

Electricity Report

14 – 20 December 2014



Introduction

The AER is required to publish the reasons for significant variations between forecast and actual price and is responsible for monitoring activity and behaviour in the National Electricity Market. The Electricity Report forms an important part of this work. The report contains information on significant price variations, movements in the contract market, together with analysis of spot market outcomes and rebidding behaviour. By monitoring activity in these markets, the AER is able to keep up to date with market conditions and identify compliance issues.

Spot market prices

Figure 1 shows the spot prices that occurred in each region during the week 14 to 20 December 2014. There were seven spot prices which were above \$5000/MWh on 17 December. As required under clause 3.8.17 of the National Electricity Rules, the AER will publish a separate report into the events on that day.

Figure 1: Spot price by region (\$/MWh)

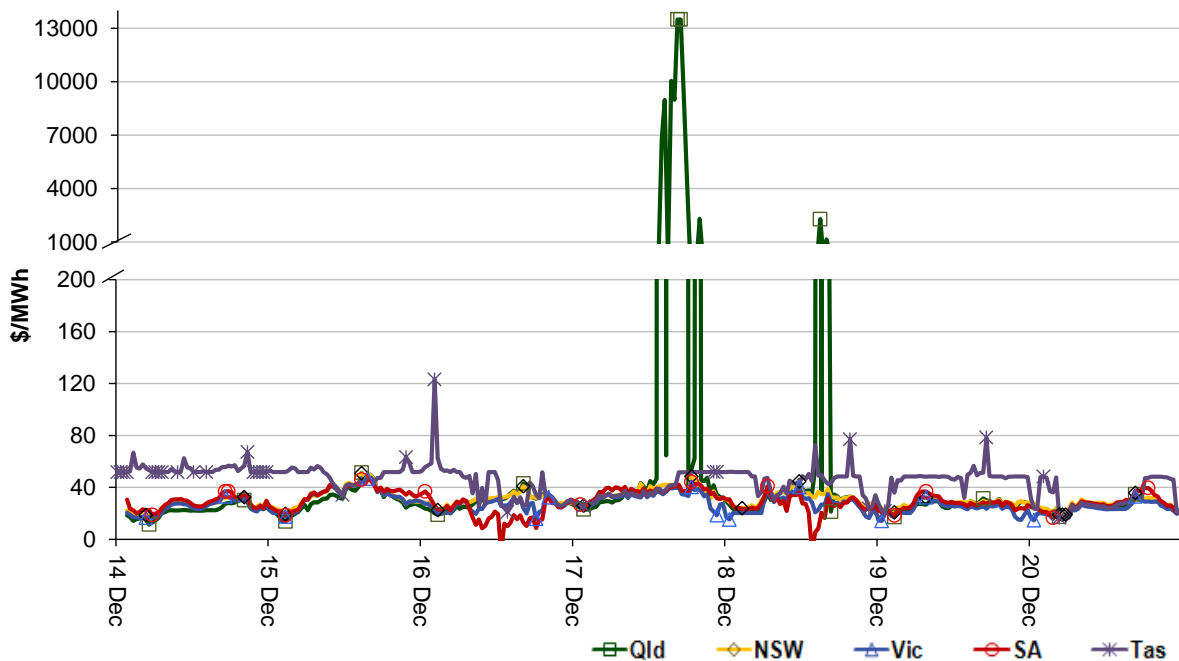


Figure 2 shows the volume weighted average (VWA) prices for the current week (with prices shown in Table 1) and the preceding 12 weeks, as well as the VWA price over the previous 3 financial years. The high prices in Queensland over the past two weeks have increased the year to date volume weighted spot price in that region from \$33/MWh to \$52/MWh.

Figure 2: Volume weighted average spot price by region (\$/MWh)

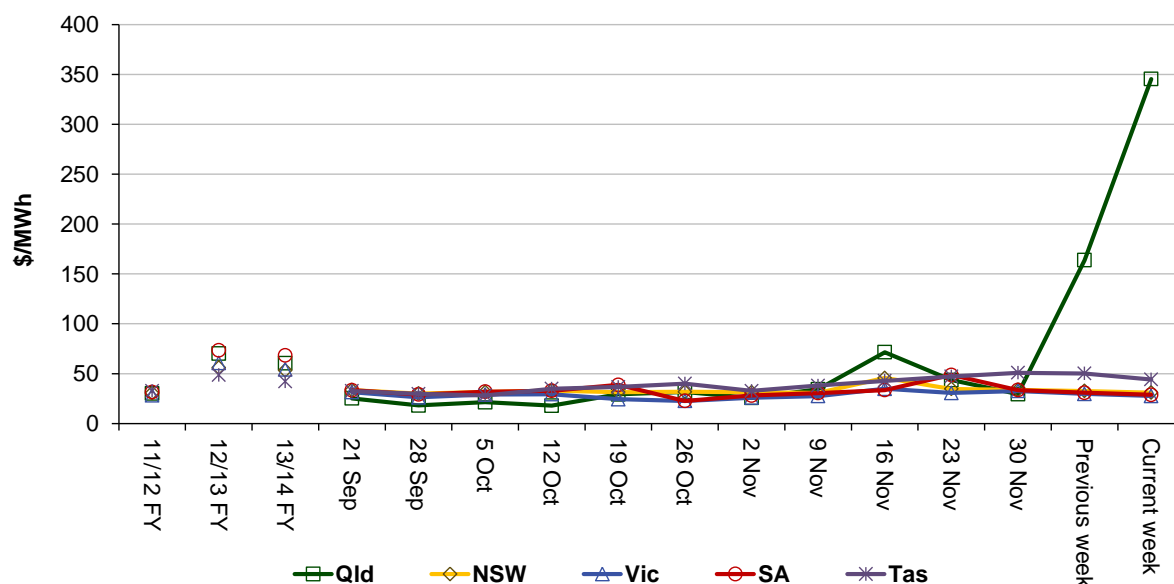


Table 1: Volume weighted average spot prices by region (\$/MWh)

Region	Qld	NSW	Vic	SA	Tas
Current week	345	31	28	29	44
13-14 financial YTD	59	56	53	72	45
14-15 financial YTD	52	37	34	41	38

Longer-term statistics tracking average spot market prices are available on the [AER website](#).

Spot market price forecast variations

The AER is required under the National Electricity Rules to determine whether there is a significant variation between the forecast spot price published by the Australian Energy Market Operator (AEMO) and the actual spot price and, if there is a variation, state why the AER considers the significant price variation occurred. It is not unusual for there to be significant variations as demand forecasts vary and participants react to changing market conditions. A key focus is whether the actual price differs significantly from the forecast price either four or 12 hours ahead. These timeframes have been chosen as indicative of the time frames within which different technology types may be able to commit (intermediate plant within four hours and slow start plant within 12 hours).

