Market analysis

AUSTRALIAN ENERGY REGULATOR

11–17 February 2007

Spot prices for the week averaged between $35/MWh in Queensland and $68/MWh in South Australia. High temperatures in Victoria and South Australia on Friday saw demand peak just below record levels.

Turnover in the energy market was $212 million. The total cost of ancillary services for the week was $272 000, or 0.1 per cent of energy market turnover.

Significant variations between actual prices and those forecast 4 and 12 hours ahead occurred in 123 or a third 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. These variations were most frequent in South Australia, occurring in almost two thirds 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

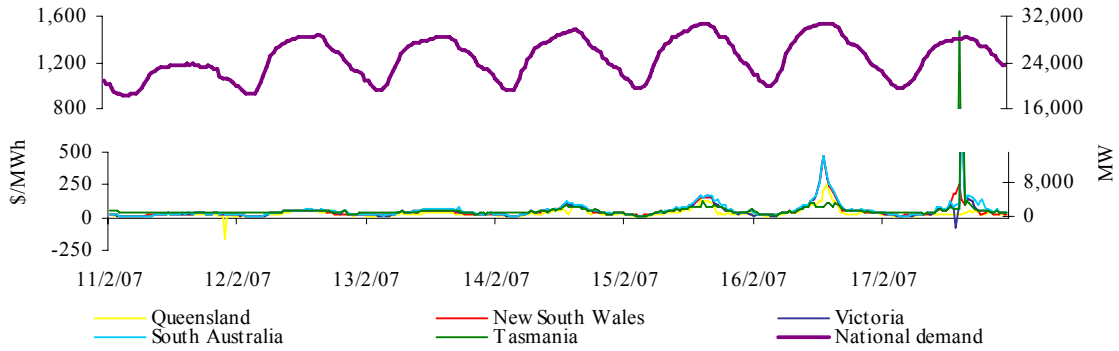


Figure 2: volume weighted average spot price for energy market ($/MWh)

	QLD	NSW	VIC	SA	TAS
Last week	35	53	58	68	54
Previous week	40	44	46	54	50
Same quarter last year	39	46	53	58	33
Financial year to date	34	39	46	50	41
% change from previous week *	▼11%	▲20%	▲28%	▲27%	▲7%
% change from same quarter last year **	▼9%	▲16%	▲10%	▲18%	▲64%
% change from year to date ***	▼3%	▼27%	▲30%	▲4%	▼44%

*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

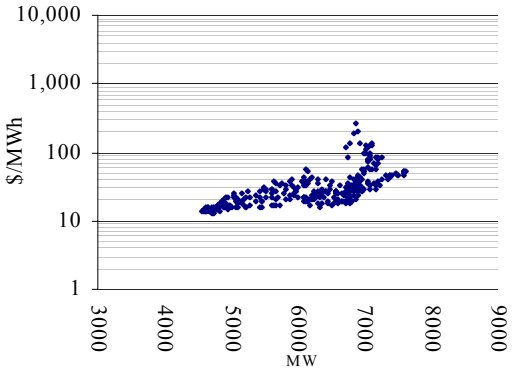


Figure 4: New South Wales

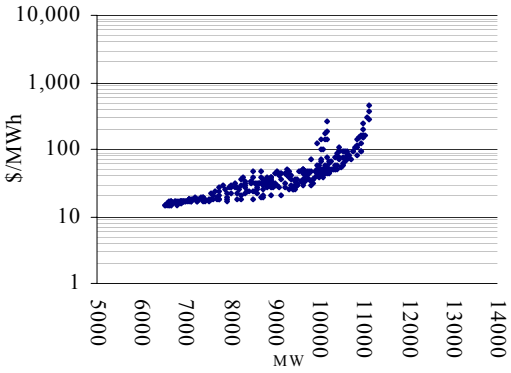


Figure 5: Victoria

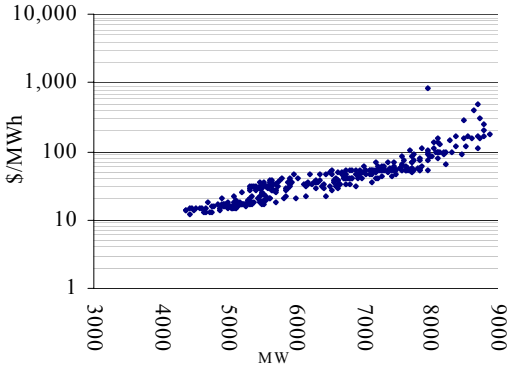


Figure 6: South Australia

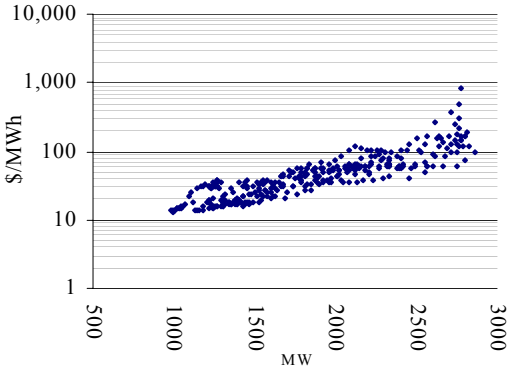
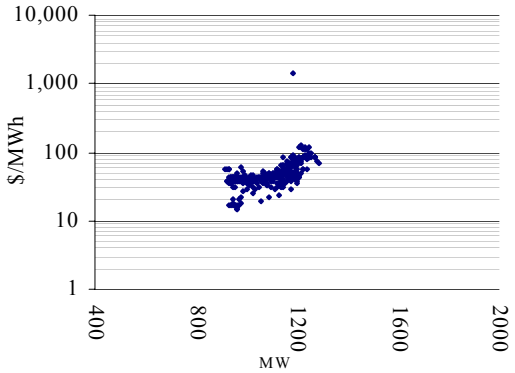


Figure 7: Tasmania



The maximum spot prices for the week ranged from $262/MWh in Queensland to $1464/MWh in Tasmania. A negative spot price in Victoria occurred on Saturday when a step change in the limits on the Snowy to Victoria interconnector at 1.45 pm saw flows into Victoria increase by over 600 MW. A negative spot price also occurred in Queensland on Sunday at 10 pm following a reduction in demand of almost 800 MW over two dispatch intervals. 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	1.69	1.35	1.25	1.34	0.95
Previous week	0.72	0.65	0.64	0.66	0.34
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

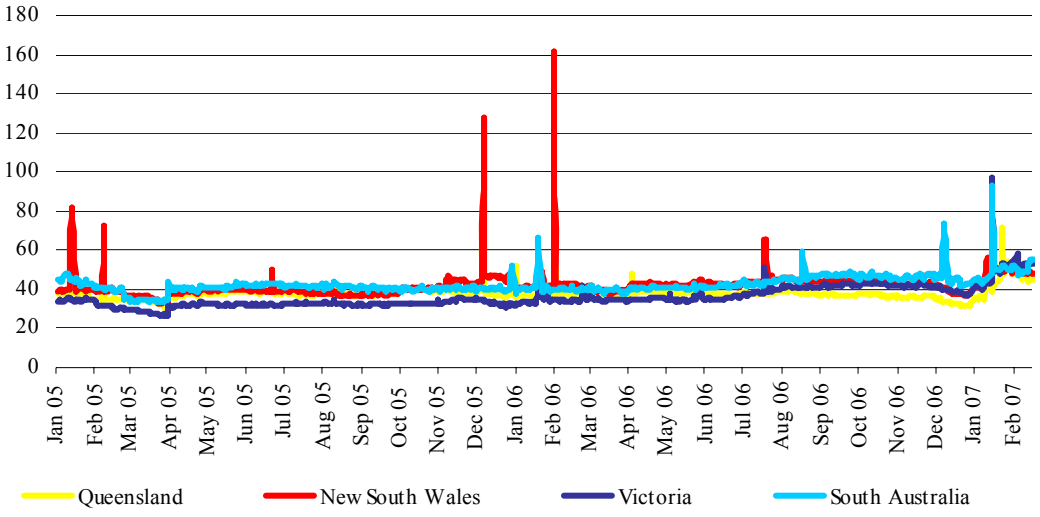
Figure 9 sets out the d-cyphaTrade wholesale electricity price index (WEPI)* for each region throughout the week excluding Tasmania. Figure 10 sets out the WEPI since 1 January 2005.

Figure 9: d-cyphaTrade WEPI for the week

	Monday	Tuesday	Wednesday	Thursday	Friday
Queensland	45.74	44.41	44.67	45.20	45.34
New South Wales	47.64	47.90	47.76	49.43	48.33
Victoria	52.76	50.96	51.02	52.95	53.31
South Australia	48.92	49.24	50.93	53.75	54.91

* 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

Low reserves were forecast in South Australia for Friday and Saturday.

