

## 13 – 19 March 2016

### 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 13 to 19 March 2016. There were eight occasions where the spot price in Queensland was greater than three times the Queensland weekly average price of \$119/MWh and above \$250/MWh. There was one occasion where the spot price in Tasmania was greater than three times the Tasmania weekly average price of \$253/MWh and above \$250/MWh.

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

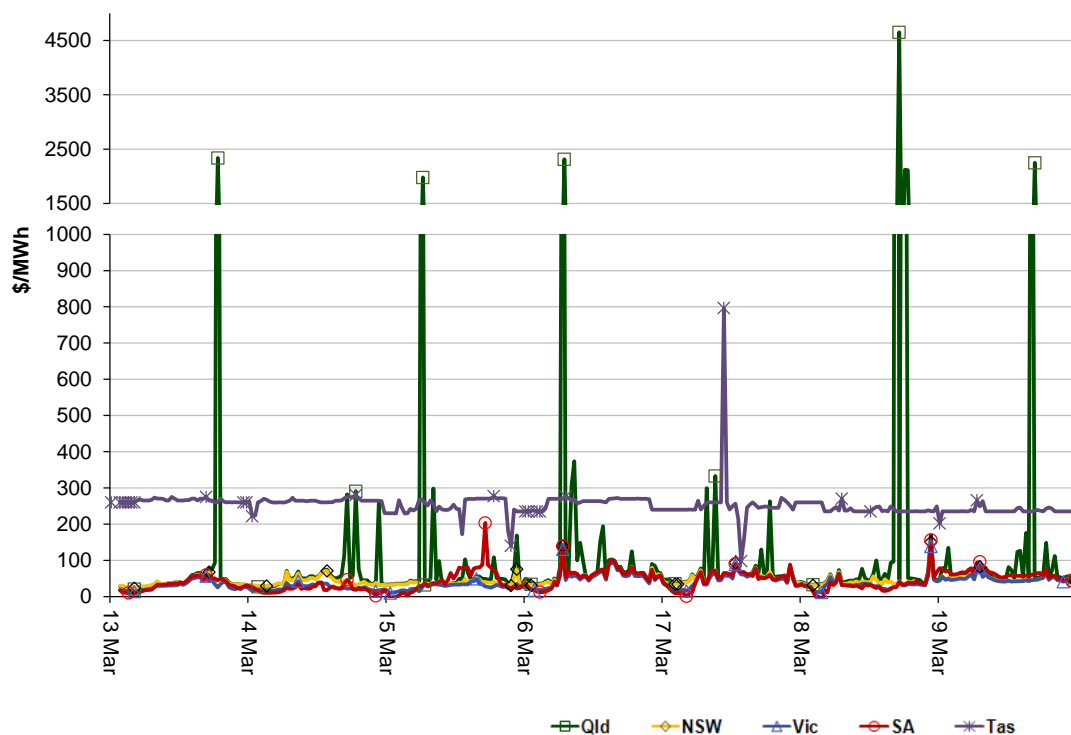
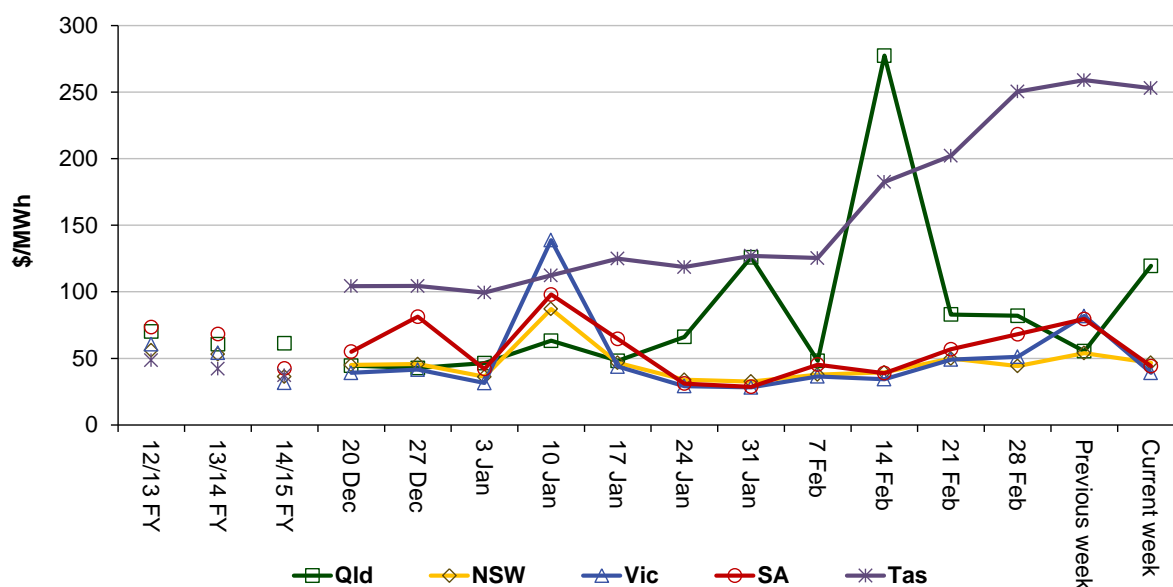