There were 197 trading intervals throughout the week where actual prices varied significantly from forecasts. This compares to the weekly average in 2013 of 97 counts and the average in 2012 of 60. Reasons for the variations for this week are summarised in Table 2. Based on AER analysis, the table summarises (as a percentage) the number of times when the actual price differs significantly from the forecast price four or 12 hours ahead and the major reason for that variation. The reasons are classified as availability (which means that there is a change in the total quantity or price offered for generation), demand forecast inaccuracy, changes to network capability or as a combination of factors (when there is not one dominant reason). An instance where both four and 12 hour ahead forecasts differ significantly from the actual price will be counted as two variations.

Table 2: Reasons for variations between forecast and actual prices

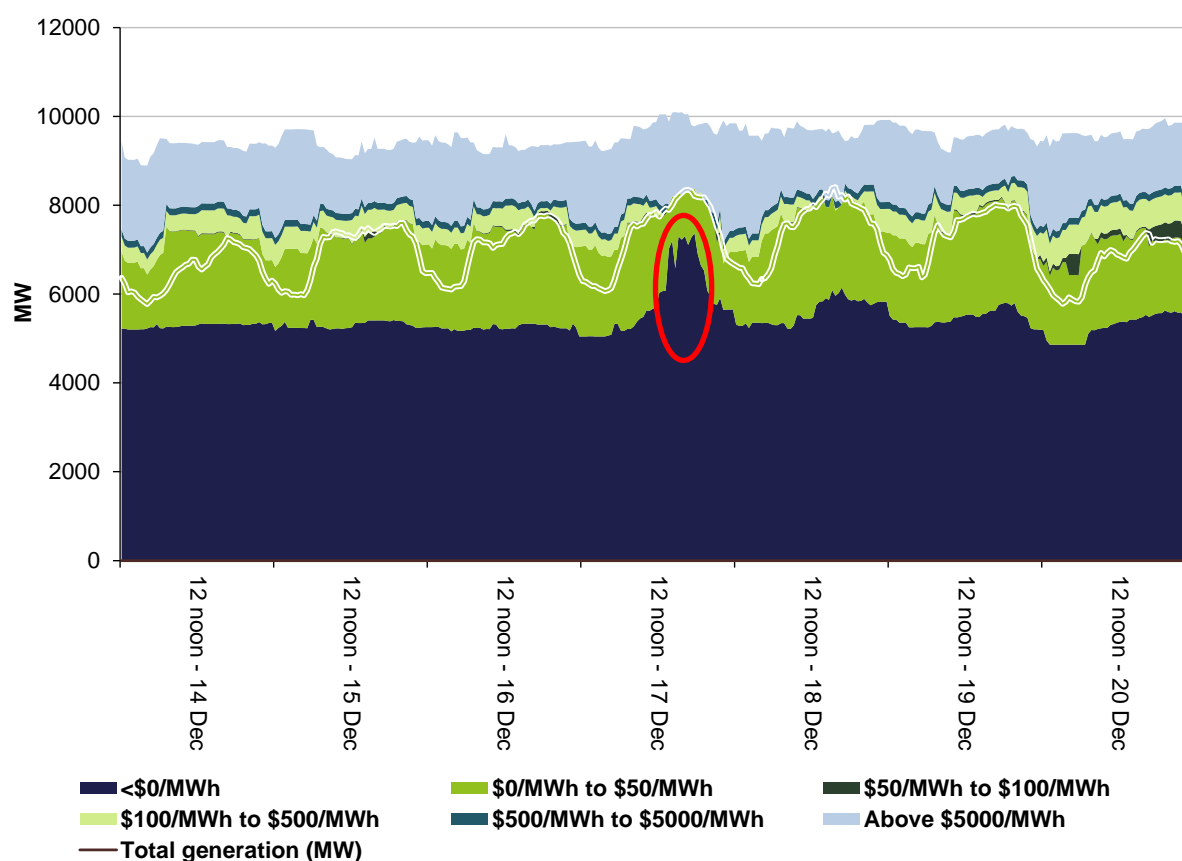
	Availability	Demand	Network	Combination
% of total above forecast	1	18	0	1
% of total below forecast	76	3	0	1

Note: Due to rounding, the total may not be 100 per cent.

Generation and bidding patterns

The AER reviews generator bidding as part of its market monitoring to better understand the drivers behind price variations. Figures 3 to 7 show, the total generation dispatched and the amounts of capacity offered within certain price bands for each 30 minute trading interval in each region.

Figure 3: Queensland generation and bidding patterns



The increase in capacity priced less than zero, as highlighted in the red ellipse, is a result of Queensland participants rebidding capacity to low prices in response to high prices. This will be discussed in the relevant *Spot prices above \$5000/MWh* report.