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

Figure 11: Queensland

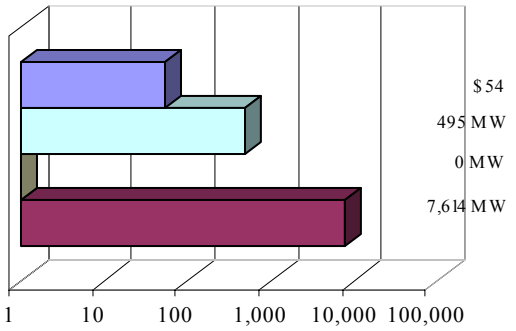


Figure 12: New South Wales

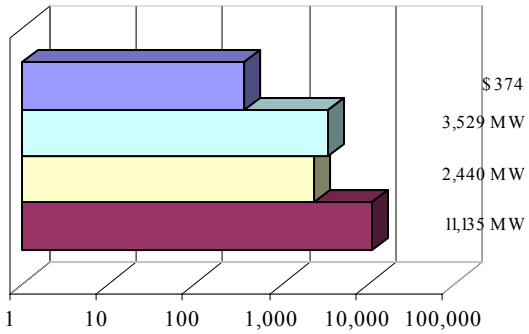


Figure 13: Victoria

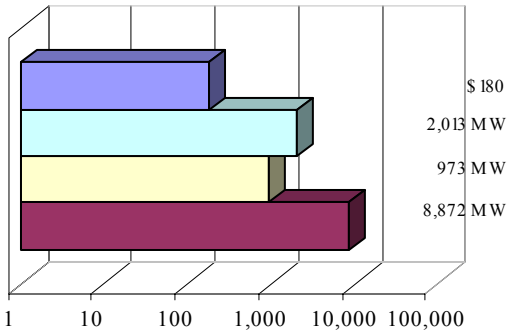


Figure 14: South Australia

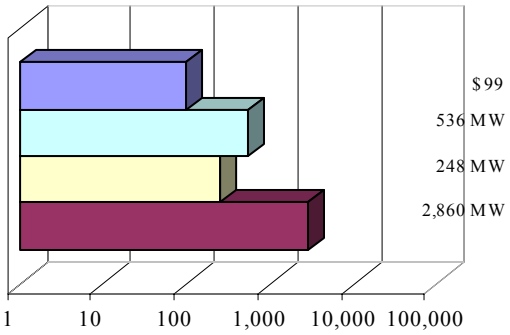
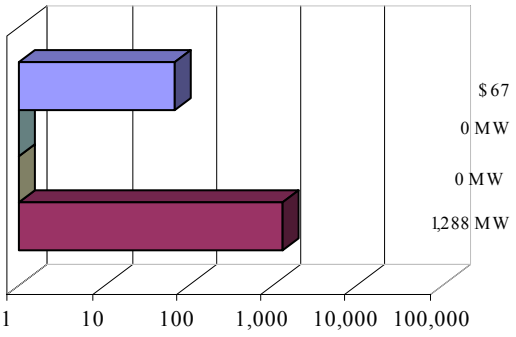
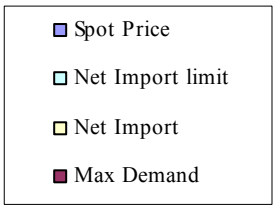


Figure 15: Tasmania





Price variations

There were 123 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

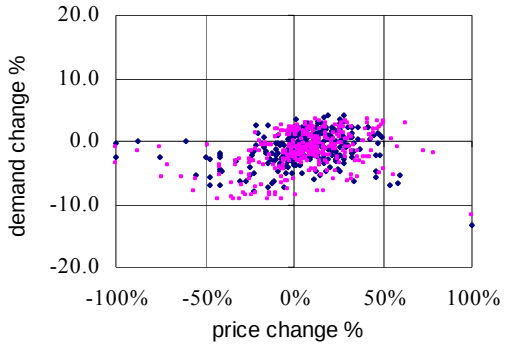


Figure 17: New South Wales

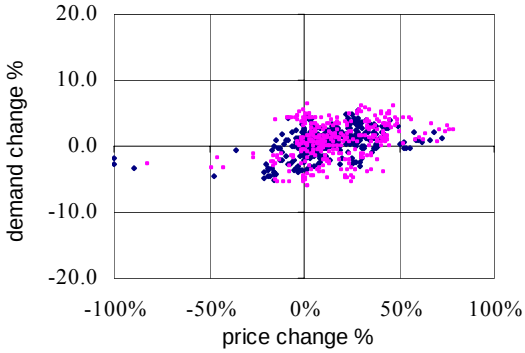


Figure 18: Victoria

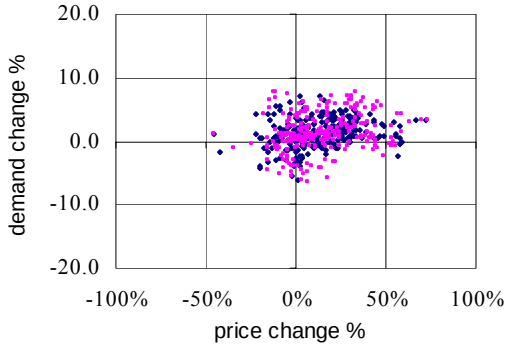


Figure 19: South Australia

Figure 20: Tasmania

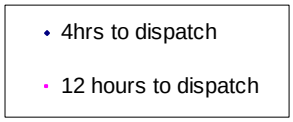
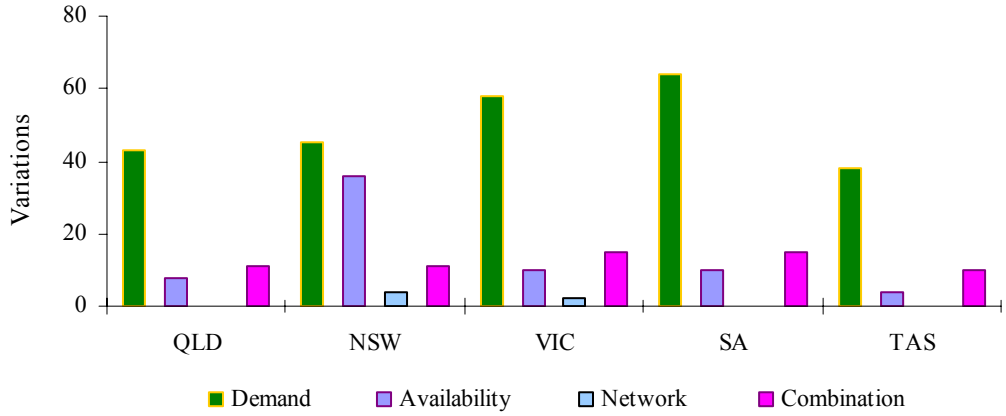


Figure 21 summarises the number and most probable reason for variations between forecast and actual prices.

Figure 21: reasons for variations between forecast and actual prices



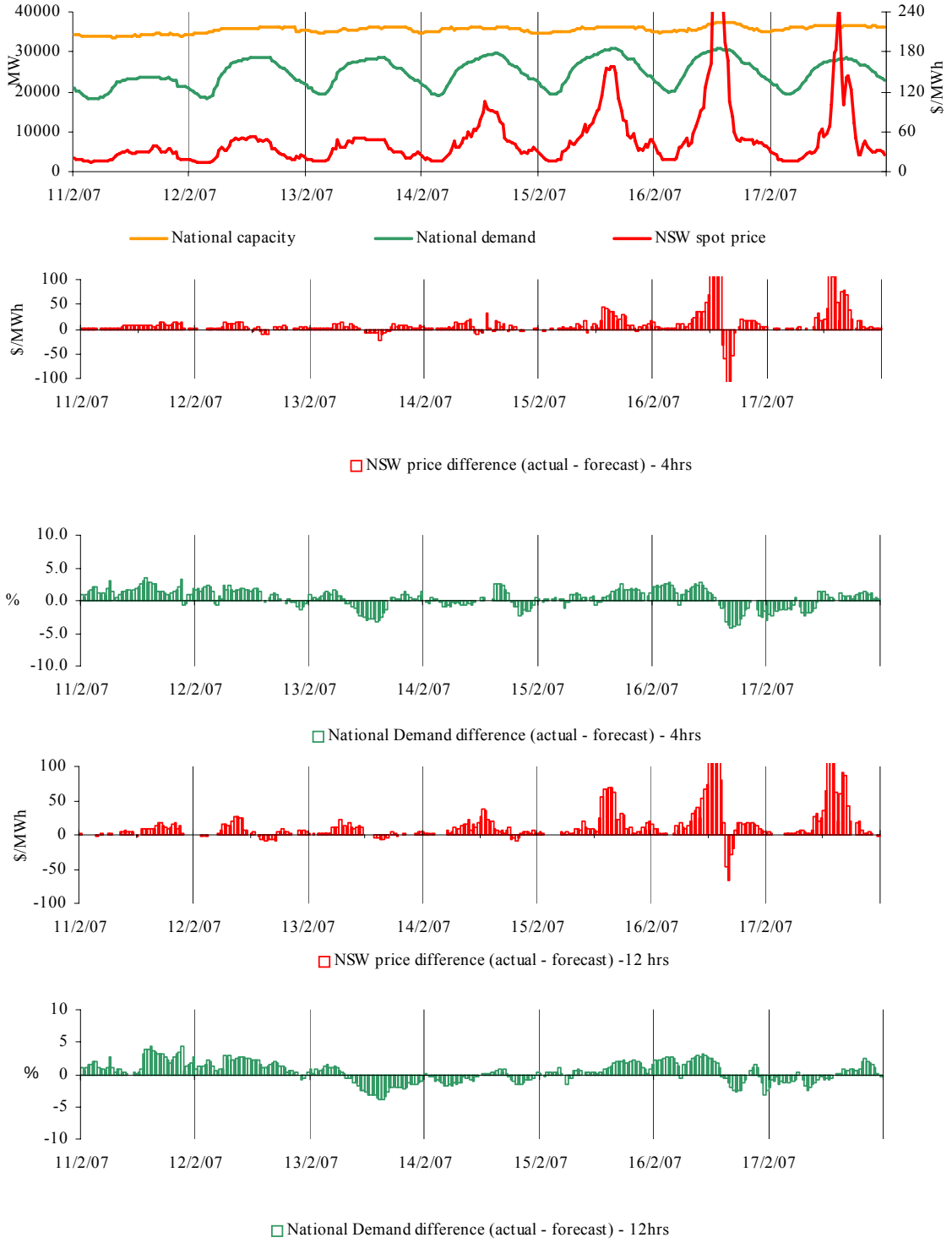
Price and demand

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 $53/MWh.

