Market analysis

AUSTRALIAN ENERGY REGULATOR

19 MARCH – 25 MARCH 2006

On Tuesday 21 March, Directlink Joint Ventures, in accordance with the AER's decision of 3 March[1], ceased its registration as a market network service provider as the asset is now a regulated interconnector. The Directlink interconnector will be known as the Terranora interconnector.

Average spot prices for the week increased to $40/MWh in South Australia where maximum temperatures were above 30 degrees from Thursday, peaking at 35 degrees on Saturday. A single 5-minute price spike on Wednesday of close to $10 000/MWh, also contributed to the increase. Spot prices across the other regions ranged from $16/MWh in Queensland to $29/MWh in Tasmania.

Turnover in the energy market was $85 million. The total cost of ancillary services for the week, including Tasmania, was around $1 million, or one per cent, of energy market turnover. The majority of this cost occurred in forty minutes on Saturday night as a result of requirements for local services in Tasmania.

Significant variations between actual prices and those forecast 4 and 12 hours ahead occurred in 25, 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 a fifth of all trading intervals across the market. These variations were most frequent in South Australia occurring in more than half of all trading intervals.

Energy prices

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

Figure 1: volume weighted average spot price for energy market ($/MWh)

	QLD	NSW	VIC	SA	TAS
Last week	16	21	24	40	29
Previous week	20	24	23	25	26
Same quarter last year	25	35	22	31	-
Financial year to date	34	49	39	46	68
% change from previous week	▼23%	▼10%	▲3%	▲59%	▲11%
% change from same quarter last year	▼37%	▼39%	▲7%	▲29%	-
% change from year to date	▲2%	▼6%	▲30%	▲14%	-

[1] The AER's decision can be located at http://www.aer.gov.au/content/index.phtml?itemId=692516

Figure 2: national demand and spot prices

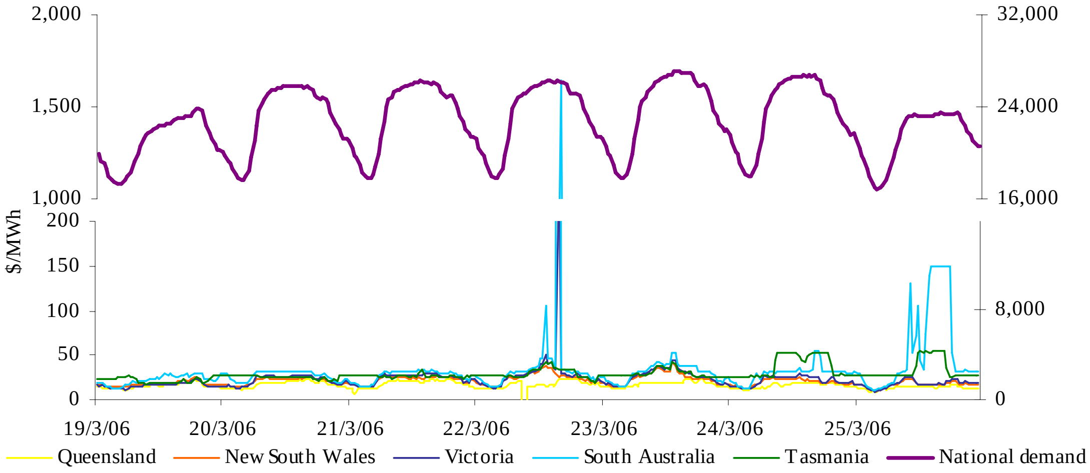


Figure 3: volatility index during peak periods

	QLD	NSW	VIC	SA	TAS
Last week	0.35	0.41	0.45	0.32	0.66
Previous week	0.36	0.40	0.31	0.30	0.21
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

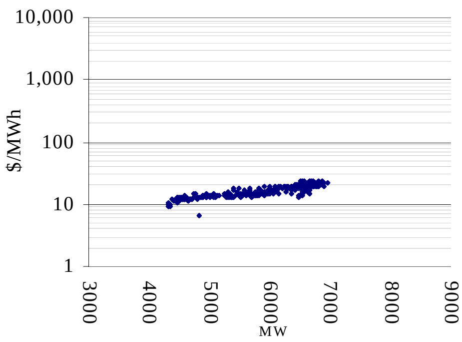


Figure 5: New South Wales

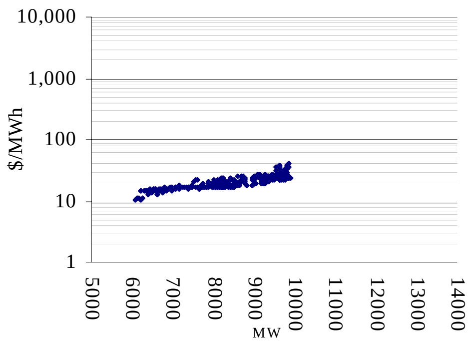


Figure 6: Victoria

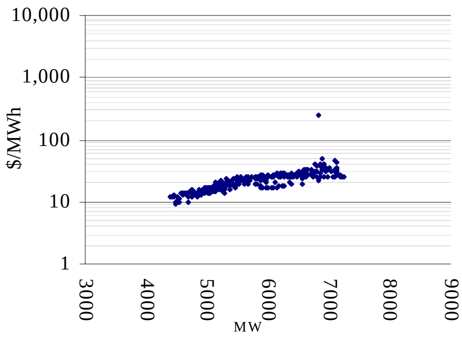


Figure 7: South Australia

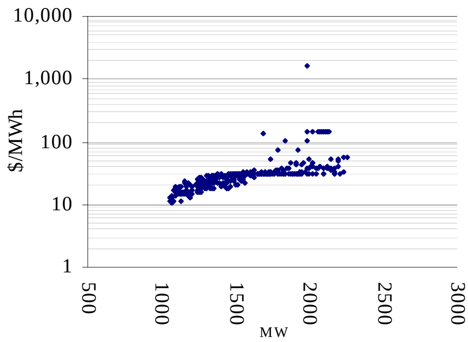
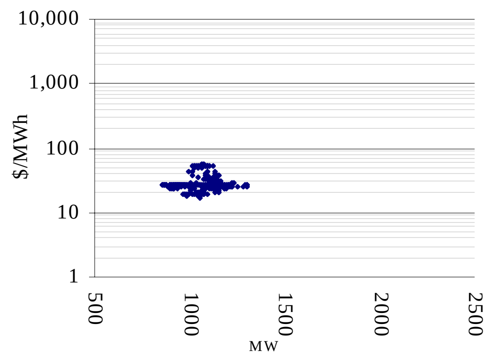


Figure 8: Tasmania



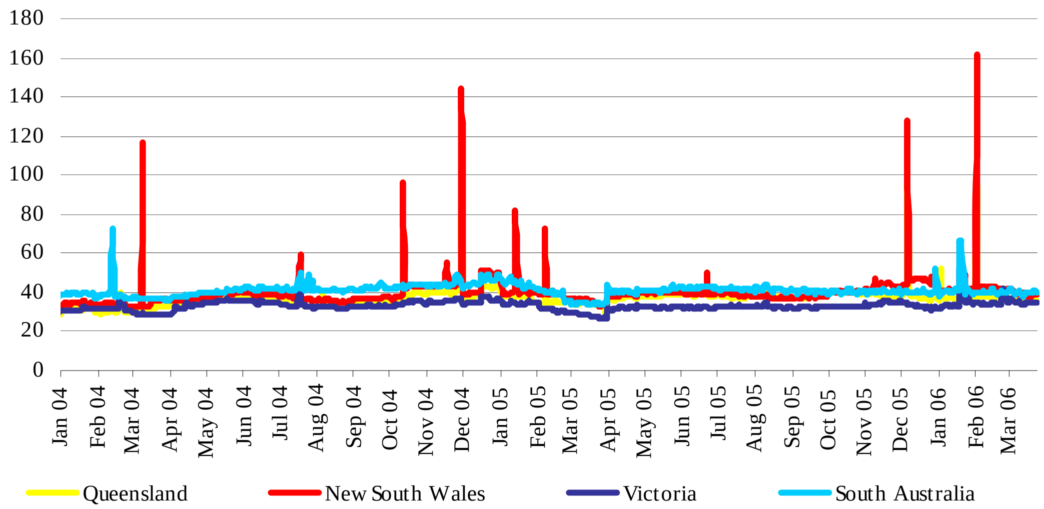
Maximum spot prices in Victoria and South Australia were $256/MWh and $1644/MWh respectively. Maximum prices across the other regions ranged from $24/MWh in Queensland to $55/MWh in Tasmania. On Wednesday morning the 5-minute price in Queensland fell to the price floor of -$1000/MWh for two dispatch intervals from 9.05 am when network outages in New South Wales led to a 300 MW reduction in export capability from Queensland. This reduction was not forecast.

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	35.61	35.56	35.38	35.51	35.40
New South Wales	38.29	38.76	38.50	38.86	38.80
Victoria	34.96	35.11	35.06	34.96	34.97
South Australia	39.49	40.05	40.63	40.45	40.33

Figure 10: d-cyphaTrade WEPI



Reserve

There were no low reserve conditions forecast for the week.