Figure 2 shows the volume weighted average (VWA) prices for the current week (with prices shown in Table 1) and the preceding 12 weeks, as well as the VWA price over the previous 3 financial years.

**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	119	47	39	44	253
14-15 financial YTD	71	36	32	41	38
15-16 financial YTD	60	46	44	61	86

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 195 trading intervals throughout the week where actual prices varied significantly from forecasts. This compares to the weekly average in 2015 of 133 counts and the average in 2014 of 71. 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**

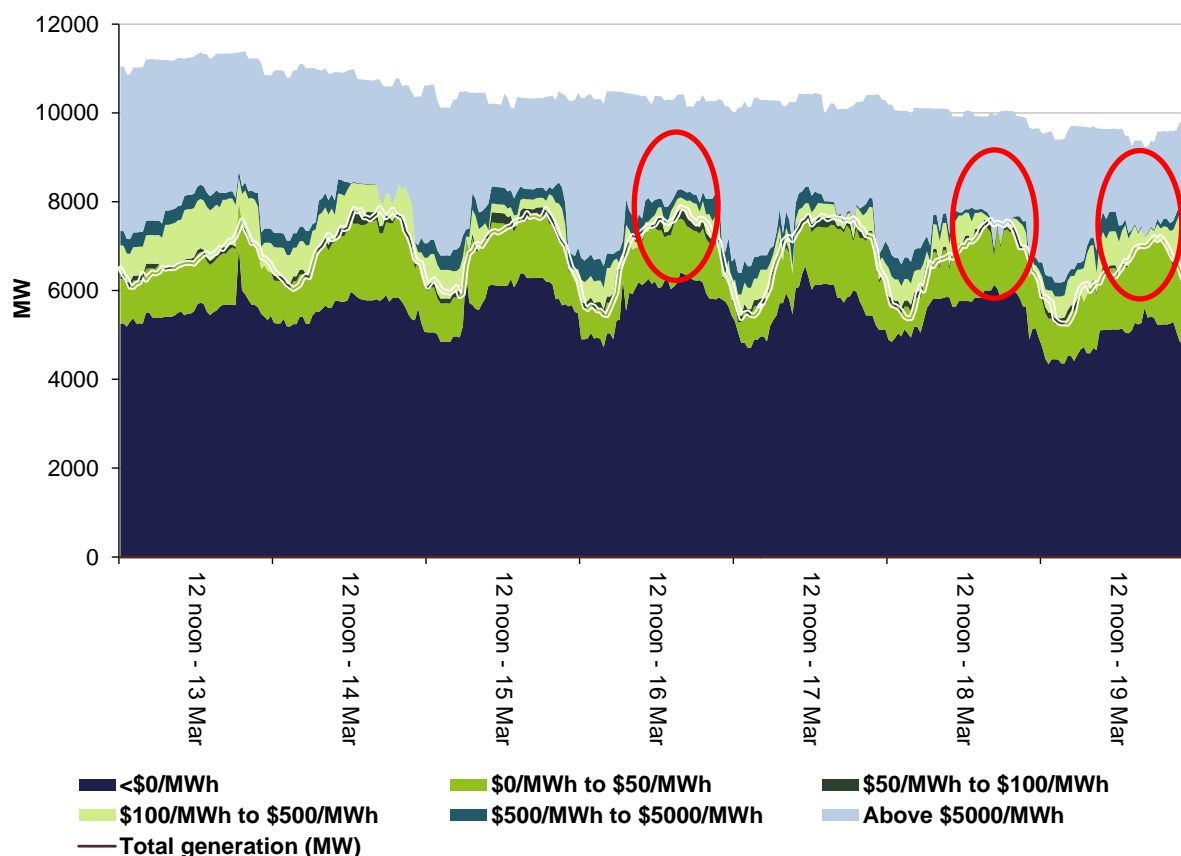
	Availability	Demand	Network	Combination
% of total above forecast	9	13	0	8
% of total below forecast	5	37	0	27