Friday, 16 February

12:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	162.16	92.47	89.00
Demand (MW)	30 232	29 777	29 506
Available capacity (MW)	36 908	36 607	37 145
12:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	272.14	115.85	89.01
Demand (MW)	30 526	30 155	29 768
Available capacity (MW)	37 014	36 767	37 264
1:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	373.76	119.10	89.11
Demand (MW)	30 615	30 346	29 990
Available capacity (MW)	37 248	37 020	37 483
1:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	467.47	125.93	108.16
Demand (MW)	30 691	30 513	30 117
Available capacity (MW)	37 298	37 015	37 486
2:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	293.68	117.92	114.48
Demand (MW)	30 703	30 706	30 377
Available capacity (MW)	37 318	37 037	37 485
2:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	239.89	117.84	112.45
Demand (MW)	30 607	30 806	30 706
Available capacity (MW)	37 305	37 100	37 470
3:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	194.04	225.33	114.20
Demand (MW)	30 600	30 957	30 781
Available capacity (MW)	37 316	37 298	37 470
3:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	166.99	226.73	150.32
Demand (MW)	30 631	30 950	30 825
Available capacity (MW)	37 310	37 329	37 467

Conditions at the time saw demand close to forecast four and 12 hours ahead, and at close to record levels, nationally and in South Australia and Victoria .

Delta Electricity's 660 MW Vales Point unit five was expected to return to service from a short term outage the previous evening. A series of rebids reduced the availability to a maximum of 280 MW and delayed the return of the unit. The rebid reason given was "Return to service::capacity limit change".

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

At 3.29 pm the previous day, the availability of Enertrade's Gladstone unit two was reduced from 280 MW to zero. In response, Enertrade shifted capacity from other units in its portfolio into lower prices. The rebid reasons given were "Plant problem::Change availability". Over the course of the day, around 155 MW of capacity across Gladstone was shifted from prices of less than $100/MWh into prices around $270/MWh. The rebid reason given was "Inter/intra connector constraint::change MW distrib". Some plant problems at Collinsville saw small reductions in the available capacity offered by Enertrade.

At 8.09 am that morning, TRUenergy shifted 240 MW of capacity at Yallourn priced at around $135/MWh to above $9000/MWh. The rebid reason given was "PD conditions::redist MW across port".

Over three rebids starting at 8.30 am Ecogen Energy shifted 250 MW of capacity at Newport from prices above $9000/MWh to below $280/MWh. The rebid reasons given were 'Plant conditions-redist MW across portfolio".

Over three rebids in the morning Origin Energy shifted 155 MW of capacity across Ladbroke and Quarantine from prices above $9000/MWh to zero. The rebid reasons given were "Change in PDS" and "Match bid to output change in PDS".

Over two rebids at 10.41 am and 12.11 pm Callide Power Traders shifted as much as 222 MW of capacity across its units from prices below $20/MWh to above $9000/MWh. The rebid reasons given were "Optimisation dec change MW dist" and "chge PD sens::chge MW distribution".

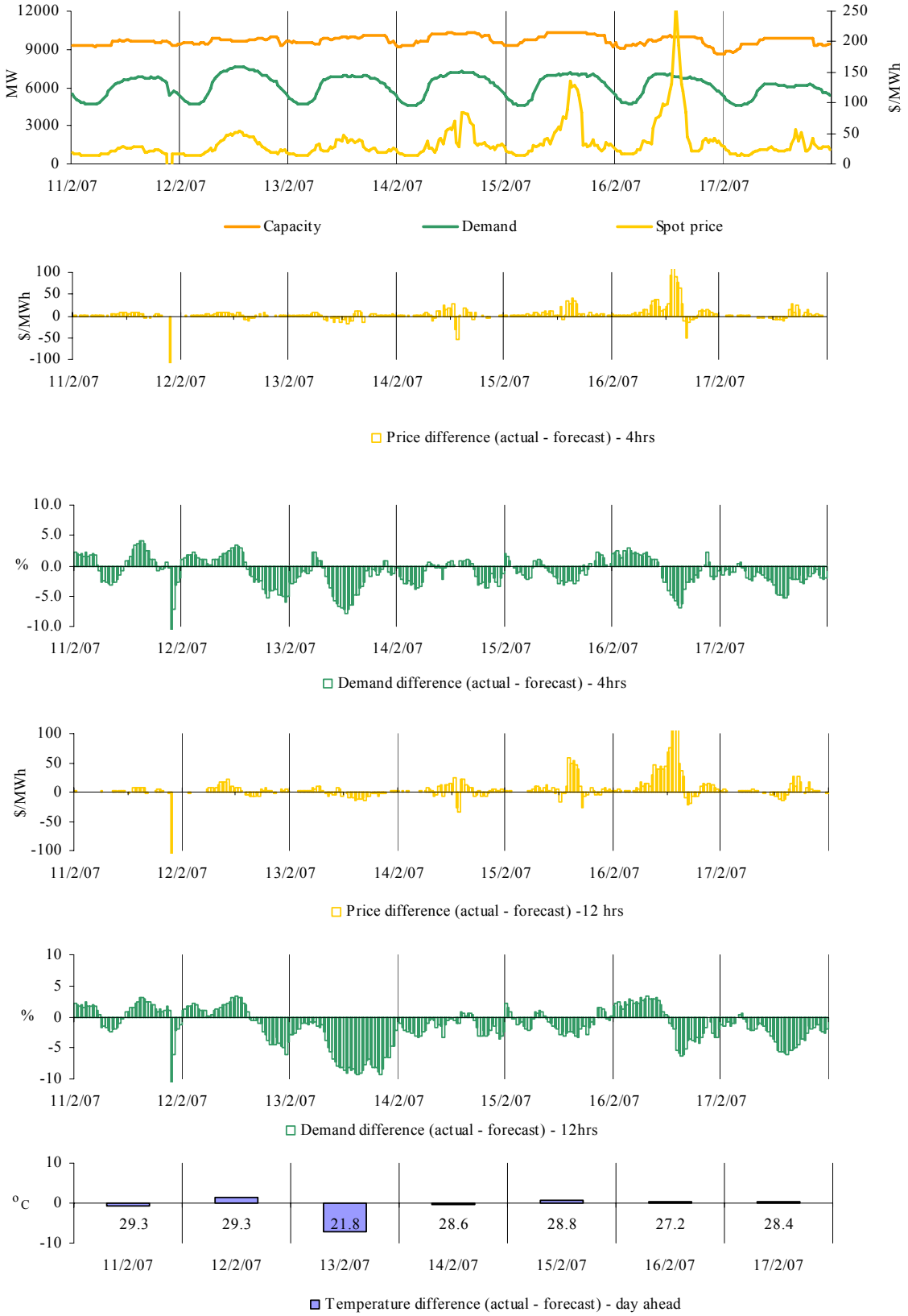
At 10.25 am Snowy Hydro shifted 560 MW of capacity from prices below $155/MWh to above $435/MWh, with 410 MW of this capacity shifted to prices above $5000/MWh. The rebid reason given was "Chnge contrct postn VIC dmnd higher exptd:bandshift up".

From 10.25 am LYMMCO shifted as much as 280 MW of capacity at Loy Yang A from prices below $20/MWh to above $9000/MWh. The rebid reason given was "Act dem expected to exceed FC at 1025".

At 1.20 pm Stanwell Corporation shifted 280 MW of capacity at Stanwell from prices below $135/MWh to above $270/MWh. The rebid reason given was "Manage transmission constraint".

There was no other significant rebidding.

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



There were 12 occasions in Queensland where the spot price was greater than three times the weekly average price of $35/MWh. Seven of these occurred when prices were generally aligned across all regions and this is detailed in the national market outcomes section. On the remaining five occasions, price was also aligned with the rest of the mainland, however, only in Queensland was the price greater than three times the weekly average price for the region. These events are presented below.

Thursday, 15 February

2:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	135.02	99.72	77.40
Demand (MW)	7124	7290	7300
Available capacity (MW)	10 301	10 318	10 316
3:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	126.35	99.43	76.52
Demand (MW)	7098	7266	7276
Available capacity (MW)	10 306	10 322	10 316
3:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	128.45	86.11	75.35
Demand (MW)	7074	7252	7262
Available capacity (MW)	10 307	10 321	10 325
4:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	120.56	86.11	75.35
Demand (MW)	7035	7243	7253
Available capacity (MW)	10 306	10 325	10 316
4:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	111.69	83.60	73.10
Demand (MW)	7007	7187	7238
Available capacity (MW)	10 302	10 320	10 316

