

# Electricity Report

## 22 – 28 February 2015



AUSTRALIAN ENERGY  
REGULATOR

### 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 22 to 28 February 2015. There was one occasion where the spot price in South Australia was above \$250/MWh and greater than three times the regional weekly average price.

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

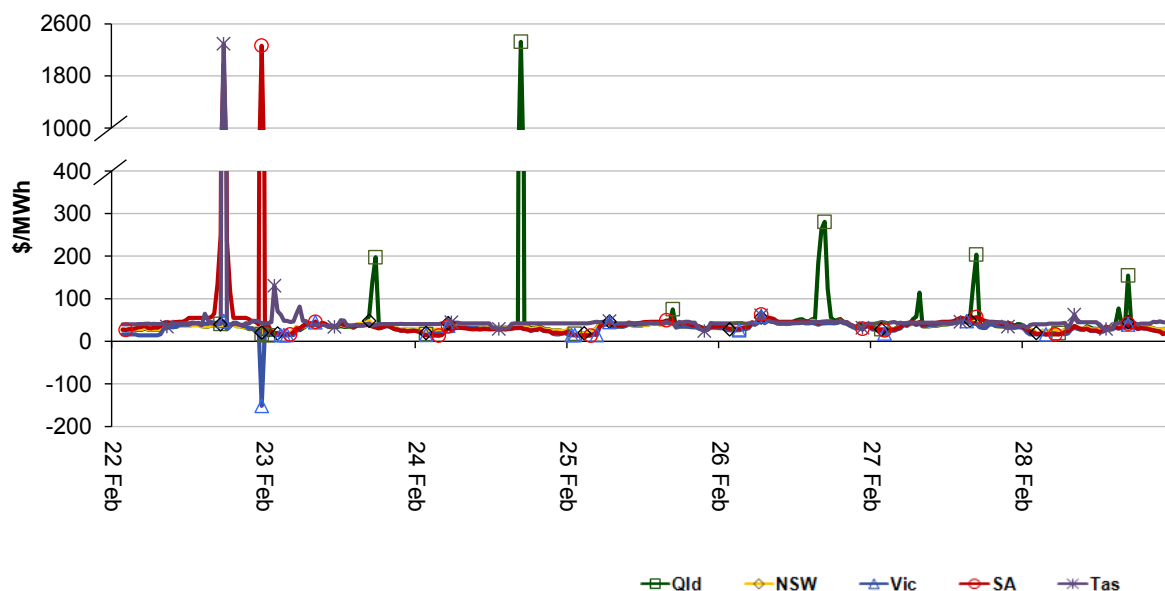
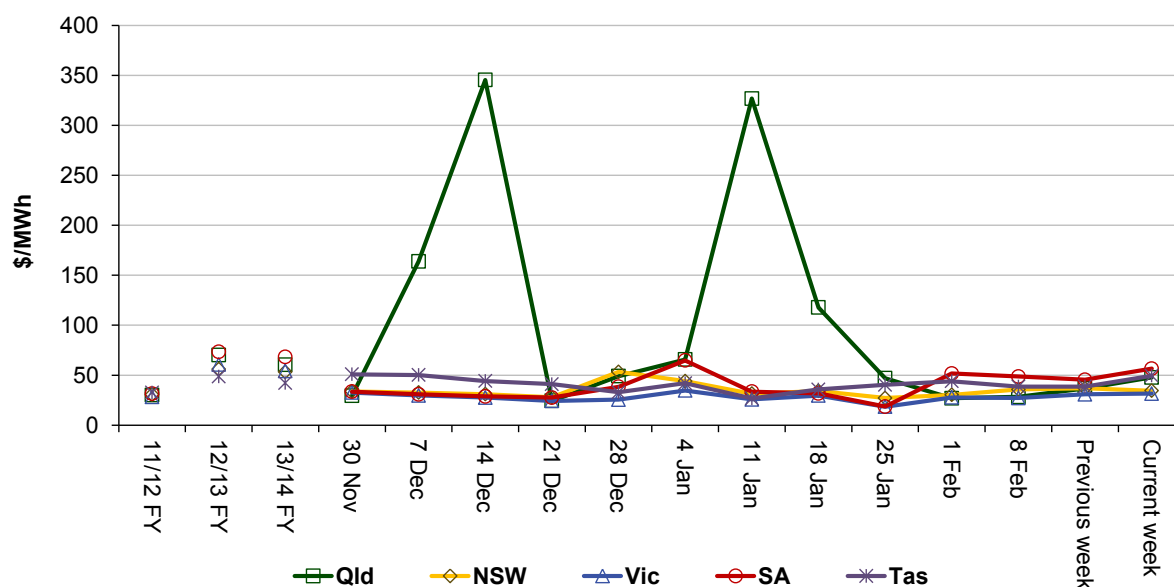


Figure 2 shows the volume weighted average (VWA) prices for the current week (with prices shown in Table 1) and the preceding 12 weeks, as well as the VWA price over the previous 3 financial years.