Figures 11 to 15 show spot price, net imports and limits at the time of weekly maximum demand.

Figure 11: Queensland

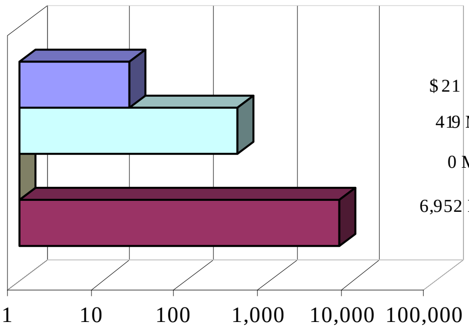


Figure 12: New South Wales

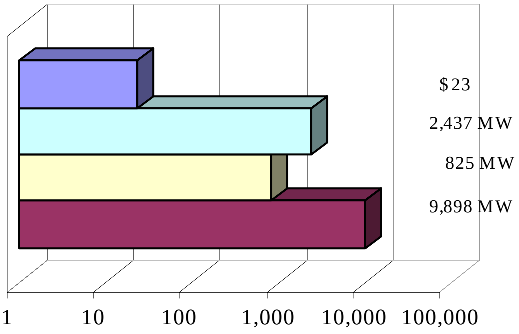


Figure 13: Victoria

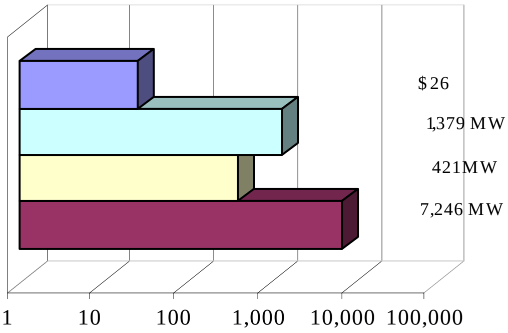


Figure 14: South Australia

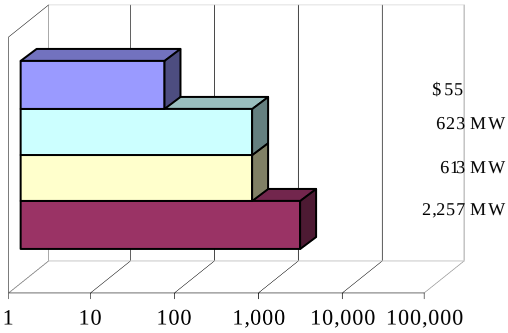
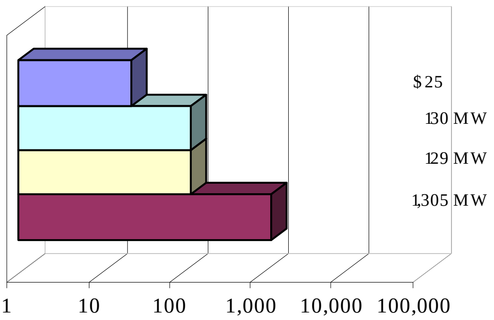
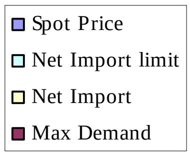


Figure 15: Tasmania





Price variations

There were 25 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 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 16: Queensland

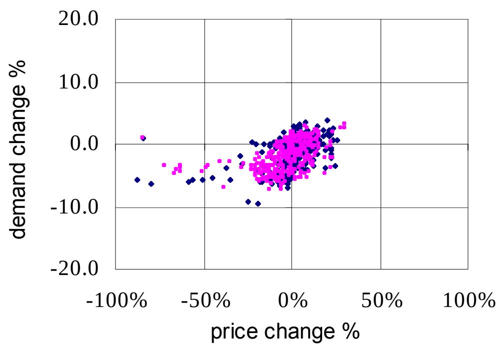


Figure 17: New South Wales

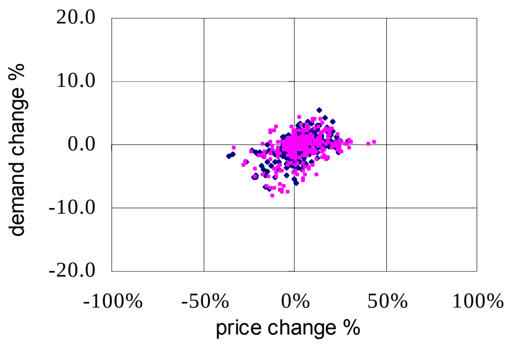


Figure 18: Victoria

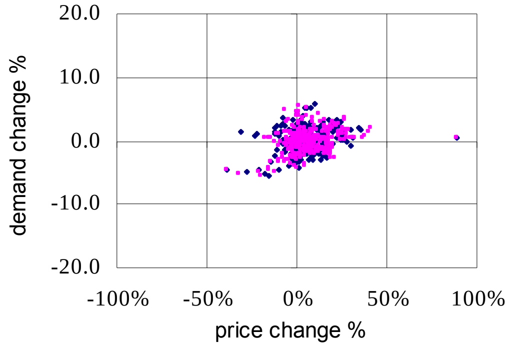


Figure 19: South Australia

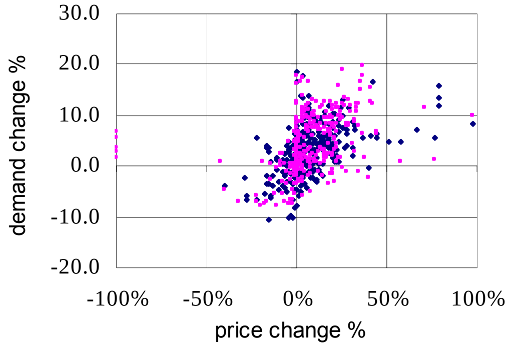
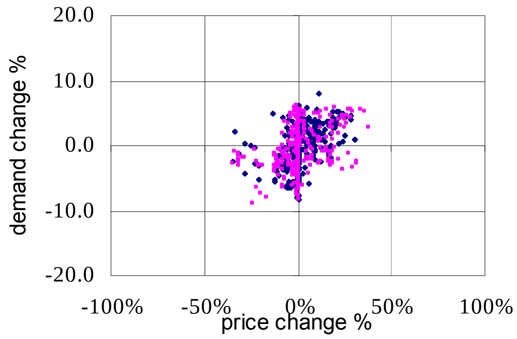


Figure 20: Tasmania



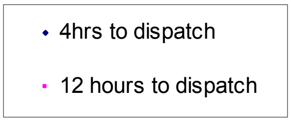
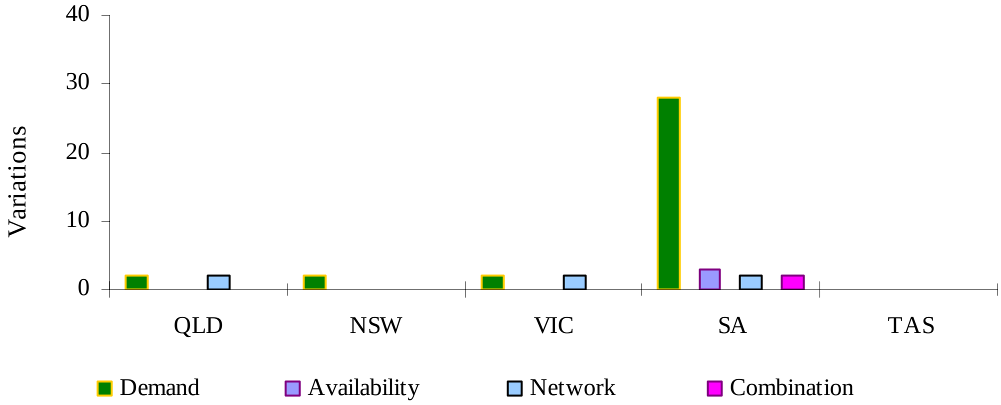


Figure 21 summarises the number and most probable reason for variations between forecast and actual prices.