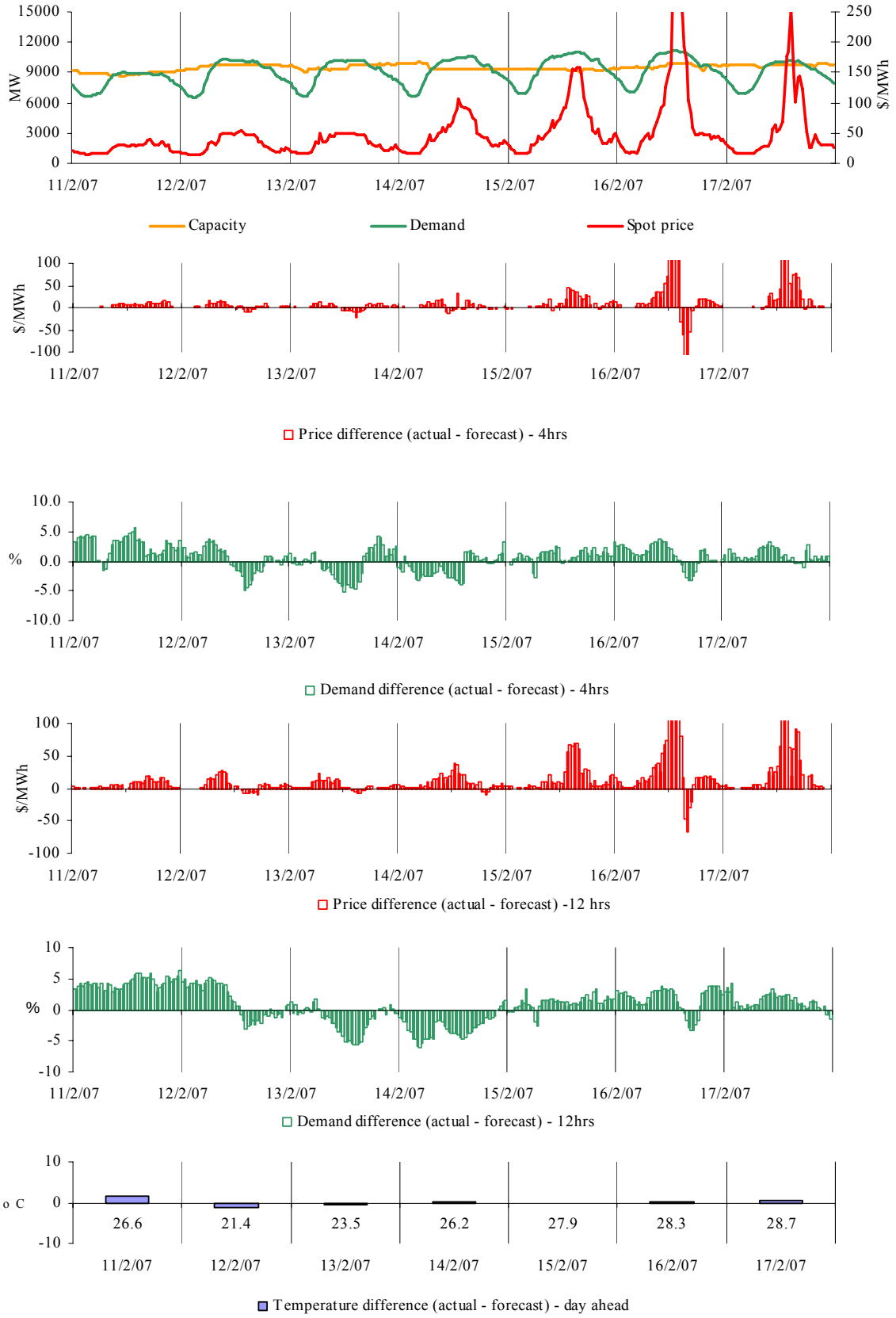
Conditions at the time saw demand around 200 MW below forecast four hours ahead. Prices were aligned with the rest of the market, with national demand around 400 MW higher than forecast.

At 8.38 am Callide Power Trader shifted 122 MW of capacity across Callide C from prices less than $15/MWh to above $9000/MWh. The rebid reason given was “Optimisation decision::change MW dist”.

Over three rebids from 1.05 pm Stanwell Corporation shifted 200 MW of capacity across its portfolio from prices below $55/MWh to above $130/MWh. The rebid reasons given were “Manage transmission constraint” and “Changed predispatch”.

There was no other significant rebidding.

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



There were 11 occasions where the spot price in New South Wales was greater than three times the New South Wales weekly average price of $53/MWh. Eight of these occurred when prices were generally aligned across all regions and this is detailed in the national market outcomes section. The remaining three occasions are presented below.

Saturday, 17 February

1:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	177.78	66.61	44.21
Demand (MW)	10115	10055	9897
Available capacity (MW)	9721	9851	10179
2:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	182.88	75.87	51.65
Demand (MW)	10156	10063	9909
Available capacity (MW)	9721	9851	10179
2:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	254.79	85.25	52.79
Demand (MW)	10188	10086	9937
Available capacity (MW)	9721	9691	10179

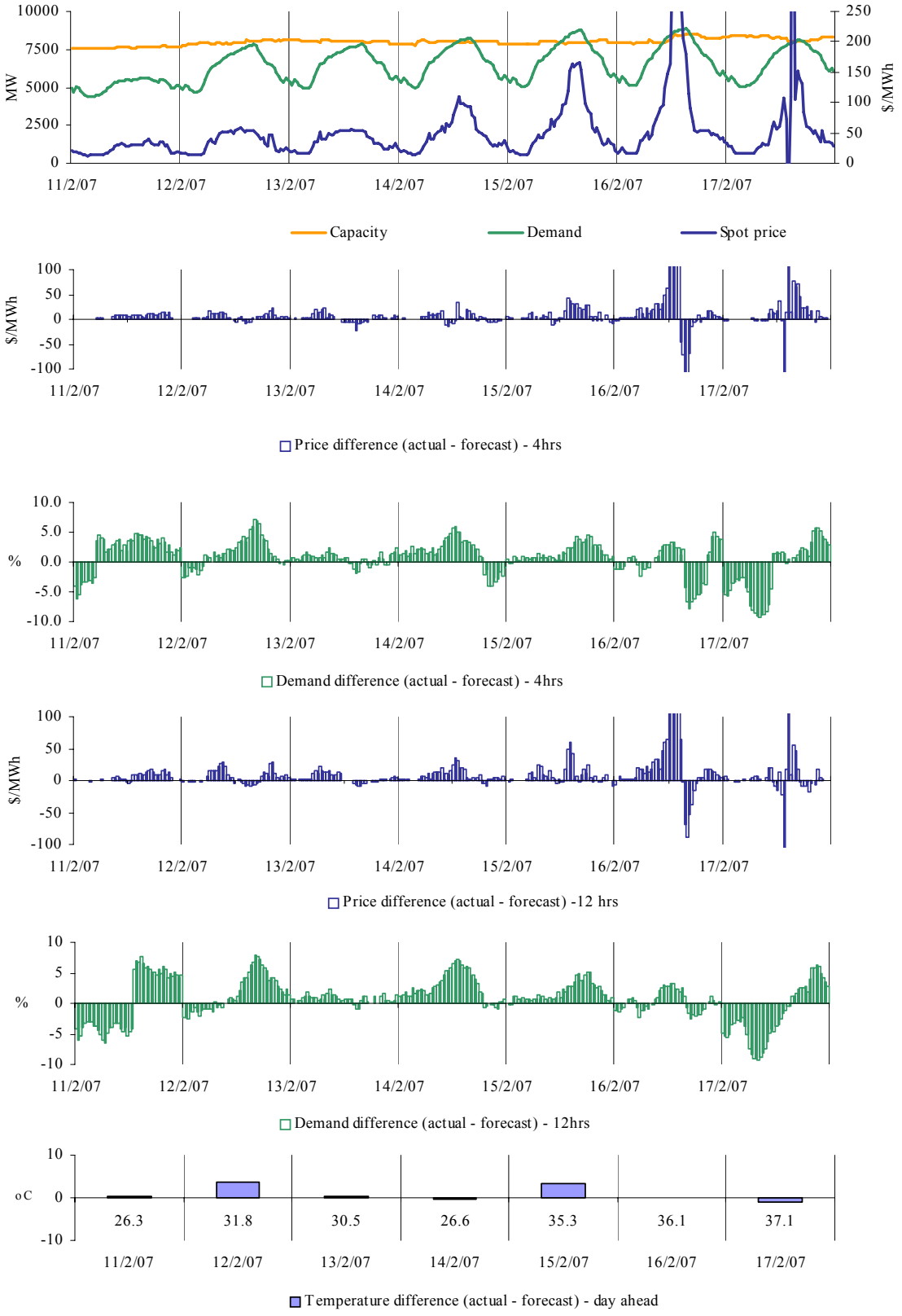
Conditions at the time saw demand close to forecast four hours ahead.

At 6.41 am Eraring Energy reduced the capacity of Eraring units one and two by 330 MW. The rebid reason given was “Cooling Tower outage”. A second rebid at 11.33 am, further reduced the availability of Eraring unit two by 50 MW and shifted 50 MW from prices of less than $20/MWh to around $400/MWh. The rebid reasons given were “Lake temperature management”.

From 1.15 pm a system normal network constraint led to see-sawing limits on the Snowy to Victoria interconnector. When the constraint bound, prices in New South Wales and Snowy increased to around $450/MWh whilst prices in the southern regions fell, to as low as $-1000/MWh in Victoria. Counter price flows between Snowy and Victoria were occurring at these times with flows forced south by as much as 730 MW. In response, NEMMCO intervened to limit the accumulation of negative inter-regional settlement residues from 2.20 pm, restricting flows from Snowy into Victoria to 200 MW.

There was no other significant rebidding.

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



There were eight occasions in Victoria where the spot price was greater than three times the weekly average price of $58/MWh. Seven of these occurred when prices were generally aligned across all regions and this is detailed in the national market outcomes section. The remaining occasion is presented below.

