Market analysis

AUSTRALIAN ENERGY REGULATOR

18–24 March 2007

Spot prices for the week averaged between $56/MWh in Tasmania and $83/MWh in New South Wales. Unseasonably high demands were experienced across the market late in the week, with demand in Victoria exceeding the extreme forecast for this time of year.

Turnover in the energy market was $297 million. The total cost of ancillary services for the week was $489 000, or 0.2 per cent of energy market turnover.

Significant variations between actual prices and those forecast 4 and 12 hours ahead occurred in 109 or a quarter 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 over half 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

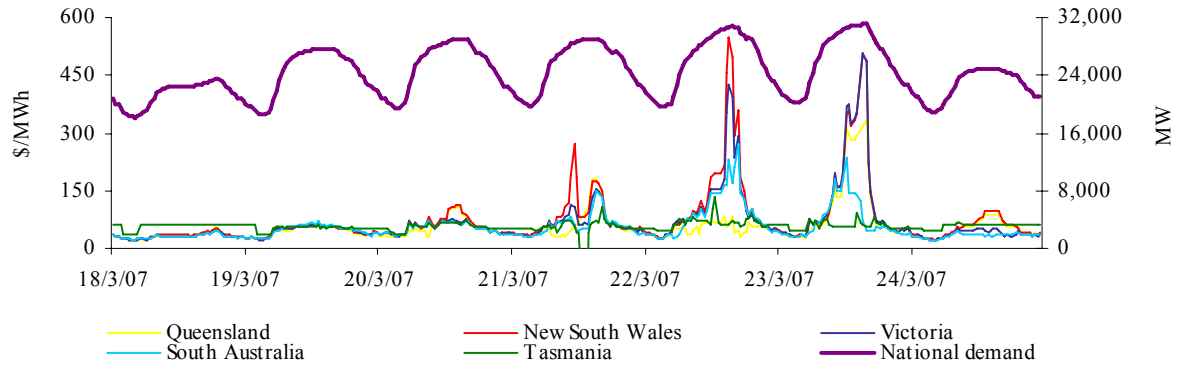


Figure 2: volume weighted average spot price for energy market ($/MWh)

	QLD	NSW	VIC	SA	TAS
Last week	60	83	77	61	56
Previous week	65	42	72	75	48
Same quarter last year	38	45	53	57	33
Financial year to date	37	41	48	51	43
% change from previous week *	▼8%	▲100%	▲6%	▼19%	▲16%
% change from same quarter last year **	▲55%	▲83%	▲45%	▲7%	▲69%
% change from year to date ***	▲8%	▼16%	▲24%	▲11%	▼37%

*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

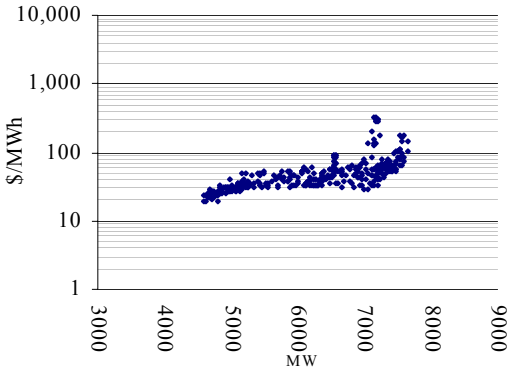


Figure 4: New South Wales

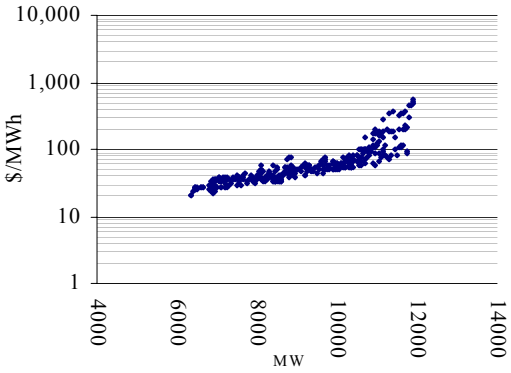


Figure 5: Victoria

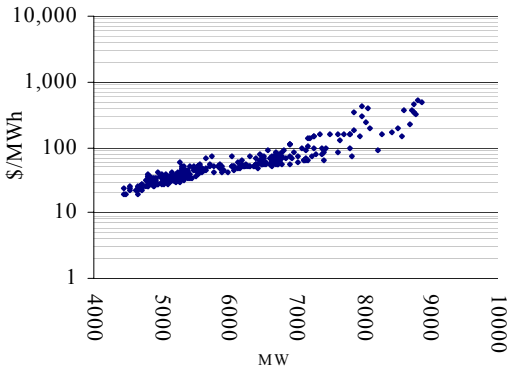


Figure 6: South Australia

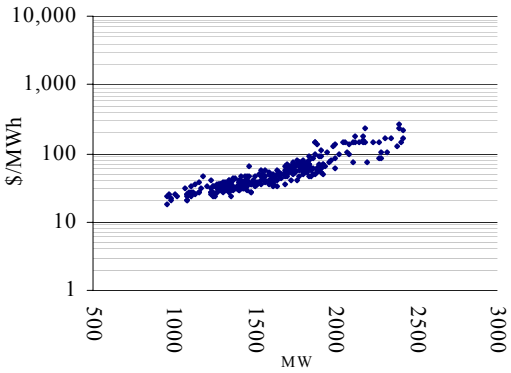
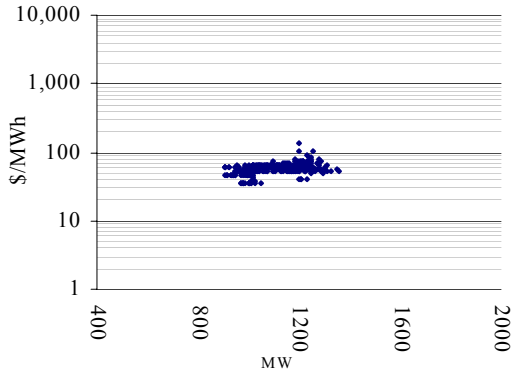


Figure 7: Tasmania



The maximum spot prices for the week ranged from $135/MWh in Tasmania to $546/MWh in New South Wales. The spot price in Tasmania fell to a low of -$832/MWh on Wednesday following a 100 MW reduction in demand. 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	1.26	2.13	1.58	1.58	0.32
Previous week	0.77	0.55	0.92	0.94	0.14
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

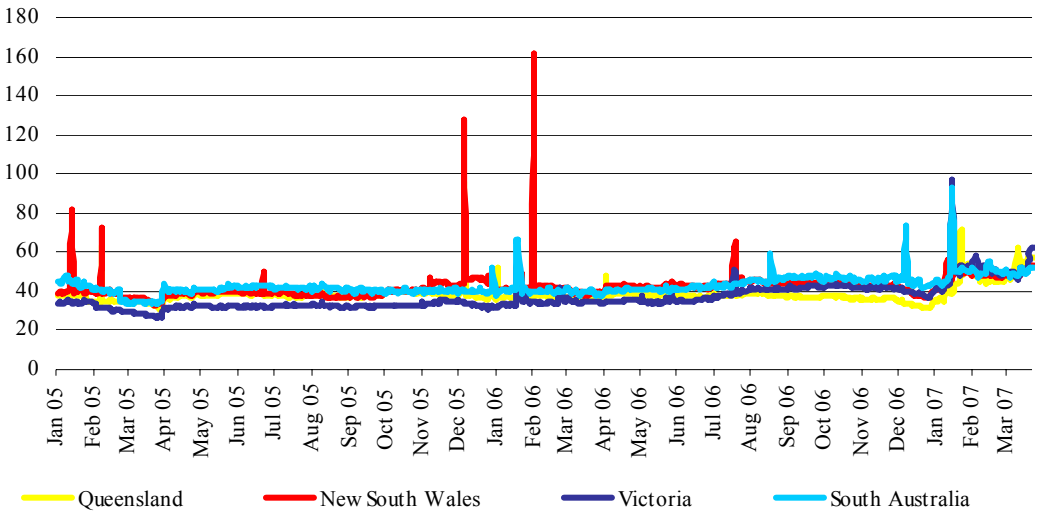
Figure 9 sets out the d-cyphaTrade wholesale electricity price index (WEPI)* for each region throughout the week excluding Tasmania. Figure 10 sets out the WEPI since 1 January 2005.

Figure 9: d-cyphaTrade WEPI for the week

	Monday	Tuesday	Wednesday	Thursday	Friday
Queensland	54.99	55.32	57.24	56.81	57.17
New South Wales	50.34	52.09	52.59	53.52	53.50
Victoria	51.54	53.42	54.47	56.59	62.65
South Australia	49.34	51.03	50.05	52.58	52.00

* 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

There were no low reserves forecast.

