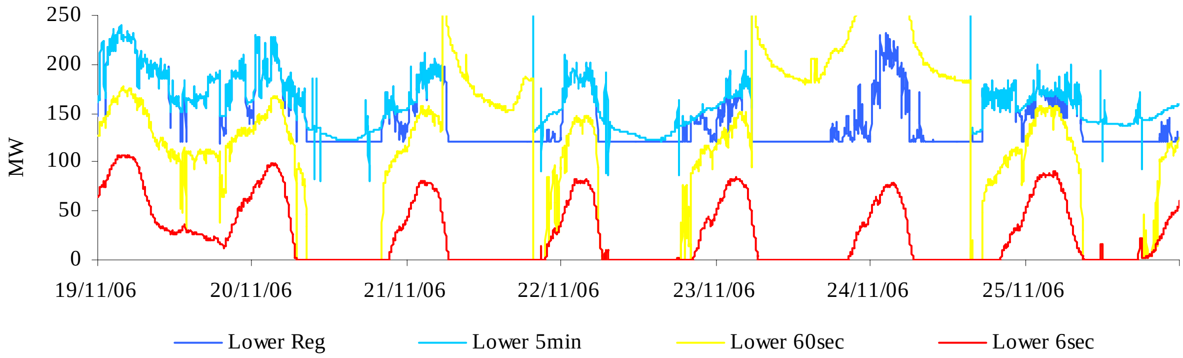
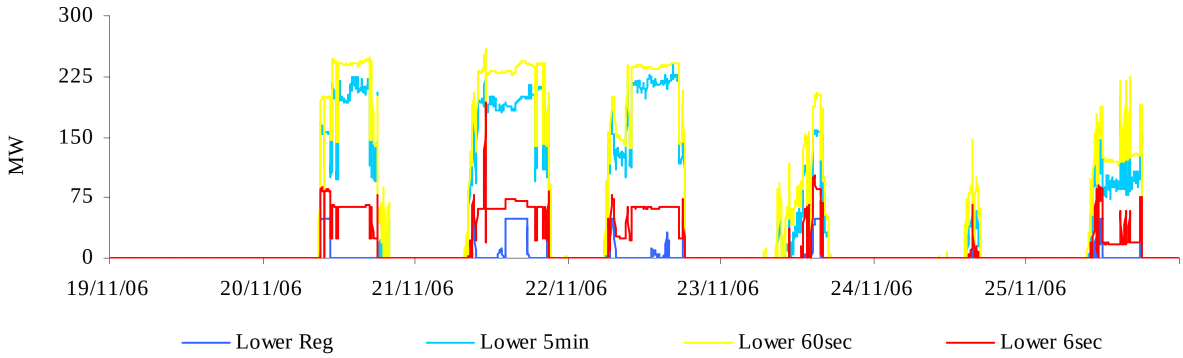


Figure 69A: lower requirements – Tasmania



Australian Energy Regulator
November 2006