**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	48	35	32	57	50
13-14 financial YTD	61	53	54	68	42
14-15 financial YTD	72	37	32	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 124 trading intervals throughout the week where actual prices varied significantly from forecasts. This compares to the weekly average in 2014 of 71 counts and the average in 2013 of 97. 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**

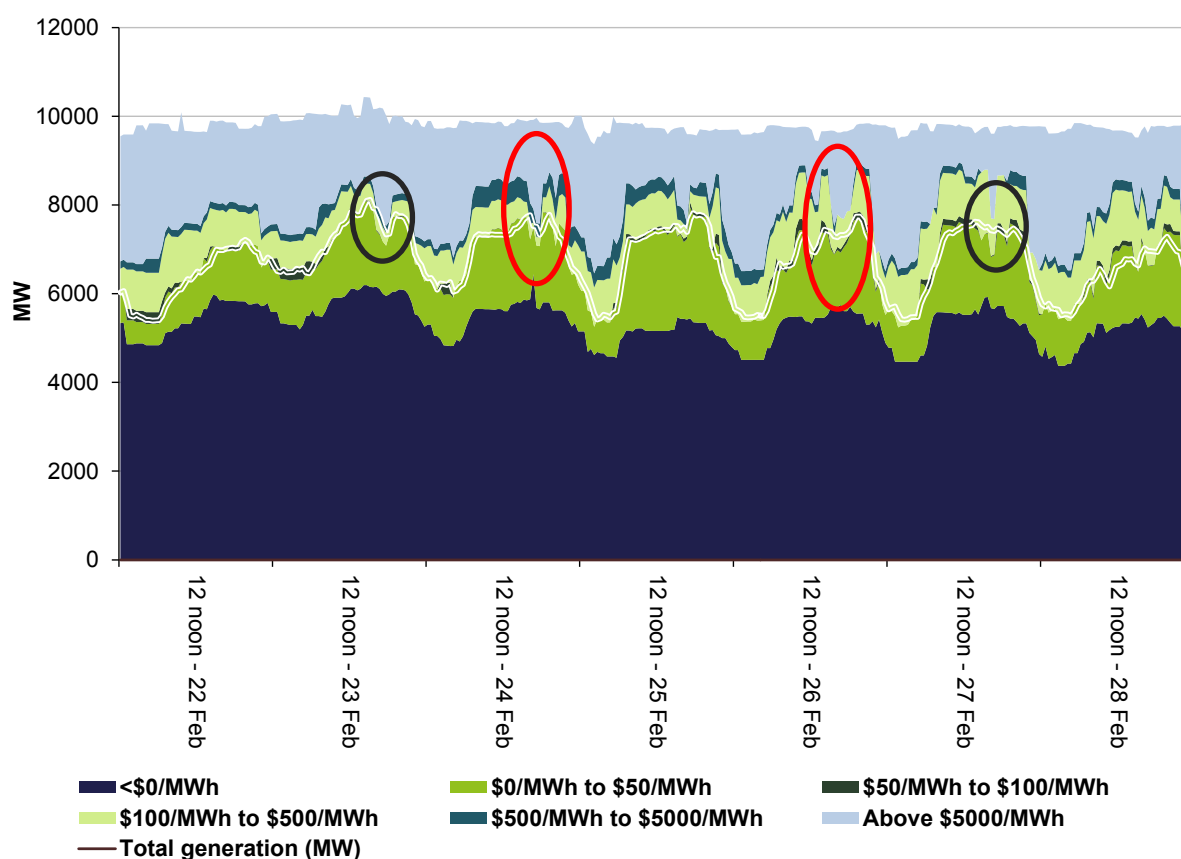
	Availability	Demand	Network	Combination
% of total above forecast	2	34	0	1
% of total below forecast	53	7	0	3

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

## Generation and bidding patterns

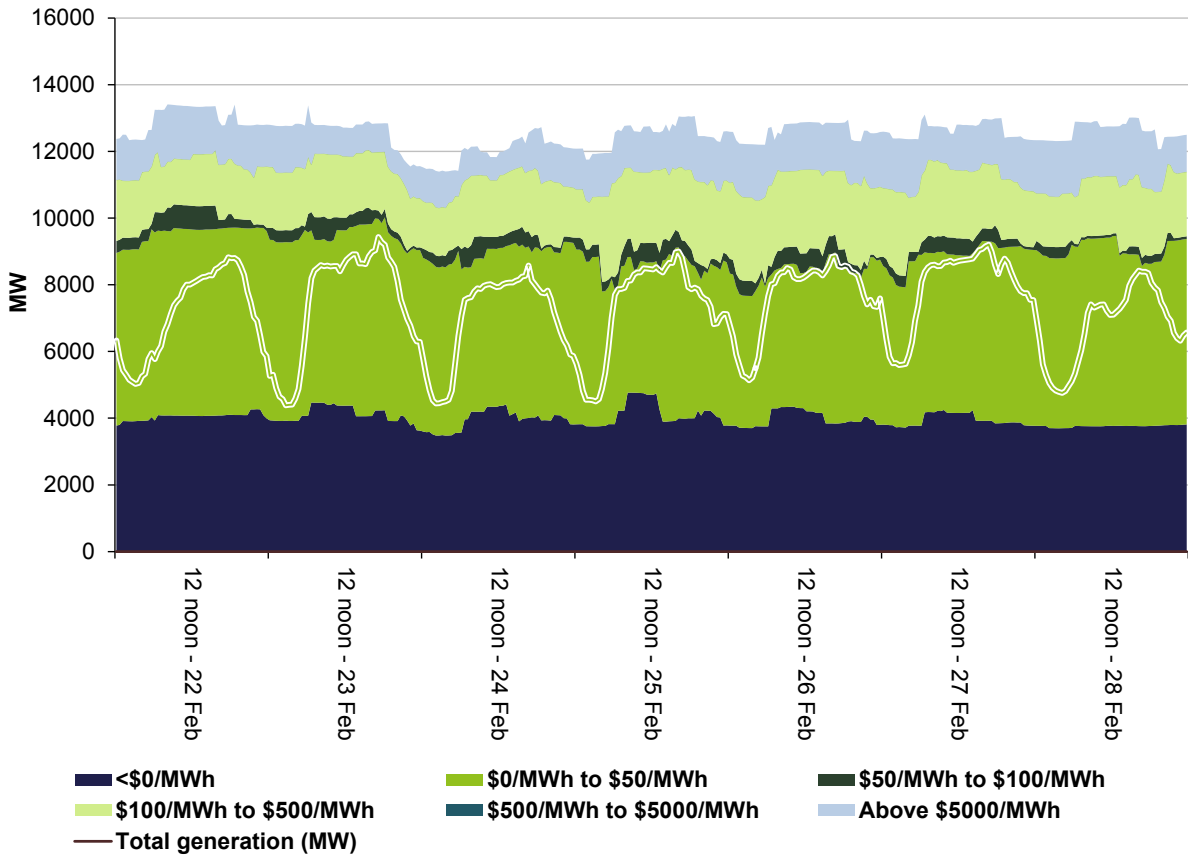
The AER reviews generator bidding as part of its market monitoring to better understand the drivers behind price variations. Figure 3 to Figure 7 show, the total generation dispatched and the amounts of capacity offered within certain price bands for each 30 minute trading interval in each region.