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

Figure 11: Queensland

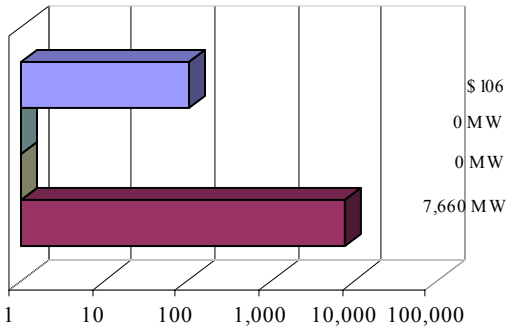


Figure 12: New South Wales

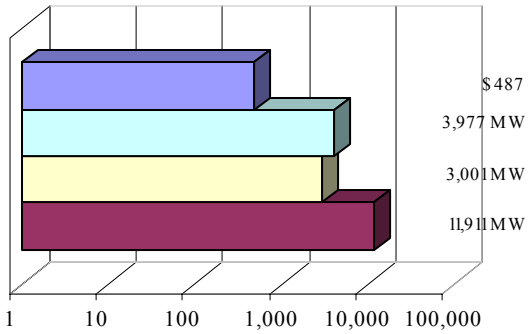


Figure 13: Victoria

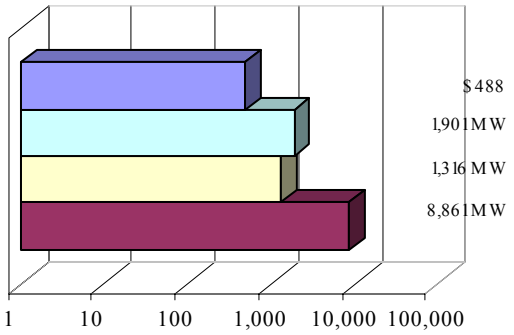


Figure 14: South Australia

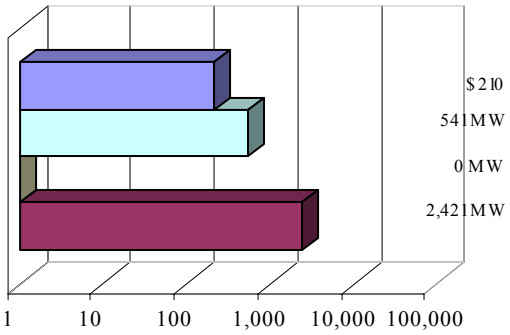
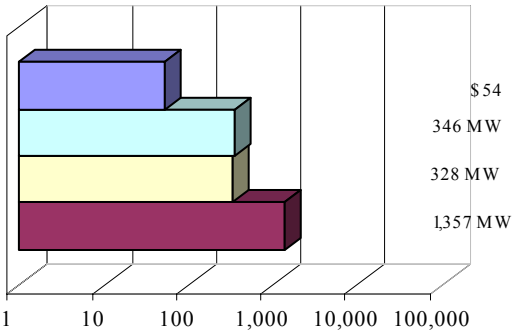


Figure 15: Tasmania



Price variations

There were 109 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

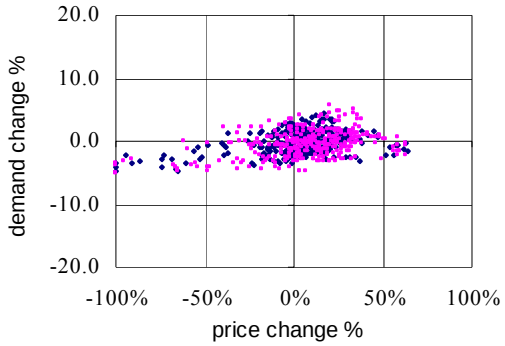


Figure 17: New South Wales

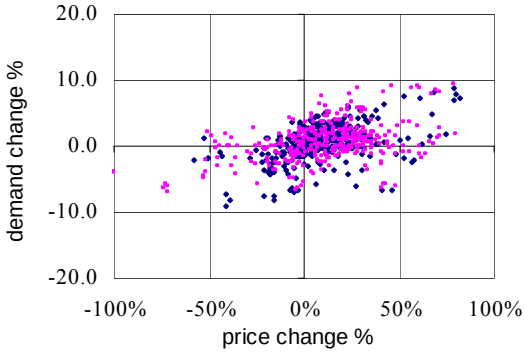


Figure 18: Victoria

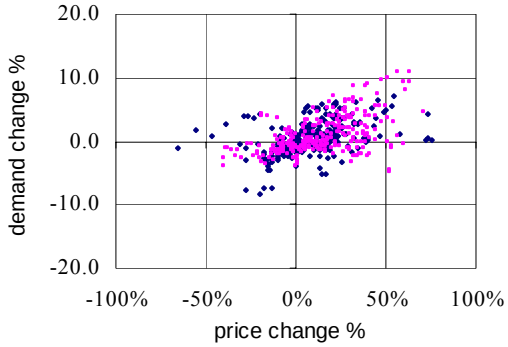


Figure 19: South Australia

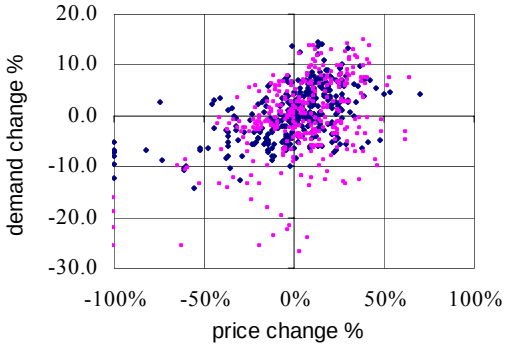


Figure 20: Tasmania

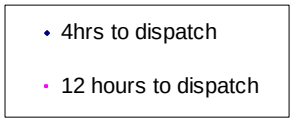


Figure 21 summarises the number and most probable reason for variations between forecast and actual prices.

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 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 $78/MWh. A further occasion, when prices were aligned across the market but the price in New South Wales that was less than three times the weekly average, has been included for completeness.

Thursday, 22 March

3:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	458.83	94.84	148.71
Demand (MW)	30 627	29 915	29 777
Available capacity (MW)	34 900	35 536	35 700
3:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	546.19	100.00	154.77
Demand (MW)	30 765	30 041	29 882
Available capacity (MW)	35 128	35 539	35 748
4:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	500.00	100.00	154.68
Demand (MW)	30 898	30 010	29 809
Available capacity (MW)	35 177	35 532	35 693
4:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	290.44	93.09	116.32
Demand (MW)	30 704	29 836	29 578
Available capacity (MW)	35 197	35 738	35 713
5:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	360.24	74.06	75.96
Demand (MW)	30 545	29 375	29 146
Available capacity (MW)	35 191	35 763	35 743

Conditions at the time saw national demand 900 MW higher than forecast four hours ahead and 1400 MW higher than forecast twelve hours ahead.

A planned outage of a transmission line between Eraring to Newcastle line in New South Wales restricted flows from Queensland to New South Wales to as low as 165 MW between 7.30 am and 8 pm. The nominal limit on flows across this interconnector is 1078 MW. Throughout the morning, Enertrade reduced the capacity across its portfolio by 230 MW, primarily at Collinsville. Around 130 MW of this capacity was priced below $100/MWh. The rebid reason given was “Extend outage::change avail”. These rebids included shifting 120 MW of capacity at Oakey from prices above $9000/MWh to below $280/MWh. The rebid reason given was “Rearrangement-outage::change MW distrib.”

At 8.22 am Delta Electricity committed 210 MW at Munmorah, all of which was priced below zero. The units return to service followed its trip on Tuesday, two days earlier.

At 1.29 pm Delta Electricity’s Wallerawang unit eight tripped reducing its capacity by 500 MW, 350 MW of which was priced below $100/MWh.

At 2.19 pm Callide Power Trading rebid 200 MW of capacity across its units from prices below $30/MWh to above $9000/MWh. The rebid reason given was “Chge PD::chge MW dist.”.

There was no other significant rebidding.

Friday, 23 March

12:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**

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

Price ($/MWh)	349.72	151.00	124.47
Demand (MW)	30 544	30 355	29 787
Available capacity (MW)	35 020	35 709	36 044
1:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	356.66	151.92	137.27
Demand (MW)	30 721	30 357	29 999
Available capacity (MW)	34 926	35 602	36 048
1:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	320.00	482.47	150.16
Demand (MW)	30 810	30 996	30 130
Available capacity (MW)	35 115	36 011	36 516
2:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	333.85	477.94	147.14
Demand (MW)	30 809	31 165	30 184
Available capacity (MW)	35 174	36 122	36 521
2:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	349.09	258.01	137.22
Demand (MW)	30 863	30 997	30 133
Available capacity (MW)	35 254	36 113	36 496
3:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	453.29	262.44	151.10
Demand (MW)	30 985	31 049	30 221
Available capacity (MW)	35 332	35 789	36 496
3:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	504.28	476.17	150.14
Demand (MW)	31 104	30 978	30 270
Available capacity (MW)	35 372	35 353	36 496
4:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	487.08	157.72	138.20
Demand (MW)	31 103	30 468	30 157
Available capacity (MW)	35 545	35 598	36 724
4:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	225.72	154.91	89.84
Demand (MW)	30 631	30 150	29 821
Available capacity (MW)	35 548	35 665	36 724

Conditions at the time saw national demand at near record levels. Demand was almost 650 MW higher than forecast four hours ahead and 1000 MW higher than forecast twelve hours ahead, with forecasting errors in Victoria accounting for the majority. Demand in Victoria was within 200 MW of the record and surpassed NEMMCO's extreme (or 10 per cent probability of exceedance) demand forecast for the day. The temperature in Melbourne reached the its highest for this time of the year, since 1940.

