Market analysis

AUSTRALIAN ENERGY REGULATOR

5–11 FEBRUARY 2006

Cooler temperatures across the mainland led to lower demands and average prices compared to the previous week. Spot prices averaged between $18/MWh in Victoria and $21/MWh in South Australia.

An unplanned transmission line outage in Tasmania on Tuesday afternoon led to $1000/MWh energy prices. The average price of $37/MWh was up compared to the previous week. The price for frequency control ancillary services exceeded $5000/MW for three services at the same time.

Turnover in the energy market for the mainland was $73 million with the cost of ancillary services totaling around $170 000, or 0.2 per cent of turnover. Turnover in Tasmania for the week was $6.3 million with the cost of ancillary services reaching just over $400 000 or 6 per cent of turnover reflecting the events of Tuesday.

Significant variations between actual prices and those forecast 4 and 12 hours ahead occurred in 22, or around 7 per cent 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 of all trading intervals across the market. These variations were most frequent in South Australia occurring in around half of all trading intervals.

Energy prices

Figure 1 sets out national demand and spot prices in each region for each trading interval. Figure 2 compares the volume weighted average price with the averages for the previous week, the same quarter last year and for the financial year to date. Figure 3 compares the weekly price volatility index with the averages for the previous week and the same quarter last year.

Figure 1: national demand and spot prices

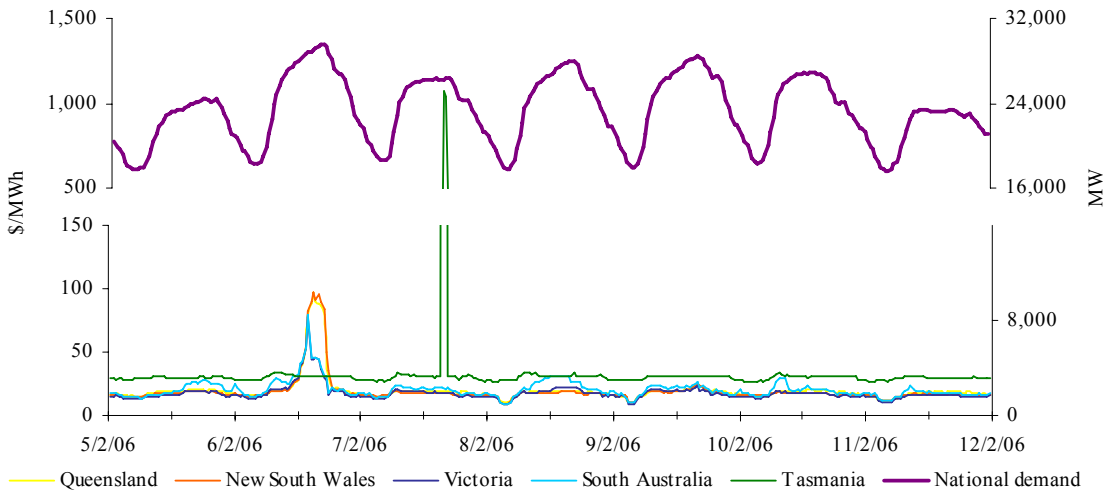


Figure 2: volume weighted average spot price for energy market ($/MWh)

	QLD	NSW	VIC	SA	TAS
Last week	20	20	18	21	37
Previous week	175	265	28	30	31
Same quarter last year	25	35	22	31	-
Financial year to date	36	54	35	48	74
% change from previous week	▼89%	▼92%	▼37%	▼31%	▲18%
% change from same quarter last year	▼19%	▼44%	▼19%	▼33%	-
% change from year to date	▼1%	▼8%	▲13%	▲14%	-

Figure 3: volatility index during peak periods

	QLD	NSW	VIC	SA	TAS
Last week	0.20	0.29	0.37	0.61	0.05
Previous week	2.88	2.79	0.86	0.76	0.08
Same quarter last year	0.73	0.74	0.78	0.70	-

Figures 4 to 8 show the weekly correlation between spot price and demand.

Figure 4: Queensland

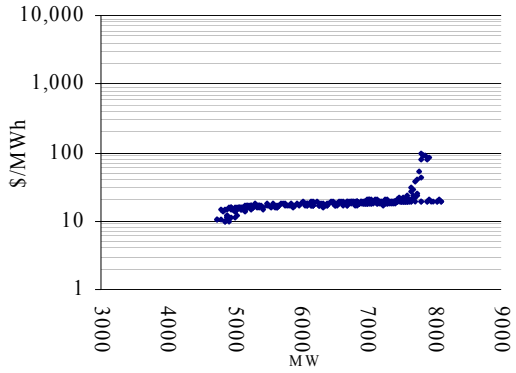


Figure 5: New South Wales

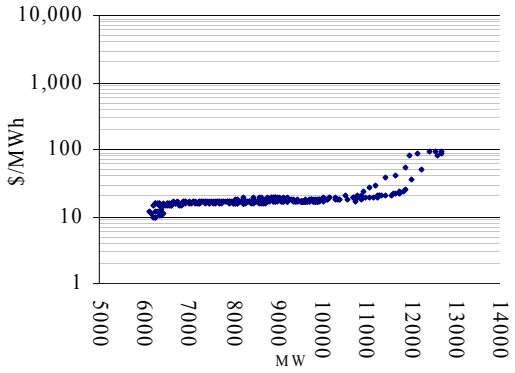


Figure 6: Victoria

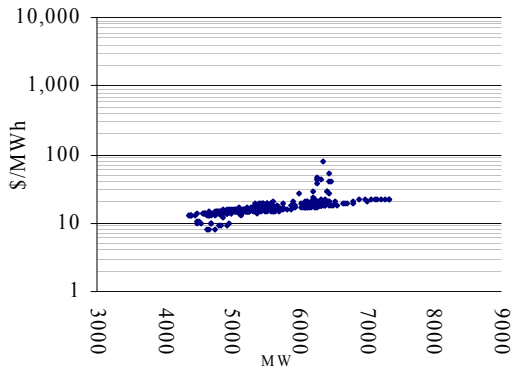


Figure 7: South Australia

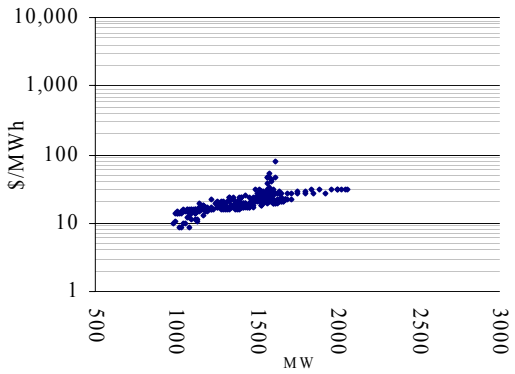
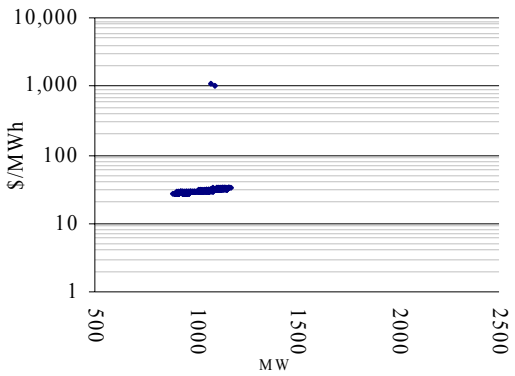


Figure 8: Tasmania



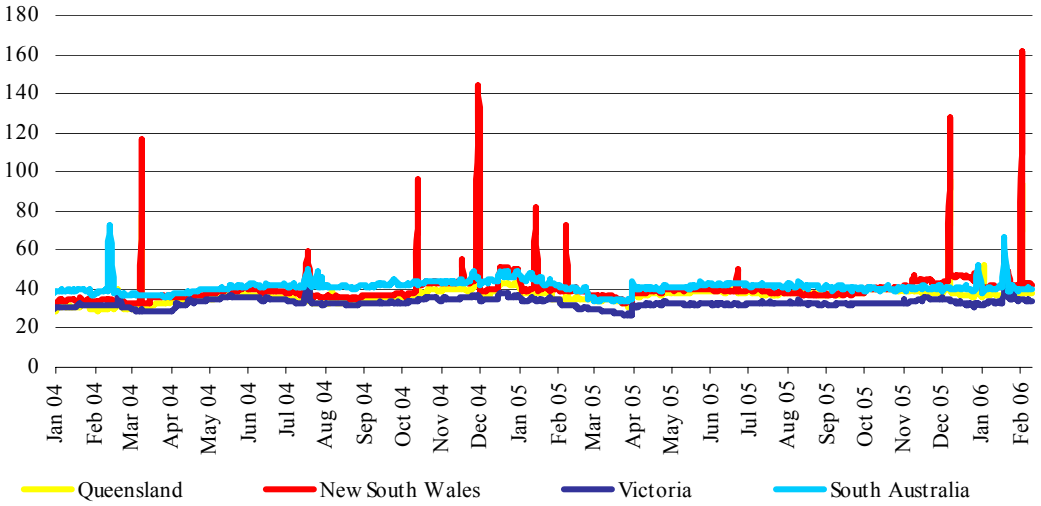
Maximum spot prices for the week reached around $97/MWh in New South Wales and Queensland and around $78/MWh in Victoria and South Australia – all occurring on Monday afternoon. In Tasmania, the highest price for the week, of $1076/MWh, was recorded at 3.30pm on Tuesday following the loss of the Sheffield to Farrell transmission lines.