Figure 4: New South Wales generation and bidding patterns

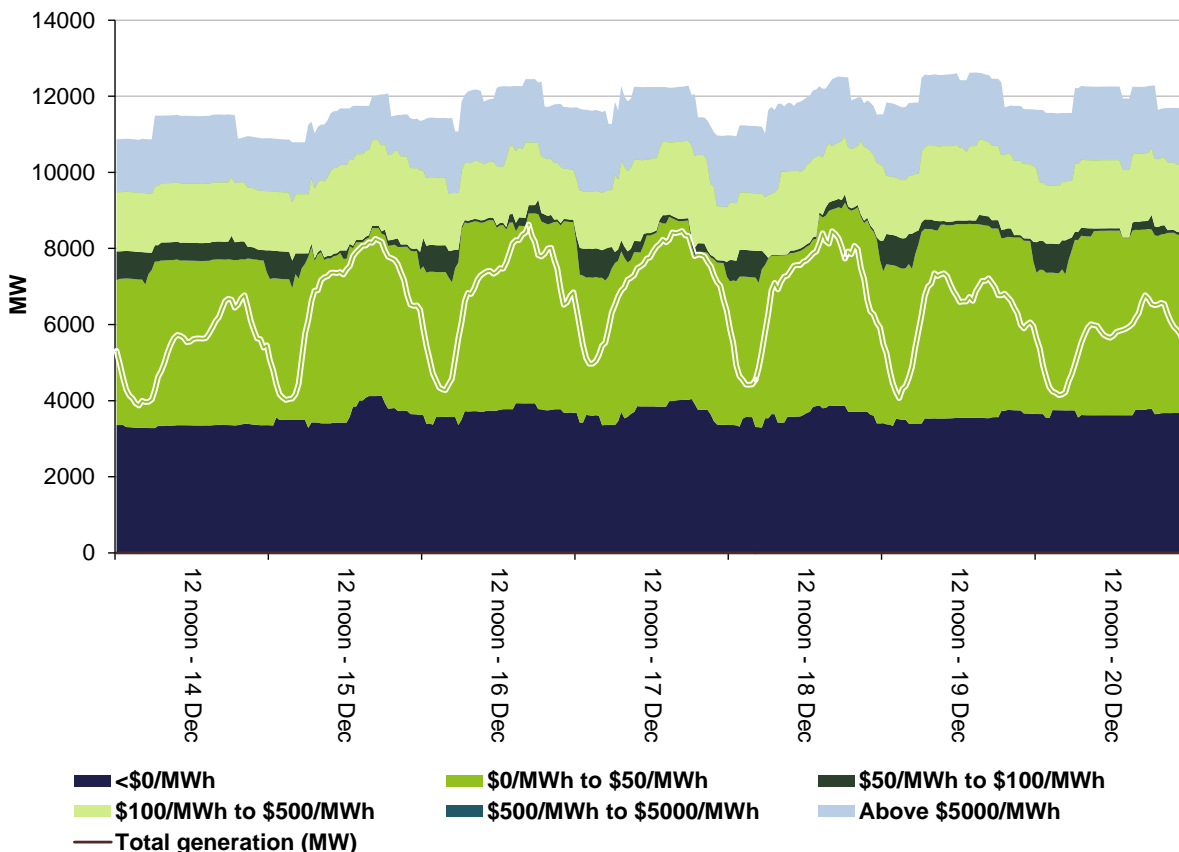


Figure 5: Victoria generation and bidding patterns

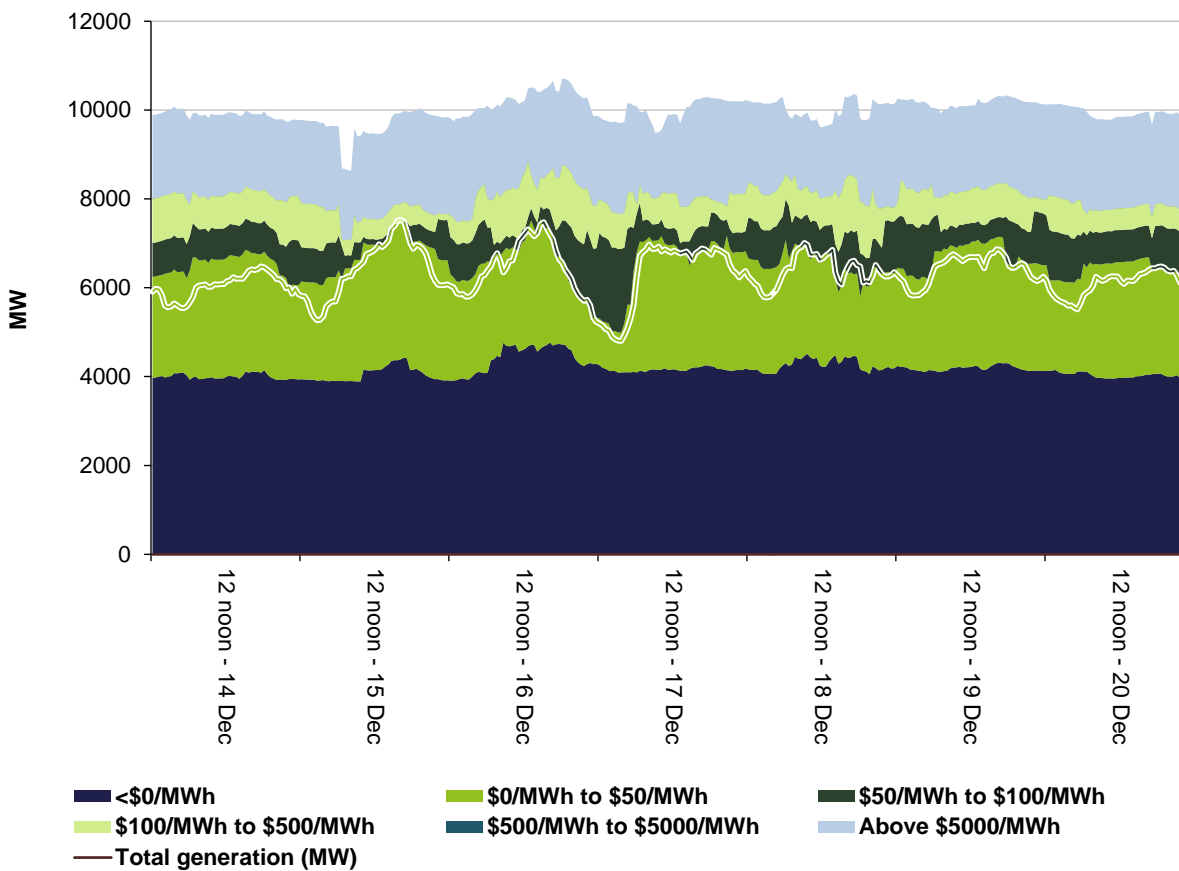


Figure 6: South Australia generation and bidding patterns

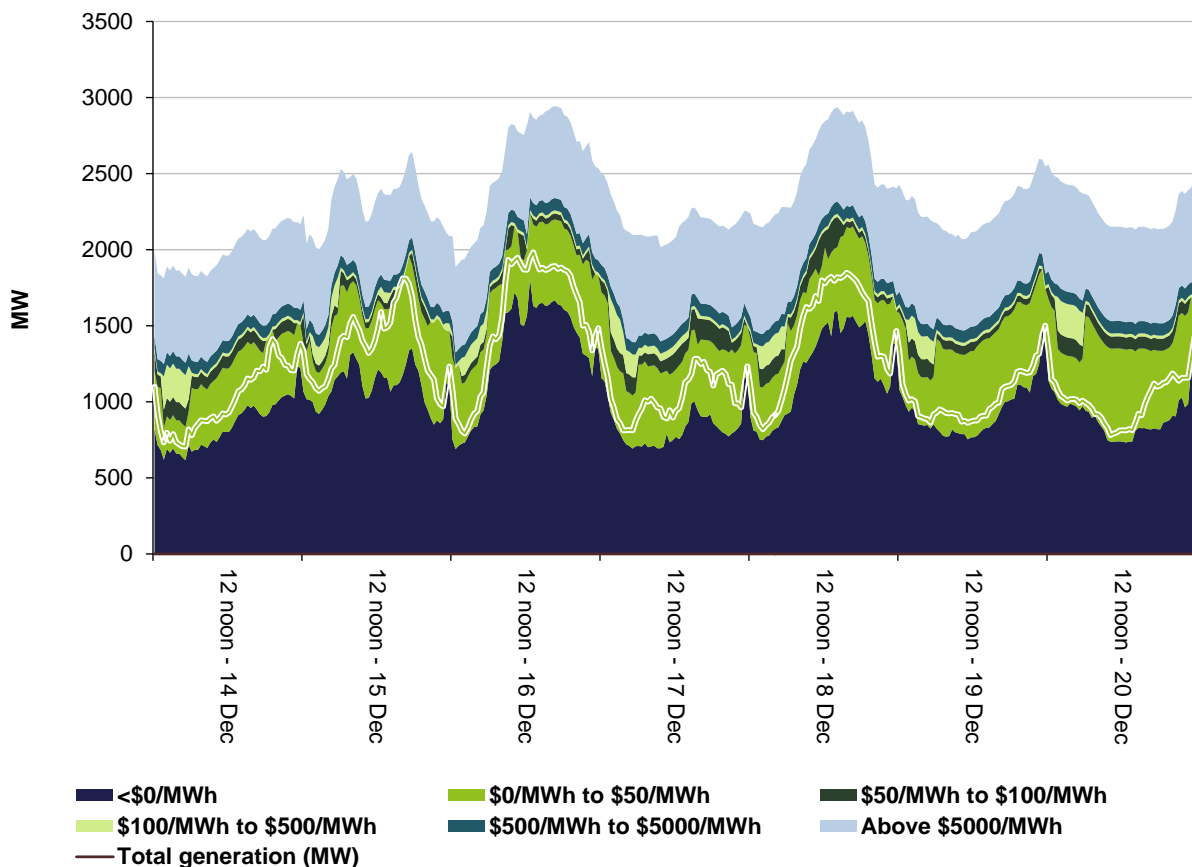
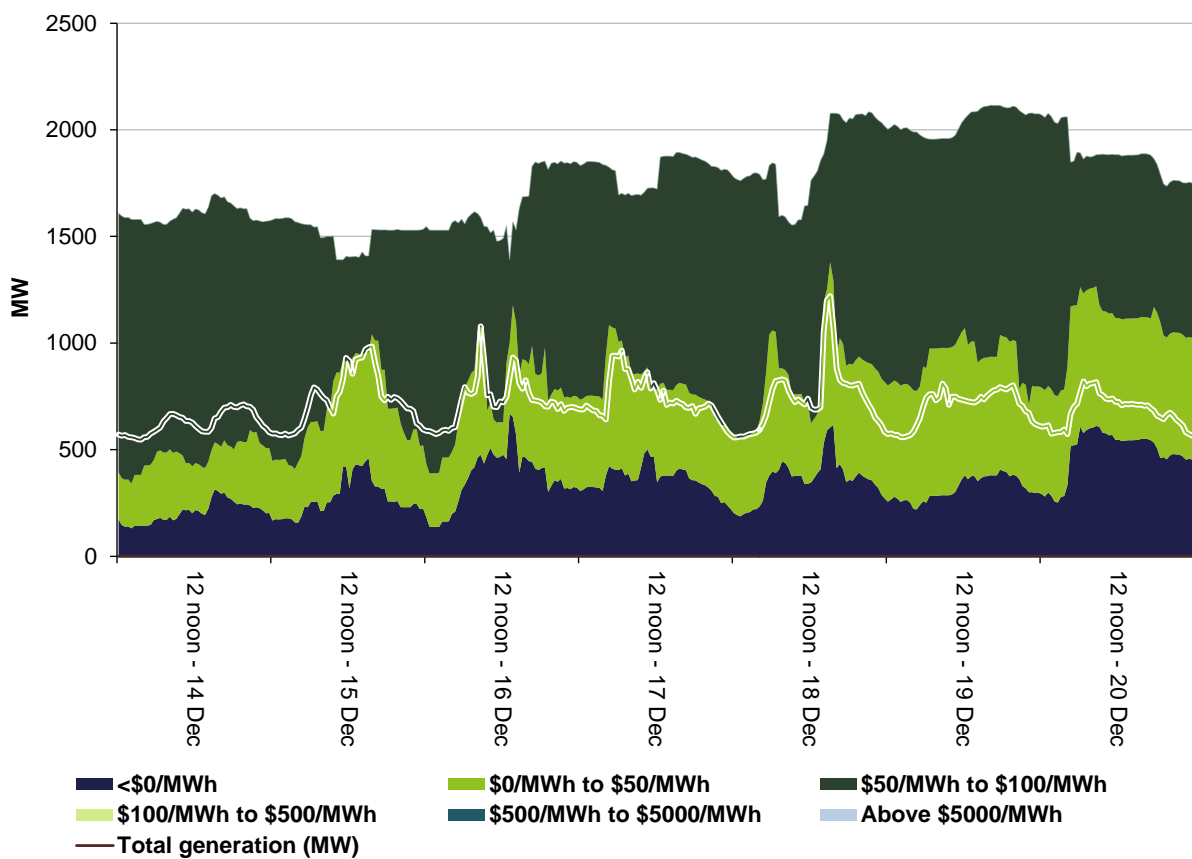


Figure 7: Tasmania generation and bidding patterns



Frequency control ancillary services markets

Frequency control ancillary services (FCAS) are required to maintain the frequency of the power system within the frequency operating standards. Raise and lower regulation services are used to address small fluctuations in frequency, while raise and lower contingency services are used to address larger frequency deviations. There are six contingency services:

- *fast services*, which arrest a frequency deviation within the first 6 seconds of a contingent event (raise and lower 6 second)
- *slow services*, which stabilise frequency deviations within 60 seconds of the event (raise and lower 60 second)
- *delayed services*, which return the frequency to the normal operating band within 5 minutes (raise and lower 5 minute) at which time the five minute dispatch process will take effect.

The Electricity Rules stipulate that generators pay for raise contingency services and customers pay for lower contingency services. Regulation services are paid for on a “causer pays” basis determined every four weeks by AEMO.

The total cost of FCAS on the mainland for the week was \$535 000 or less than 1 per cent of energy turnover on the mainland.

The total cost of FCAS in Tasmania for the week was \$920 000 or around 12 per cent of energy turnover in Tasmania. The high FCAS cost in Tasmania was mainly driven by the events on 16 December.