Prices in South Australia and Tasmania diverged from the rest of the market during this period with both regions exporting at near the nominal limit.

From 7.44 am and over several rebids Delta Electricity reduced capacity at Munmorah and Wallerawang by 390 MW. A further 120 MW of capacity at Mount Piper was shifted from prices below $100/MWh to above $9700/MWh. In total, as much as 450 MW of capacity was removed or shifted from prices of less than $100/MWh. The rebid reasons given included

"Milling capacity::capacity limit change", Plant conditions BCP::band shift" and "Conductivity::capacity limit".

At 8.21 am and 10.41 am Tarong Energy rebid 110 MW of capacity across Tarong and Wivenhoe from prices below $300/MWh to above $450/MWh. The rebid reasons given were "Cover contract position::volume profile change" and "Cover contract position:: adjust availability and profile". At 9.52 am Tarong Energy reduced the capacity of Tarong unit one by 210 MW, 140 MW of which was priced below $125/MWh. The rebid reason given was "Load down at lower ROC::fixed load".

At 8.48 am Macquarie Generation rebid 510 MW of capacity across its Bayswater units from prices below $20/MWh to above $560/MWh. The rebid reason given was "Load higher than originally anticipated". The AER notes that demand in NSW was close to forecast, while demand in Victoria was significantly higher than forecast.

At 10.47 am CS Energy reduced the capacity of Callide B unit two by 165 MW. All of this capacity was priced below $50/MWh. The rebid reason given was "Air heater failure".

At 10.51 am Enertrade reduced the available capacity across its portfolio by 407 MW. All of this capacity was priced below $150/MWh. These reductions related to delays in the return to service of Gladstone unit two following a three day outage, and the return of Collinsville units two, three and five.

At 10.54 am LYMMCO rebid 134 MW of capacity across its units from prices below $50/MWh to above $4500/MWh. The rebid reason given was "Material change in PD at 10:01".

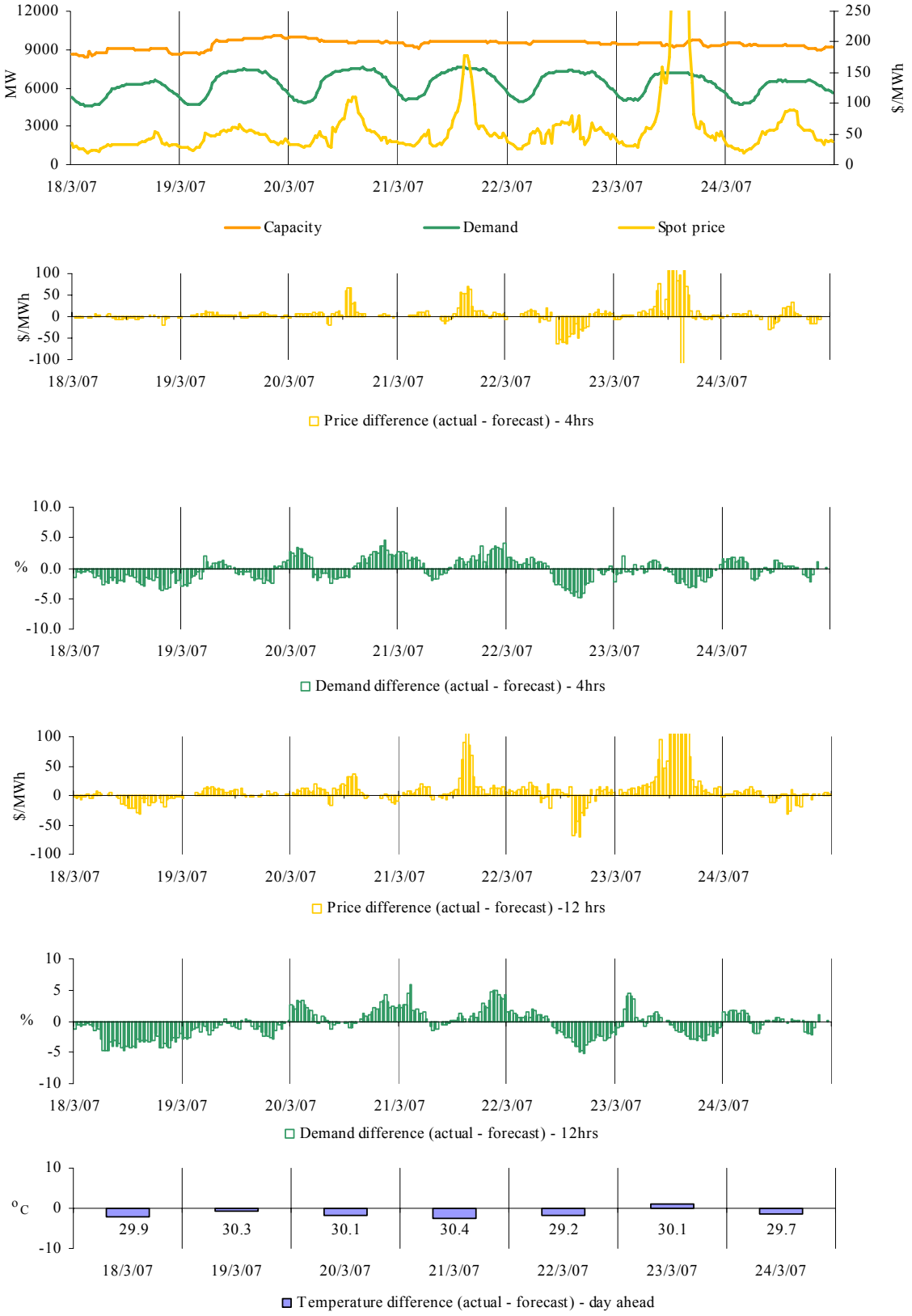
At 12.14 pm Callide Power Trading reduced the capacity of its units by 100 MW, this followed a rebid at 11.16 am which shifted 100 MW of capacity from prices of less than $30/MWh to above $9000/MWh. The rebid reasons given were "Mill change over" and "OPTIDEC CHNG MW DIST" (or Optimisation decision change MW distribution).

At 12.39 pm Snowy Hydro rebid 310 MW of capacity at Laverton North from prices above $9000/MWh to zero. The rebid reason given was "Prices higher than fcast:bandshift down".

At 3.50 pm Stanwell Corporation rebid as much as 279 MW of capacity at Stanwell from prices below $65/MWh to above $265/MWh, 180 MW was shifted to prices above $9000/MWh. The rebid reason given was "Manage transmission constraint".

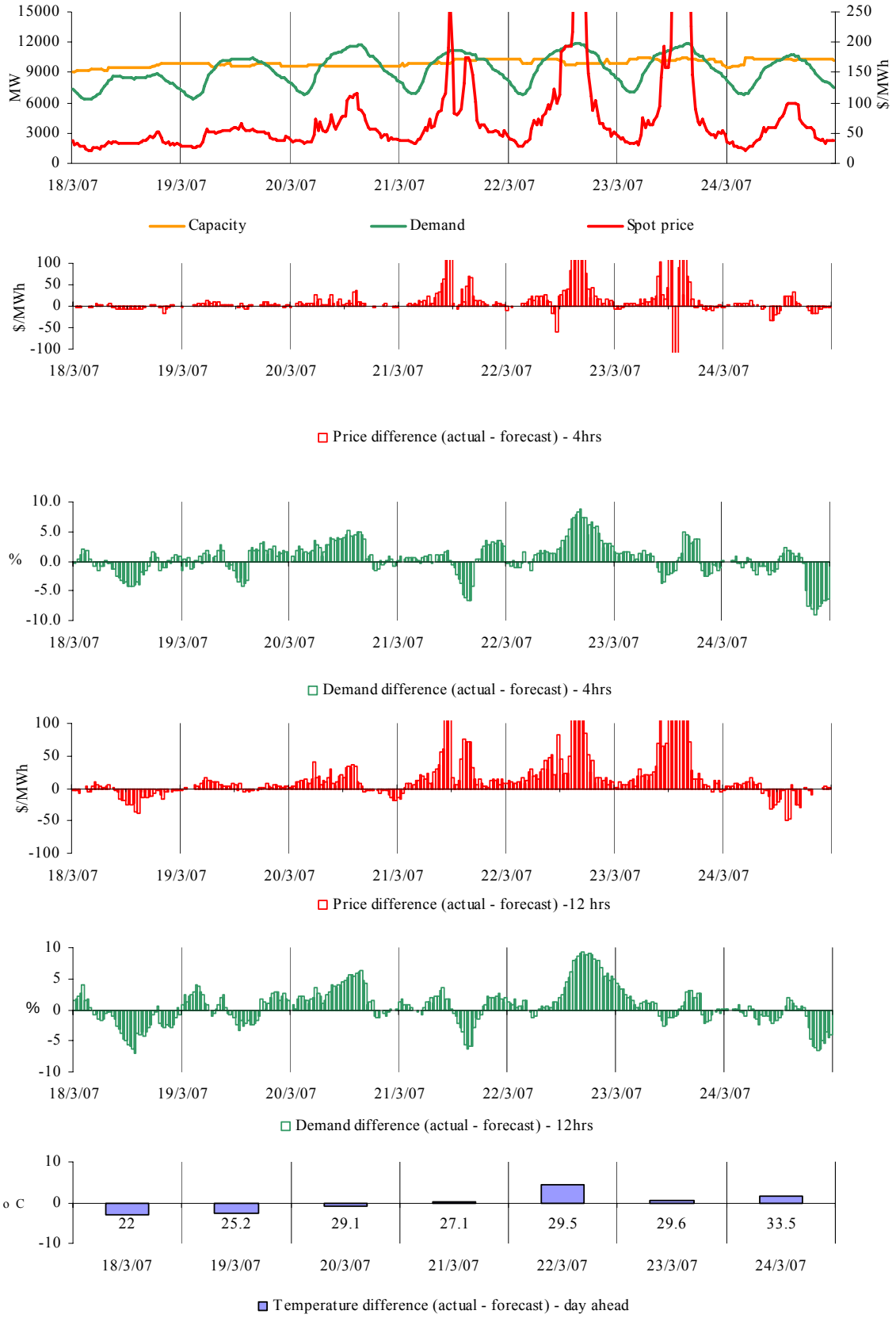
There was no other significant rebidding.