Saturday, 17 February

3:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	823.34	95.35	93.15
Demand (MW)	7959	7928	7993
Available capacity (MW)	7997	8339	8375

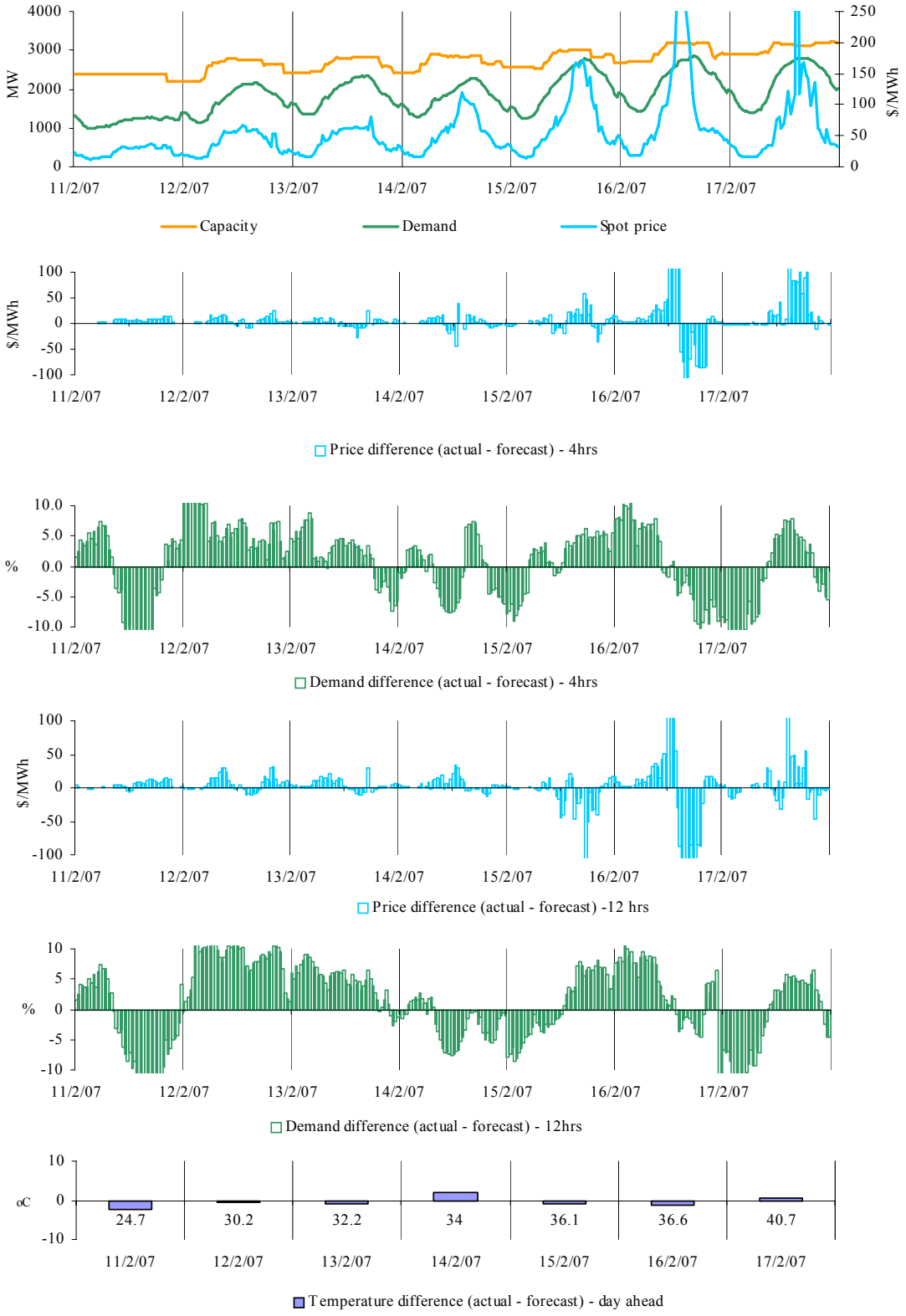
Conditions at the time saw demand close to forecast and available capacity 340 MW below that forecast four and twelve hours ahead.

From 1.15 pm a system normal network constraint led to see-sawing limits on the Snowy to Victoria interconnector. When the constraint bound, prices in New South Wales and Snowy increased to around $450/MWh whilst prices in the southern regions fell, to as low as $-1000/MWh Victoria. Counter price flows between Snowy and Victoria were occurring at these times with flows forced south by as much as 730 MW. In response, NEMMCO intervened to limit the accumulation of negative inter-regional settlement residues from 2.20 pm, limiting imports from Snowy to 200 MW.

At 2.50 pm, the five-minute dispatch price in Victoria, Tasmania and South Australia increased from around $300/MWh to more than $4000/MWh for one dispatch interval. This coincided with a rebid by Hydro Tasmania that shifted 488 MW of capacity from prices of less than $250/MWh to above $7500/MWh, which reduced flows into Victoria across Basslink by 180 MW. The rebid was effective for the remainder of the trading interval. The rebid reason given was “Unexpected constraint”.

There was no other significant rebidding.

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



There were seven occasions in South Australia where the spot price was greater than three times the weekly average price of $68/MWh. Six of these occurred when prices were generally aligned across all regions and this is detailed in the national market outcomes section. The remaining occasion is presented below.

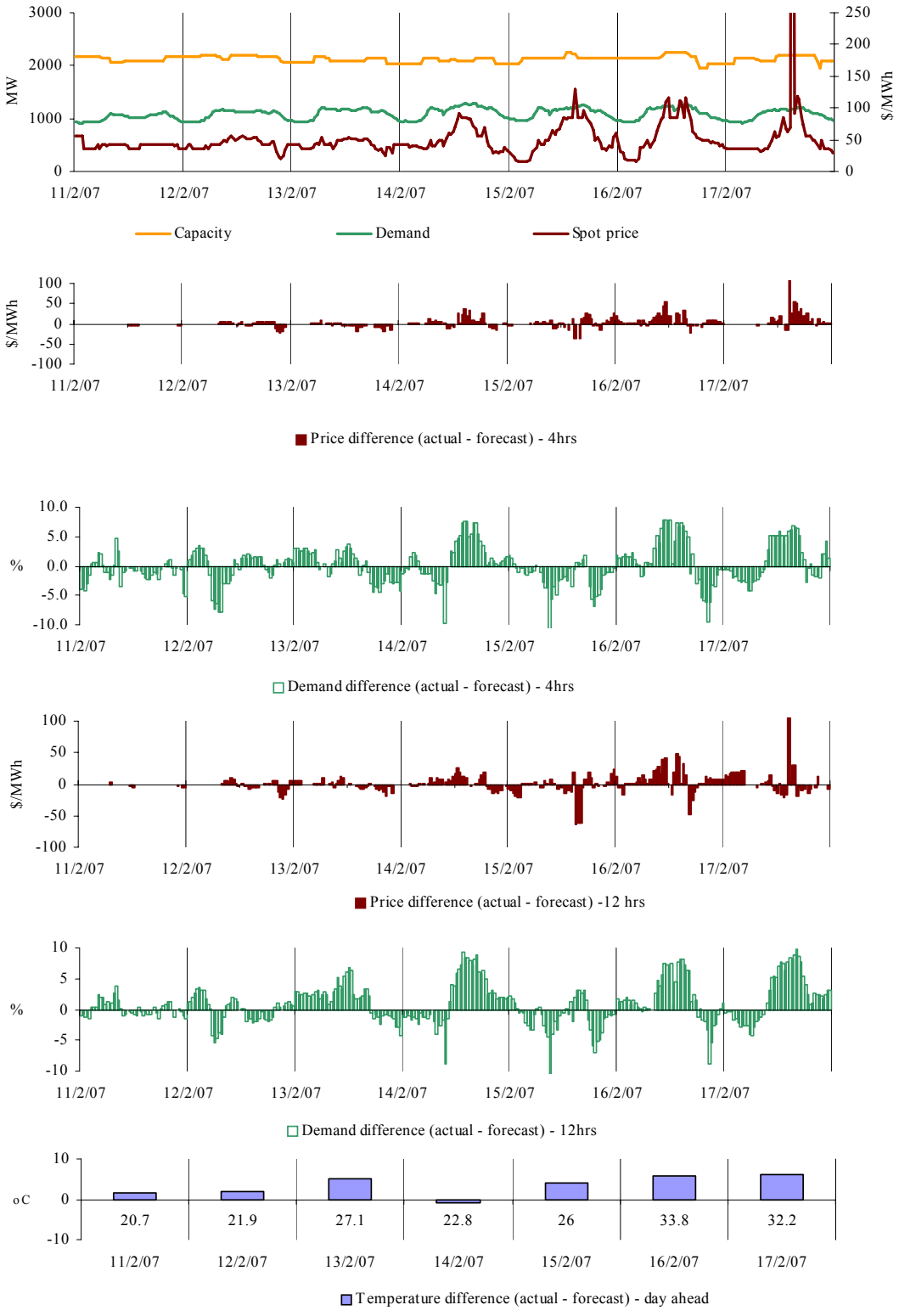
Saturday, 17 February

3:00 pm	Actual	4 hr forecast	12 hr forecast
Price ($/MWh)	828.32	108.33	110.78
Demand (MW)	2782	2573	2632
Available capacity (MW)	3117	3187	3256

Conditions at the time saw demand up to 210 MW higher than forecast four hours ahead. Prices in South Australia were aligned with Victoria and reflecting the conditions there. A single five-minute dispatch price of $4000/MWh occurred in both regions at 2.50 pm. Further details of this event are included in the Victoria section.

There were no significant rebids.

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 weekly average price of $54MWh.

Saturday, 17 February

3:00 pm	Actual	4 hr forecast	12 hr forecast
Price ($/MWh)	1463.75	84.84	84.77
Demand (MW)	1183	1114	1083
Available capacity (MW)	2187	2079	2079

Conditions at the time saw demand and available capacity close to that forecast four and 12 hours ahead. Prices were aligned with Victoria for most of the trading interval, reflecting the conditions there.

A rebid by Hydro Tasmania at 2.39 pm, which was first used for the five-minute dispatch interval ending 2.50 pm, shifted 488 MW of capacity across its portfolio from prices below $250/MWh to above $7500/MWh. The rebid reason given was “Unexpected constraint”. This rebid resulted in reduced flows into Victoria across Basslink by 180 MW. The rebid was effective for the remainder of the trading interval. This saw the five-minute dispatch price increase from around $300/MWh in Victoria, Tasmania and South Australia to around $4000/MWh in Victoria and South Australia and $8000/MWh in Tasmania, for one dispatch interval.

There was no other significant rebidding.