**Figure 3 : Queensland generation and bidding patterns**

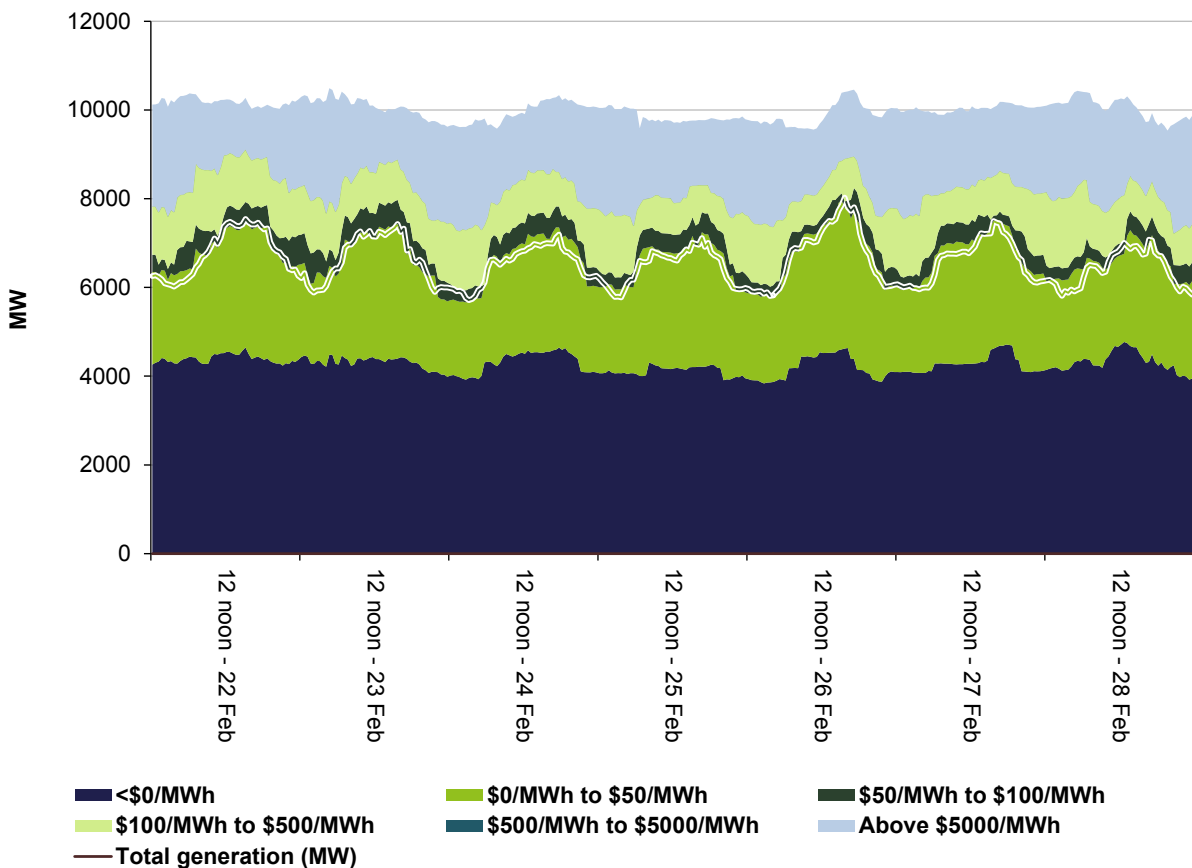


The red ellipses on Figure 3 above for Queensland highlight the rebidding that resulted in the high spot prices. A detailed analysis of the events relating to these periods is in the “Detailed market analysis of significant price events” below. The black ellipses on Figure 3 highlight rebidding that resulted in prices around \$200/MWh.