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



There were nine occasions in Queensland where the spot price was greater than three times the weekly average price of $60/MWh. At the time, prices were aligned across the market. 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 14 occasions where the spot price in New South Wales was greater than three times the weekly average price of $83/MWh. Thirteen of these occurred when prices were generally aligned across all regions and are detailed in the national market outcomes section. The remaining occasion is presented below.

Wednesday, 21 March

11:30 am	Actual	4 hr forecast	12 hr forecast
Price ($/MWh)	273.65	70.25	54.20
Demand (MW)	11155	10965	10966
Available capacity (MW)	9964	10329	10331

Conditions at the time saw demand close to forecast with available capacity 360 MW lower than forecast.

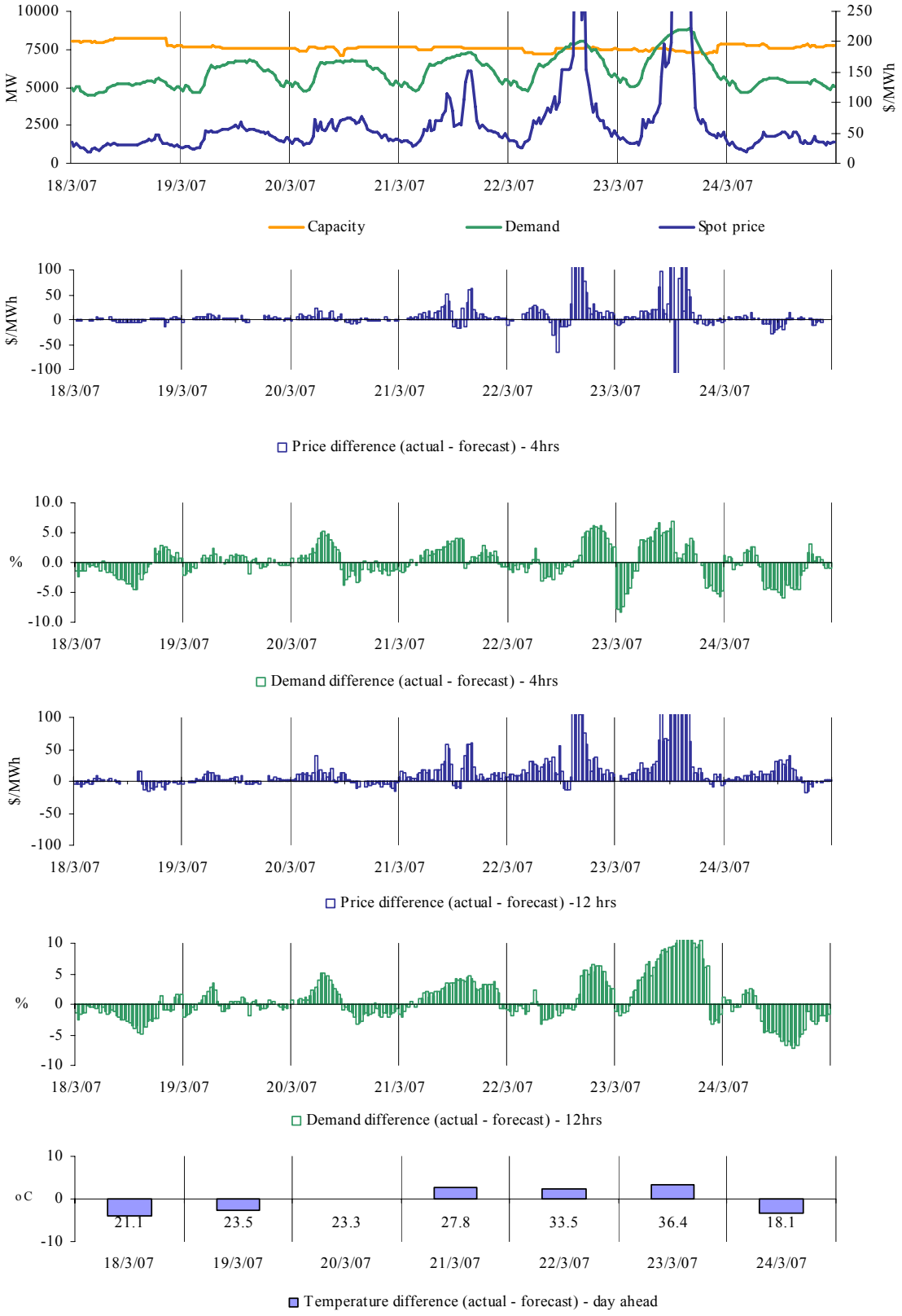
A planned network outage between Newcastle and Eraring in New South Wales led to counter price flow from New South Wales into Queensland. NEMMCO intervened to limit further accumulations at 11.20 am, restricting flows into Queensland to 100 MW.

Over a number of rebids from 6 am Delta Electricity shifted 290 MW of capacity across its portfolio from prices below $25/MWh to above $9000/MWh. The rebid reasons included “Operating conditions::band shift” and “Operational limitations::band shift”.

At 9.46 am Delta Electricity delayed the return to service of Vales Point unit five after a four day outage. This rebid effectively removed 360 MW of capacity priced below $20/MWh. The unit was returned to full capacity by 1 pm.

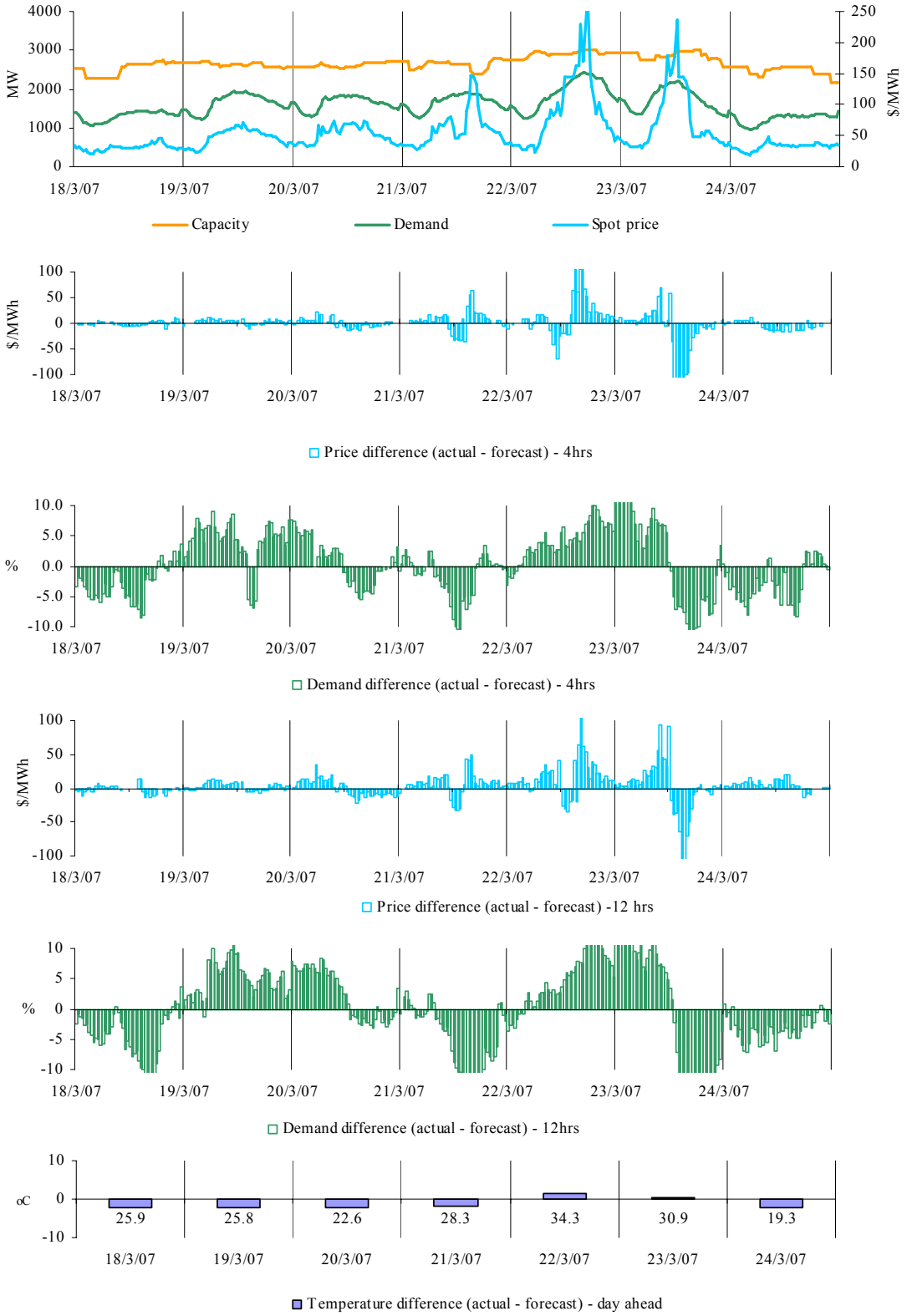
There was no other significant rebidding.