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

## Generation and bidding patterns

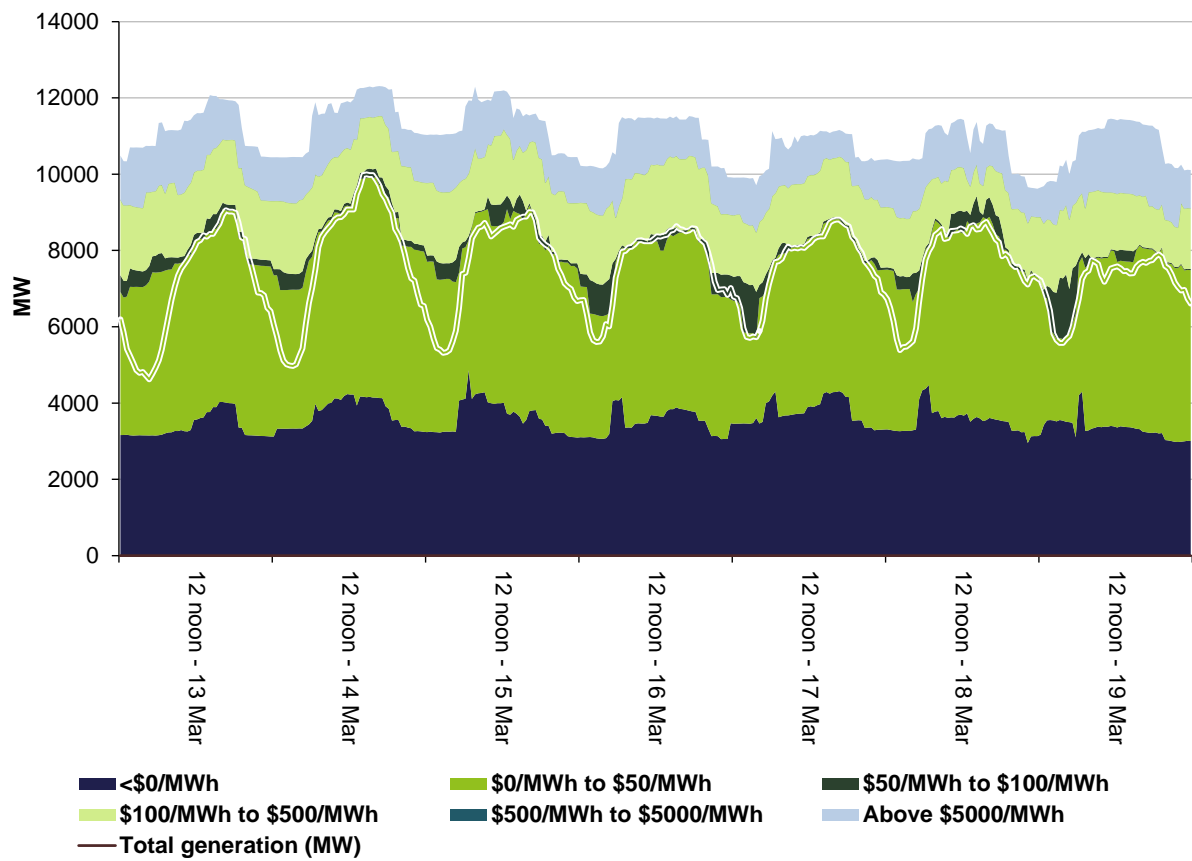
The AER reviews generator bidding as part of its market monitoring to better understand the drivers behind price variations. Figure 3 to Figure 7 show, the total generation dispatched and the amounts of capacity offered within certain price bands for each 30 minute trading interval in each region.