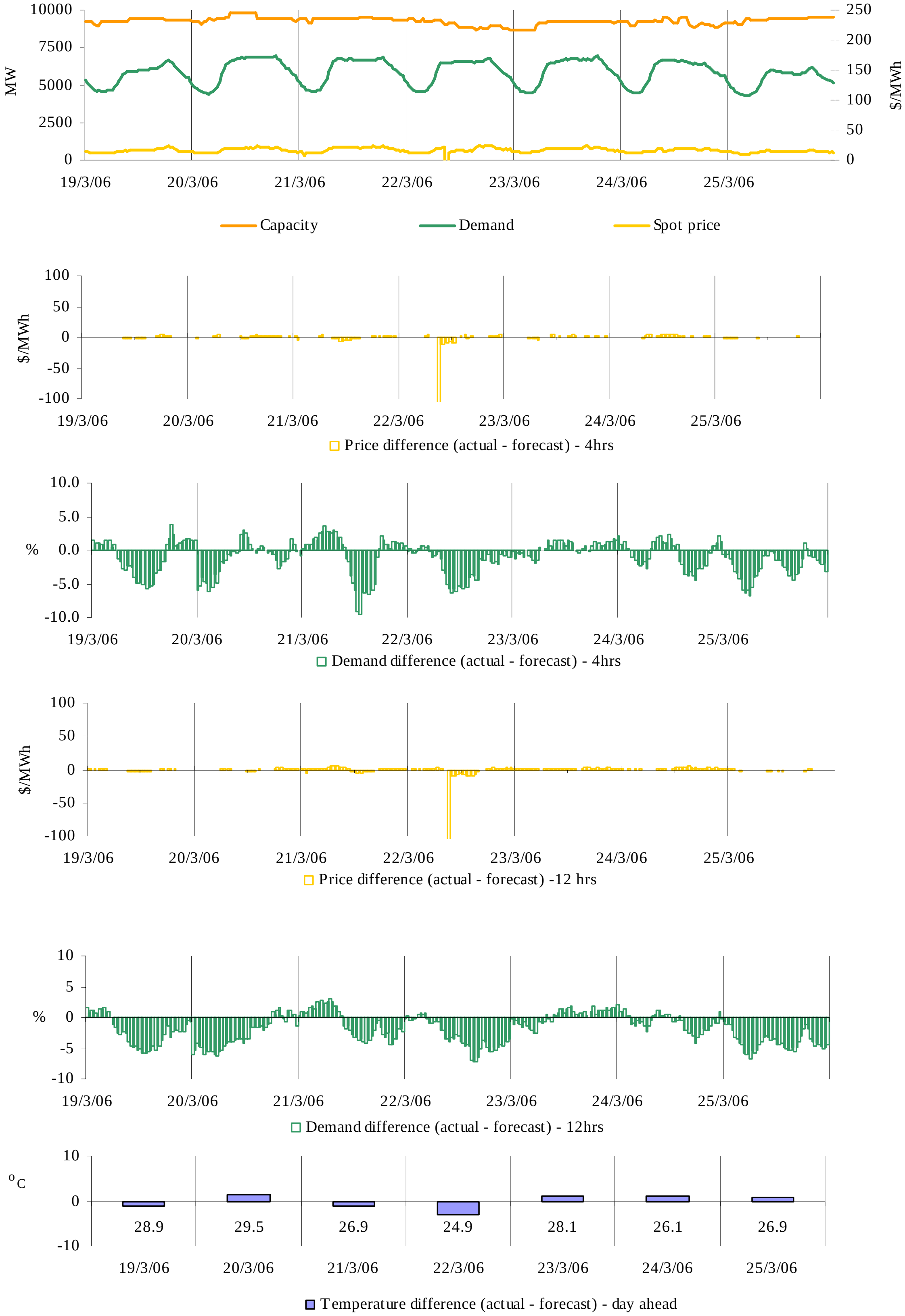
Figure 21: reasons for variations between forecast and actual prices



Price and demand

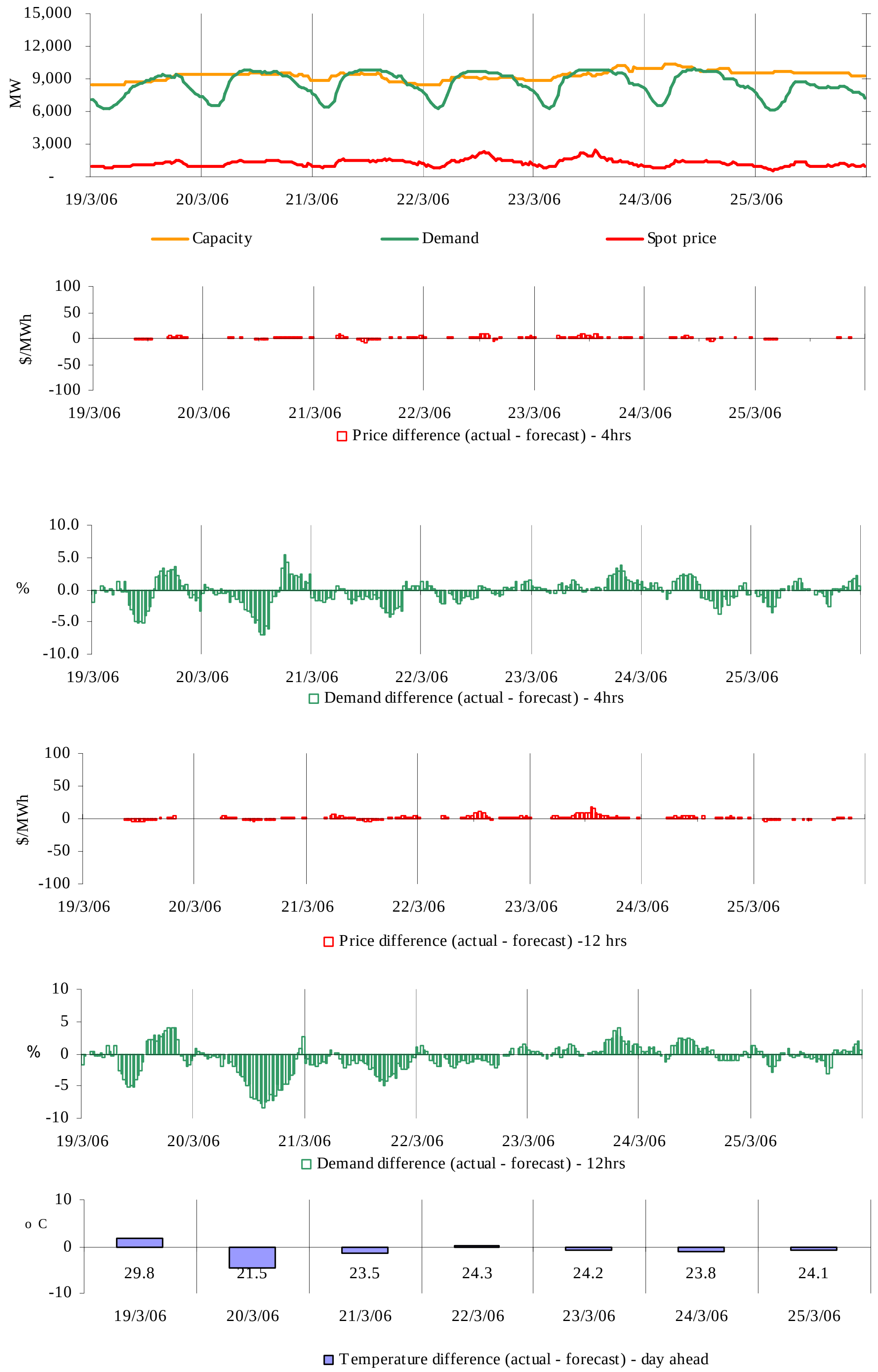
Figures 22 - 51 set out details of spot prices and demand on a regional basis. They include the actual spot price, actual demand outcomes and variation from forecasts made 4 and 12 hours ahead of dispatch on a daily basis. The differences between the maximum temperature and the temperature forecast at around 6.00 pm the day before are also included. Figures 52 - 56 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 22-27: Queensland actual spot price, demand and forecast differences



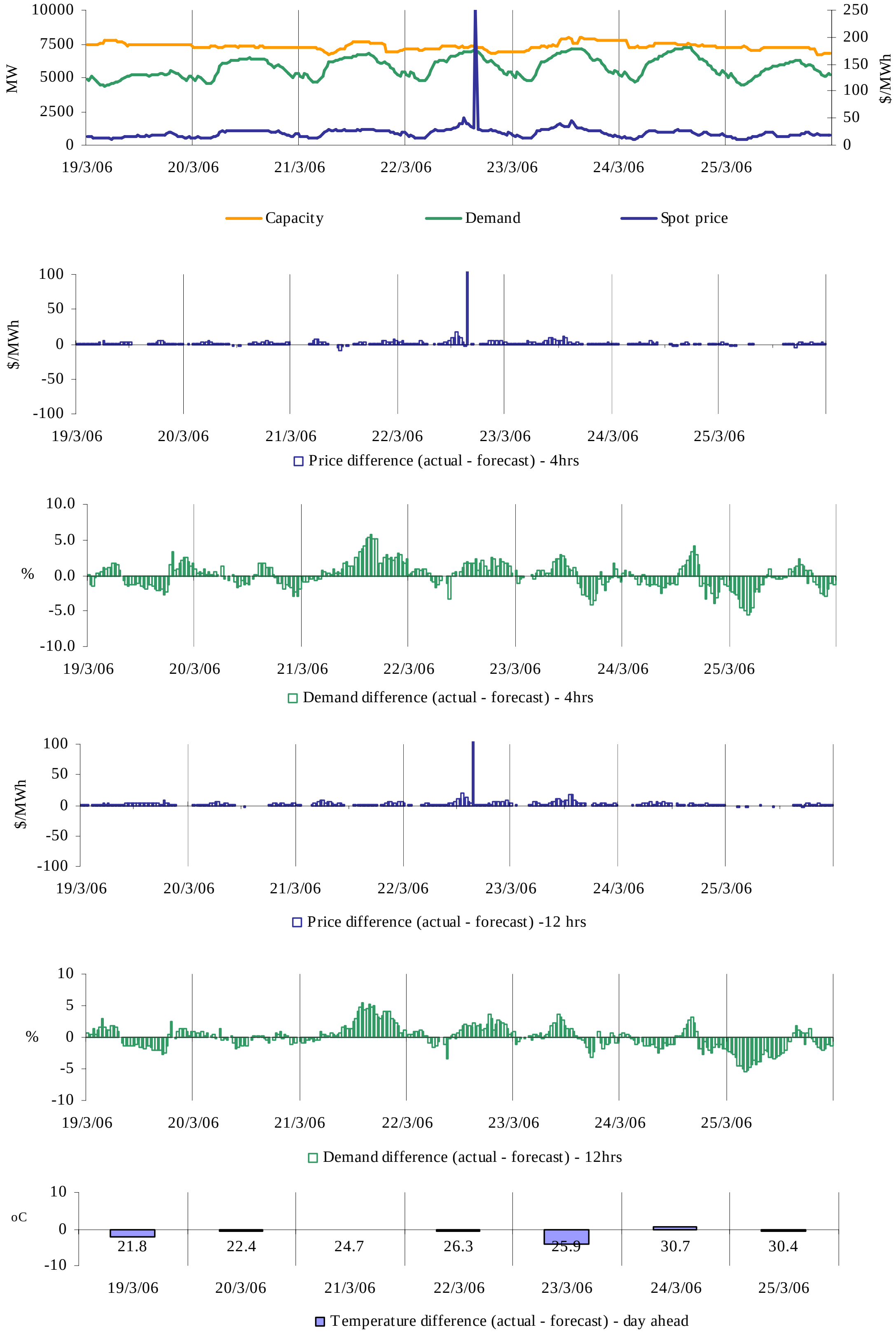
There was no occasion in Queensland where the spot price was greater than three times the weekly average price of $16/MWh.