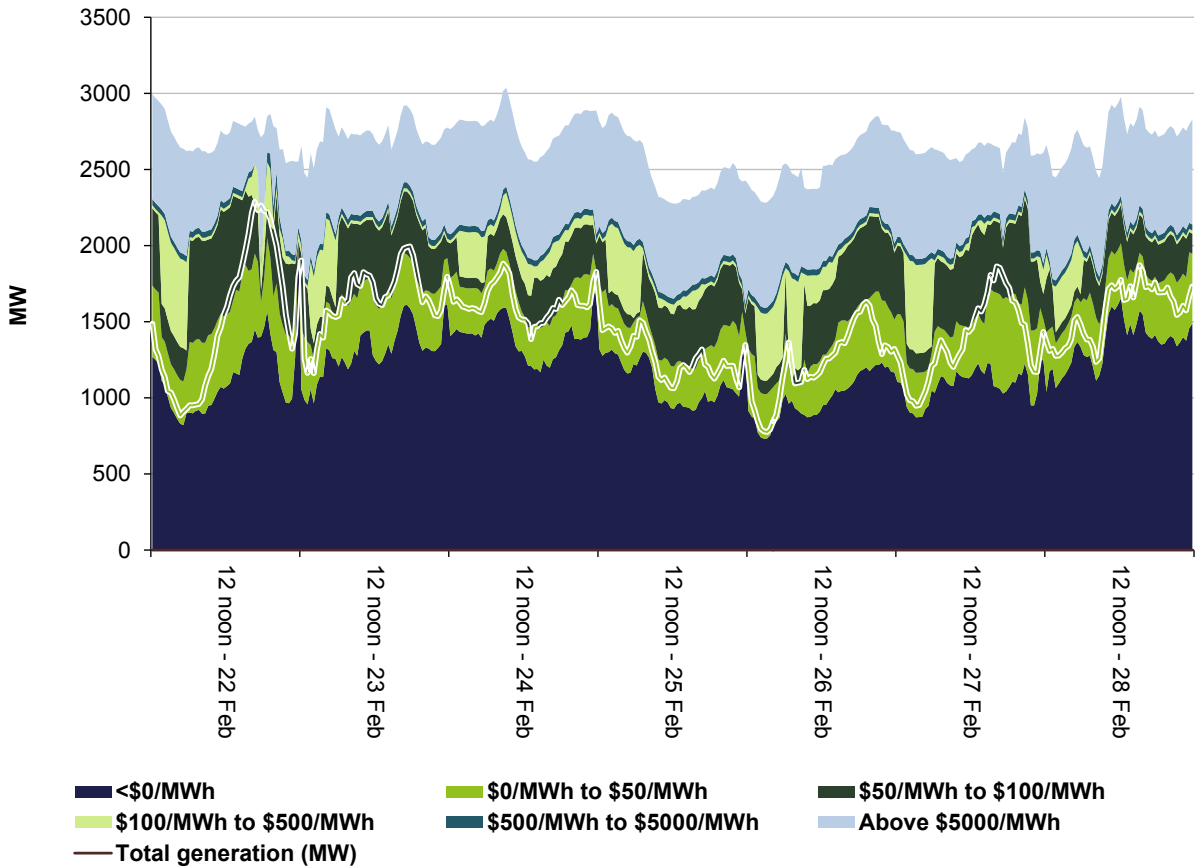
**Figure 4 : New South Wales generation and bidding patterns**



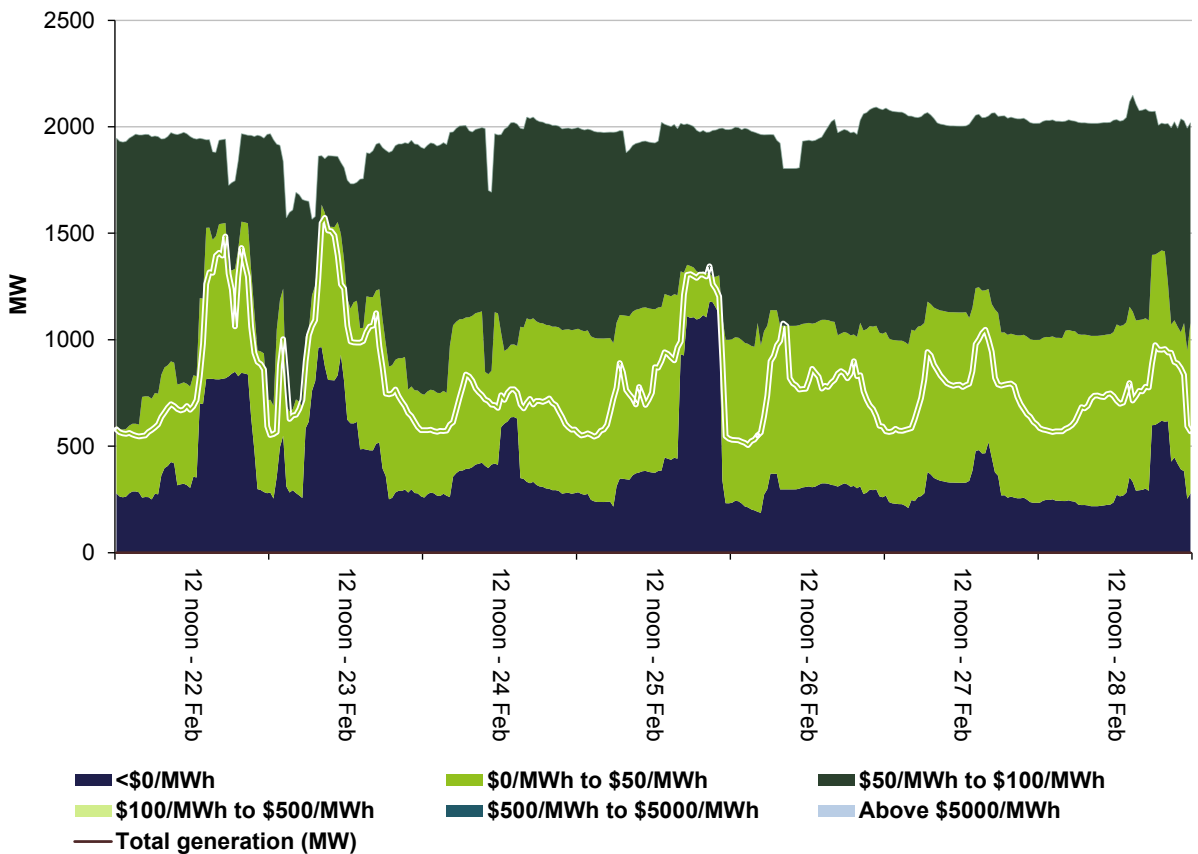
**Figure 5 : Victoria generation and bidding patterns**