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

Figure 9: d-cyphaTrade WEPI for the week

	Monday	Tuesday	Wednesday	Thursday	Friday
Queensland	38.14	37.53	37.63	37.47	37.36
New South Wales	43.36	41.56	42.02	42.96	41.59
Victoria	34.18	34.25	34.78	33.86	33.67
South Australia	39.44	39.87	40.60	39.43	39.82

Figure 10: d-cyphaTrade WEPI



Reserve

There were no low reserve conditions forecast for the week. Directions were issued to Directlink on Monday and Friday to manage network issues associated with the Gold Coast and northern New South Wales. Figures 11 to 14 show spot price, net imports and limits at the time of weekly maximum demand.

Figures 11 to 14: spot price, net import and limit at time of weekly maximum demand

Figure 11: Queensland

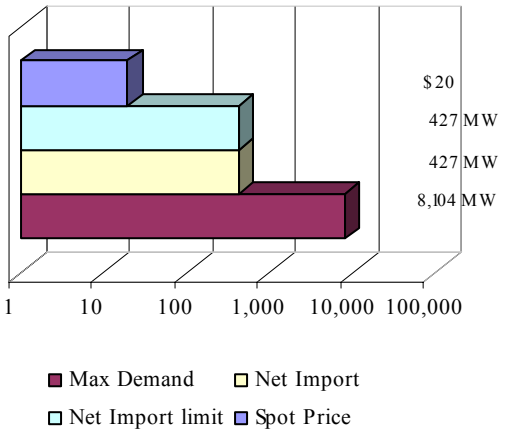


Figure 12: New South Wales

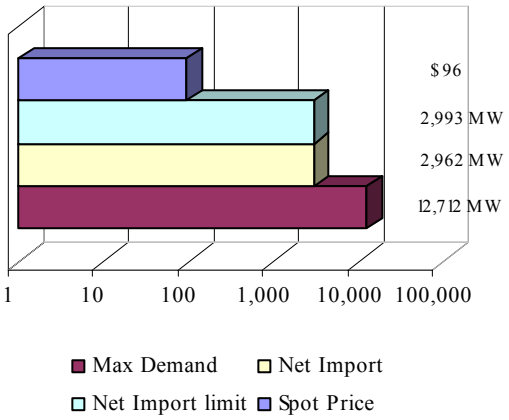


Figure 13: Victoria

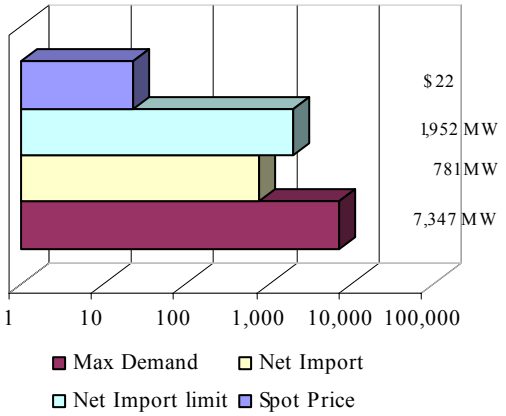
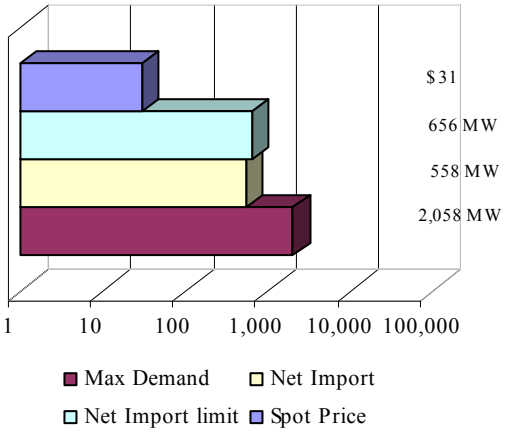


Figure 14: South Australia



In Tasmania, demand reached a maximum of 1172 MW at 8.30am on Tuesday morning. The spot price at that time was $33/MWh.

Price variations

There were 22 trading intervals where actual prices significantly varied from forecasts made 4 and 12 hours ahead of dispatch. Figures 15 to 19 show the difference in actual and forecast price versus the difference in actual and forecast demand. The figures highlight the correlation 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 15: Queensland

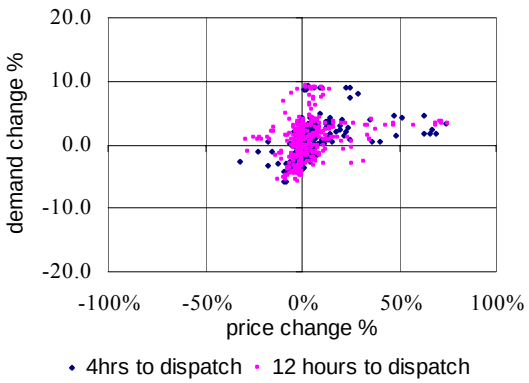


Figure 16: New South Wales

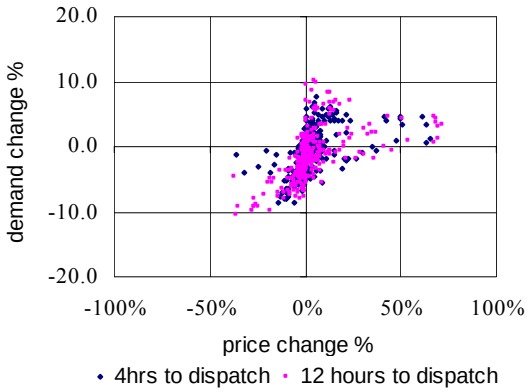


Figure 17: Victoria

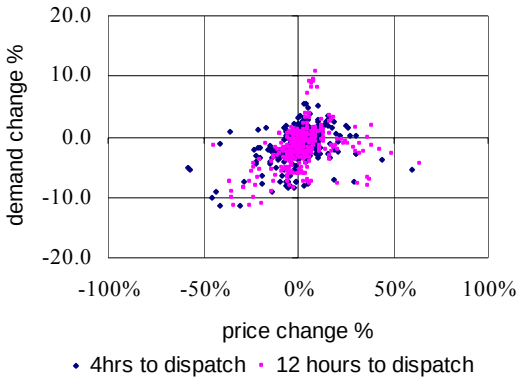


Figure 18: South Australia

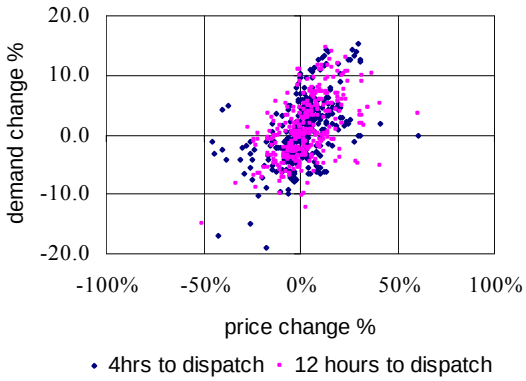


Figure 19: Tasmania

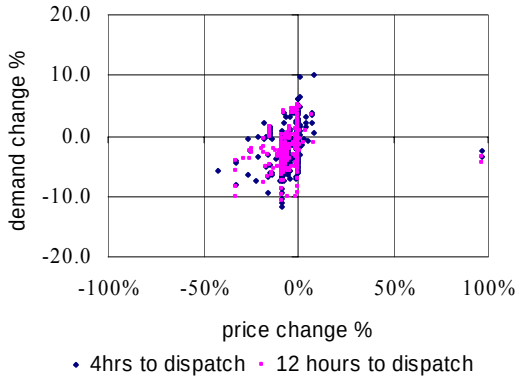
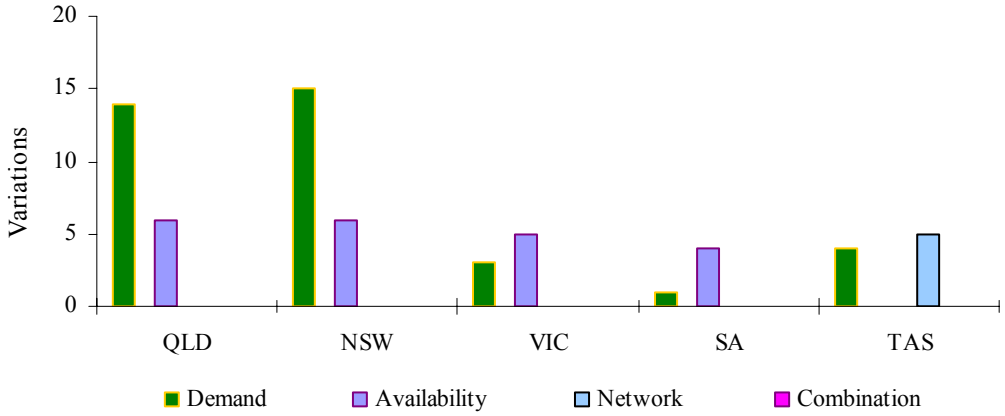


Figure 20 summarises the number and most probable reason for variations between forecast and actual prices.