Figures 28-33 New South Wales actual spot price, demand and forecast differences



There was no occasion in New South Wales where the spot price was greater than three times the weekly average price of $21/MWh.

Figures 34-39: Victoria actual spot price, demand and forecast differences



There was one occasion in Victoria where the spot price was greater than three times the weekly average price of $24/MWh. This occurred on Wednesday afternoon.

Wednesday, 22 March

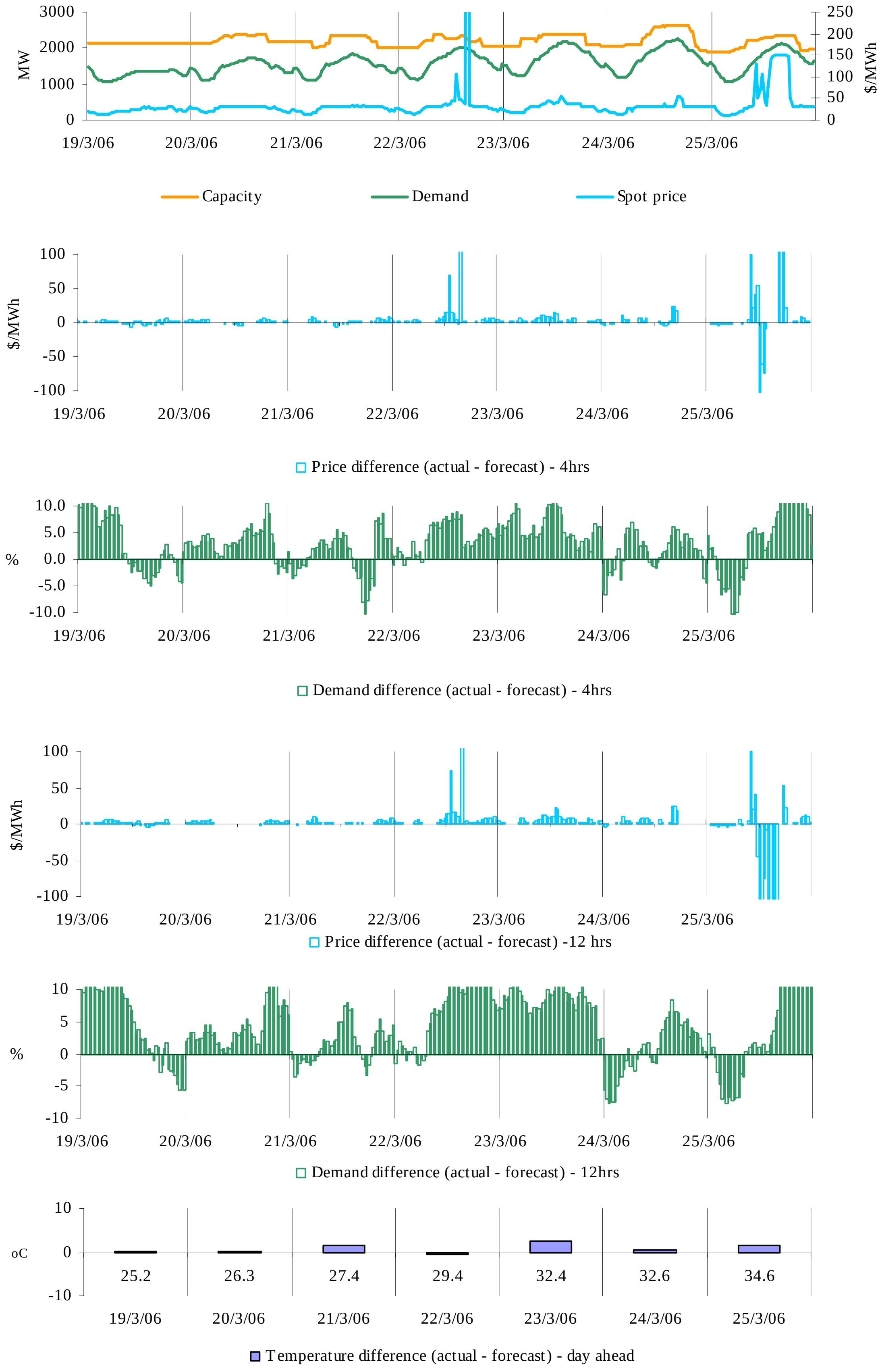
4:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	255.90	29.75	29.27
Demand (MW)	6829	6787	6792
Available capacity (MW)	7335	7352	7391

Conditions at the time saw demand and availability close to forecast.

A planned outage in New South Wales between Wagga and Yanco restricted flows into Victoria from Snowy to around 1100 MW, which is around 600 MW below its nominal limit. At 3.35pm, a step change in the limit set by the constraint modelling this outage saw a 5-minute reduction in flows across the interconnector of 400 MW. This reduction was not forecast and led to a dispatch price of $1392/MWh in Victoria and $9632/MWh in South Australia. The limit, which was being driven by flows on network elements in the vicinity of Wagga, returned to previous levels over the next two dispatch intervals.

Around 500 MW of capacity in Victoria was shifted into low prices across the portfolios of Alinta, AGL and Ecogen following the price spike.

Figures 40-45: South Australia actual spot price, demand and forecast differences



There were 11 occasions in South Australia where the spot price was greater than three times the weekly average price of $40/MWh. These occurred on Wednesday and Saturday.

Wednesday, 22 March

4:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	1644.26	31.94	30.92
Demand (MW)	1989	1825	1791
Available capacity (MW)	2269	2375	2390

An outage in New South Wales between Wagga and Yanco restricted flows into Victoria from Snowy to around 1100 MW, which is around 600 MW below its nominal limit. At 3.35 pm a step change in the limit set by the constraint modelling this outage saw a 400 MW reduction in flows from Snowy into Victoria. At the same time around 90 MW was forced counter-price from South Australia to Victoria across the Murraylink interconnector. Flows across the Heywood interconnector increased by around 100 MW to the limit of 460 MW in response.

Earlier in the day, at 1.44pm, AGL committed 60 MW at Hallet power station from 1.55pm to 3.30 pm by shifting capacity from $9600/MWh to zero for this period. The rebid reason given was “1344N predispatch: forecast price increase::increase”. At 3.35pm all the capacity of Hallet power station returned to the earlier price of around $9600/MWh. This led to a reduction of low priced capacity in South Australia at the same time as the unexpected increase in flows into Victoria across the Murraylink interconnector. The combination of limited available capacity in South Australia and the change in interconnector flows, meant that the unit was not shutdown, but was instead dispatched to around 20MW, setting the price of $9632/MWh.

The limits on the Victoria to Snowy and Murraylink interconnectors, which were being driven by power flows on network elements in the vicinity of Wagga, returned to previous levels over the next two dispatch intervals.

Around 700 MW of capacity was shifted into low prices across the portfolios of Origin, Cummins, International Power, AGL and TRU Energy following the price spike.

Saturday, 25 March

10:30 am	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	131.33	30.70	30.75
Demand (MW)	1685	1594	1661
Available capacity (MW)	2205	2209	2189

Conditions at the time saw demand 100MW higher than forecast four hours ahead of dispatch, with less than 40 MW of capacity priced between $30/MWh and $150/MWh. From around 9.50am, five-minute predispatch was forecasting prices of $149/MWh, with the 10am 30-minute predispatch showing prices of less than $35/MWh.

At 10.04 am, effective from 10.15am, Origin Energy shifted 42MW of capacity from $9000/MWh to zero at Quarantine. The rebid reason given was “(N) Change in PDS”.