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



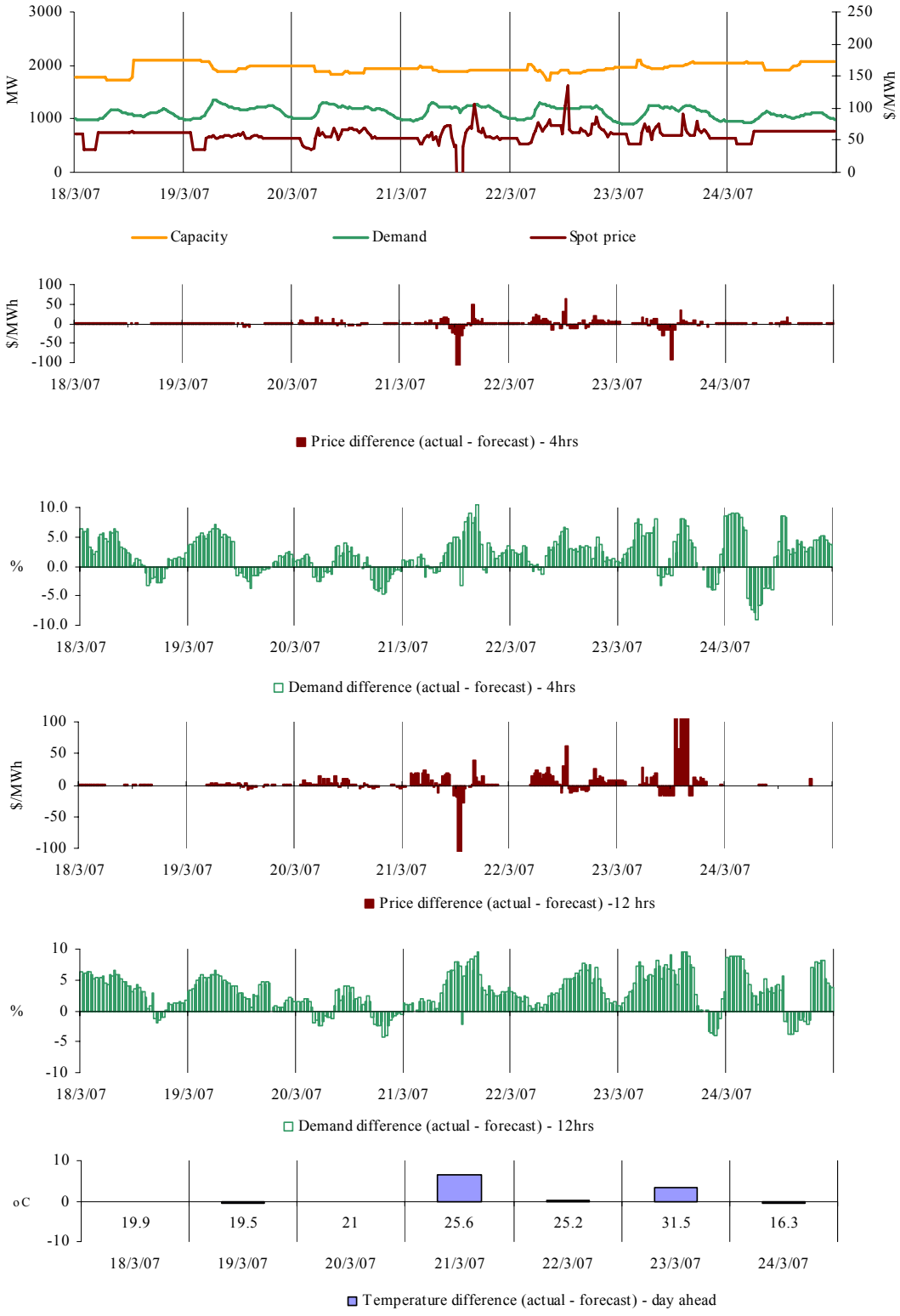
There were 13 occasions in Victoria where the spot price was greater than three times the weekly average price of $77/MWh. At the time, prices were aligned across the market. The circumstances of these events are detailed under the national market outcomes section.

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



There were four occasions in South Australia where the spot price was greater than three times the weekly average price of $61/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 was no occasion where the spot price in Tasmania was greater than three times the weekly average price of $56/MWh.

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

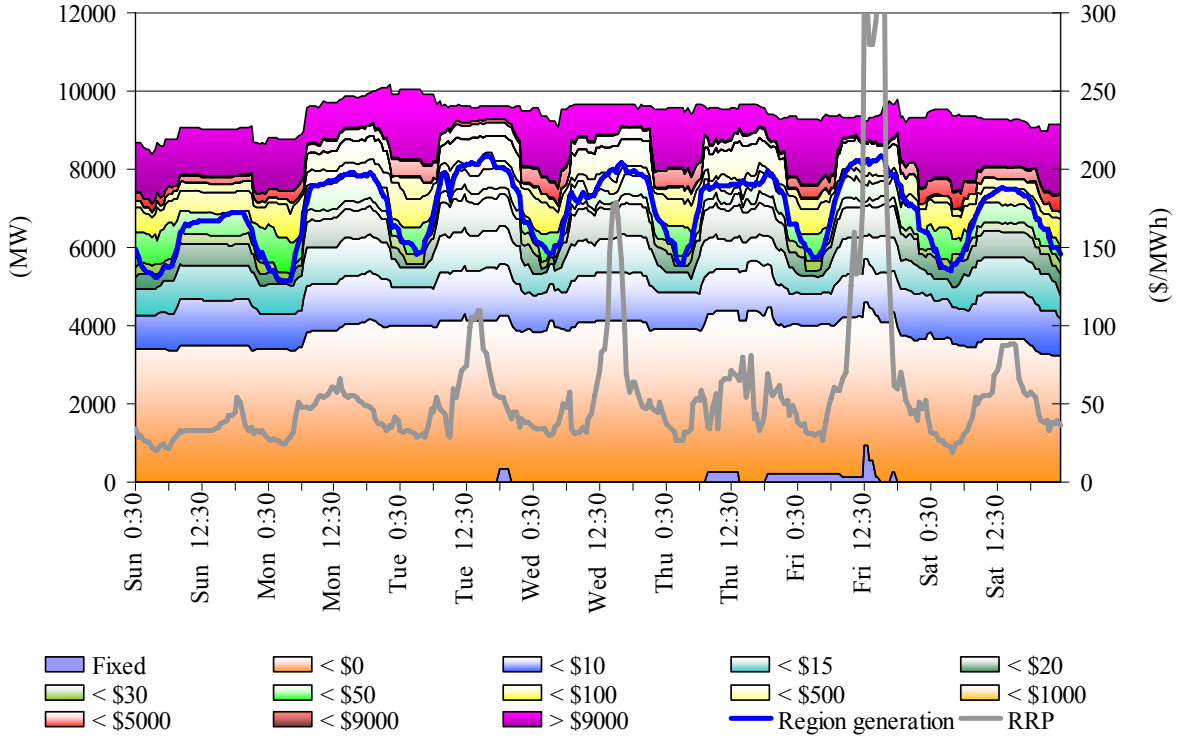


Figure 58: New South Wales closing bid prices, dispatched generation and spot price