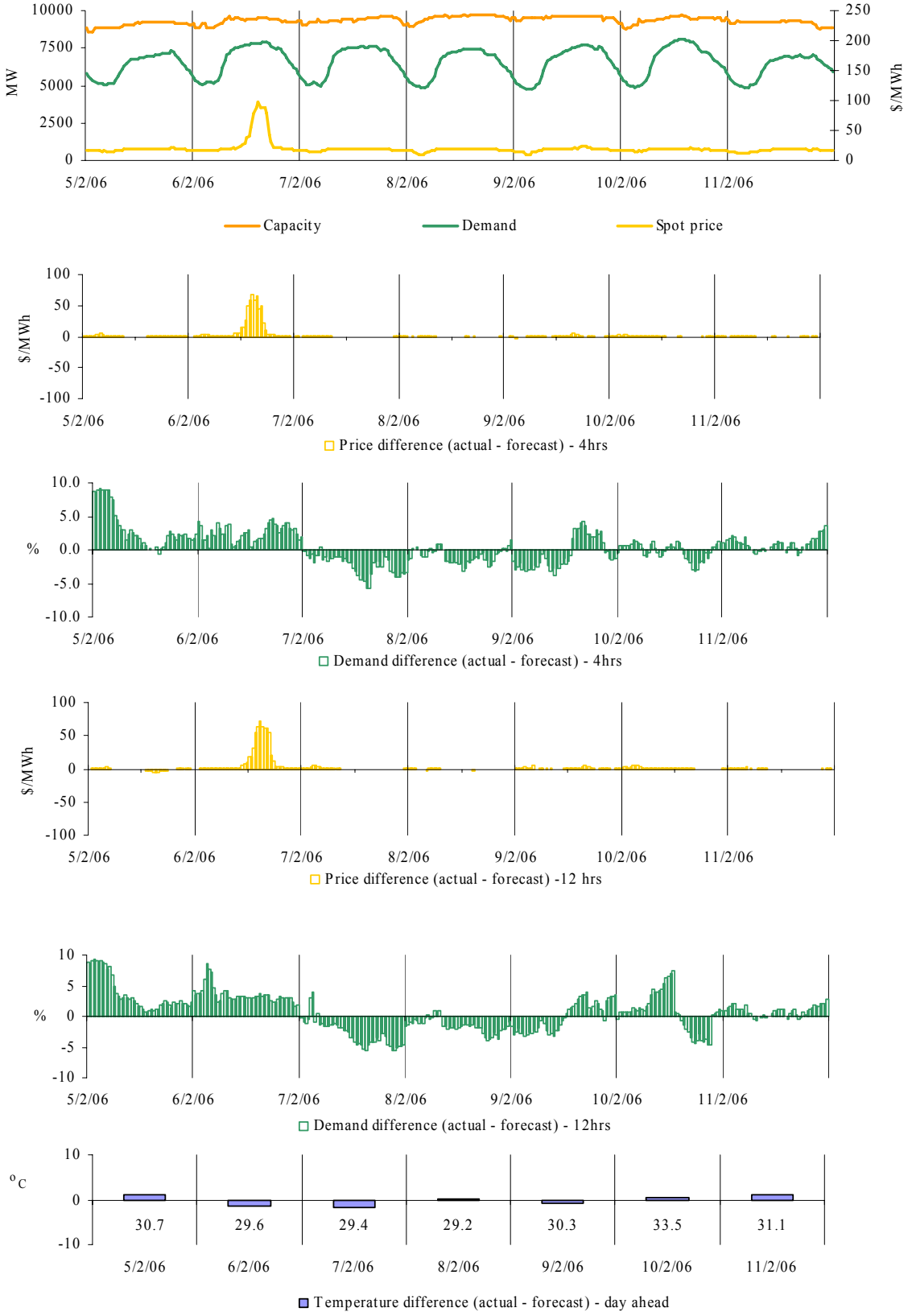
Figure 20: reasons for variations between forecast and actual prices NETWORK IN TAS?



Price and demand

Figures 21 - 50 set out details of spot prices and demand on a regional basis. They include the actual spot price, actual demand outcomes and variation from forecasts made 4 and 12 hours ahead of dispatch on a daily basis. The differences between the maximum temperature and the temperature forecast at around 6.00 pm the day before are also included. Figures 51 - 55 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.

Figures 21-26: Queensland actual spot price, demand and forecast differences



There were 7 occasions in Queensland where the spot price was greater than three times the weekly average price of $20/MWh. These occurred on Monday afternoon.

Monday, 6 February

2:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	79.50	29.43	24.26
Demand (MW)	7805	7681	7562
Available capacity (MW)	9397	9517	9942
2:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	88.13	29.70	24.39
Demand (MW)	7826	7689	7571
Available capacity (MW)	9475	9517	9942
3:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	97.19	29.70	24.22
Demand (MW)	7809	7668	7546
Available capacity (MW)	9483	9502	9942
3:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	89.19	29.70	24.79
Demand (MW)	7826	7645	7534
Available capacity (MW)	9516	9437	9942
4:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	87.65	22.84	27.26
Demand (MW)	7875	7615	7610
Available capacity (MW)	9506	9502	9942
4:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	87.07	42.55	25.35
Demand (MW)	7920	7594	7637
Available capacity (MW)	9489	9502	9942
5:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	79.44	29.70	24.29
Demand (MW)	7891	7533	7620
Available capacity (MW)	9489	9502	9942

Conditions at the time saw demand between 100 MW and 300 MW higher than forecast 4 hours ahead. Prices were aligned with New South Wales.

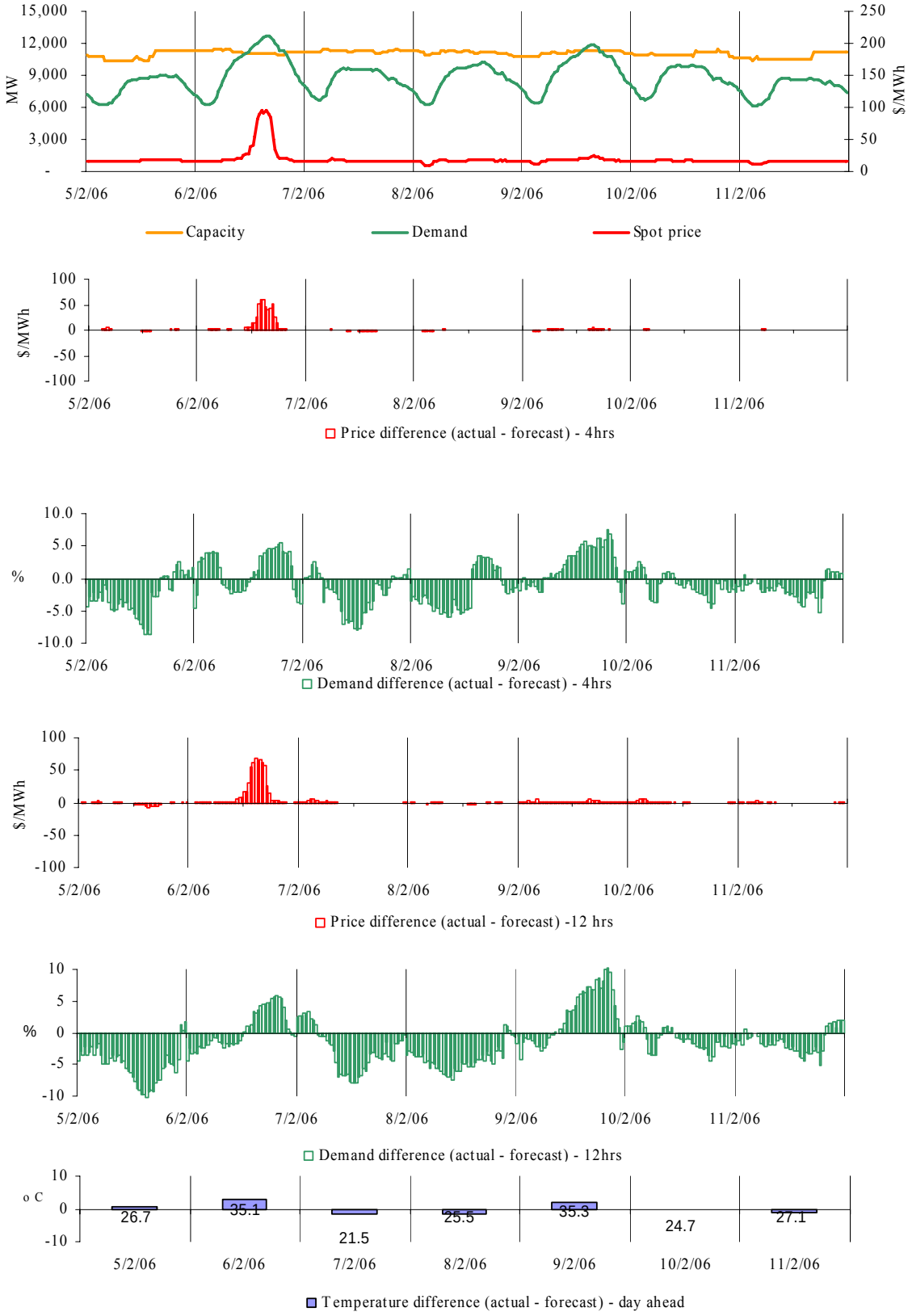
At around 8am, the availability of Millmerran unit 2 was reduced by 245 MW – the reason given was "changed plant conditions". All of this capacity was priced at less than zero. Rebids related to the availability of Callide Power during the morning saw reductions of up to 90 MW in the availability of Callide C unit 4. The rebid reasons given included "High emissions" and "Fabric filter high DPS", where DPS refers to differential pressure". All of this capacity was priced at less than $15/MWh.

At 1.54pm, Origin Energy shifted 30 MW of capacity at Roma unit 7 from prices over $9000/MWh down to $1/MWh, the rebid reason was "est(n) change in PDS".

At 2.13pm, Enertrade rebid 315 MW of capacity at Gladstone from below $80/MWh to over $200/MWh. The rebid reason was "material change in market conditions::change MW distribution".

There was no other significant rebidding.