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

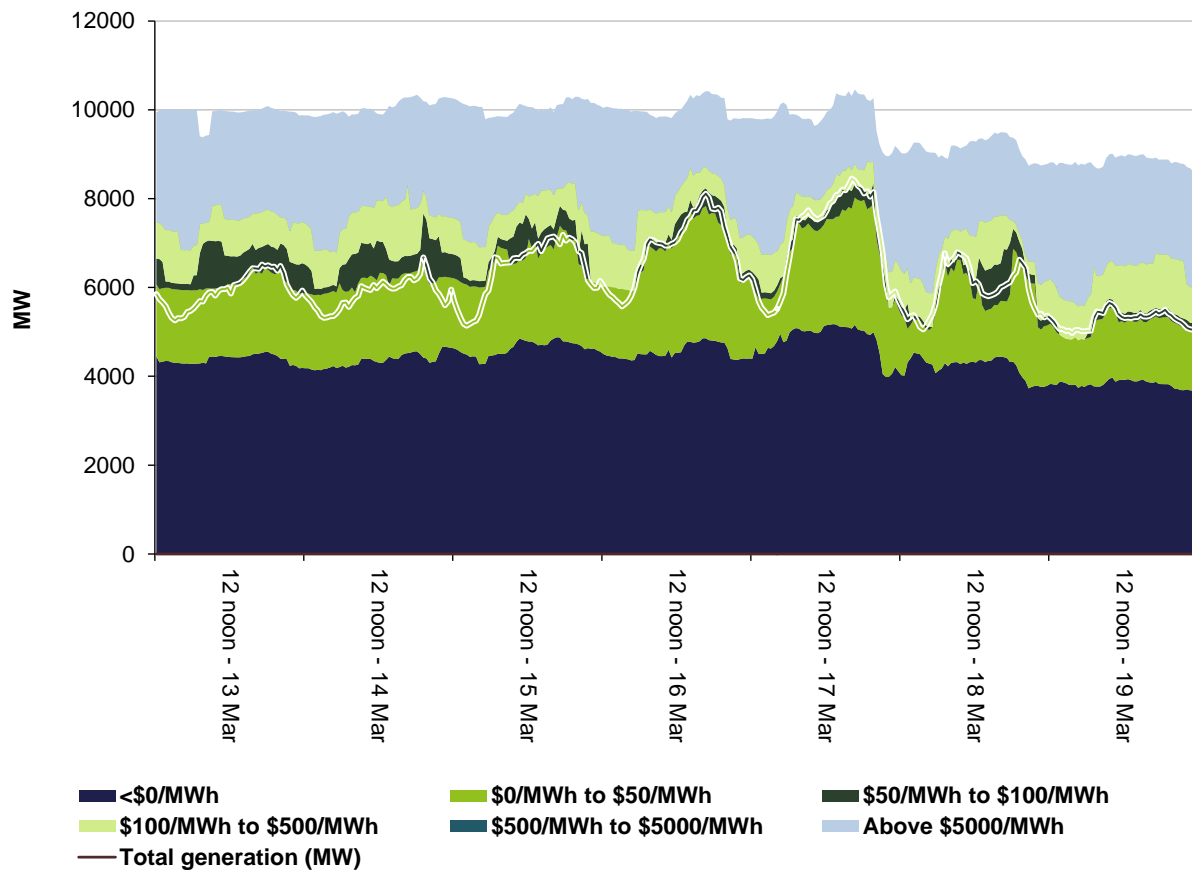


The red ellipses highlight rebidding that resulted in high prices detailed in “Detailed market analysis of significant price events”.

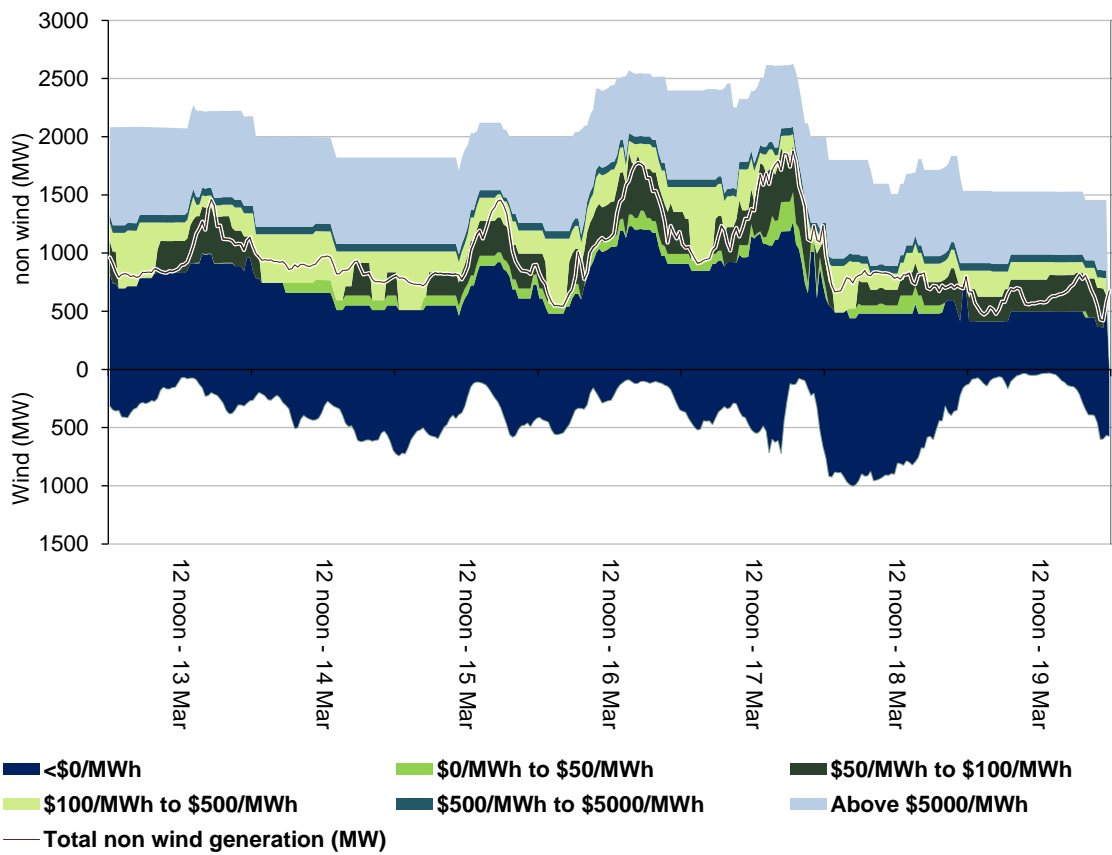
**Figure 4: New South Wales generation and bidding patterns**