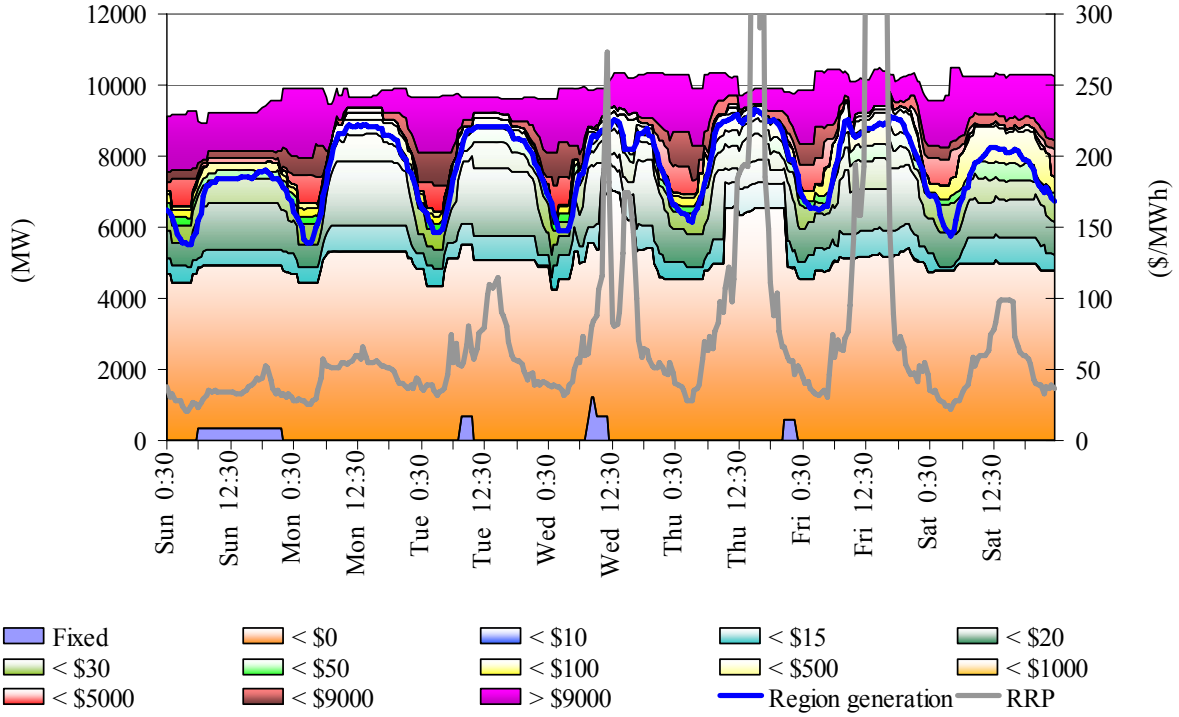


Figure 59: Victoria closing bid prices, dispatched generation and spot price

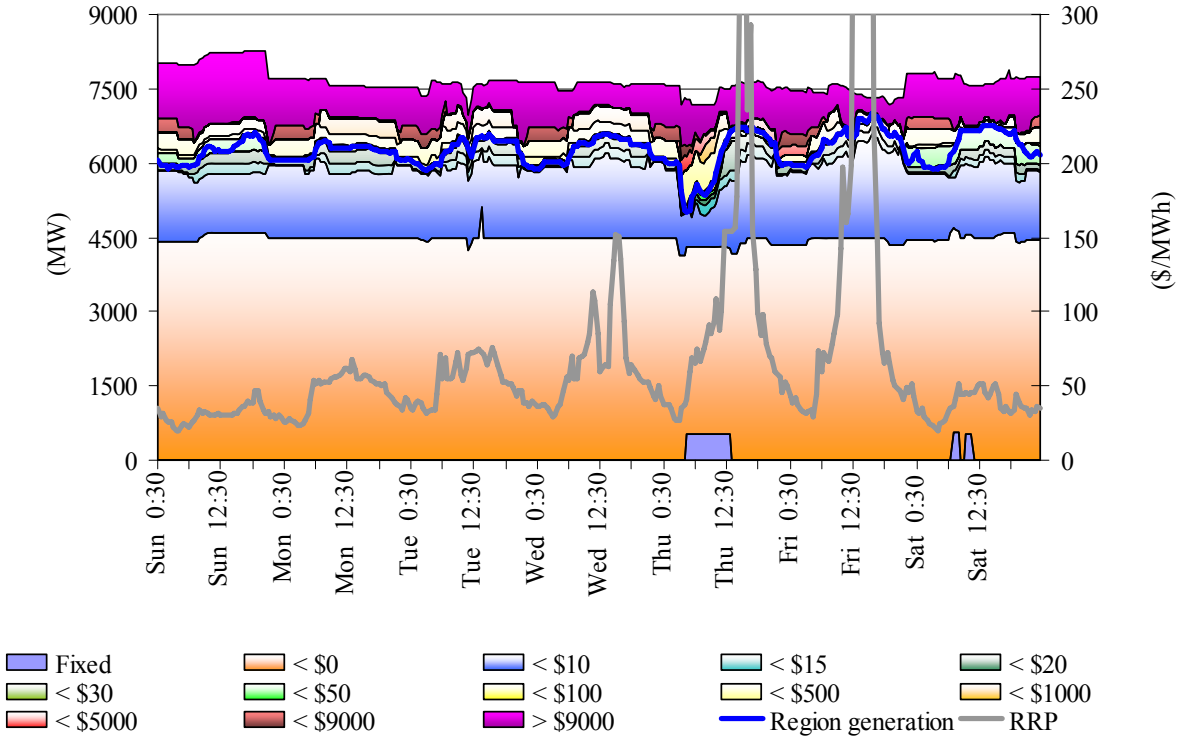


Figure 60: South Australia closing bid prices, dispatched generation and spot price

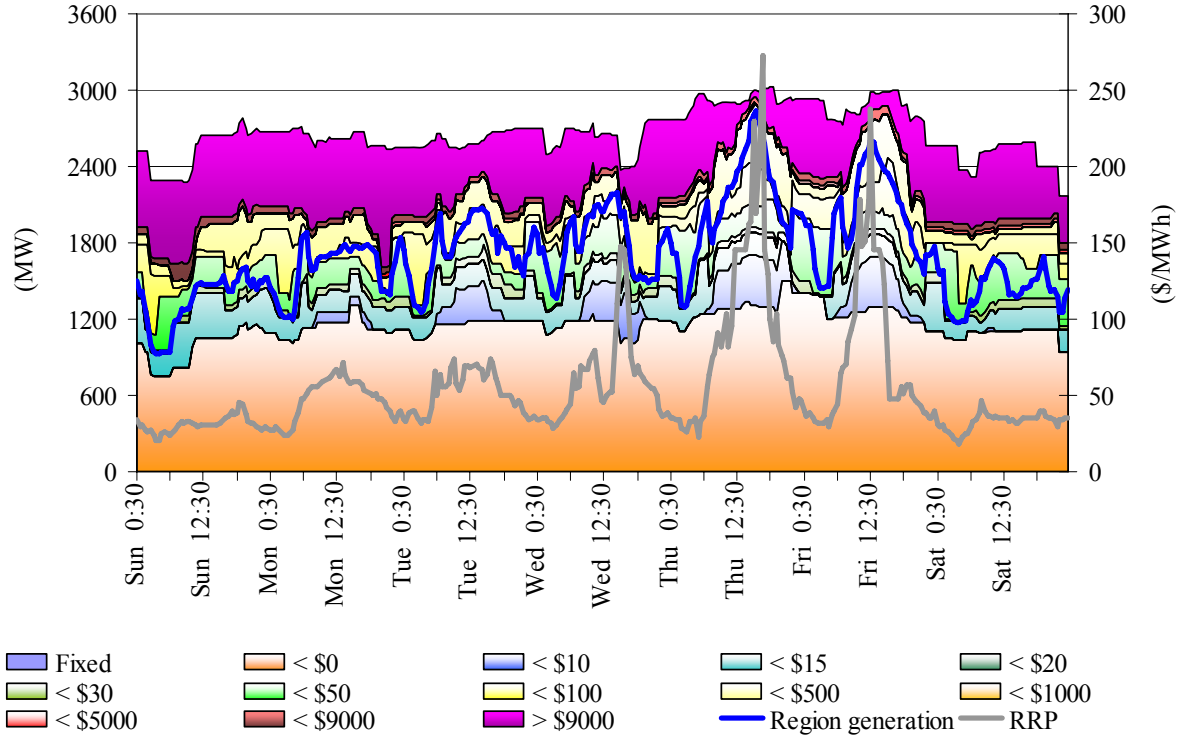
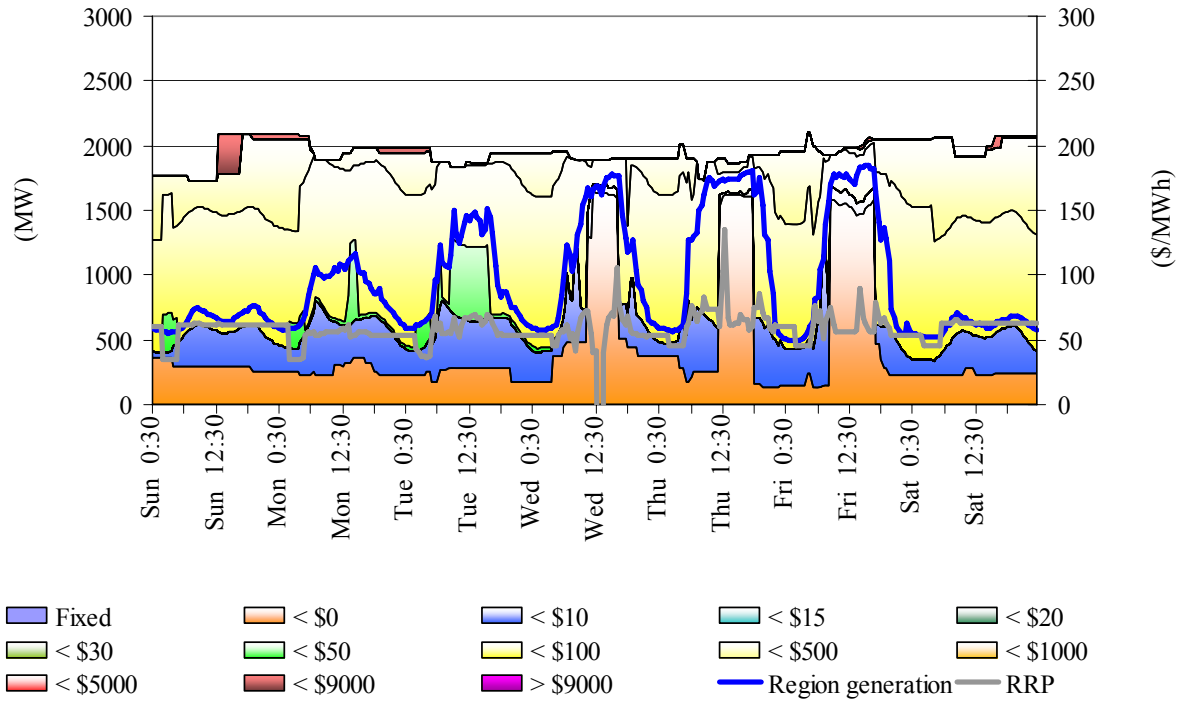