Figures 27-32 New South Wales actual spot price, demand and forecast differences



There were 7 occasions in New South Wales where the spot price was greater than three times the weekly average price of $20/MWh. These occurred on Monday.

Monday, 6 February

2:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	82.56	30.20	27.08
Demand (MW)	11 991	11 918	11 921
Available capacity (MW)	11 057	11 497	11 537
2:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	89.76	30.71	27.22
Demand (MW)	12 143	11 982	11 981
Available capacity (MW)	11 057	11 497	11 537
3:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	96.40	35.41	27.05
Demand (MW)	12 434	12 009	12 009
Available capacity (MW)	11 057	11 497	11 537
3:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	91.70	45.09	27.93
Demand (MW)	12 567	12 147	12 162
Available capacity (MW)	11 057	11 347	11 537
4:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	95.73	55.00	30.00
Demand (MW)	12 712	12 201	12 247
Available capacity (MW)	11 107	11 347	11 537
4:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	89.44	45.42	28.08
Demand (MW)	12 679	12 129	12 131
Available capacity (MW)	11 107	11 187	11 537
5:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	83.51	32.19	27.10
Demand (MW)	12 591	12 022	12 025
Available capacity (MW)	11 107	11 187	11 537

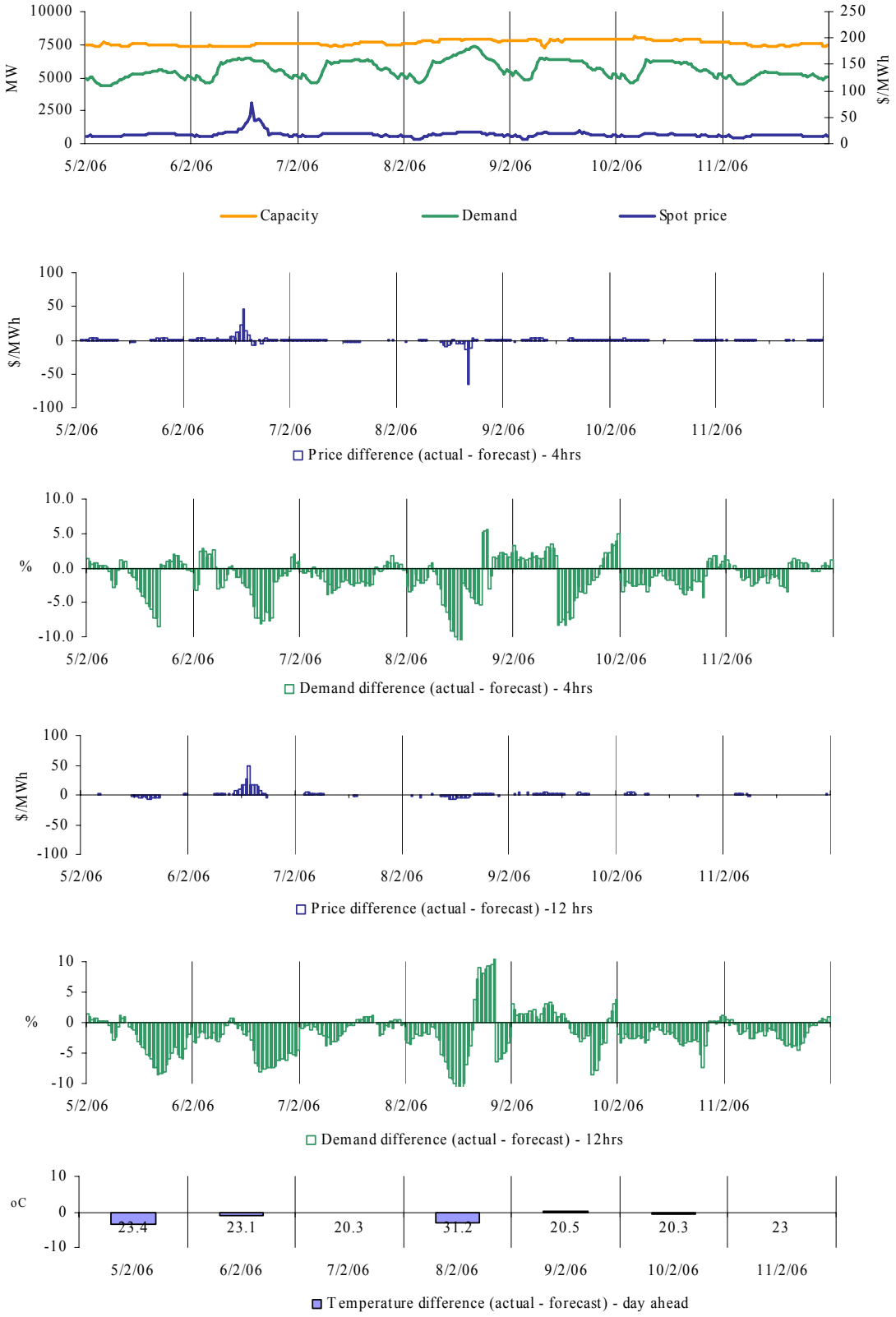
Conditions at the time saw demand close to forecast early in the afternoon, but more than 500MW higher than forecast four hours ahead by 4pm. Temperatures reached 35 degrees, which was 3 degrees higher than forecast the previous day.

From 10.30am, over a number of rebids, Eraring Energy shifted as much as 720 MW of capacity from prices of less than $30/MWh to around $100/MWh. The rebid reason given for all rebids was “lake temperature management”.

The availability of Macquarie Generation’s Liddell station was reduced by as much as 250 MW. Most of this capacity was priced at less than $30/MWh. The rebid reasons given included “Milling limit, “Mill RTS delayed, “HP Heater limit”. At 1.23pm, 400 MW of capacity at Bayswater was shifted from $16/MWh to around $90/MWh. The rebid reason given was “sensitivities have changed”, referring to a change in the forecast of sensitivity of price to changes in demand.

There was no other significant rebidding.

Figures 33-38: Victoria actual spot price, demand and forecast differences



There was 1 occasion in Victoria where the spot price was greater than three times the weekly average price of $18/MWh. This occurred on Monday.

Monday, 6 February

2:00 pm	Actual	4 hr forecast	12 hr forecast
Price ($/MWh)	77.52	30.74	27.73
Demand (MW)	6364	6722	6647
Available capacity (MW)	7487	7602	7821

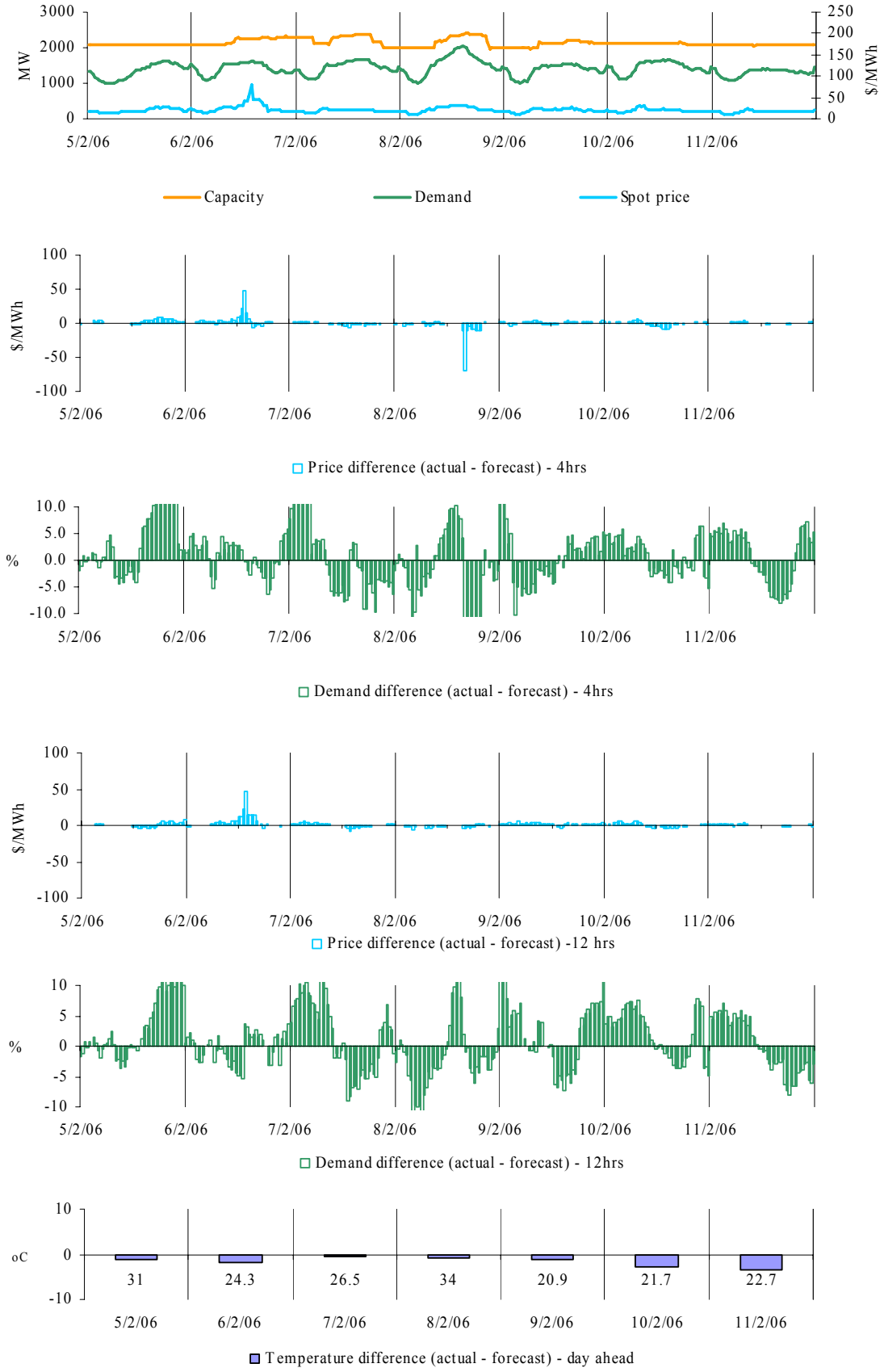
During the period demand was almost 400 MW lower than forecast 4 hours ahead. Prices were aligned across the mainland. Rebids across International Power's Hazelwood from early in the morning saw around 360 MW of capacity removed during the day. This included more than 100 MW at unit 7 as the unit was delayed in its return to service. Almost all of this capacity had all been priced at less than $20/MWh. The rebid reasons given included "Draft plant limit", "Firing plant limit", "cooling water limitation", "emission limit", "Unit start up", "revised synchronization time" and "revised rate of run-up capacity".