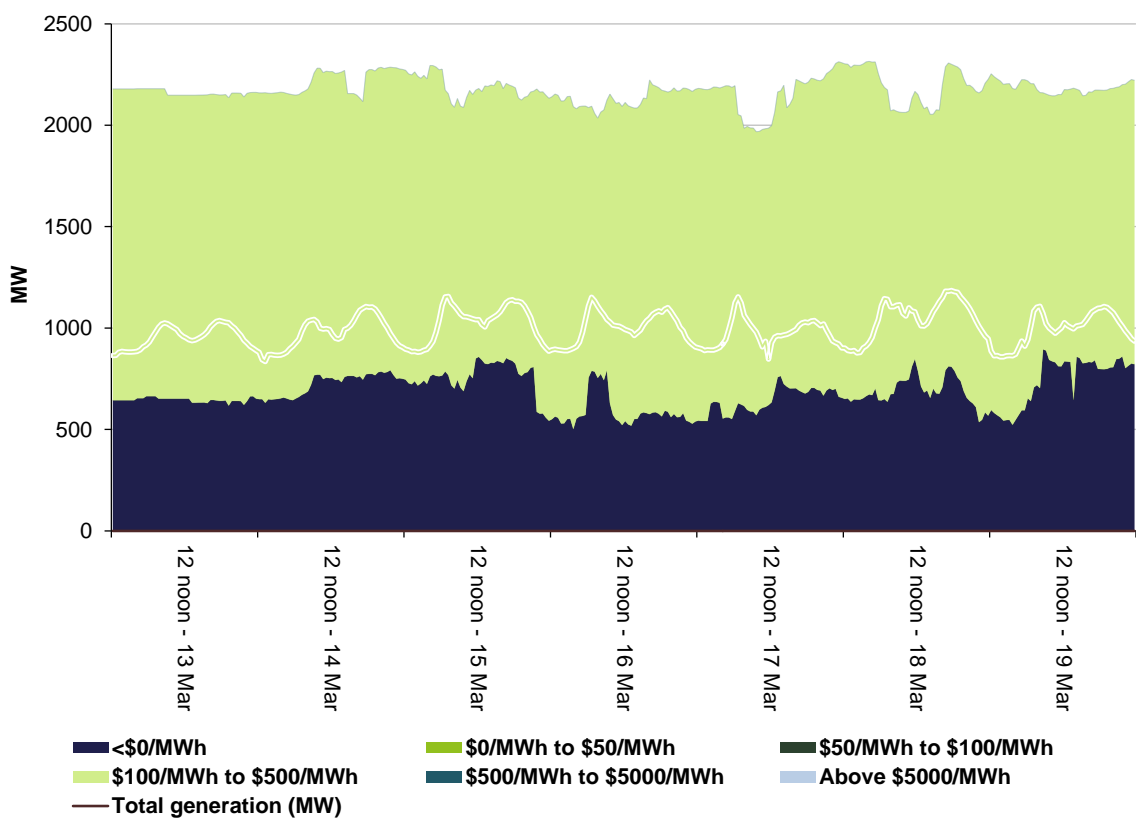
**Figure 5: Victoria generation and bidding patterns**