Figure 8: Daily frequency control ancillary service cost

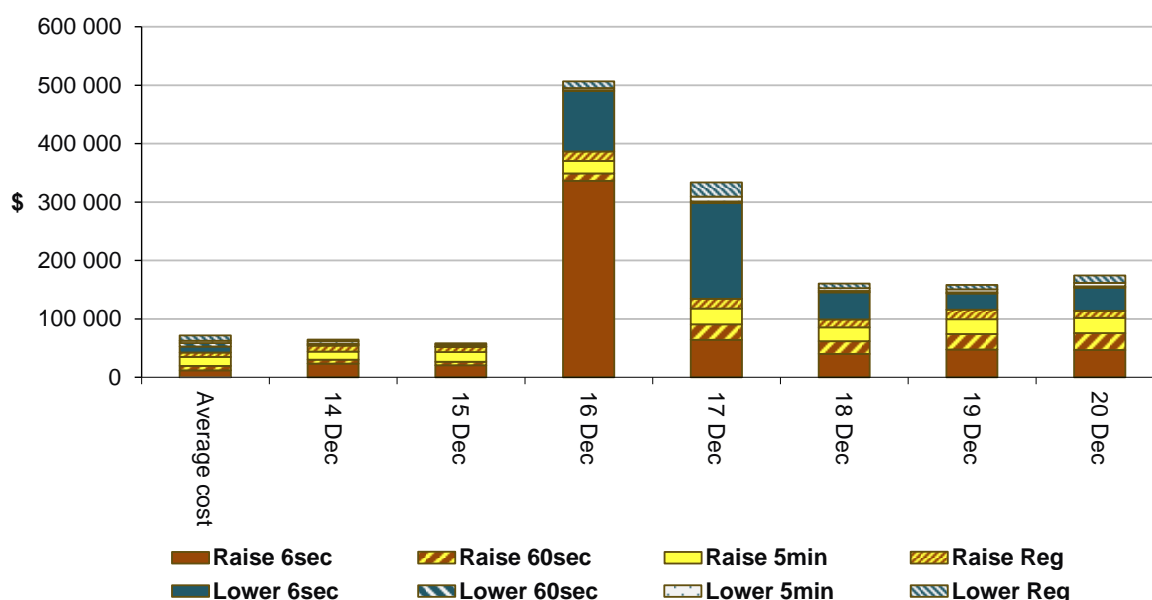


Figure 8 shows the daily breakdown of cost for each FCAS for the NEM, as well as the average cost since the beginning of the previous financial year. The figure shows FCAS costs were high on 16 December (the majority of which was accumulated in Tasmania). At 7.46 am, Basslink and the Gordon to Chapel St No. 1 and 2 lines tripped due to lightning.

Basslink was importing 469 MW at the time (into Tasmania) and remained offline until 9 am. Following this incident, at around noon AEMO reclassified Basslink as a credible contingency and directed Basslink to turn off its frequency controller to maintain power system security. This meant that all Tasmanian FCAS services had to be sourced locally and consequently the requirement for these services increased.

The requirement for raise 6 second services increased from 66 MW at 12.15 pm to 113 MW at 12.20 pm. This saw the respective FCAS price increase from \$18.91/MW at 12.15 pm to \$860.77/MW. The price stayed above \$550/MW until 1.30 pm, resulting in a cost of around \$320 000. The requirement for lower 6 second services increase from zero at 12.20 pm to 334 MW at 12.25 pm. The lower 6 second price exceeded \$100/MW until 12.40 pm and remained above \$20/MW for the remainder of the day. The cost for this service amounted to around \$103 000 for the day.

At 1.20 pm a Tasmanian generator was directed to reduce output to 70 MW to reduced FCAS requirements. The direction issued to Basslink was cancelled on 19 December at 1.17 pm.

Detailed market analysis of significant price events

We provide more detailed analysis of events where the spot price was greater than three times the weekly average price in a region and above \$250/MWh or was below -\$100/MWh.

Queensland

There were eleven occasions where the spot price in Queensland was greater than three times the Queensland weekly average price of \$345/MWh and above \$250/MWh.

Wednesday, 17 December

Time	Price (\$/MWh)			Demand (MW)			Availability (MW)		
	Actual	4 hr forecast	12 hr forecast	Actual	4 hr forecast	12 hr forecast	Actual	4 hr forecast	12 hr forecast
2:00 PM	6736.60	36.52	39.19	8011	7969	7923	9991	10 053	10 099
2:30 PM	8979.62	63.88	37.35	8117	8124	8042	9979	10 083	10 099
3:30 PM	10 060.33	40.79	38.87	8317	8347	8224	10 080	10 089	10 134
4:00 PM	8992.75	2157.99	43.01	8385	8455	8320	10 101	10 085	10 134
4:30 PM	13 499.00	2157.99	44.66	8422	8521	8395	10 046	10 142	10 134
5:00 PM	13 499.00	13 499.00	45.02	8445	8578	8408	10 052	10 105	10 114
5:30 PM	8989.31	13 499.00	38.52	8395	8374	8221	9810	9844	9864
6:00 PM	4526.70	95.98	35.10	8252	8169	8034	9779	9828	9864
8:00 PM	2299.47	300.98	31.00	8153	7922	7859	9853	9887	9890

Events of 17 December 2014 will be discussed in the relevant *Spot prices above \$5000/MWh* report.

Thursday, 18 December

Appendix A contains the Price Setter¹ for the below high price trading intervals. Price Setter has been included to show how prices were set on these occasions.

Time	Price (\$/MWh)			Demand (MW)			Availability (MW)		
	Actual	4 hr forecast	12 hr forecast	Actual	4 hr forecast	12 hr forecast	Actual	4 hr forecast	12 hr forecast
3:00 PM	2282.63	37.11	36.53	8155	8067	8160	9696	9789	9630
4:00 PM	1139.96	37.35	37.35	8095	8153	8301	9736	9752	9840

Conditions at the time saw demand and available capacity close to forecast. A constraint used to manage the outage of the Armidale SVC was limiting imports into Queensland to between 45 MW to 63 MW at the time of high prices.

3 pm trading interval

Relevant rebidding for 18 December 3 pm trading interval

Time submitted	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
2.05 pm	2.15 pm	CS Energy	Gladstone	407	<25	13 500	1404A interconnector constraint-QNI almost binding north-SL
2.33 pm	2.40 pm	Origin Energy	Mt Stuart	80	-1000	13 500	1432A constraint management - NMQ_NIL_B1 SL
2.49 pm	3 pm	CS Energy	Wivenhoe	250	15	13 500	1448A interconnector constraint-QNI almost binding north-SL
Total capacity rebid from low to high prices				737			

With low-priced generation either fully dispatched or ramp rate limited the dispatch price increase from \$36/MWh at 2.55 pm to \$13 499/MWh at 3 pm.

¹ Price setter identifies, for a 30 minute trading interval, each five minute dispatch interval price and the generating units involved in setting the energy price.