At around 1.40pm, Ecogen shifted approximately 170 MW of capacity at Jeeralang B, from prices above $280/MWh down to prices below $55/MWh. The rebid reasons given was "Adj to unit commitment due to PD conditions".

Over two rebids from 1.40pm, LYMMCO shifted 200 MW of capacity at Loy Yang A from prices below $15/MWh to prices around $90/MWh and $240/MWh. The reason for the rebid was "due to change in PD".

There was no other significant rebidding.

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



There was 1 occasion in South Australia where the spot price was greater than three times the weekly average price of $21/MWh. This occurred on Monday.

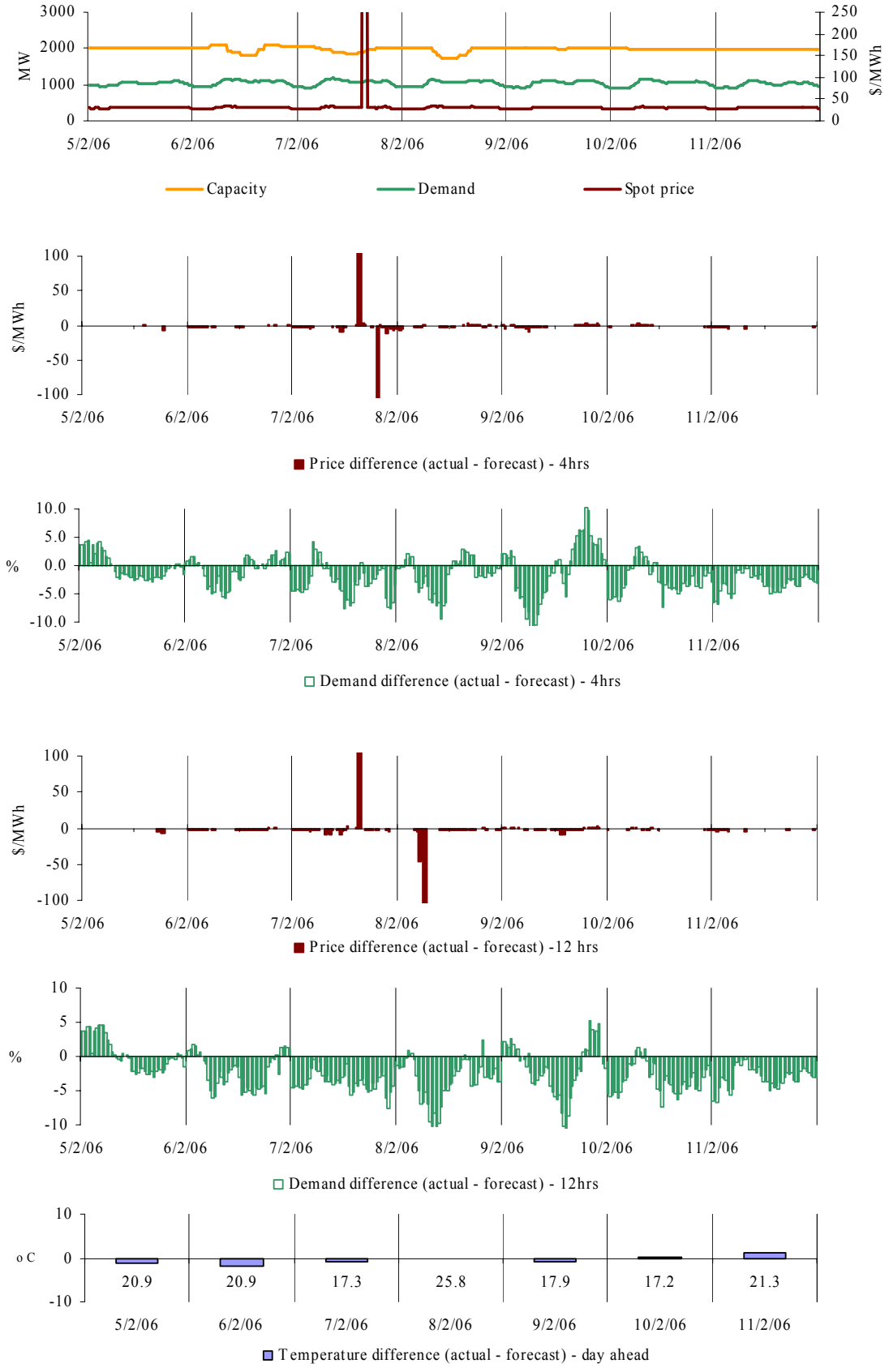
Monday, 6 February

2:00 pm	Actual	4 hr forecast	12 hr forecast
Price ($/MWh)	78.92	31.07	31.00
Demand (MW)	1610	1611	1552
Available capacity (MW)	2267	2271	2276

Conditions at the time saw demand and available capacity close to forecast. Prices were aligned across the mainland.

There was no significant rebidding.

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



There were 2 occasions in Tasmania where the spot price was greater than three times the weekly average price of $37/MWh. These occurred on Tuesday.

Thursday, 7 February

3:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	1075.52	30.95	31.00
Demand (MW)	1077	1114	1124
Available capacity (MW)	1875	1879	1879
4:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	1042.60	30.95	31.00
Demand (MW)	1092	1119	1129
Available capacity (MW)	1942	1879	1879

At 2.14pm, two transmission lines between Farrell in the west and Sheffield in the north opened. The simultaneous loss of both lines is considered a non-credible event and as such is not planned for. At 2.40pm, NEMMCO invoked a constraint that restricted the combined output from generation in western Tasmania to less than 55 MW. This included generation at Reece, Bastyan, Tribute, John Butters and Mackintosh. These generators were dispatched to around 80MW. Further constraints were invoked from 3.10pm which also precluded these generators from providing frequency control services. These generators had been significant contributors to a number of the ancillary services markets prior to the event. As a result, there was a shortfall in the supply of some services, which saw prices reach $10 000/MW for the lower regulation, and the raise 6 second services for the period from 3.30pm to 3.40pm. The price for the raise regulation service increase to around $5000/MW at the same time.

Hydro Tasmania committed Cethana at 3.37pm, with 78 MW of capacity priced at less than $30/MWh. The rebid reason given was “Transmission outage”. This rebid also swapped the ancillary service offers from Reece unit 1 to Cethana, reducing the price across the energy and ancillary service markets.

There was no other significant rebidding.

Figure 51: Queensland closing bid prices, dispatched generation and spot price

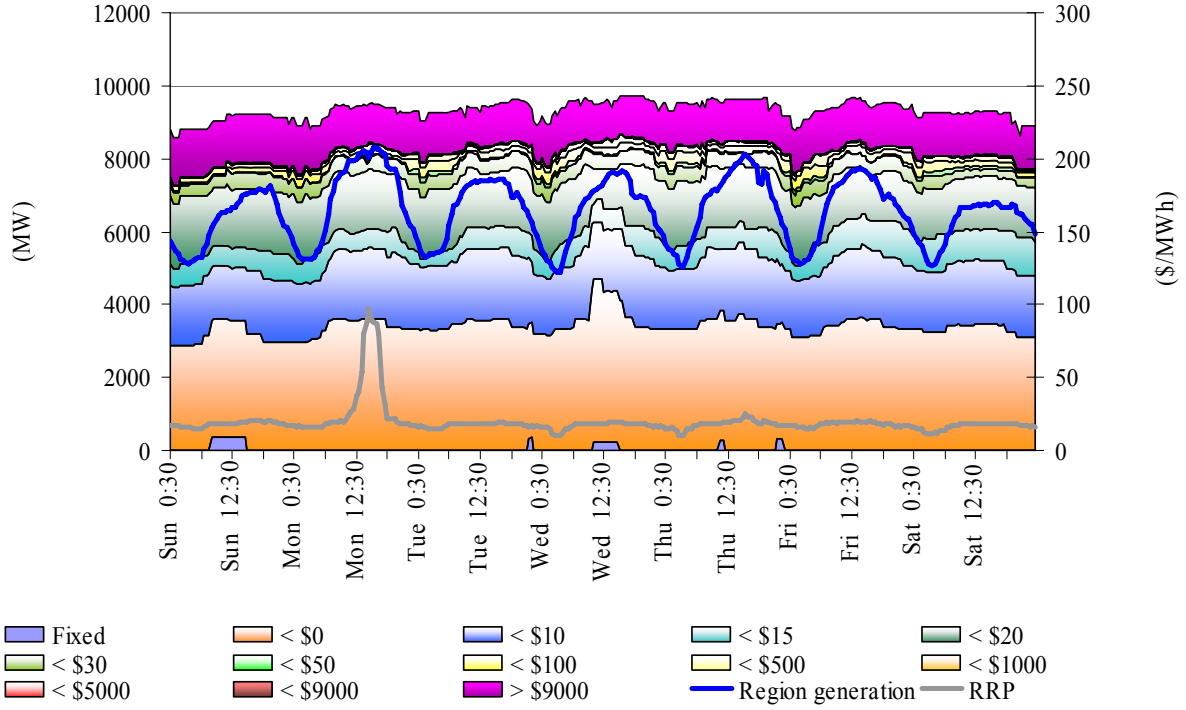


Figure 52: New South Wales closing bid prices, dispatched generation and spot price