**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.

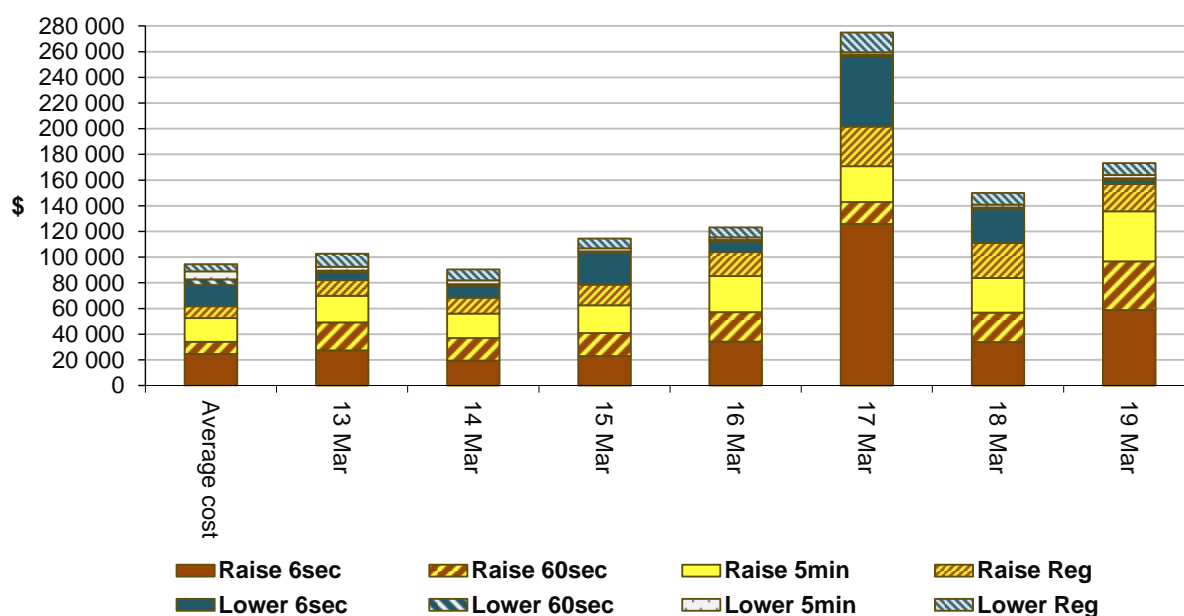
The Electricity Rules stipulate that generators pay for raise contingency services and customers pay for lower contingency services. Regulation services are paid for on a “causer pays” basis determined every four weeks by AEMO.

The total cost of FCAS on the mainland for the week was \$698 000 or less than 1 per cent of energy turnover on the mainland.

The total cost of FCAS in Tasmania for the week was \$330 500 or less than 1 per cent of energy turnover in Tasmania.

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.

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



In Tasmania on 17 March there were high raise 6 second prices of \$7750/MW and \$7137/MW at 10.35 am and 10.40 pm respectively at a cost of around \$100 000. These were a result of Gordon reducing the availability of raise 6 second services by 45 MW over two rebids.

## 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 eight occasions where the spot price in Queensland was greater than three times the Queensland weekly average price of \$119/MWh and above \$250/MWh.

#### Sunday, 13 March

**Table 3: Price, Demand and Availability**

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>7 pm</b>	2335.93	199.49	115.14	7287	7302	7404	11 360	11 319	11 446

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

During the high priced period, QNI and Terranora interconnectors were constrained by system normal constraints which limited flows into Queensland to approximately 205 MW and 12 MW respectively.

As a result of a 182 MW increase in demand, with low priced capacity either ramp rate limited or stranded in FCAS, the dispatch price increased from \$60/MWh at 6.40 pm to \$13 789/MWh at 6.45 pm. Following rebids of high priced capacity to lower prices, the price returned to around \$35/MWh for the remainder of the trading interval.

#### Tuesday, 15 March

**Table 4: Price, Demand and Availability**

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>6.30 am</b>	1977.85	31.65	30.93	6044	6171	6147	10 489	10 660	10 695

Conditions at the time saw demand close to forecast and availability 170 MW lower than forecast four hours ahead. Flows across QNI into Queensland were being limited to around 30 MW and flows across Terranora were being forced into New South Wales by around 20 MW (counter-price) by ramping constraints used to manage the planned outage of an Armidale to Tamworth line.

**Table 5: Rebids for the 6.30 am trading interval**

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
5.57 am	6.05 am	CS Energy	Gladstone	80	<27	13800	0556A DISPATCH PRICE HIGHER THAN 5MIN FORECAST-SL

At 6.05 am there was a 122 MW increase in demand and the above rebid became effective. With lower priced generation either ramp rate limited or stranded in FCAS, the dispatch price increased from \$49/MWh at 6 am to \$13 800/MWh at 6.05 am. In response to the high price participants rebid around 1500 MW of capacity to the price floor and the dispatch price fell to the price floor at 6.20 am and 6.25 am.

**Wednesday, 16 March**

**Table 6: Price, Demand and Availability**

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>7 am</b>	2313.04	296.94	296.94	6523	6529	6472	10 465	10 425	10 425
<b>9 am</b>	373.44	345.72	345.72	6994	7012	6971	10 419	10 435	10 395

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

Flows across QNI and Terranora were being forced into New South Wales by around 25 MW each (counter-price) by ramping constraints used to manage the planned outage of an Armidale to Tamworth line.