At 10.05am, also effective from 10.15am, International Power shifted 80MW of capacity at Pelican Point from prices of below $30/MWh to above $100/MWh. The rebid reason given was “SA Demand above forecast, change in 5-min PD price”.

There was no other significant rebidding.

Saturday, 25 March

2:00 pm	Actual	4 hr forecast	12 hr forecast
Price ($/MWh)	140.00	149.00	149.10
Demand (MW)	1983	1938	1976
Available capacity (MW)	2306	2333	2273
2:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	148.88	149.00	298.00
Demand (MW)	2023	1955	1992
Available capacity (MW)	2306	2322	2272
3:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	149.00	149.00	298.00
Demand (MW)	2062	1964	2001
Available capacity (MW)	2328	2302	2272
3:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	149.00	149.00	298.00
Demand (MW)	2085	1960	2011
Available capacity (MW)	2336	2275	2272
4:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	149.03	149.00	298.00
Demand (MW)	2110	1945	1990
Available capacity (MW)	2336	2254	2272
4:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	149.07	149.00	298.00
Demand (MW)	2130	1940	1986
Available capacity (MW)	2336	2275	2272
5:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	149.00	30.70	149.00
Demand (MW)	2116	1866	1858
Available capacity (MW)	2336	2296	2272
5:30 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	149.00	30.70	149.00
Demand (MW)	2096	1814	1828
Available capacity (MW)	2336	2296	2292
6:00 pm	**Actual**	**4 hr forecast**	**12 hr forecast**
Price ($/MWh)	148.50	30.70	96.00
Demand (MW)	2072	1747	1765
Available capacity (MW)	2336	2326	2292

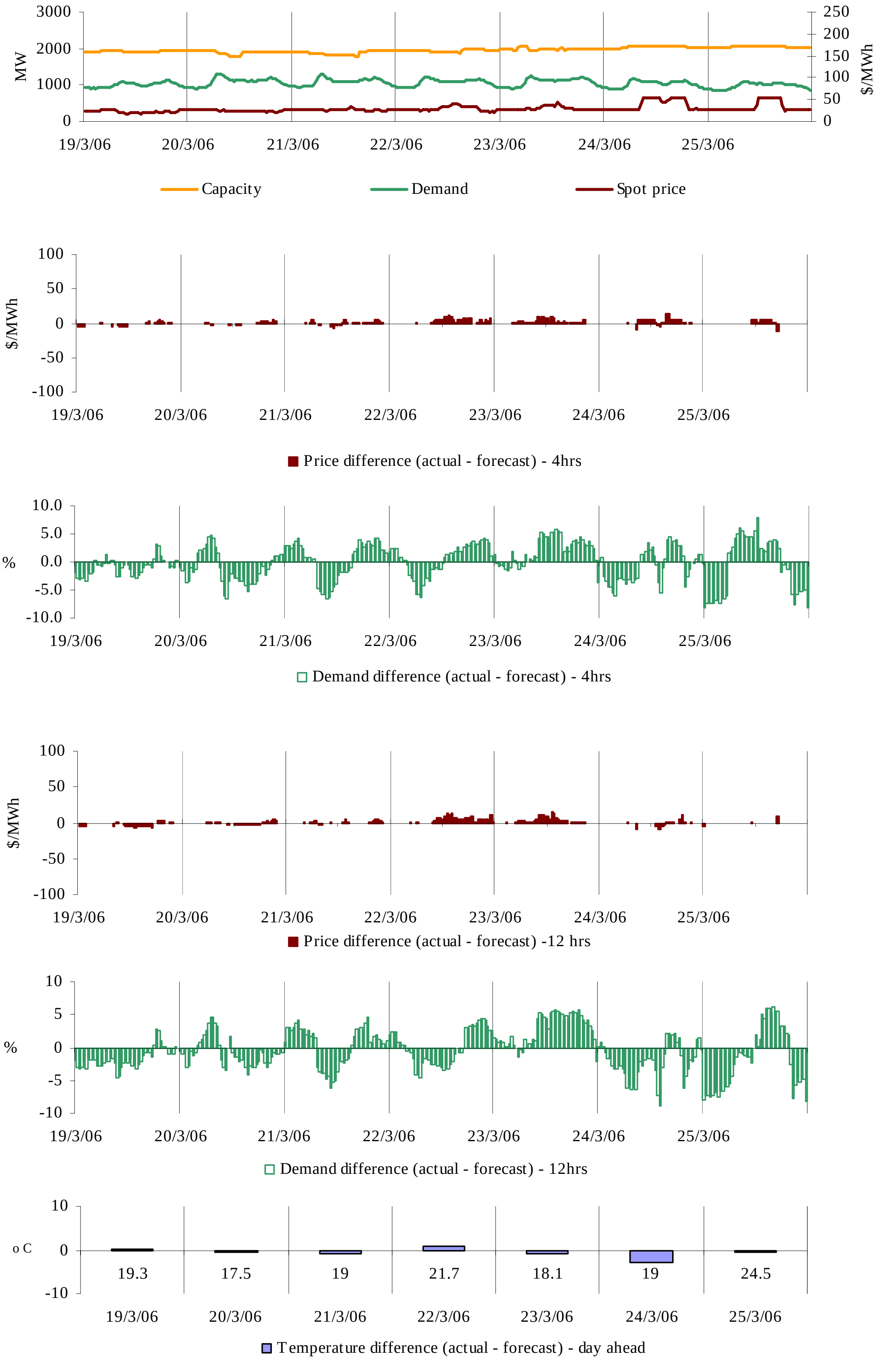
Conditions at the time saw demand as much as 300MW higher than forecast four hours ahead.

From 8.28 am over a number of rebids, AGL shifted as much as 150 MW of capacity at Hallet from prices above $9000/MWh to zero. The rebid reason given was “Predispatch: forecast price increase::increase”.

Over a number of rebids from 10 am, Origin Energy shifted as much as 84 MW at Quarantine from prices above $9000/MWh to zero. The rebid reasons given were “(NP) change in PDS, match bid to output” and “(P) Unit unavailable”.

There was no other significant rebidding.

Figures 46-51: 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 $29/MWh.

Figure 52: Queensland closing bid prices, dispatched generation and spot price

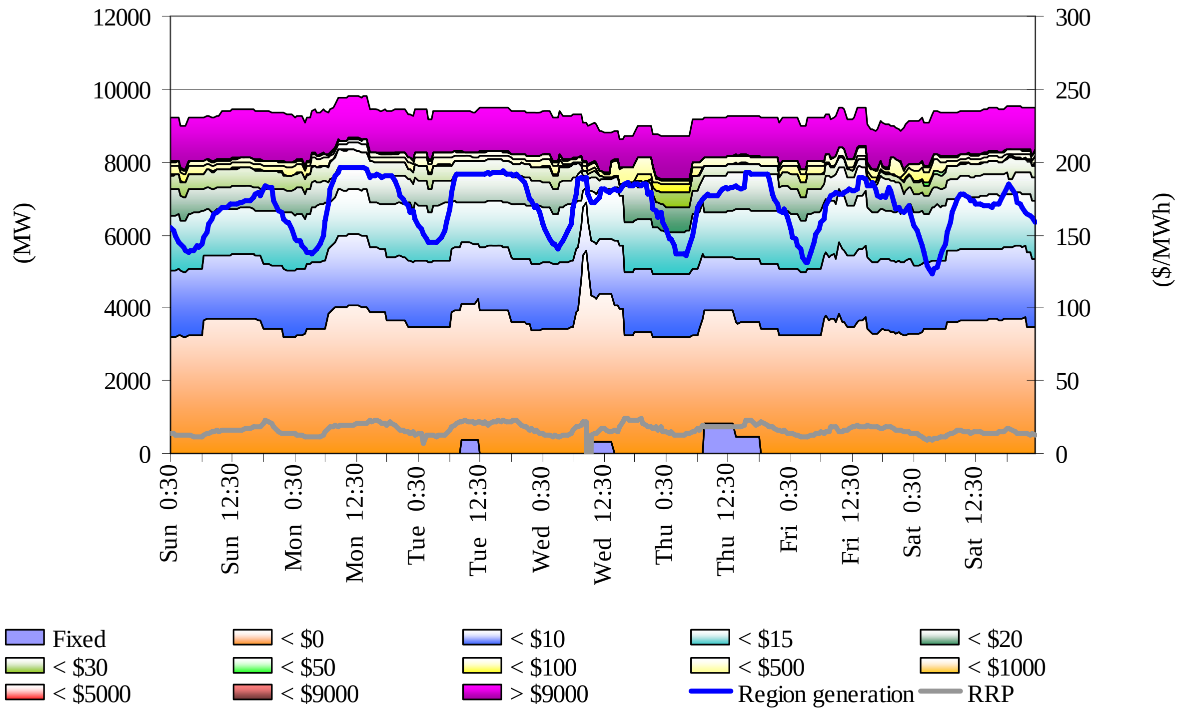


Figure 53: New South Wales closing bid prices, dispatched generation and spot price