Figure 61: Tasmania closing bid prices, dispatched generation and spot price



Ancillary service market

The total cost of ancillary services on the mainland for the week was $182 000 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 ($/MW)	0.62	0.32	1.03	2.31	0.10	0.49	1.29	0.98
Previous week ($/MW)	0.52	0.23	0.86	1.96	0.04	0.58	1.29	1.03
Last quarter ($/MW)	1.76	0.73	1.15	1.54	0.39	2.28	5.00	1.93
Market Cost ($1000s)	$24	$11	$56	$47	$0	$5	$27	$13
% of energy market	0.01%	0.01%	0.02%	0.02%	0.01%	0.01%	0.01%	0.01%

The total cost of ancillary services in Tasmania for the week was $307 000 or 3 per cent of the total turnover in the energy market in Tasmania. On Thursday afternoon, following an energy rebid from Hydro Tasmania which increased the dispatch of a number of generators for energy, effectively reducing the availability of these units for the lower 6 second service, the price for lower 6 second services increased to as high as $2383/MW. This added $193 000 to the cost of ancillary services 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 ($/MW)	4.09	0.73	1.30	2.07	46.73	1.02	0.62	0.70
Previous week ($/MW)	2.33	1.30	1.59	1.93	0.10	0.71	0.66	0.88
Last quarter ($/MW)	4.97	0.49	2.93	3.00	12.67	0.43	0.82	0.45
Market Cost ($1000s)	$15	$7	$14	$12	$235	$12	$6	$5
% of energy market	0.14%	0.07%	0.13%	0.12%	2.25%	0.12%	0.06%	0.05%

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

Figure 64: daily frequency control ancillary service cost

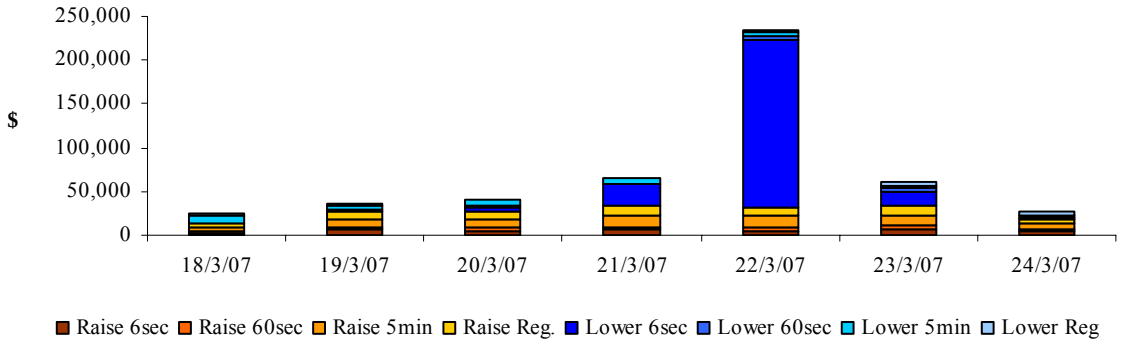
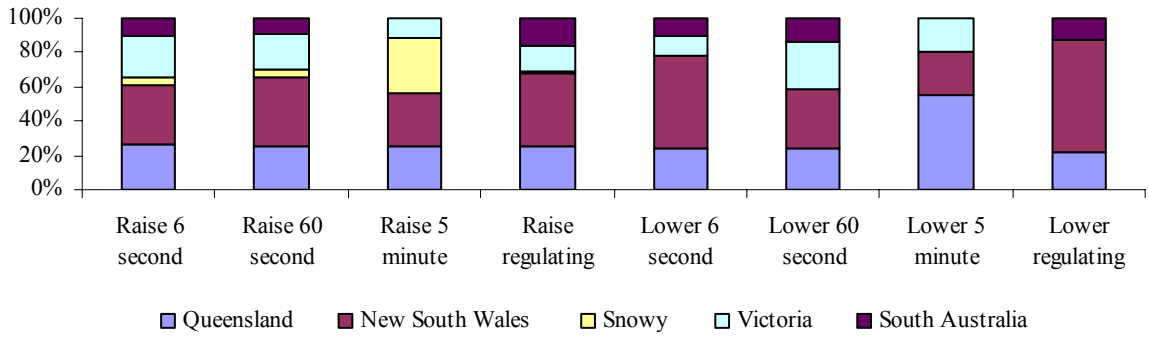


Figure 65 shows the contribution, on a percentage basis, that frequency control ancillary service providers are utilised (in each mainland region) to satisfy the total requirement for each service.