**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.

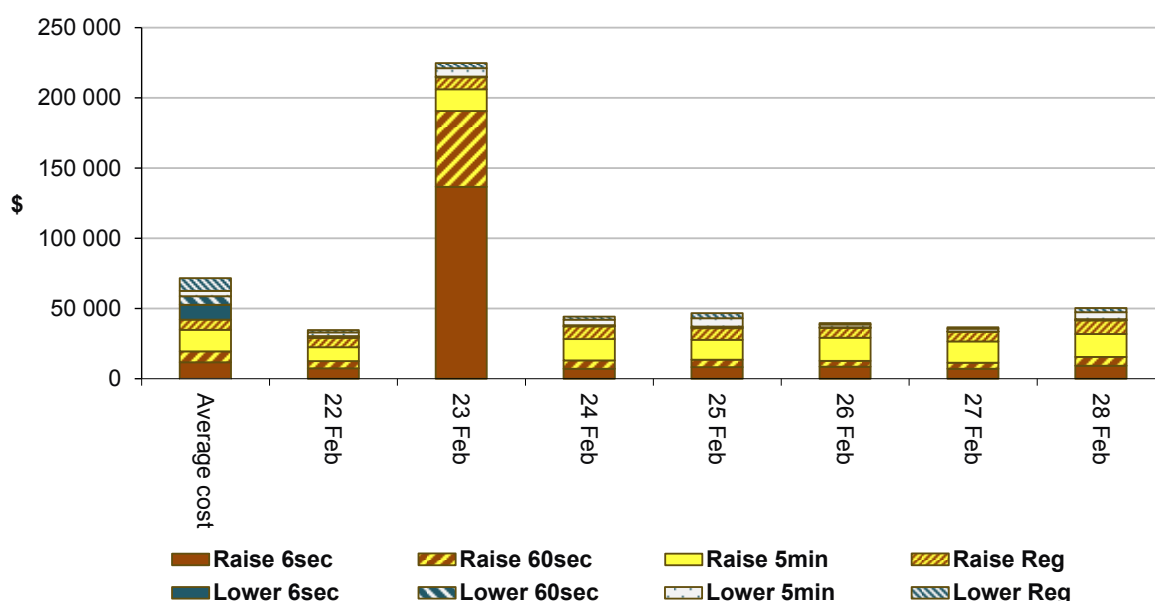
The Electricity Rules stipulate that generators pay for raise contingency services and customers pay for lower contingency services. Regulation services are paid for on a “causer pays” basis determined every four weeks by AEMO.

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 total cost of FCAS on the mainland for the week was \$236 500 or less than 1 per cent of energy turnover on the mainland.

The total cost of FCAS in Tasmania for the week was \$240 500 or around 3 per cent of energy turnover in Tasmania. A majority of this cost (around \$183 000) occurred on 23 February. At midday there was a reclassification of the Farrell to Sheffield No.1 and 2 220kV lines as a credible contingency due to lightning. Constraints were invoked which set the requirement for lower 6 second services which went from zero at midday to 134 MW at 12.20 pm. As a result the price of Raise 6 second services reaching \$1126/MW at 12.20 pm.

**Figure 8 : Daily frequency control ancillary service cost**



## 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.

### South Australia – Sunday 22 February

On this day, there were two occasions in South Australia where the spot price was greater than three times the South Australian weekly average price of \$57/MWh and above \$250/MWh.

**Table 3 : Price, Demand and Availability – South Australia**

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
<b>5.30 pm</b>	251	65	65	2657	2568	2438	2757	2718	2770
<b>6 pm</b>	1988	64	64.98	2674	2572	2461	2710	2723	2762

Conditions at the time saw demand around 100 MW higher than that forecast four hours ahead. Available generation was close to forecast four hours ahead. Wind generation was low at around 140 MW.

System normal constraints were forcing flows across Murraylink into Victoria from 4 pm until 5.35 pm by up to 72 MW. From 5.40 pm exports into South Australia from Victoria were limited to around 80 MW. Heywood was importing into South Australia at around 460 MW.

**Table 4 : Rebids for 5.30 pm**

Time in	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
<b>4.25 pm</b>	4.35 pm	AGL	Torrens Island	160	65	288	1620~P~080 CHG in pipeline COND~802 avoid UNORTH overrun SEAGAS

**Table 5 : Rebids for 6 pm**

Time in	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
<b>4.25 pm</b>	4.35 pm	AGL	Torrens Island	160	65	288	1620~P~080 CHG in pipeline COND~802 avoid UNORTH overrun SEAGAS
<b>5.33 pm</b>	5.40 pm	AGL	Torrens Island	200	288	351	1730~P~080 CHG in pipeline COND~802 avoid UNORTH overrun SEAGAS

Time in	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
5.43 pm	5.50 pm	AGL	Torrens Island	160	55	351	1740~P~080 CHG in pipeline COND~802 avoid UNORTH overrun SEAGAS
5.43 pm	5.50 pm	Alinta	Northern	243	55	10 500	1742A dry creek started@17:43
5.53 pm	6 pm	AGL	Torrens Island	320	351	10 760	1750~P~080 CHG in pipeline COND~802 avoid UNORTH overrun SEAGAS
<b>Total capacity rebid from low to high prices</b>				<b>1 083</b>			

At 5.10 pm, demand increased by 30 MW and wind generation decreased by 52 MW to 138 MW.