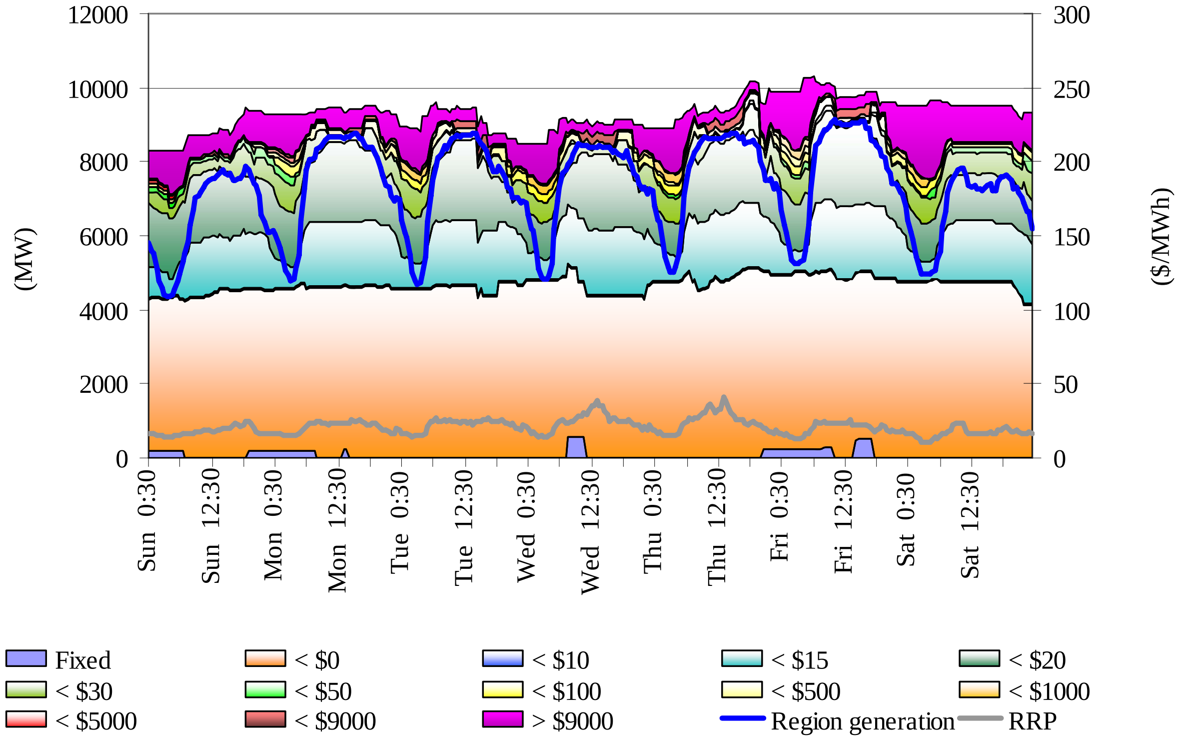


Figure 54: Victoria closing bid prices, dispatched generation and spot price

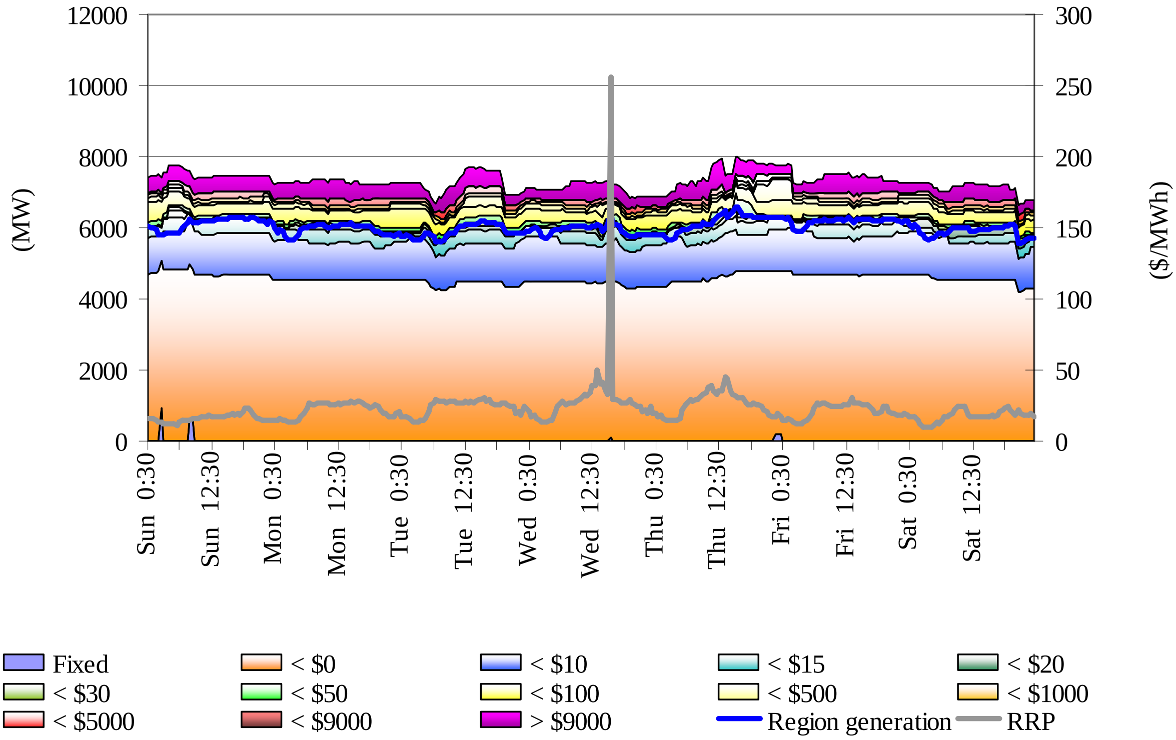


Figure 55: South Australia closing bid prices, dispatched generation and spot price

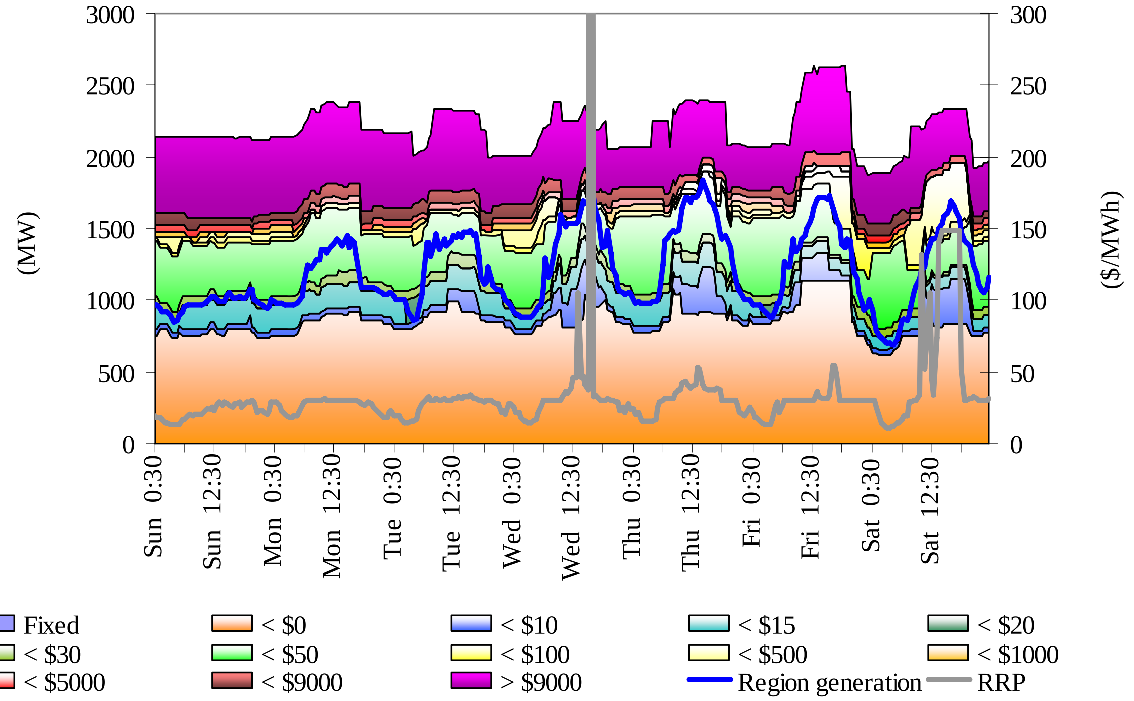
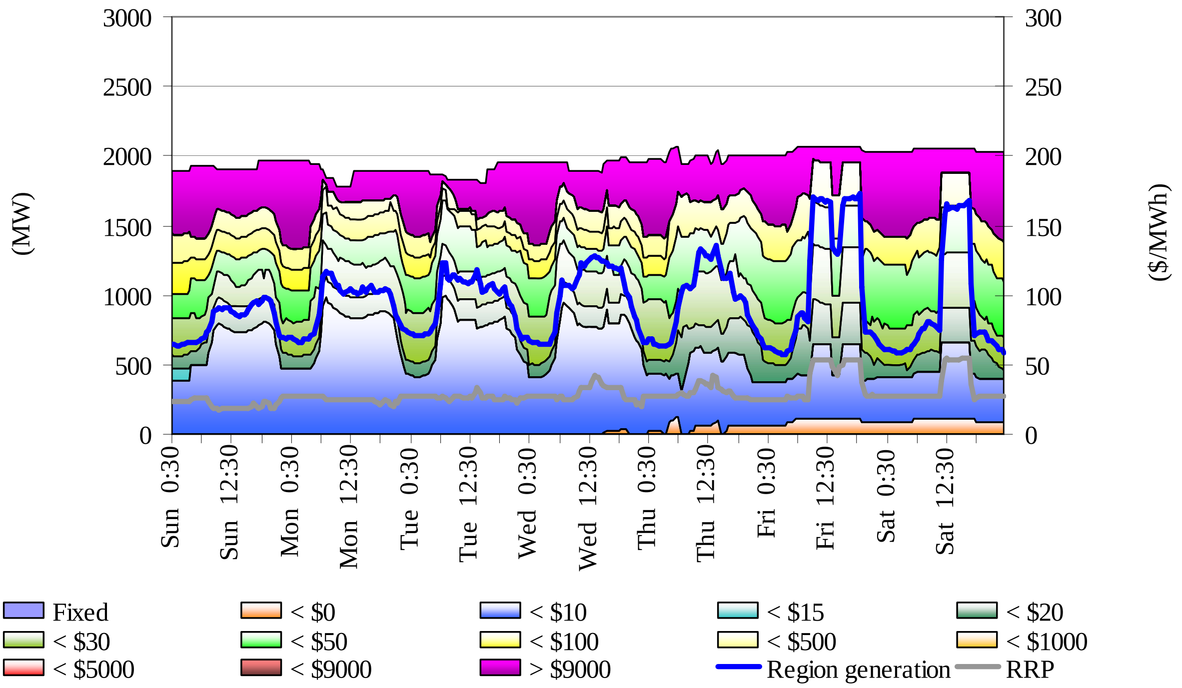