4 pm trading interval

Relevant rebidding for 18 December 4 pm trading interval

Time submitted	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
3.41 pm	3.50 pm	CS Energy	Gladstone	170	<28	13 500	1539A dispatch price lower than 30min forecast-SL
3.41 pm	3.50 pm	Origin Energy	Mt Stuart	79	-1000	13 500	1535A constraint management - NMQ_NIL_B1 SL
3.49 pm	4 pm	CS Energy	Wivenhoe	250	15	13 500	1548A interconnector constraint-potential to bind-SL
3.50 pm	4 pm	Callide Power	Callide C	38	-1000	13 500	1550A change in 5min pd QNI flow – SL
3.53 pm	4 pm	CS Energy	Gladstone	-120	<13 500	N/A*	1552P technical issues-oil leak on feed pump-SL
Total capacity rebid from low to high prices				537			

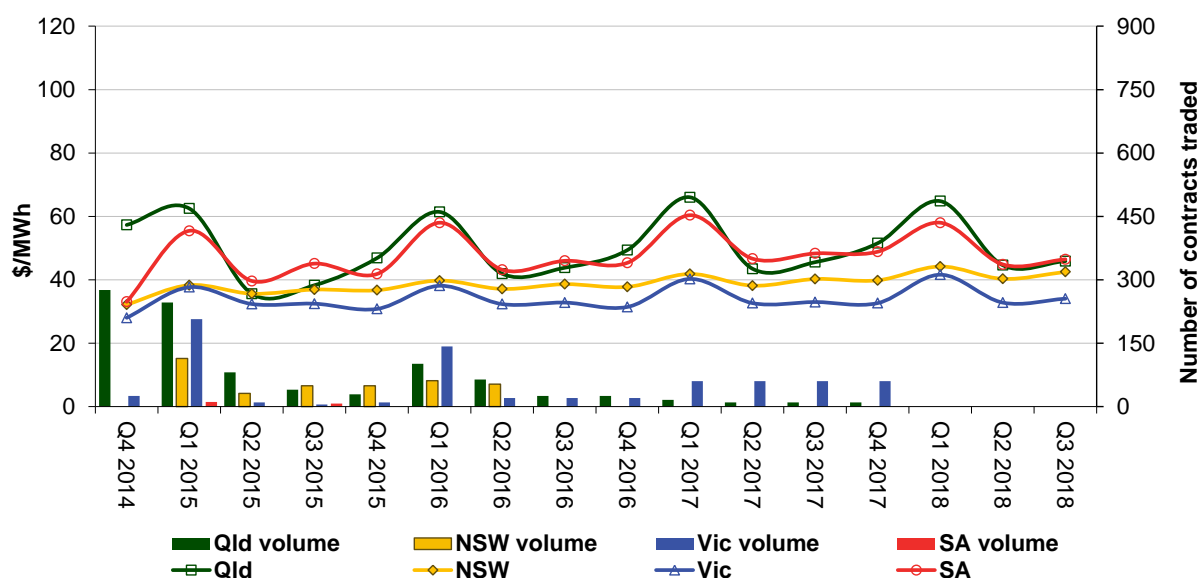
* N/A denotes reduction in capacity.

With low-priced generation fully dispatched the dispatch price increased from \$45/MWh at 3.55 pm to \$6667/MWh at 4 pm.

Financial markets

Figure 9 shows for all mainland regions the prices for base contracts (and total traded quantities for the week) for each quarter for the next four financial years.

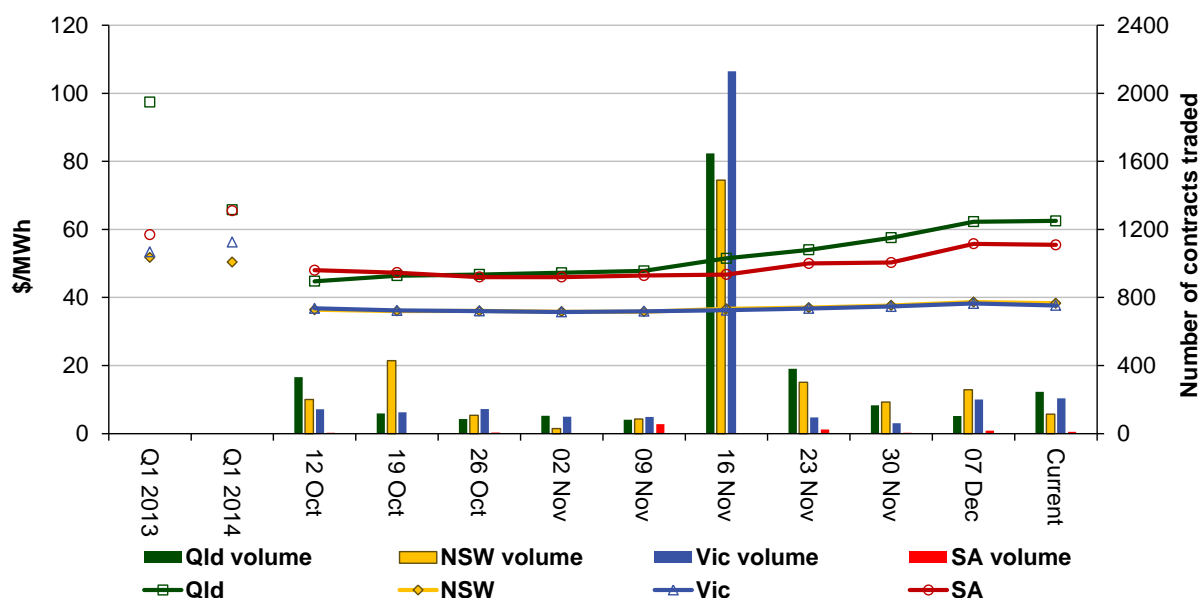
Figure 9: Quarterly base future prices Q4 2014 – Q3 2018



Source: ASXEnergy.com.au

Figure 10 shows how the price for each regional Quarter 1 2015 base contract has changed over the last 10 weeks (as well as the total number of trades each week). The closing quarter 1 2013 and quarter 1 2014 prices are also shown. The AER notes that data for South Australia is less reliable due to very low numbers of trades. The high volume of trades in figure 10 is due to options on calendar year base load expiring on Wednesday 19 November.