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

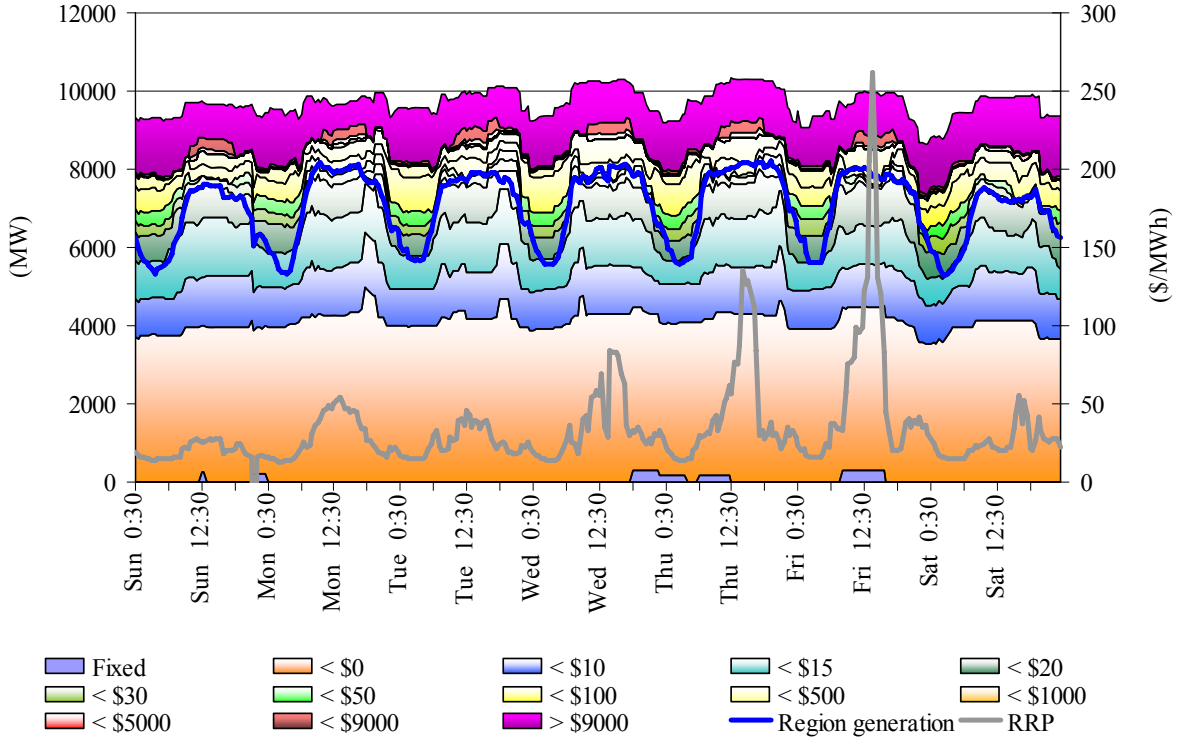


Figure 58: New South Wales closing bid prices, dispatched generation and spot price

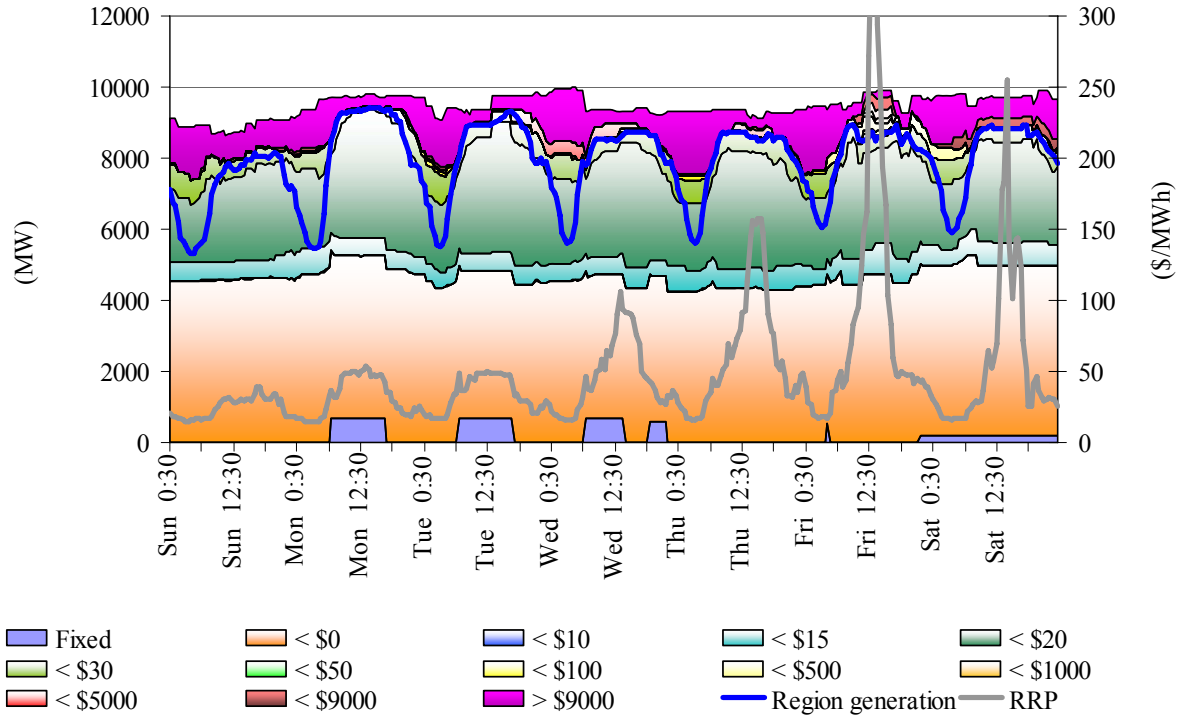


Figure 59: Victoria closing bid prices, dispatched generation and spot price

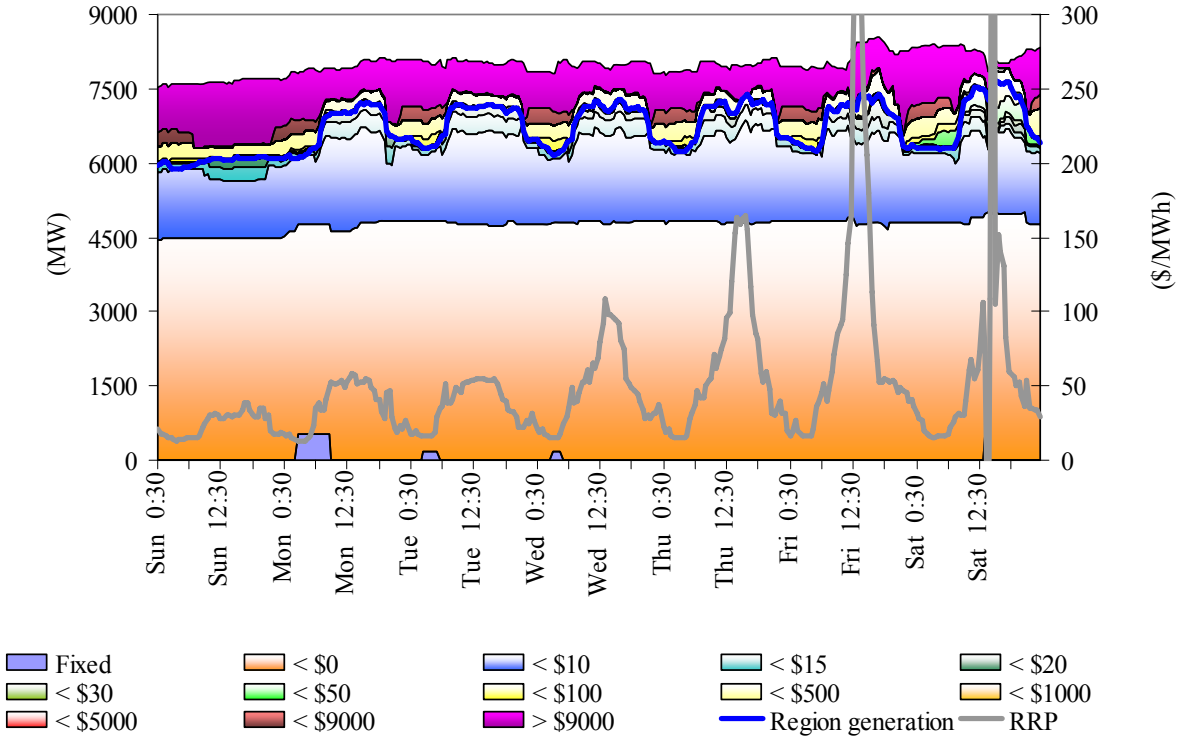


Figure 60: South Australia closing bid prices, dispatched generation and spot price