Figure 56: Tasmania closing bid prices, dispatched generation and spot price



Ancillary service market

The total cost of ancillary services on the mainland for the week was around $173 000 or 0.2 per cent of the total turnover in the energy market. Figure 57 summarises the volume weighted average prices and costs for the eight frequency control ancillary services across the mainland.

Figure 57: 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	0.58	0.37	1.00	0.77	0.17	0.73	1.20	1.11
Previous week	0.42	0.22	0.73	0.70	0.12	0.07	0.25	0.91
Last quarter	1.76	0.73	1.15	1.54	0.39	2.28	5.00	1.93
Market Cost ($1000s)	27	17	63	17	1	7	23	18
% of energy market	0.03%	0.02%	0.08%	0.02%	0.00%	0.01%	0.03%	0.02%

The total cost of ancillary services in Tasmania for the week was $906 000 or 18 per cent of the total turnover in the energy market in Tasmania. At 11.05 pm on Saturday evening, prices for lower 6 second services in Tasmania increased to around $10 000/MW for 40 minutes. This followed a rebid by Hydro Tasmania which reduced the availability of this service at Gordon by 23MW. This rebid resulted in a shortfall in supply for that service. This capacity was restored at 11.36 pm for 11.45 pm. The rebid reasons given were “Hydrological optimisation” and “Co-optimisation of energy & FCAS” respectively. Figure 58 summarises for Tasmania the prices and costs for the eight frequency control ancillary services.

Figure 58: 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	1.04	0.80	5.03	2.05	77.21	0.01	0.01	0.41
Previous week	0.90	0.60	2.12	0.98	2.18	0.03	0.11	0.78
Last quarter	7.89	1.05	1.05	1.58	4.43	1.06	1.06	1.97
Market Cost ($1000s)	6	9	62	7	817	0	0	4
% of energy market	0.11%	0.18%	1.21%	0.14%	15.9%	0.01%	0.01%	0.07%

Figure 59 shows the daily breakdown of cost for each frequency control ancillary service.

Figure 59: daily frequency control ancillary service costs

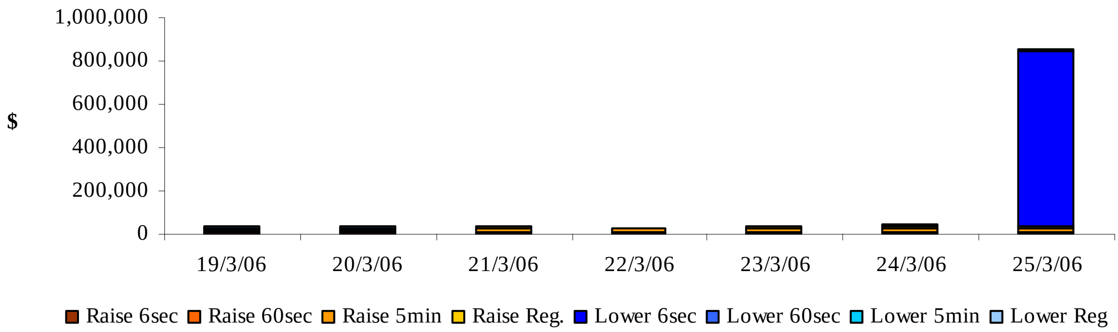
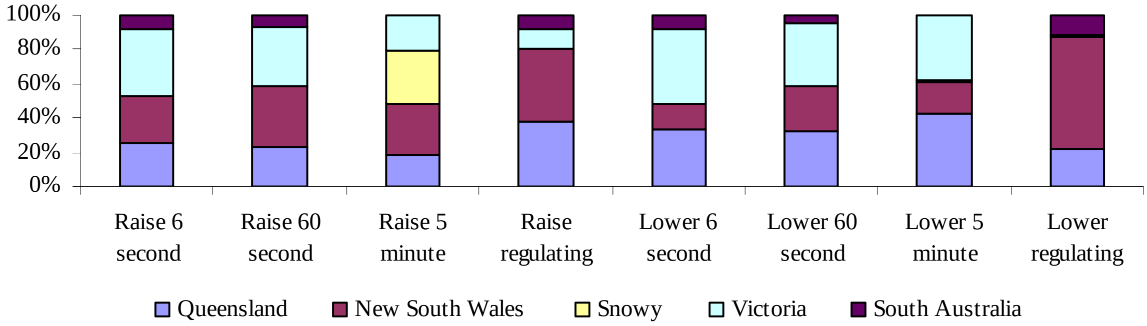


Figure 60 shows the contribution, on a percentage basis, that frequency control ancillary service providers are utilised (in each mainland region) to satisfy the total requirement for each service.

Figure 60: regional participation in ancillary services on the mainland



Figures 61 and 62 show 30-minute prices for each frequency control ancillary service throughout the week.