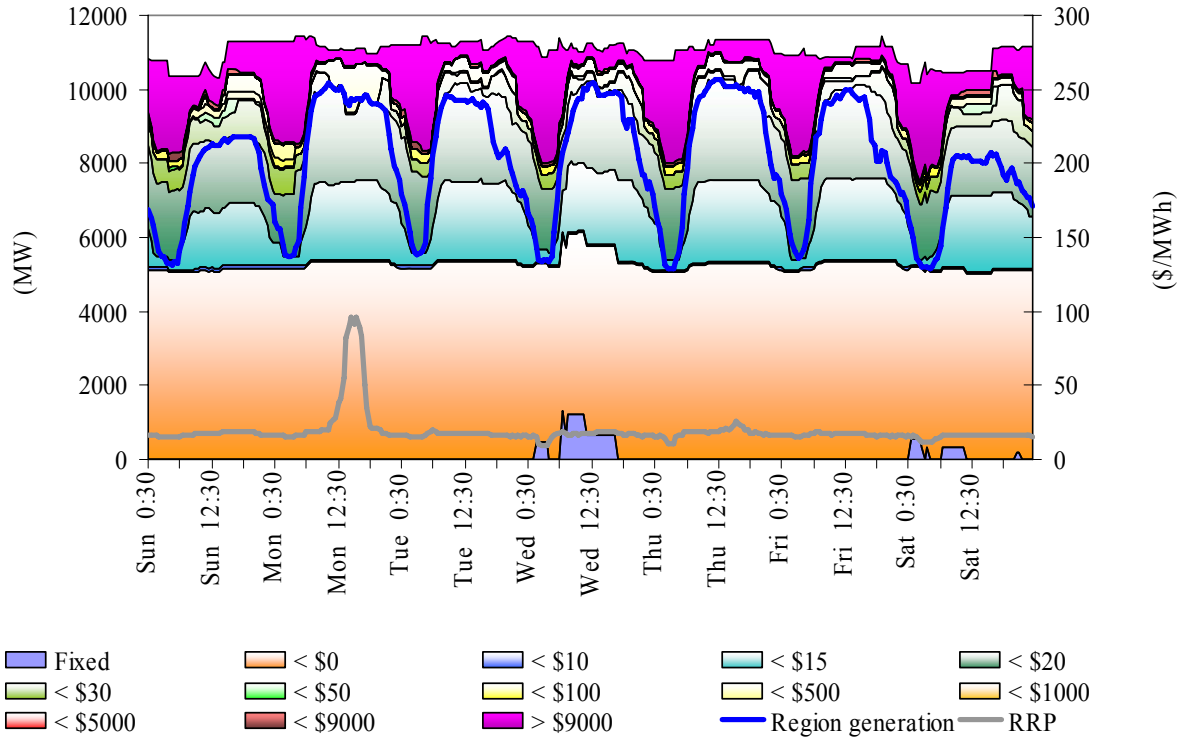


Figure 53: Victoria closing bid prices, dispatched generation and spot price

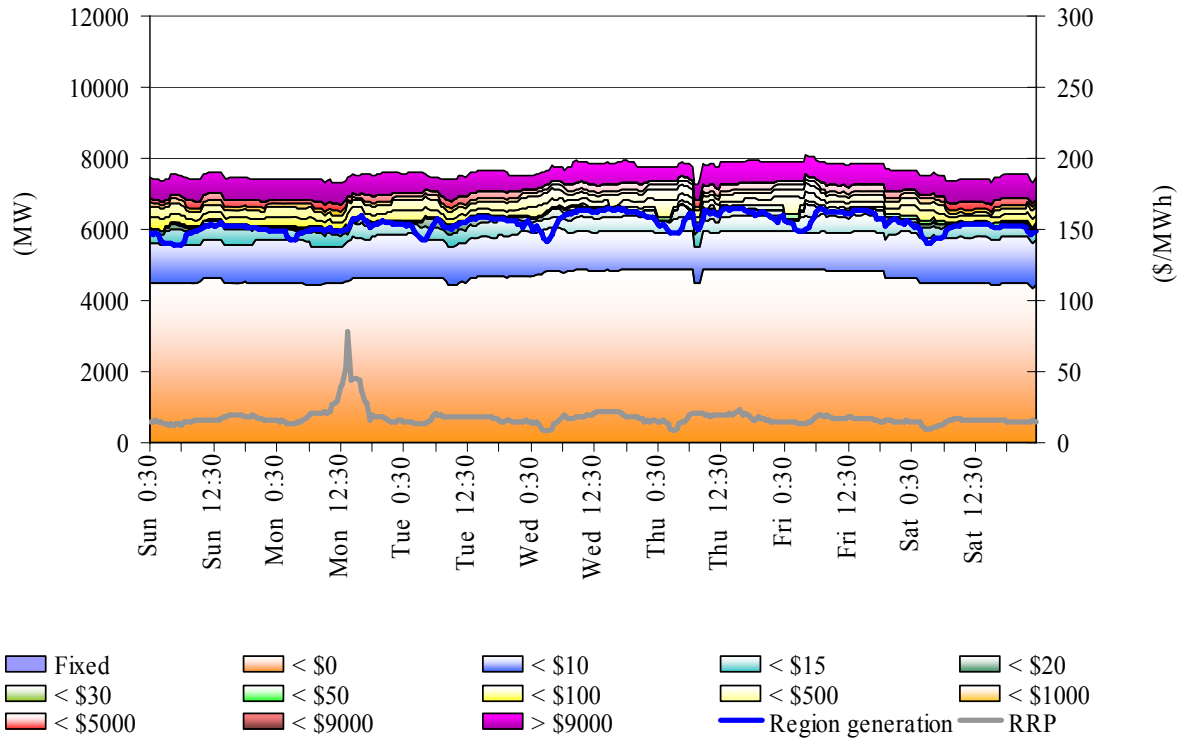


Figure 54: South Australia closing bid prices, dispatched generation and spot price

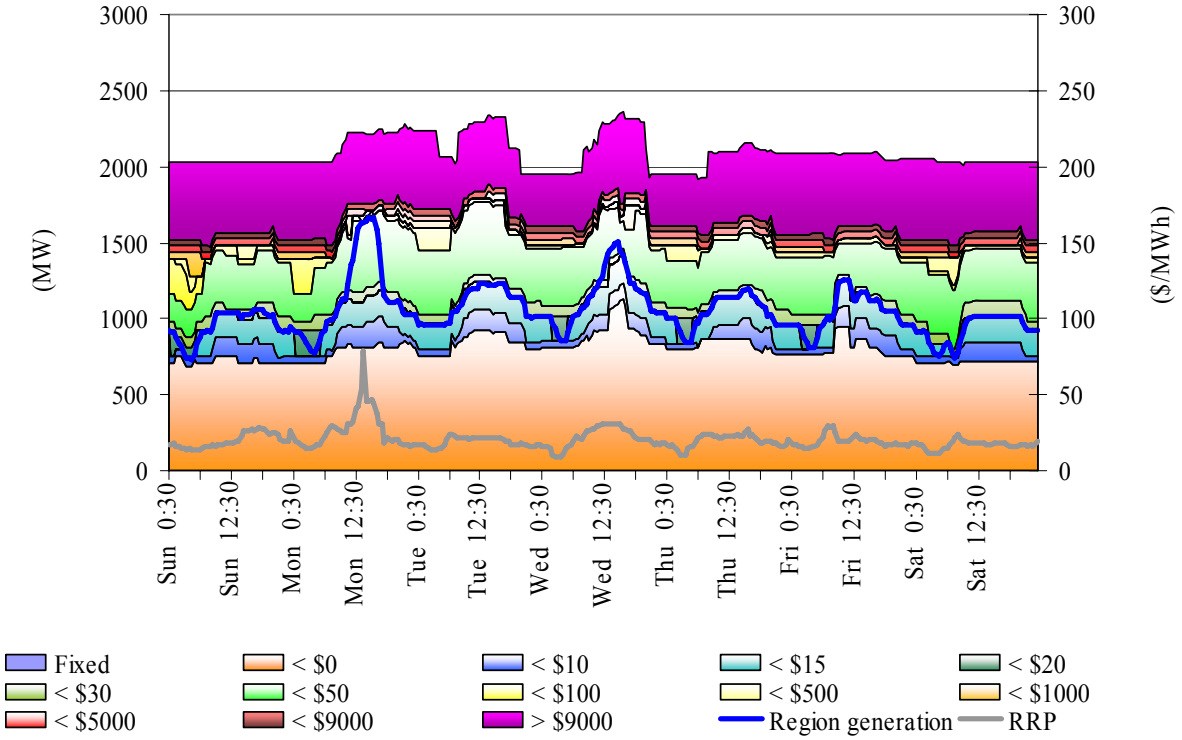
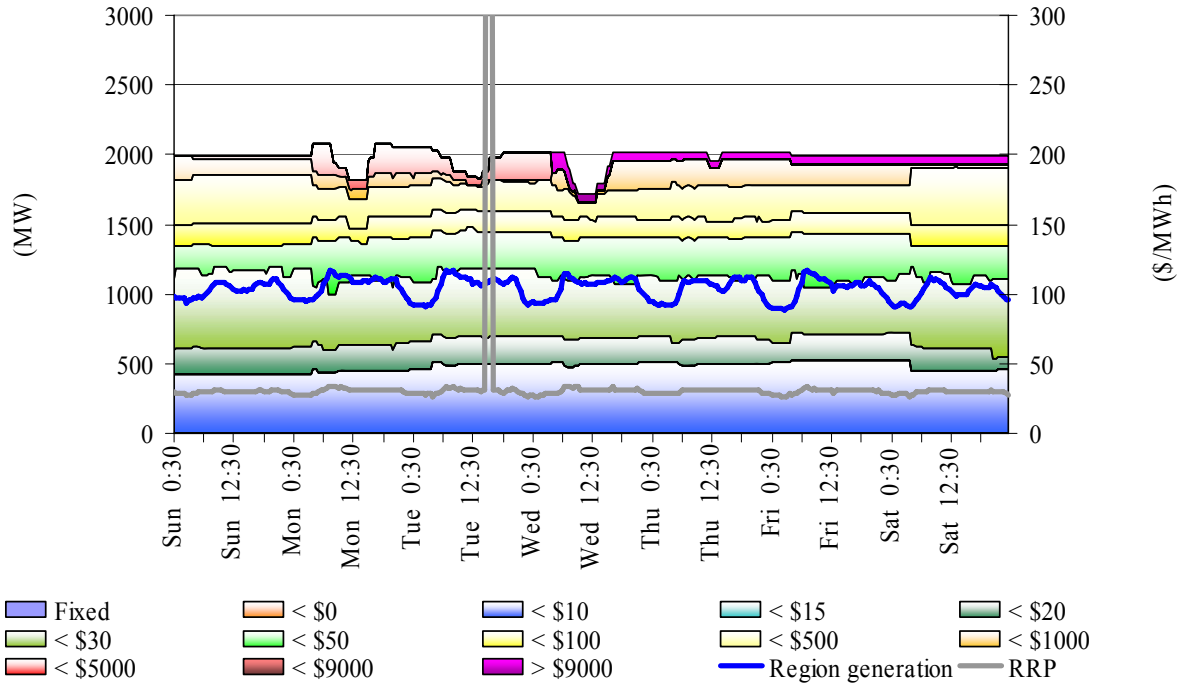