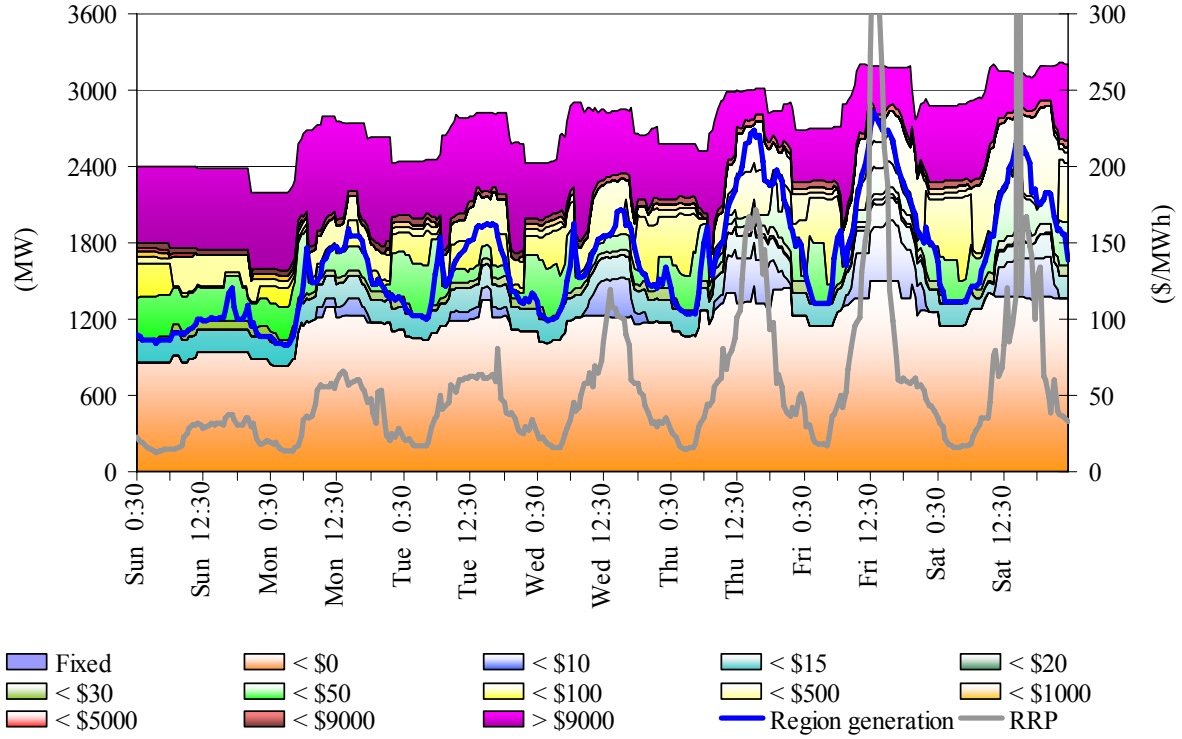
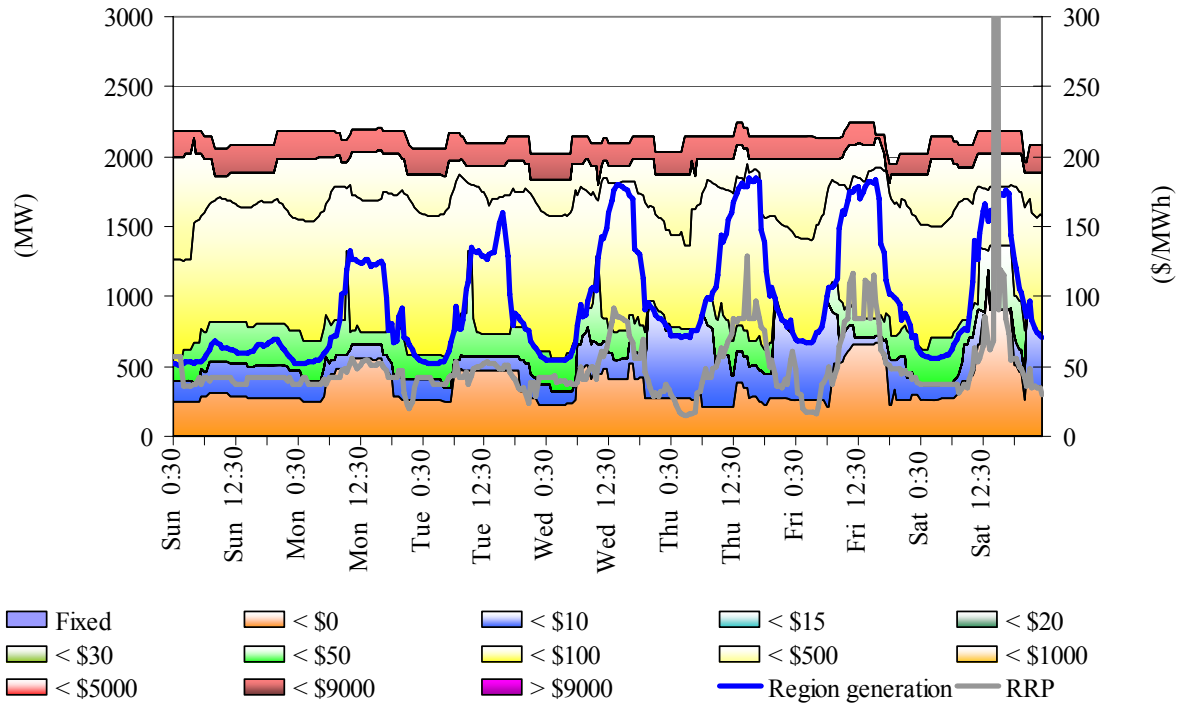


Figure 61: Tasmania closing bid prices, dispatched generation and spot price



Ancillary service market

The total cost of ancillary services on the mainland for the week was $209 000 or 0.1 per cent of the energy market. There was a local requirement in Queensland for lower contingency services due to lightning in the vicinity of QNI on Sunday. The price of lower 5 minute services increased to as high as $1000/MW, with the cost totalling around $39 000. Similar conditions also occurred on Wednesday. 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 ($/MW)	0.46	0.28	1.01	2.47	1.90	0.49	2.94	0.93
Previous week ($/MW)	0.40	0.22	1.66	3.10	0.39	0.23	0.96	1.13
Last quarter ($/MW)	1.76	0.73	1.15	1.54	0.39	2.28	5.00	1.93
Market Cost ($1000s)	$19	$10	$60	$43	$3	$4	$60	$12
% of energy market	0.01%	0.01%	0.03%	0.02%	0.01%	0.01%	0.03%	0.01%

The total cost of ancillary services in Tasmania for the week was $63 000 or 0.6 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 ($/MW)	1.73	0.51	0.65	1.86	0.32	0.93	0.83	0.77
Previous week ($/MW)	19.35	0.51	0.74	2.34	0.20	1.05	0.81	1.33
Last quarter ($/MW)	4.97	0.49	2.93	3.00	12.67	0.43	0.82	0.45
Market Cost ($1000s)	$7	$5	$6	$16	$2	$12	$8	$6
% of energy market	0.07%	0.05%	0.07%	0.16%	0.02%	0.12%	0.08%	0.06%

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

Figure 64: daily frequency control ancillary service cost

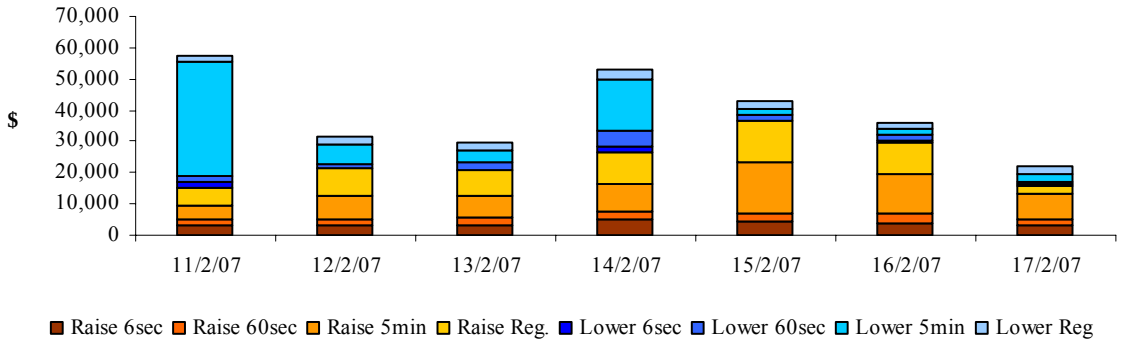
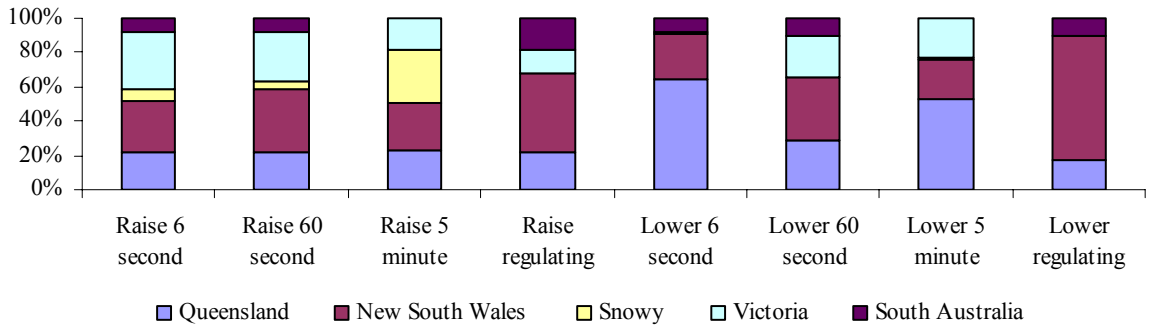


Figure 65 shows the contribution, on a percentage basis, that frequency control ancillary service providers are utilised (in each mainland region) to satisfy the total requirement for each service.