With low-priced capacity either, fully dispatched or trapped in FCAS, the dispatch price increased from \$64.99/MWh at 5.05 pm to \$288/MWh at 5.10 pm.

Prices remained around \$250/MWh for the following dispatch intervals as conditions remained largely unchanged and there was no other rebidding to increase available capacity below the market price. The dispatch price increased to \$350/MWh at 5.50 pm, and then to \$10 500/MWh at 6 pm as further rebids became effective.

### South Australia and Victoria – Monday 23 February

There was one occasion in South Australia where the spot price was greater than three times the South Australian weekly average price of \$57/MWh and above \$250/MWh and another occasion where the spot price in Victoria was below -\$100/MWh.

**Table 6 : Price, Demand and Availability – South Australia**

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
Midnight	2265	45.99	44.97	1852	1985	1913	2551	2569	2590

**Table 7 : Price, Demand and Availability – Victoria**

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
Midnight	-152	27.60	29.73	5316	5255	5441	10 238	10 110	10 275

In South Australia, demand was 133 MW lower than forecast four hours before and available generation was close to forecast. In Victoria, demand was 61 MW lower than forecast four hours before, and available generation was 128 MW higher than forecast four hours before.



In South Australia, demand increased by 208 MW from 1811 MW at 11.30 pm to 2018 MW at 11.35 pm. This was related to off peak hot water load.

The change in demand could not be met by South Australian generators who were either off-line, ramp rate up constrained or fully dispatched. Heywood was importing at its limit and as a result Murraylink flow exceeded its import limit causing a system normal constraint managing flow across Murraylink and the Vic to NSW interconnector to violate. This saw the dispatch price in South Australia increase from \$46/MWh at 11.30 pm to the price cap at 11.35 pm.

The violated constraint also caused the target flows on the VIC to NSW interconnector to switch from exporting 28 MW into New South Wales to importing into Victoria at 439 MW. Excess generation in Victoria was then constrained down or off and the price was set at the price floor at 11.35 pm in Victoria.

### Tasmania – Sunday 22 February

There was one occasion where the spot price in Tasmania was greater than three times the Tasmania weekly average price of \$50/MWh and above \$250/MWh.

**Table 8 : Price, Demand and Availability – Tasmania**

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
<b>6 pm</b>	2296	42	45	1128	1088	1096	1876	1963	1980

Demand was 40 MW higher than forecast four hours before. Available generation was 87 MW lower than forecast four hours before.

At 5.48 pm, effective from 5.55 pm, Hydro Tasmania reduced the available capacity of Gordon by 226 MW all of which was priced below \$42/MWh. The reason given was “1750P unit trip of GO1 and GO2 due to network event”. As a result, at 6 pm, a constraint used to avoid the overload of a Farrell to Sheffield 220 kV line violated. This resulted in a number of Tasmanian generators being constrained down by around 110 MW and flows were forced out of Tasmania across Basslink at 121 MW.

With low-priced capacity either constrained, ramp rate limited, fully dispatched, trapped or stranded in FCAS, the dispatch price increased from \$98.02/MWh at 5.55 pm to \$13 500/MWh at 6 pm.

There were no significant rebids.

## Queensland – Tuesday 24 February

There were three occasions where the spot price in Queensland was greater than three times the Queensland weekly average price of \$48/MWh and above \$250/MWh.

**Table 9 : Price, Demand and Availability – 24 February**

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
<b>5 pm</b>	2325	36.46	41.37	7447	7381	7436	9917	9940	9840

Demand and available generation was close to forecast four hours ahead.

Imports into Queensland across QNI were limited to around 240 MW due to a system normal constraint which prevents voltage collapse in New South Wales for the loss of Kogan Creek. Flow across Terranora was being forced into New South Wales at 50 MW.

**Table 10 : Rebids for 5 pm**

Time in	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
<b>3.14 pm</b>	3.25 pm	CS Energy	Gladstone	60	34	13 500	1638A change in 5min PD RRP - SL
<b>4.22 pm</b>	4.30 pm	Stanwell	Stanwell	520	<35	13 499	1620A material change in QNI flow DI1620
<b>4.33 pm</b>	4.40 pm	Millmerran	Millmerran	102	7	13 500	16:32 A change in 5min PD RRP - SL
<b>4.38 pm</b>	4.45 pm	Callide	Callide C	53	-1000	13 500	1638A change in 5min PD RRP - SL
<b>4.44 pm</b>	4.55 pm	CS Energy	Gladstone	150	34	13 500	1643A interconnector constraint-binding in PD-SL
<b>4.48 pm</b>	4.55 pm	CS Energy	Gladstone	10	0	13 500	1648P provide steam for other units-SL
<b>Total capacity rebid from low to high prices</b>				<b>895</b>			

At 4.50 pm the system normal constraint bound and the dispatch price increased from \$41/MWh at 4.45 pm to \$301.01/MWh at 4.50 pm. At 4.55 pm, when CS Energy's became effective, low-priced capacity either ramp rate limited, fully dispatched or stranded in FCAS and the dispatch price increased to \$13 499/MWh.