Figure 55: Tasmania closing bid prices, dispatched generation and spot price



Ancillary service market

The total cost of ancillary services on the mainland for the week was around $170 000 or 0.2 per cent of the total turnover in the energy market. Figure 56 summarises the volume weighted average prices and costs for the eight frequency control ancillary services across the interconnected regions.

Figure 56: frequency control ancillary service prices and costs

	Raise 6 sec	Raise 60 sec	Raise 5 min	Raise reg	Lower 6 sec	Lower 60 sec	Lower 5 min	Lower reg
Last week	0.47	0.41	0.99	0.45	0.15	0.19	0.71	1.57
Previous week	0.54	0.44	1.07	0.88	0.15	0.19	0.14	1.47
Last quarter	1.76	0.73	1.15	1.54	0.39	2.28	5.00	1.93
Market Cost ($1000s)	22	19	64	10	1	1	15	34
% of energy market	0.03%	0.03%	0.09%	0.01%	0.00%	0.00%	0.02%	0.05%

The total cost of ancillary services in Tasmania for the week was around $400 000 or 6 per cent of the total turnover in the energy market in Tasmania. An unscheduled transmission line outage on Tuesday led to a shortfall in the supply of some services, resulting in prices of $10 000/MW for the lower regulation, and the raise 6 second services for the period from 3.30pm to 3.40pm. The price for the raise regulation service increase to around $5000/MW at the same time. Figure 57 summarises for Tasmania the prices and costs for the eight frequency control ancillary services.

Figure 57: 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	18.59	0.25	0.25	9.39	0.25	0.25	0.25	15.66
Previous week	0.60	0.25	0.25	0.25	0.25	0.25	0.25	0.27
Last quarter	7.89	1.05	1.05	1.58	4.43	1.06	1.06	1.97
Market Cost ($1000s)	174	3	3	79	4	8	6	132
% of energy market	2.73%	0.05%	0.04%	1.24%	0.06%	0.13%	0.10%	2.06%

Figure 58 shows the daily breakdown of cost for each frequency control ancillary service.

Figure 58: daily frequency control ancillary service costs

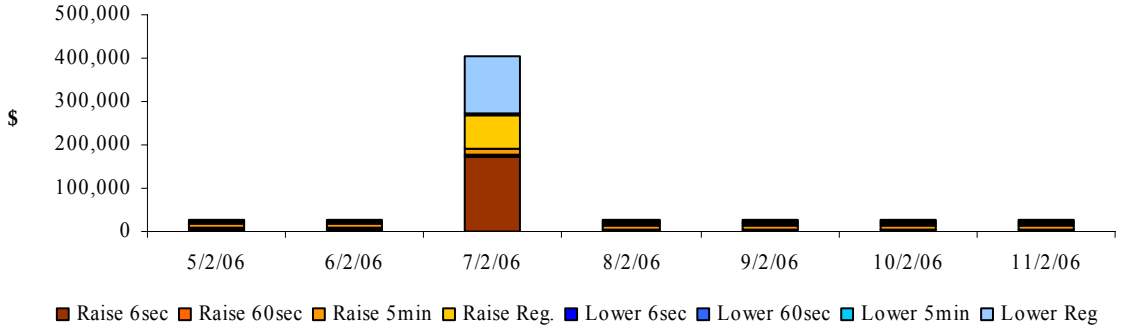
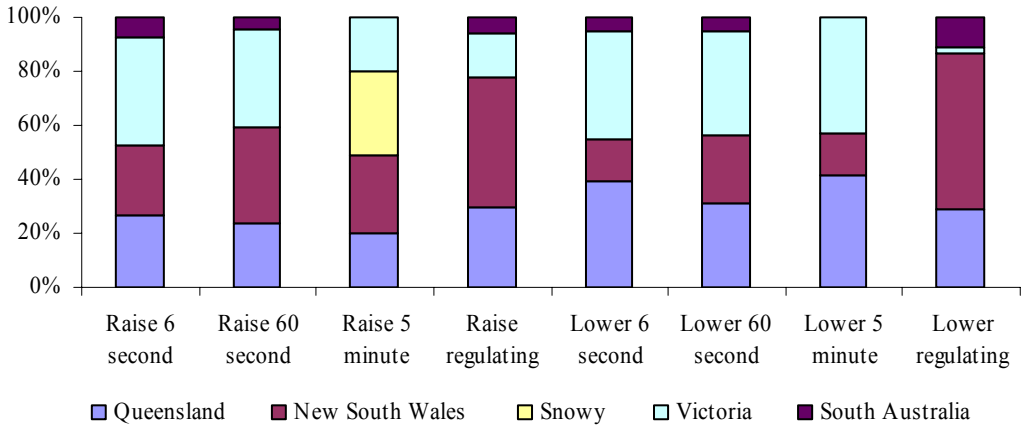


Figure 59 shows the contribution, on a percentage basis, that frequency control ancillary service providers are utilised (in each mainland region) to satisfy the total requirement for each service.

Figure 59: regional participation in ancillary services on the mainland



Figures 60 and 61 show 30-minute prices for each frequency control ancillary service throughout the week.