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

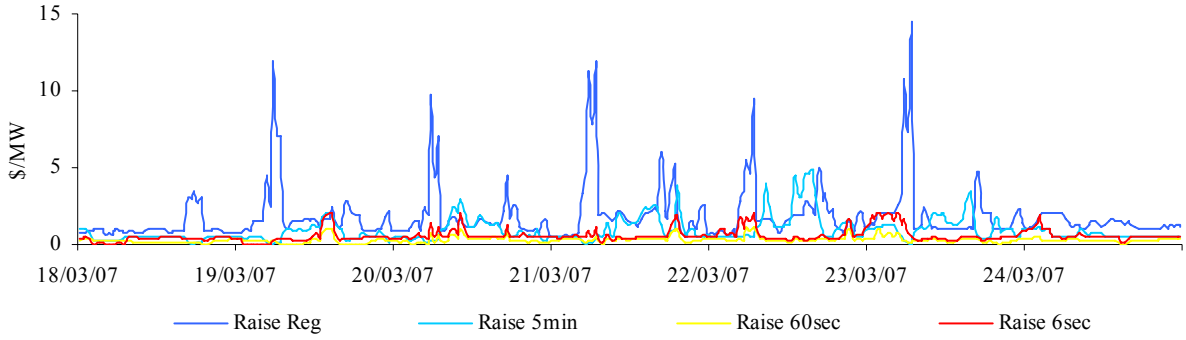


Figure 66A: prices for raise services – Tasmania

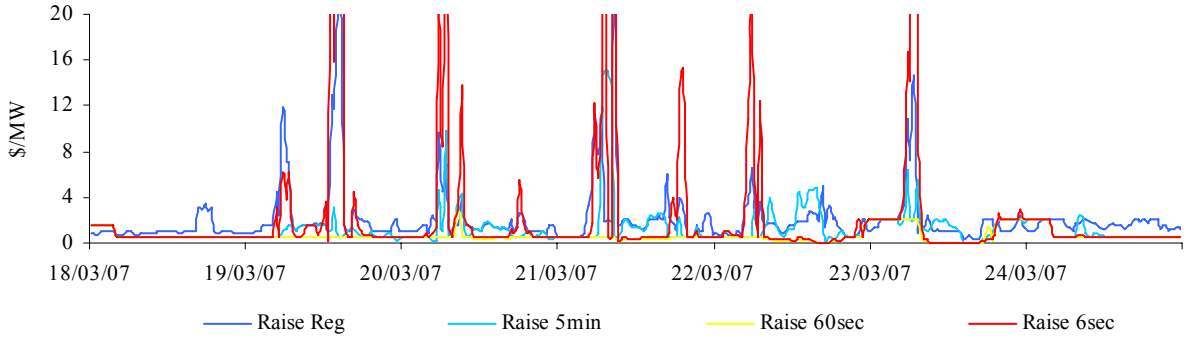


Figure 67: prices for lower services

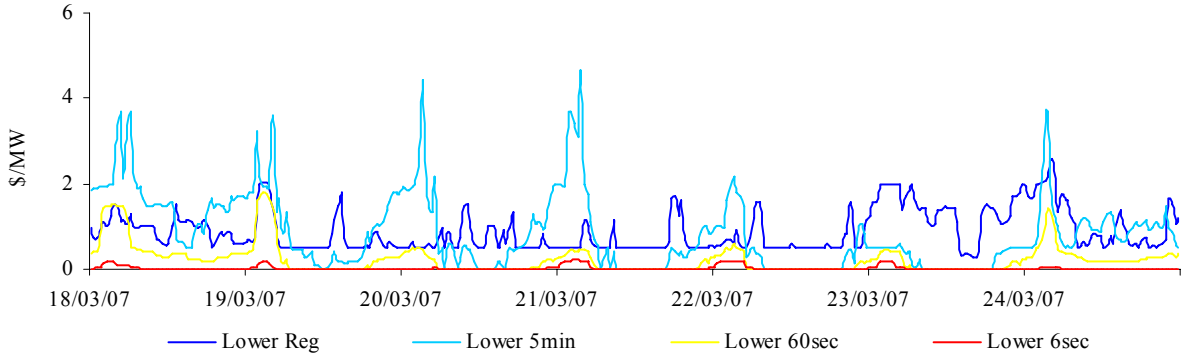
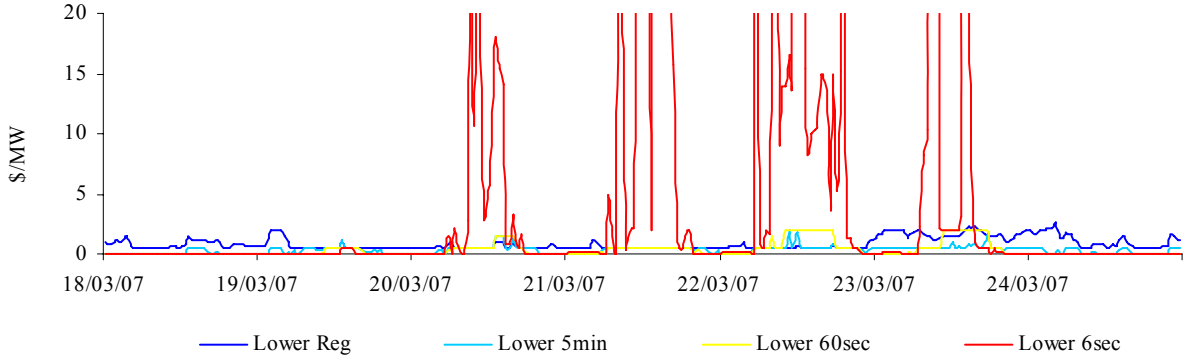


Figure 67A: prices for lower services – Tasmania



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

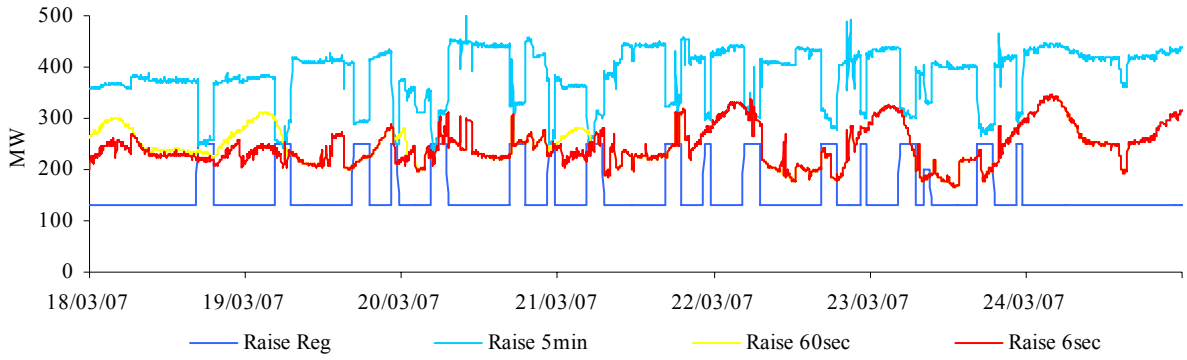


Figure 68A: raise requirements – Tasmania

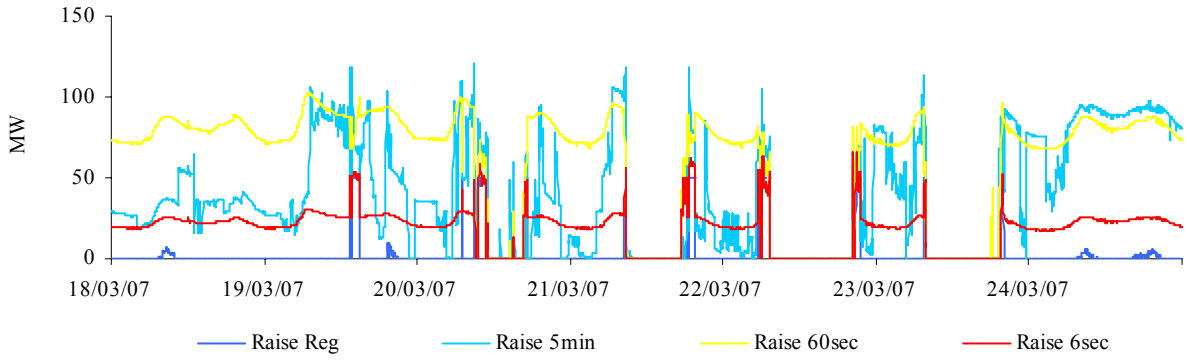


Figure 69: lower requirements

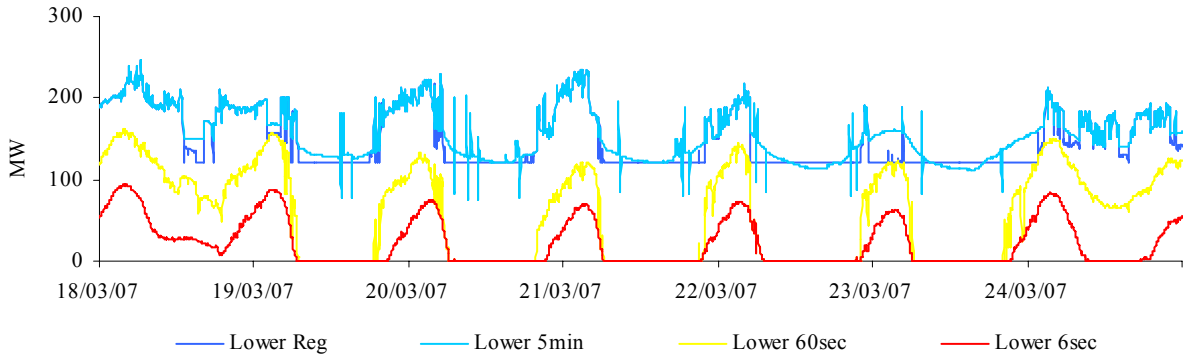
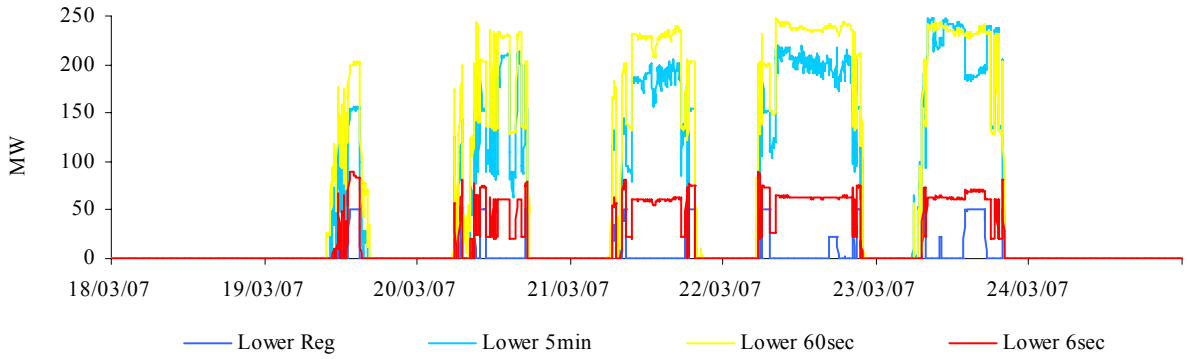


Figure 69A: lower requirements – Tasmania



Australian Energy Regulator
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