## Queensland –Thursday 26 February

**Table 11 : Price, Demand and Availability – 26 February**

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
<b>4.30 pm</b>	263	53.80	65.49	7405	7320	7302	9665	9750	9882
<b>5.00 pm</b>	280	55.88	68.20	7412	7397	7370	9633	9693	9778

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

A constraint used to avoid the voltage collapse on the loss of Kogan Creek limited flows into Queensland from New South Wales to around 210 MW. Flow into Queensland across Terranora was being limited to around 22 MW due to its long term outage.

**Table 12 : Rebids for 4.30 pm**

Time in	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
<b>3.06 pm</b>	3.15 pm	Stanwell	Stanwell	510	<70	13 499	1500A material change in QLD generation: B2PS DI1500
<b>3.43 pm</b>	3.50 pm	Millmerran	Millmerran	185	7	13 500	15:43 A change in 5MIN PD RRP - SL
<b>4.07 pm</b>	4.15 pm	Alinta	Braemar	18	<959	13 500	1605A dispatch \$299 V 5PD \$48.59@16:07
<b>4.15 pm</b>	4.25 pm	Stanwell	Kareeya & Tarong	91	<20	>13 100	1615A material change in QLD generation: wivenhoe online
<b>4.18 pm</b>	4.25 pm	Millmerran	Millmerran	20	7	13 500	16:18 A change in 5min PD RRP - SL
<b>4.17 pm</b>	4.25 pm	Callide	Callide C	40	-1000	13 500	1614A change in 5min PD RRP - SL
<b>4.21 pm</b>	4.30 pm	Callide	Callide C	20	14	N/A	1620P HI PA motor load very poor CV coal
<b>Total capacity rebid from low to high prices</b>				<b>864</b>			

**Table 13 : Rebids for 5 pm**

Time in	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
<b>4.26 pm</b>	4.35 pm	CS Energy	Gladstone	75	<45	296	1624A dispatch price higher than 30MIN forecast-SL

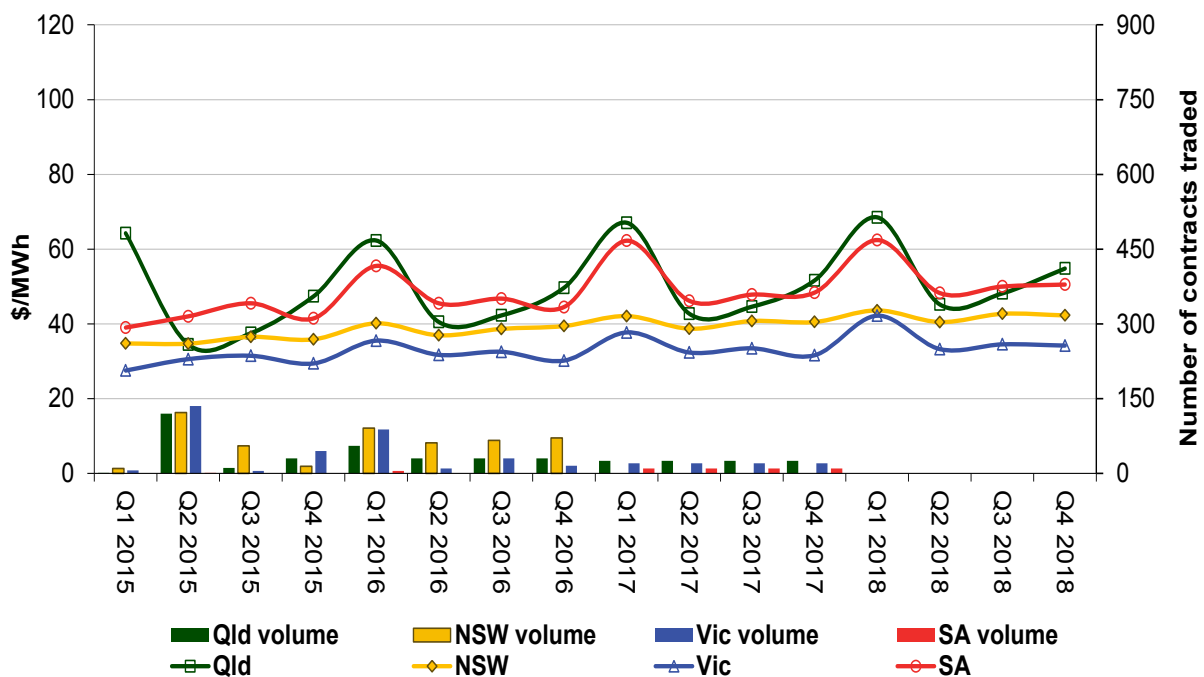
Time in	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
4.27 pm	4.35 pm	Stanwell	Stanwell	705	<70	>13 100	1630A material change in QLD generation: townsville
4.34 pm	4.45 pm	Millmerran	Millmerran	190	7	13 500	16:34 A change in 5min PD RRP - SL
4.52 pm	5 pm	Callide	Callide C	10	-1000	13 500	1651A change in 5MIN PD RRP - SL
4.52 pm	5 pm	Arrow	Braemar	129	14	13 500	1650P change in portfolio output SL
<b>Total capacity rebid from low to high prices</b>				<b>1109</b>			

At 4.10 pm, demand increased by 131 MW with low-priced capacity either ramp rate limited, fully dispatched or stranded in FCAS, the dispatch price increased from \$95.49/MWh at 4.05 pm to \$299/MWh at 4.10 pm. The dispatch price stayed between \$200/MWh and \$300/MWh for the duration of the 4.30 pm and 5 pm trading intervals.