Figure 60: prices for raise services

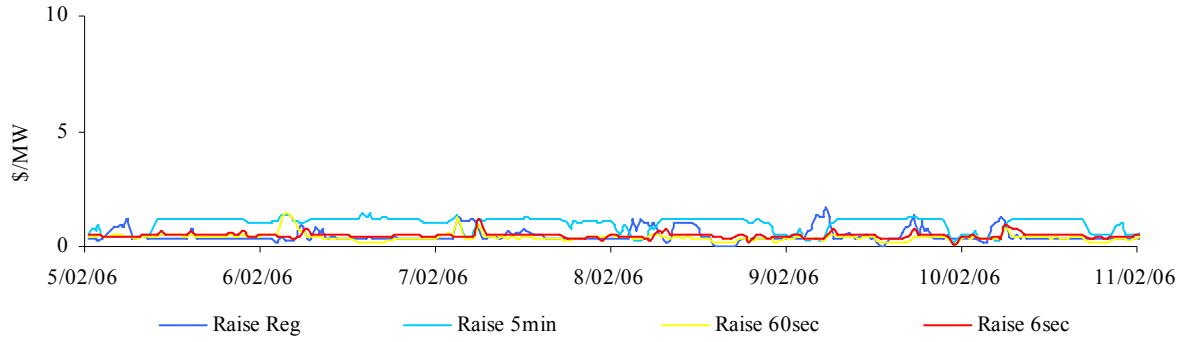


Figure 60A: prices for raise services - Tasmania

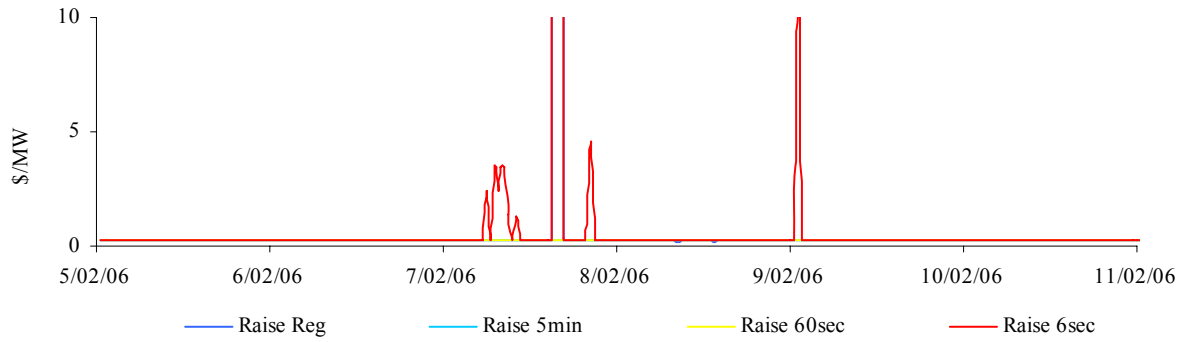


Figure 61: prices for lower services

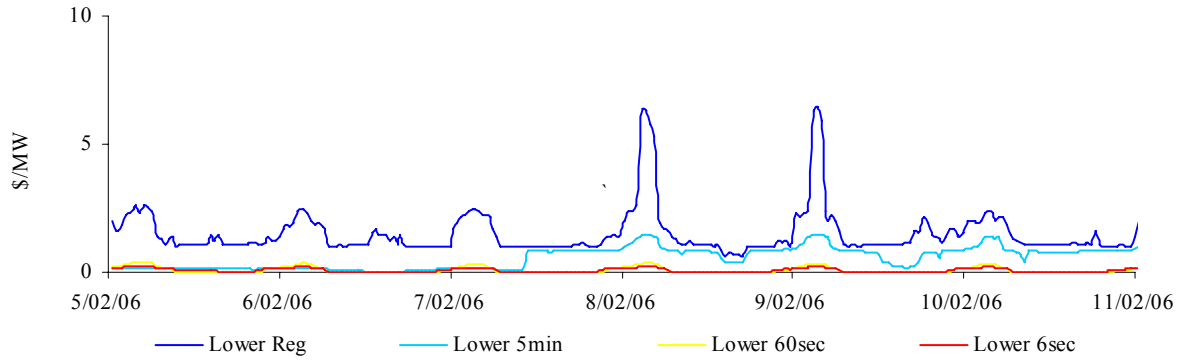
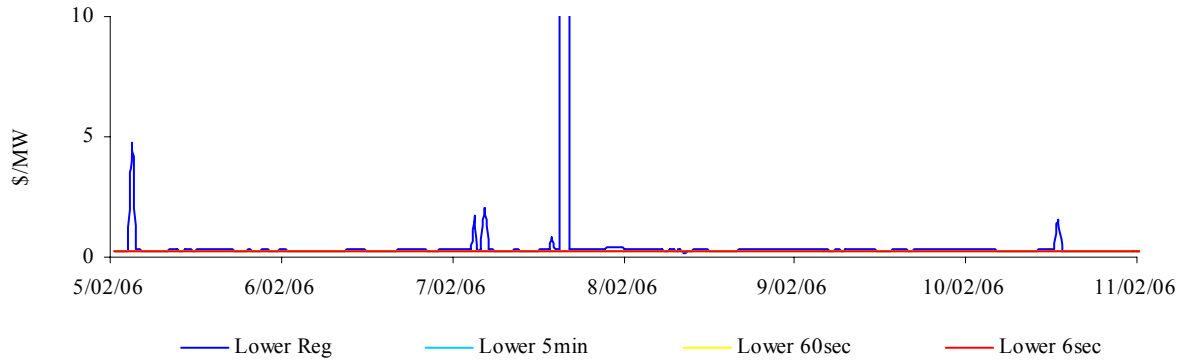


Figure 61A: prices for lower services - Tasmania



Figures 62 and 63 present for both raise and lower frequency control services the requirement, established by NEMMCO, for each service to satisfy the frequency standard.

Figure 62: raise requirements

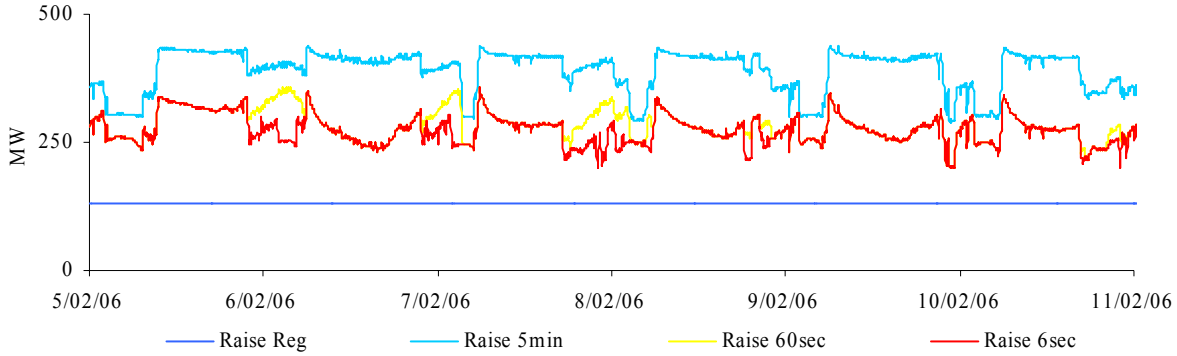


Figure 62A: raise requirements - Tasmania

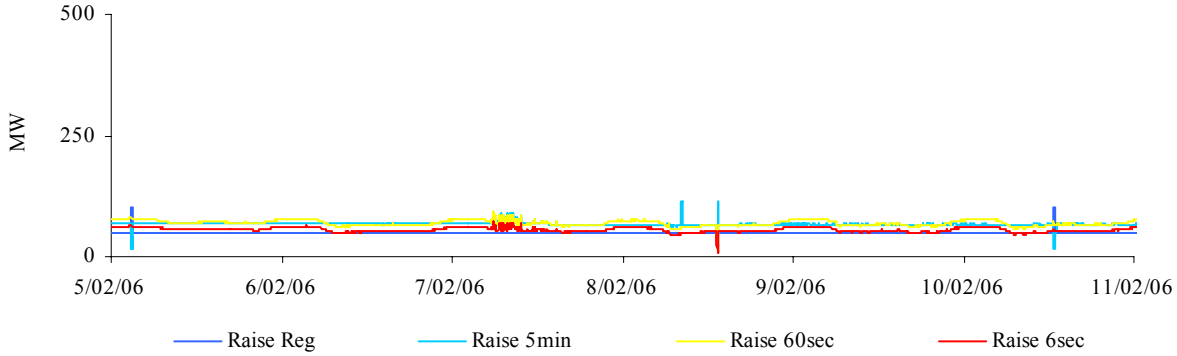


Figure 63: lower requirements

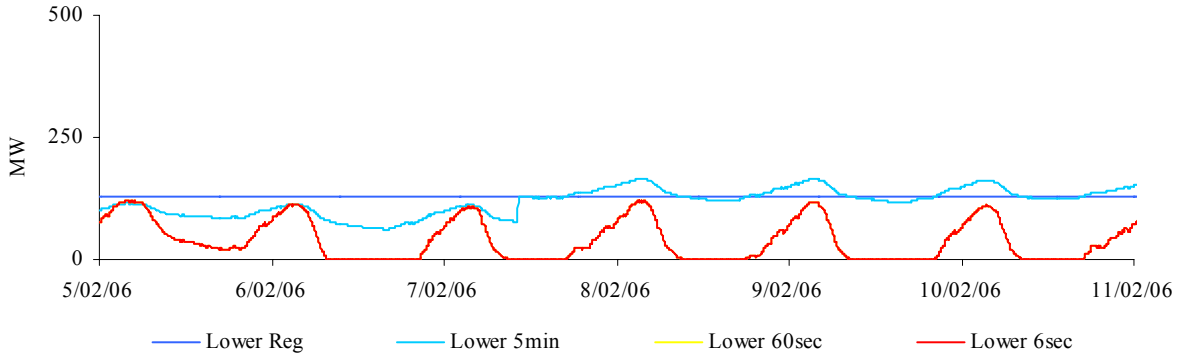
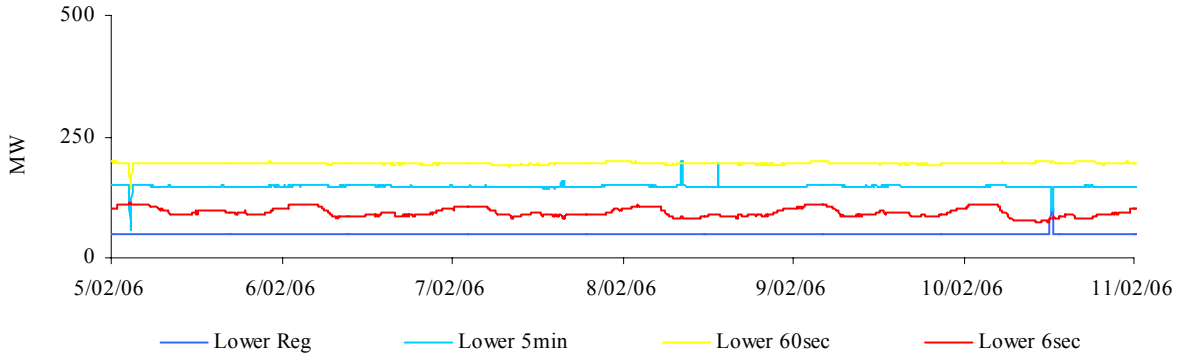


Figure 63A: lower requirements - Tasmania



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