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

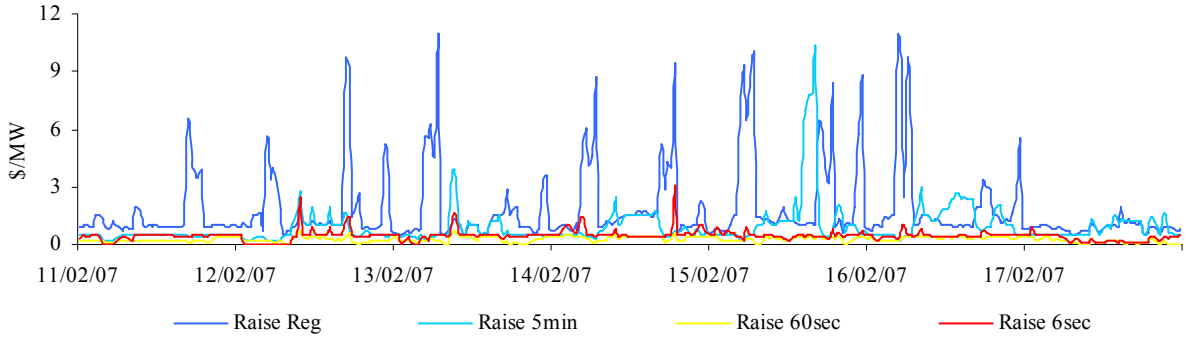


Figure 66A: prices for raise services – Tasmania

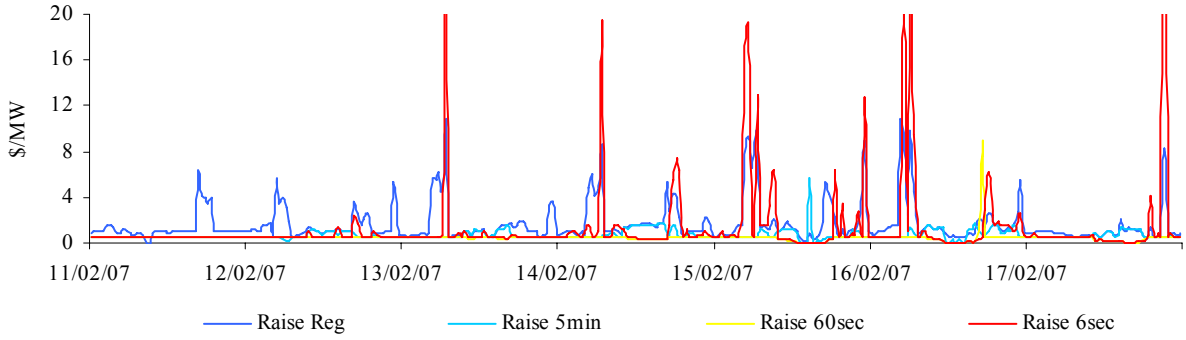


Figure 67: prices for lower services

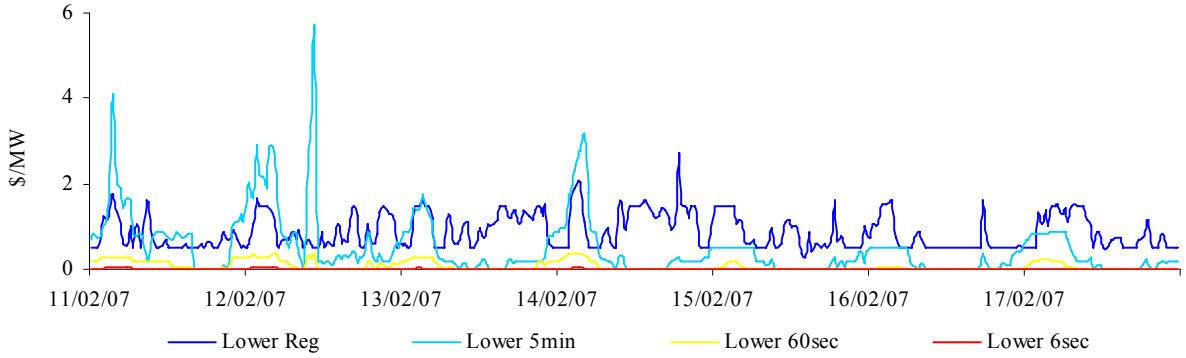
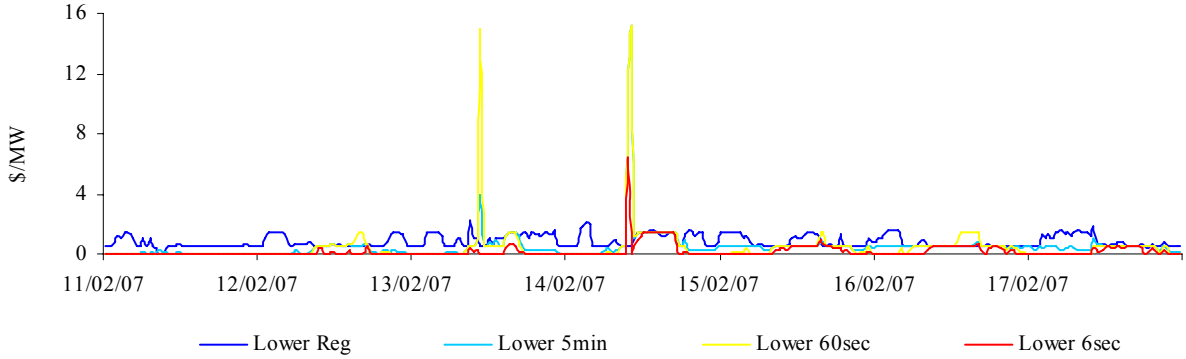


Figure 67A: prices for lower services – Tasmania



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

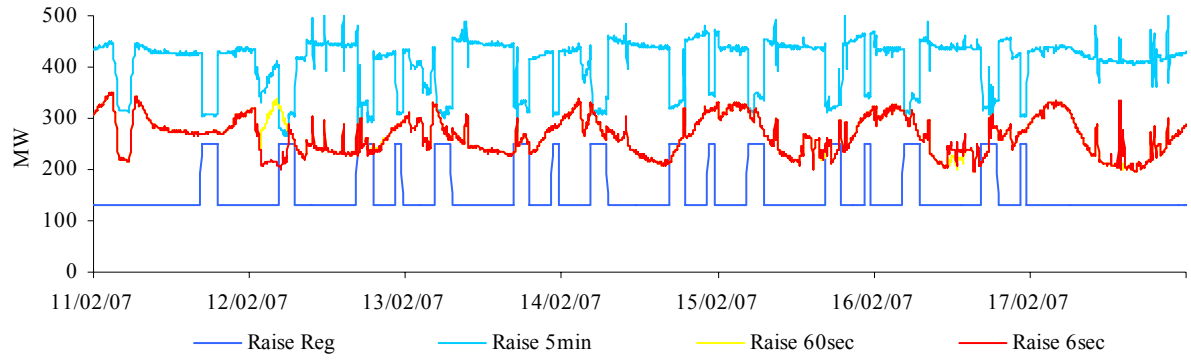


Figure 68A: raise requirements – Tasmania

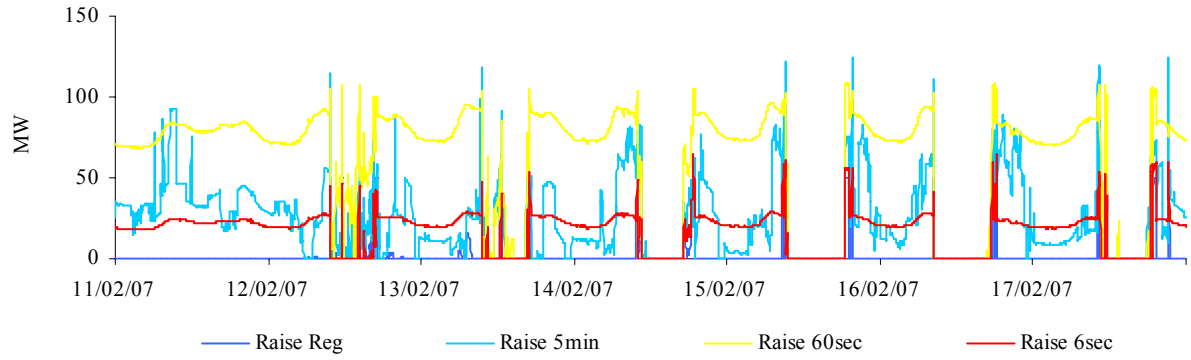


Figure 69: lower requirements

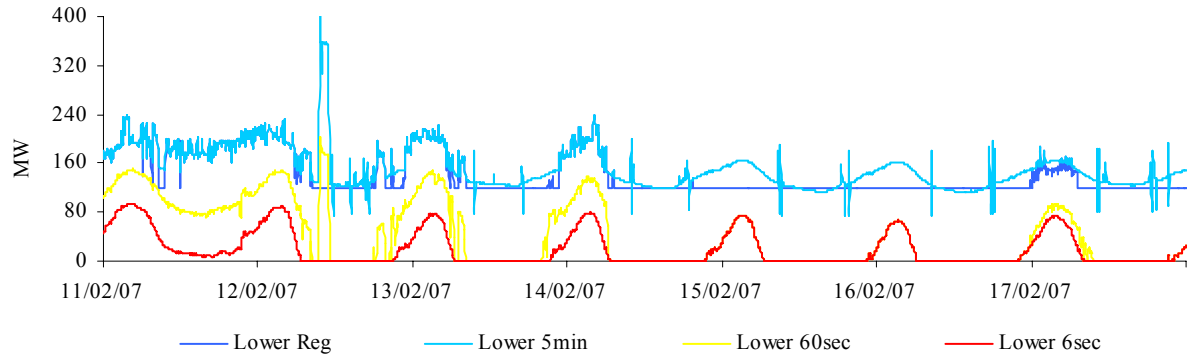
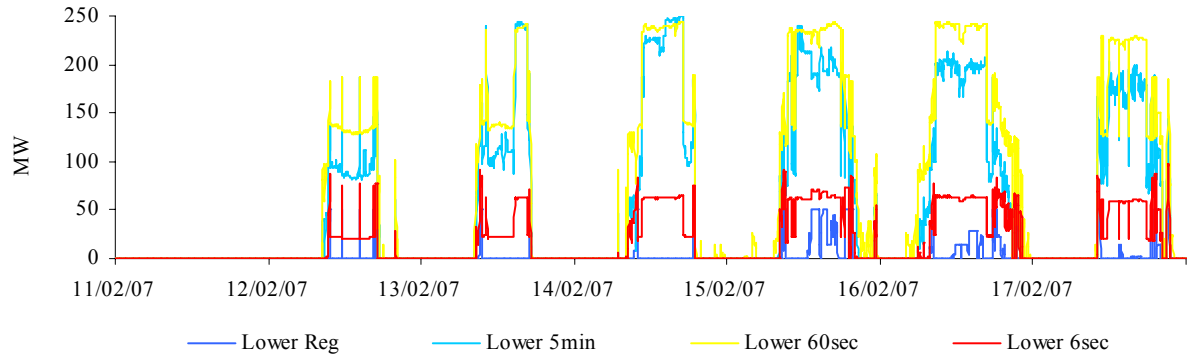


Figure 69A: lower requirements – Tasmania



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