**Table 7: Rebids for the 7 am trading interval**

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
6.45 am	6.55 am	CS Energy	Gladstone	120	<27	13 800	0644A DISPATCH PRICE HIGHER THAN 30MIN FORECAST-SL
6.48 am	6.55 am	Callide Power Trading	Callide C	43	-1000	13 800	0647A SCADA OAKEY 1 STARTED

As a result of the above rebids, with cheaper priced generation fully dispatched, ramp rate limited or stranded in FCAS, the dispatch price increased from \$200/MWh at 6.50 am to \$12 948/MWh at 6.55 am. The price fell to \$25/MWh at 7 pm as a result of the rebidding of capacity to the price floor and a 150 MW fall in demand.

The price at 9 am was close to forecast.



Friday, 18 March

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

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>	4648.35	48.90	1400.69	7661	7719	7854	10 002	10 046	10 032
<b>6 pm</b>	2121.76	38.58	1400.69	7563	7580	7708	10 035	10 039	10 035
<b>6.30 pm</b>	2114.80	48.89	663.02	7489	7513	7701	10 043	10 052	10 038

The four hour ahead forecast demand was up to 198 MW lower than the 12 hour forecast demand which resulted in a significant reduction in forecast prices. Actual demand and availability were close to forecast four hours ahead.

**Table 9: Rebids for the 5 pm trading interval**

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
4.28 pm	4.35 pm	Origin Energy	Darling Downs	140	-1	12 497	1627A DEC IN QLD DEM - 5PD 7537MW < 30PD 7769MW @ 1630 SL
4.46 pm	4.55 pm	CS Energy	Gladstone	290	<300	13 800	1646A DISPATCH PRICE HIGHER THAN 30MIN FORECAST-SL
4.47 pm	4.55 pm	CS Energy	Callide B	160	17	13 800	1646A DISPATCH PRICE HIGHER THAN 30MIN FORECAST-SL
4.47 pm	4.55 pm	Callide Power Trading	Callide C	43	-1000	13 800	1644A RRP ABOVE 5MIN PD FOR DI 1650
4.49 pm	5.00 pm	ERM Power	Oakey	46	1401	13 800	1649P AMBIENT CONDITIONS - MATCH BID TO EXPECTED UNIT OUTPUT
4.52 pm	5.00 pm	Origin Energy	Roma	-64	12 297	N/A	1650A AVOID UNECONOMIC START SL
4.53 pm	5.00 pm	Callide Power Trading	Callide C	40	-1000	13 800	1652A RRP ABOVE 5MIN PD FOR DI 1655
4.53 pm	5.00 pm	Millmerran Energy Trader	Millmerran	112	-1000	13 800	16:53 A RRP ABOVE 5MIN PD FOR DI 1655

As a result of the above rebidding, with cheaper priced generation fully dispatched or stranded in FCAS the price increased from \$61/MWh at 4.45 pm to \$1400/MWh at 4.50 pm and then to the close to the price cap for the remainder of the trading interval.

**Table 10: Rebids for the 6 pm trading interval**

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
5.53 pm	6.00 pm	CS Energy	Wivenhoe	120	-1000	13 800	1752A DISPATCH DEMAND HIGHER THAN 30MIN FORECAST-SL
5.53 pm	6.00 pm	Callide Power Trading	Callide C	42	-1000	13 800	1752A -120 MW CHANGE IN 5MPD DEMAND DI 18:00 RUNS 1745/1750
5.53 pm	6.00 pm	CS Energy	Gladstone	170	<300	13 800	1752A DISPATCH DEMAND HIGHER THAN 30MIN FORECAST-SL

As a result of the above rebidding, with cheaper priced generation fully dispatched or stranded in FCAS the price increased from \$49/MWh at 5.55 pm to \$12 497/MWh at 6 pm.

**Table 11: Rebids for the 6.30 pm trading interval**

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
5.53 pm		Origin Energy	Darling Downs	140	-1	12 497	1751A CONSTRAINT MANAGEMENT - N^Q_NIL_A SL
5.58 pm	6.05 pm	Alinta Energy	Braemar A	83	>49	34	1750~A~SPOT PRICE \$12,497 HIGHER THAN PD~
6.21 pm	6.30 pm	Callide Power Trading	Callide C	42	-1000	13 800	1819A 18:00 RRP SPIKE ABOVE PD
6.22 pm	6.30 pm	Alinta Energy	Braemar A	138	34	12 496	1815~A~SPOT PRICE 5PD 39.82 HIGHER THAN 30PD 36~

As a result of the above rebidding and an 80 MW increase in demand, with cheaper priced generation fully dispatched or ramp rate limited the price increased from \$40/MWh at 6.25 pm to \$12 497/MWh at 6.30 pm.