Figure 61: prices for raise services

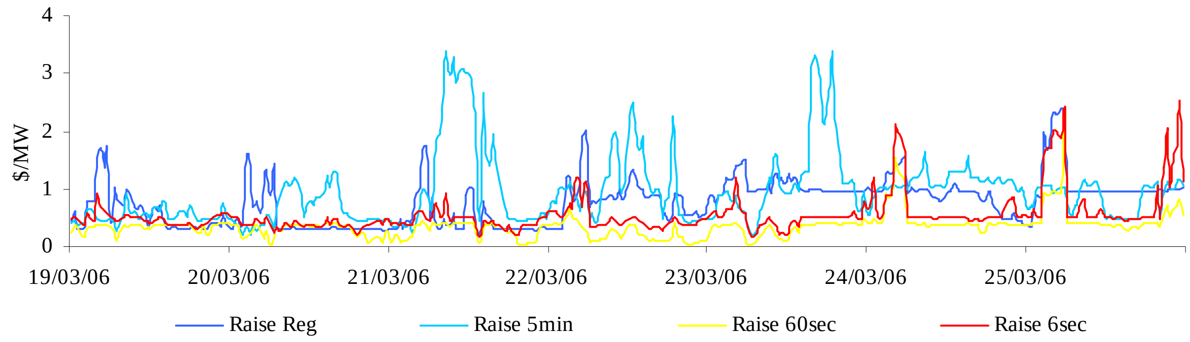


Figure 61A: prices for raise services - Tasmania

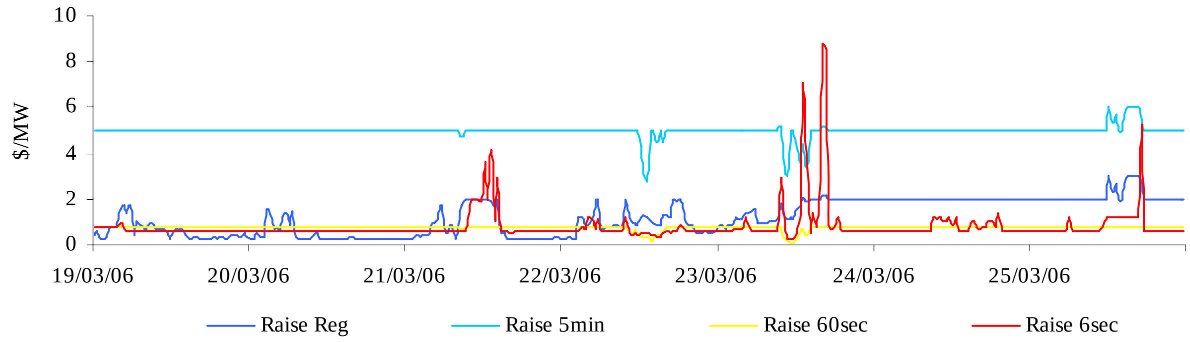


Figure 62: prices for lower services

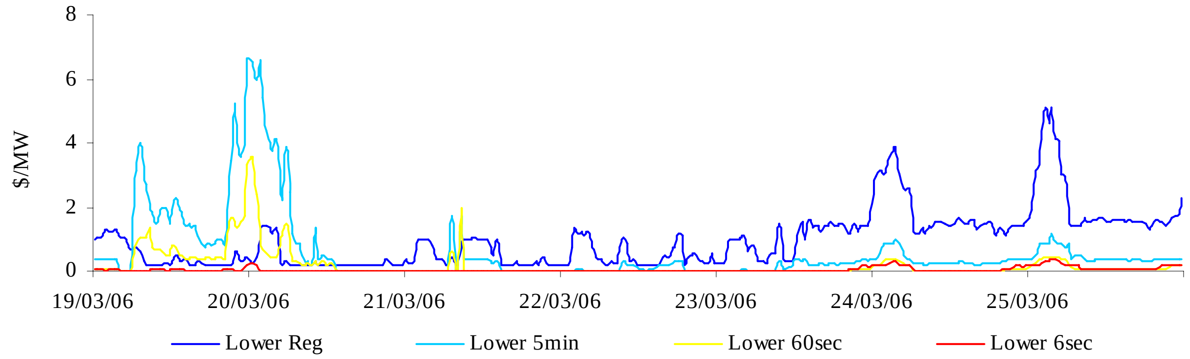
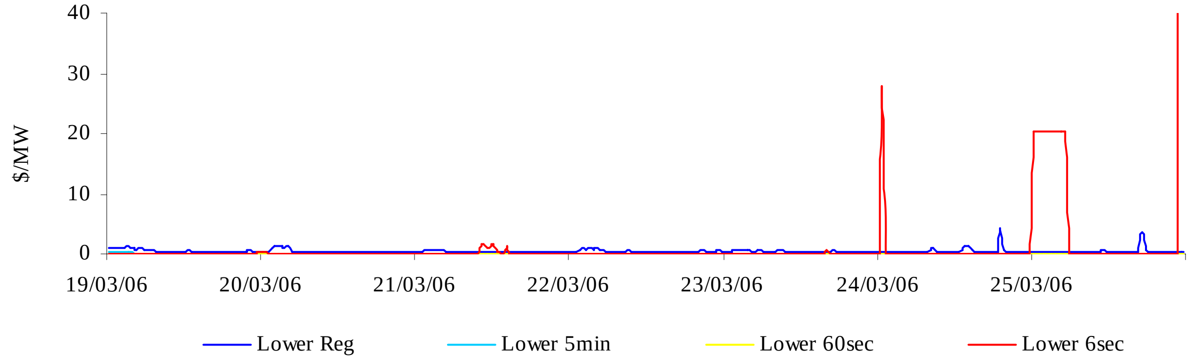


Figure 62A: prices for lower services - Tasmania



Figures 63 and 64 present for both raise and lower frequency control services the requirement, established by NEMMCO, for each service to satisfy the frequency standard.

Figure 63: raise requirements

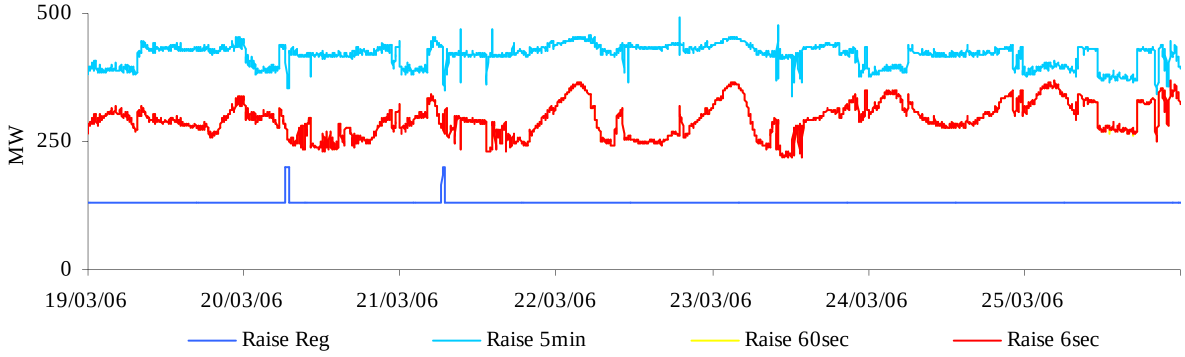


Figure 63A: raise requirements - Tasmania

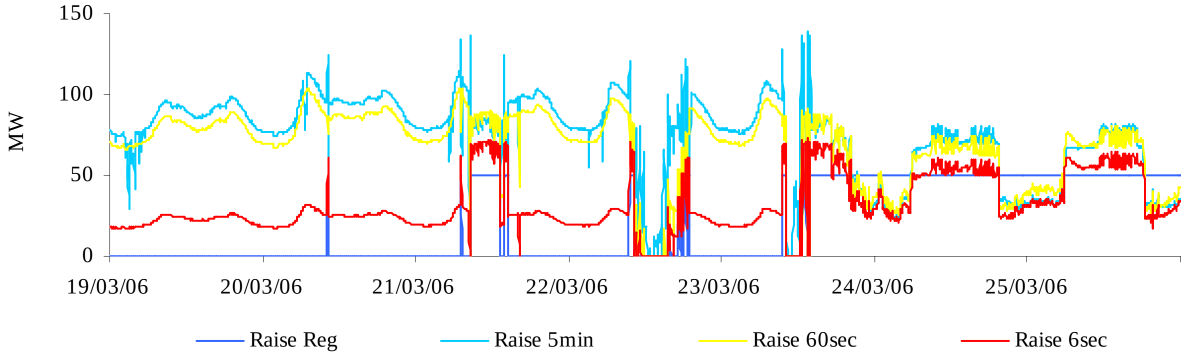


Figure 64: lower requirements

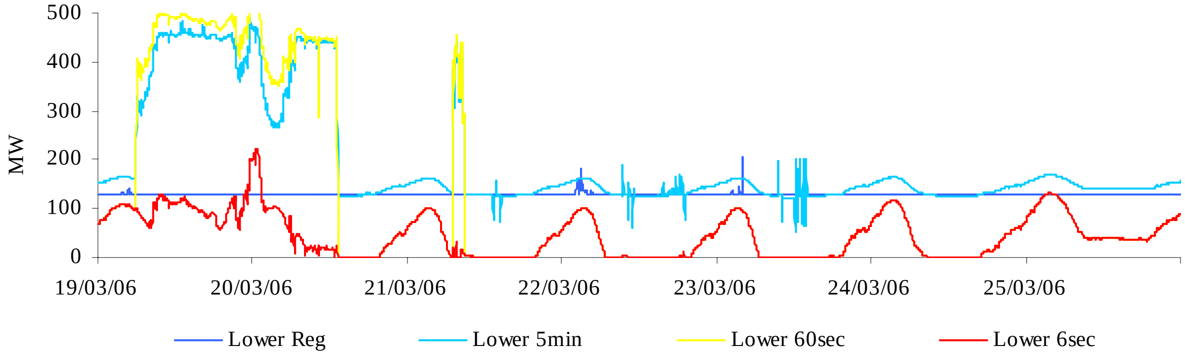
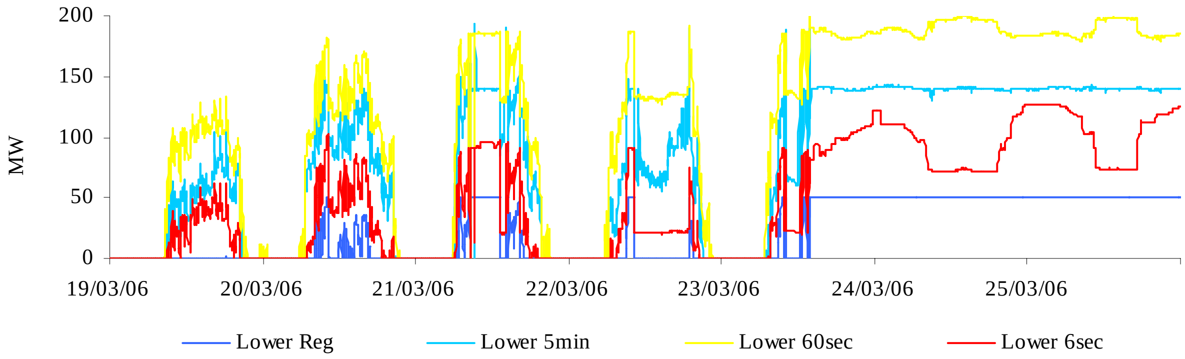


Figure 64A: lower requirements - Tasmania



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