Figure 10: Price of Q1 2015 base contracts over the past 10 weeks (and the past 2 years)



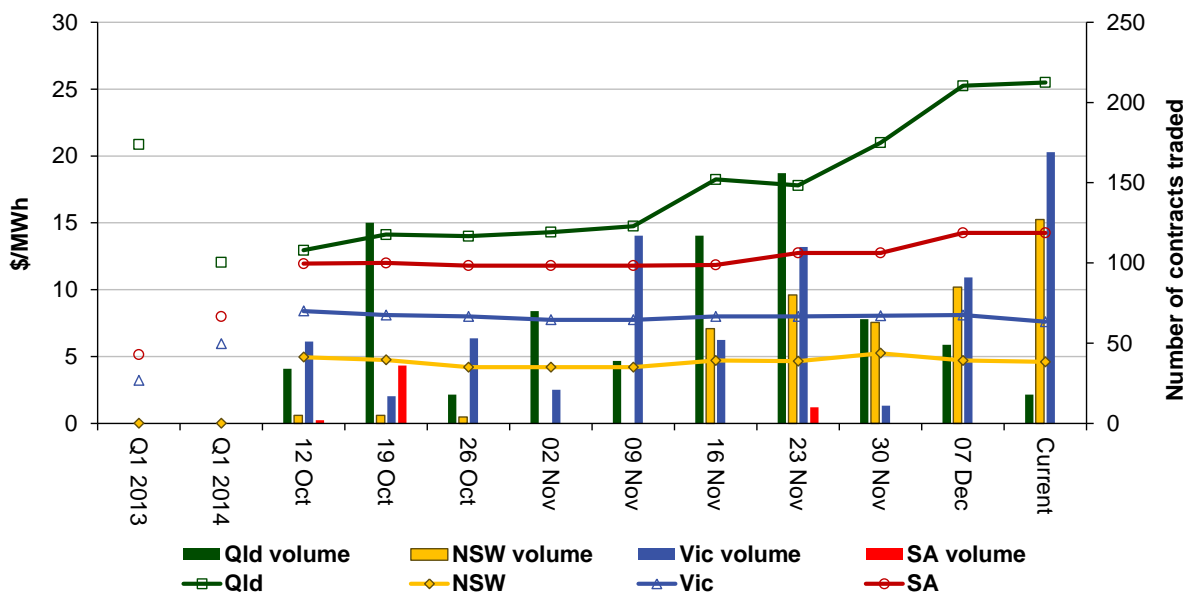
Note: Base contract prices are shown for each of the current week and the previous 9 weeks, with average prices shown for yearly periods 1 and 2 years prior to the current year

Source: ASXEnergy.com.au

Prices of other financial products (including longer-term price trends) are available in the [Performance of the Energy Sector](#) section of our website.

Figure 11 shows how the price for each regional Quarter 1 2015 cap contract has changed over the last 10 weeks (as well as the total number of trades each week). The closing quarter 1 2013 and quarter 1 2014 prices are also shown. The Queensland Q1 2105 cap contract price has now reached levels that were experienced in Q1 2013 when network capacity in central Queensland was providing opportunities for generation portfolios to raise prices.

Figure 11: Price of Q1 2015 cap contracts over the past 10 weeks (and the past 2 years)



Source: ASXEnergy.com.au

Australian Energy Regulator

January 2015

Appendix A – Price setter

The following table identifies for the trading interval in which the spot price exceeded \$250/MWh, each five minute dispatch interval price and the generating units involved in setting the energy price. The 30-minute spot price is the average of the six dispatch interval prices.

18 December 2014 15:00 PM

Time	Dispatch Price	Participant	Unit	Service	Offer price	Marginal Change	Contribution
14:35	\$35.08	Snowy Hydro	UPPTUMUT	Energy	\$32.81	1.07	\$35.11
14:40	\$40.18	Eraring Energy	ER03	Energy	\$35.97	0.55	\$19.78
		Eraring Energy	ER04	Energy	\$35.97	0.55	\$19.78
		Eraring Energy	ER01	Raise 5 min	\$3.15	1.10	\$3.47
		Eraring Energy	ER03	Raise 5 min	\$2.45	-0.55	-\$1.35
		Eraring Energy	ER04	Raise 5 min	\$2.45	-0.55	-\$1.35
			ENOF,ER01,6,ER03,6		\$0.00	27.39	\$0.00
			ENOF,ER01,6,ER04,6		\$0.00	27.39	\$0.00
			ENOF,ER02,6,ER03,6		\$0.00	27.39	\$0.00
			ENOF,ER02,6,ER04,6		\$0.00	27.39	\$0.00
14:45	\$39.95	Eraring Energy	ER04	Energy	\$35.97	1.09	\$39.21
		Eraring Energy	ER04	Raise 5 min	\$2.45	-1.09	-\$2.67
		Snowy Hydro	UPPTUMUT	Raise reg	\$3.00	1.09	\$3.27
			ENOF,ER03,6,ER04,6		\$0.00	-54.70	\$0.00
			ENOF,ER01,6,ER04,6		\$0.00	54.70	\$0.00
			ENOF,ER02,6,ER04,6		\$0.00	54.70	\$0.00
14:50	\$45.95	Snowy Hydro	UPPTUMUT	Energy	\$41.96	1.10	\$46.16
14:55	\$35.63	Snowy Hydro	UPPTUMUT	Energy	\$32.81	1.09	\$35.76
15:00	\$13499.00	Stanwell	BARRON-2	Energy	\$13499.00	0.03	\$404.97
		Stanwell	KAREEYA1	Energy	\$13499.00	0.01	\$134.99
		Stanwell	KAREEYA2	Energy	\$13499.00	0.01	\$134.99
		Stanwell	KAREEYA4	Energy	\$13499.00	0.01	\$134.99
		Stanwell	TARONG#1	Energy	\$13499.00	0.31	\$4184.69
		Stanwell	TARONG#3	Energy	\$13499.00	0.31	\$4184.69
		Stanwell	TARONG#4	Energy	\$13499.00	0.31	\$4184.69
			ENOF,BARRON-2,9,KAREEYA3,9		\$0.00	0.31	\$0.00
			ENOF,BARRON-2,9,STAN-1,10		\$0.00	2.10	\$0.00
			ENOF,BARRON-2,9,STAN-2,10		\$0.00	2.23	\$0.00
			ENOF,BARRON-2,9,STAN-3,10		\$0.00	2.10	\$0.00
			ENOF,BARRON-2,9,STAN-4,10		\$0.00	2.23	\$0.00
			ENOF,BARRON-2,9,TARONG#2,10		\$0.00	10.10	\$0.00
			ENOF,KAREEYA1,9,KAREEYA3,9		\$0.00	0.16	\$0.00
			ENOF,KAREEYA1,9,STAN-1,10		\$0.00	1.05	\$0.00
			ENOF,KAREEYA1,9,STAN-2,10		\$0.00	1.11	\$0.00
			ENOF,KAREEYA1,9,STAN-3,10		\$0.00	1.05	\$0.00
			ENOF,KAREEYA1,9,STAN-4,10		\$0.00	1.11	\$0.00
			ENOF,KAREEYA1,9,TARONG#2,10		\$0.00	5.05	\$0.00