## 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 Q1 2015 – Q4 2018**

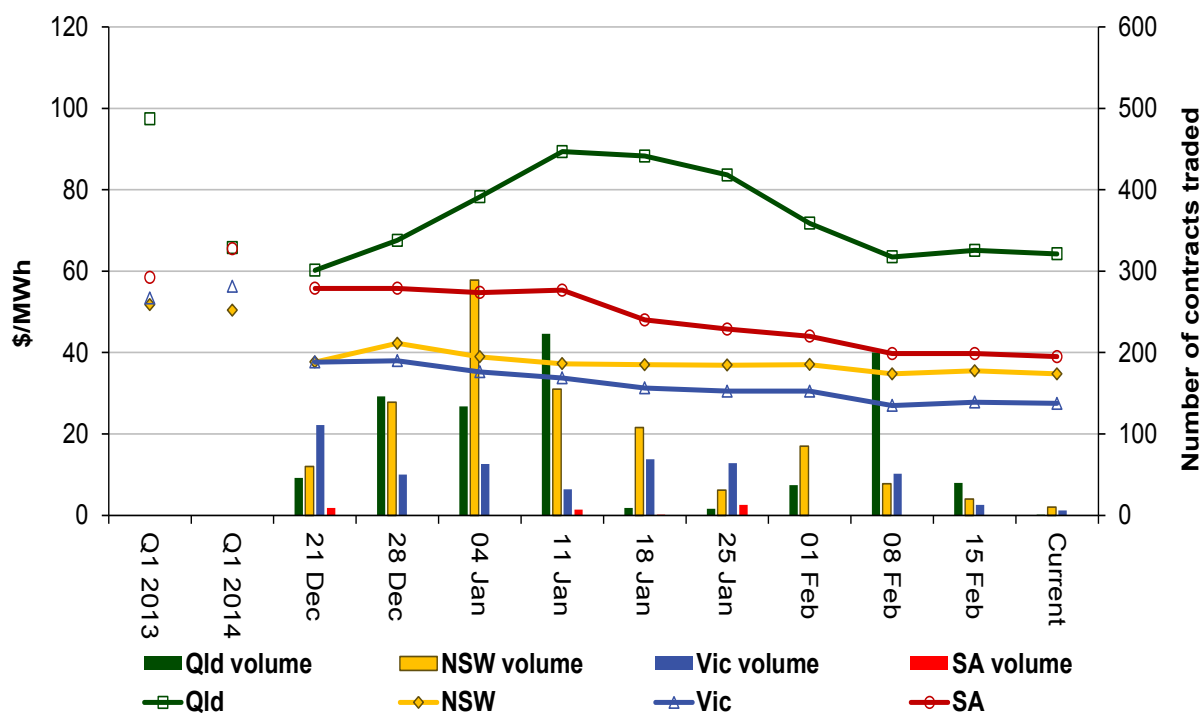


Source: ASXEnergy.com.au

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.

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



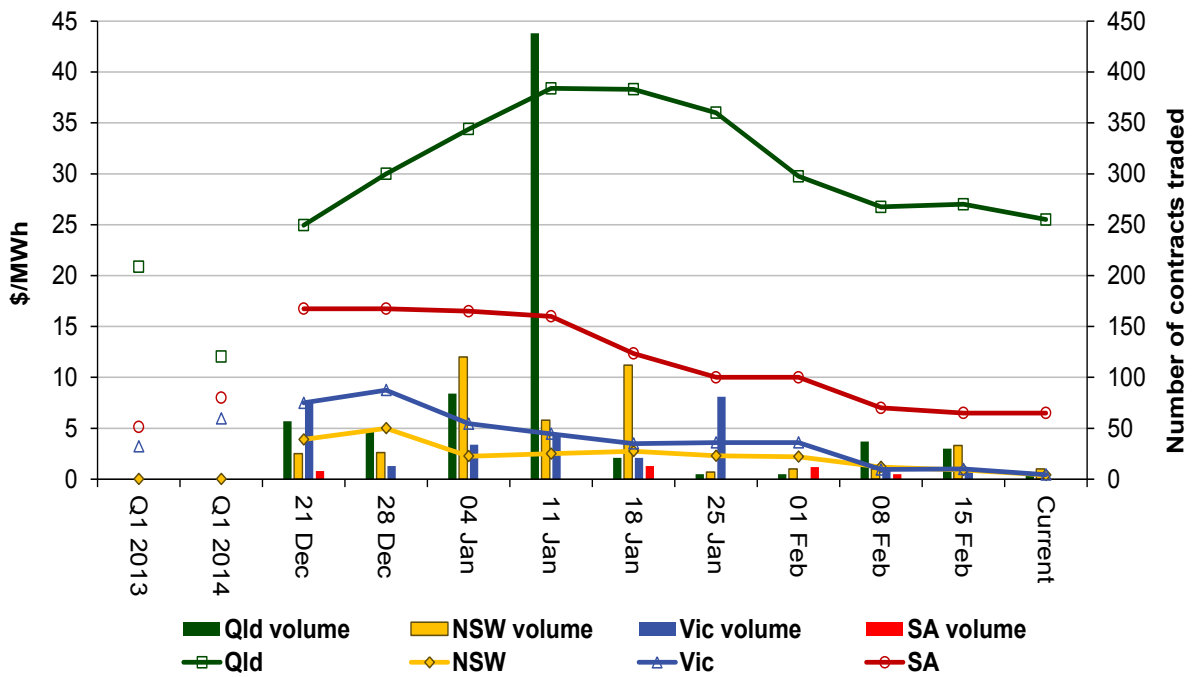
Note: Base contract prices are shown for each of the current week and the previous 9 weeks, with average prices shown for yearly periods 1 and 2 years prior to the current year.

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.

**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**

**March 2015**