ENOF,KAREEYA2,9,KARE EYA3,9	\$0.00	0.16	\$0.00
ENOF,KAREEYA2,9,STAN- 1,10	\$0.00	1.05	\$0.00
ENOF,KAREEYA2,9,STAN- 2,10	\$0.00	1.11	\$0.00
ENOF,KAREEYA2,9,STAN- 3,10	\$0.00	1.05	\$0.00
ENOF,KAREEYA2,9,STAN- 4,10	\$0.00	1.11	\$0.00
ENOF,KAREEYA2,9,TARO NG#2,10	\$0.00	5.05	\$0.00
ENOF,KAREEYA4,9,STAN- 1,10	\$0.00	1.05	\$0.00
ENOF,KAREEYA4,9,STAN- 2,10	\$0.00	1.11	\$0.00
ENOF,KAREEYA4,9,STAN- 3,10	\$0.00	1.05	\$0.00
ENOF,KAREEYA4,9,STAN- 4,10	\$0.00	1.11	\$0.00
ENOF,KAREEYA4,9,TARO NG#2,10	\$0.00	5.05	\$0.00
ENOF,TARONG#1,10,TAR ONG#2,10	\$0.00	119.92	\$0.00
ENOF,KAREEYA3,9,KARE EYA4,9	\$0.00	0.16	\$0.00
ENOF,KAREEYA3,9,TARO NG#1,10	\$0.00	3.74	\$0.00
ENOF,KAREEYA3,9,TARO NG#3,10	\$0.00	3.74	\$0.00
ENOF,KAREEYA3,9,TARO NG#4,10	\$0.00	3.74	\$0.00
ENOF,STAN- 1,10,TARONG#1,10	\$0.00	24.92	\$0.00
ENOF,STAN- 1,10,TARONG#3,10	\$0.00	24.92	\$0.00
ENOF,STAN- 1,10,TARONG#4,10	\$0.00	24.92	\$0.00
ENOF,STAN- 2,10,TARONG#1,10	\$0.00	26.48	\$0.00
ENOF,STAN- 2,10,TARONG#3,10	\$0.00	26.48	\$0.00
ENOF,STAN- 2,10,TARONG#4,10	\$0.00	26.48	\$0.00
ENOF,STAN- 3,10,TARONG#1,10	\$0.00	24.92	\$0.00
ENOF,STAN- 3,10,TARONG#3,10	\$0.00	24.92	\$0.00
ENOF,STAN- 3,10,TARONG#4,10	\$0.00	24.92	\$0.00
ENOF,STAN- 4,10,TARONG#1,10	\$0.00	26.48	\$0.00
ENOF,STAN- 4,10,TARONG#3,10	\$0.00	26.48	\$0.00
ENOF,STAN- 4,10,TARONG#4,10	\$0.00	26.48	\$0.00
ENOF,TARONG#2,10,TAR ONG#3,10	\$0.00	119.92	\$0.00
ENOF,TARONG#2,10,TAR ONG#4,10	\$0.00	119.92	\$0.00
Spot Price	\$2282.63/MWh		

18 December 2014 16:00 PM

Time	Dispatch Price	Participant	Unit	Service	Offer price	Marginal Change	Contribution
15:05	\$33.42	Eraring Energy	ER03	Energy	\$32.83	1.04	\$34.14
		LYMMCO	LYA2	Lower reg	\$0.80	-1.04	-\$0.83
		Eraring Energy	ER03	Lower reg	\$0.00	1.04	\$0.00
			ENOF,ER01,5,ER03,5		\$0.00	-83.48	\$0.00
			ENOF,ER02,5,ER03,5		\$0.00	83.48	\$0.00
			ENOF,ER03,5,ER04,5		\$0.00	-83.48	\$0.00
15:10	\$32.34	EnergyAustralia	MP2	Energy	\$31.50	1.03	\$32.45
			ENOF,MP1,5,MP2,5		\$0.00	133.45	\$0.00
15:15	\$33.96	Snowy Hydro	UPPTUMUT	Energy	\$32.81	1.04	\$34.12
15:20	\$33.97	Snowy Hydro	UPPTUMUT	Energy	\$32.81	1.04	\$34.12
15:25	\$33.96	Snowy Hydro	UPPTUMUT	Energy	\$32.81	1.04	\$34.12
15:30	\$50.55	Snowy Hydro	MURRAY	Energy	\$41.94	1.18	\$49.49
		GDF Suez	LOYYB1	Energy	\$20.20	0.02	\$0.40
		GDF Suez	LOYYB2	Energy	\$20.20	0.02	\$0.40
15:35	\$32.66	Macquarie Generation	BW03	Energy	\$31.96	1.02	\$32.60
			ENOF,BW01,5,BW03,5		\$0.00	-51.09	\$0.00
			ENOF,BW02,5,BW03,5		\$0.00	-71.53	\$0.00
			ENOF,BW03,5,BW04,5		\$0.00	-51.09	\$0.00
15:40	\$28.25	Snowy Hydro	UPPTUMUT	Energy	\$28.17	1.00	\$28.17
15:45	\$32.31	Macquarie Generation	BW01	Energy	\$31.96	0.30	\$9.59
		Macquarie Generation	BW02	Energy	\$31.96	0.42	\$13.42
		Macquarie Generation	BW04	Energy	\$31.96	0.30	\$9.59
			ENOF,BW01,5,BW03,5		\$0.00	14.87	\$0.00
			ENOF,BW02,5,BW03,5		\$0.00	20.81	\$0.00
			ENOF,BW03,5,BW04,5		\$0.00	14.87	\$0.00
15:50	\$35.08	Eraring Energy	ER01	Energy	\$32.83	0.53	\$17.40
		Eraring Energy	ER04	Energy	\$32.83	0.53	\$17.40
			ENOF,ER01,5,ER02,5		\$0.00	42.75	\$0.00
			ENOF,ER01,5,ER03,5		\$0.00	42.75	\$0.00
			ENOF,ER02,5,ER04,5		\$0.00	42.75	\$0.00
			ENOF,ER03,5,ER04,5		\$0.00	42.75	\$0.00
15:55	\$44.82	Snowy Hydro	UPPTUMUT	Energy	\$41.96	1.07	\$44.90
16:00	\$6666.66	Stanwell	STAN-1	Energy	\$6666.66	0.25	\$1666.67
		Stanwell	STAN-2	Energy	\$6666.66	0.25	\$1666.67
		Stanwell	STAN-3	Energy	\$6666.66	0.25	\$1666.67
		Stanwell	STAN-4	Energy	\$6666.66	0.25	\$1666.67
Spot Price		\$1139.96/MWh					