**Saturday, 19 March**

**Table 12: Price, Demand and Availability**

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>	2247.63	299.95	1400.69	7323	7213	7307	9257	9646	9798

Conditions at the time saw demand 110 MW greater than forecast four hours ahead and availability approximately 400 MW below forecast four hours ahead.

**Table 13: Rebids for the 4.30 pm trading interval**

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
2.53 pm		CS Energy	Wivenhoe	-250	<1400	N/A	1452P TECHNICAL ISSUES-UNIT LOCKOUT EXTENDED-SL
4.00 pm	4.10 pm	Callide Power Trading	Callide C	-150	-1000	N/A	1559P REHEATER SPLIT, CLINKER DELOAD
4.12 pm	4.20 pm	Stanwell Corporation	Tarong	120	49	13 800	1601P DEMAND LOWER THAN PD 1605-1610
4.13 pm	4.20 pm	CS Energy	Gladstone	20	>300	<36	1613P PORTFOLIO REARRANGEMENT DUE TO-CALLIDE C REDUCTION-SL
4.16 pm	4.25 pm	CS Energy	Wivenhoe	30	0	13 800	1615P TECHNICAL ISSUES-UNIT TX TEMPERATURE ISSUE-SL

As a result of the above rebidding, with cheaper priced generation fully dispatched, ramp rate limited or stranded in FCAS, the price increased from \$60/MWh at 4.20 pm to \$12 497/MWh at 4.25 pm. The price reduced to previous levels at 4.30 pm following a 280 MW fall in demand and rebidding of high priced capacity to lower prices.

## Tasmania

There was one occasion where the spot price in Tasmania was greater than three times the Tasmania weekly average price of \$253/MWh and above \$250/MWh.

### Thursday, 17 March

**Table 14: Price, Demand and Availability**

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>11 am</b>	796.60	280.18	280.16	732	875	886	1979	2002	1991

Conditions at the time saw demand approximately 100 MW below forecast four hours ahead and availability close to forecast.

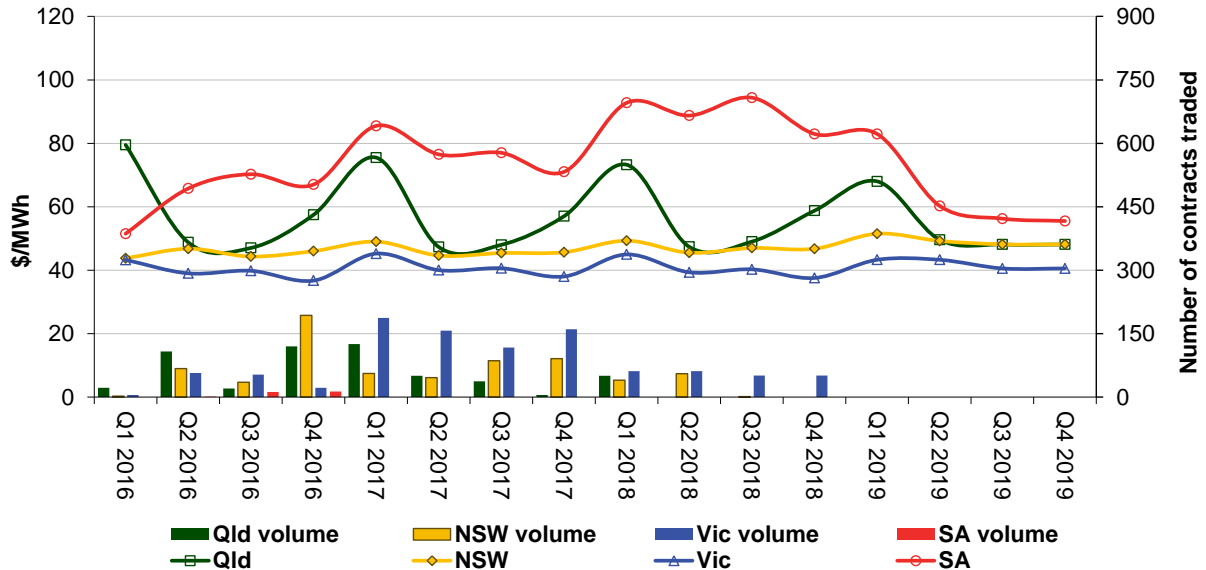
The energy price was \$1936/MWh at 10.35 am and then \$1782/MWh at 10.40 am. These high energy prices were due to the co-optimisation of energy with FCAS as a result of Hydro Tasmania withdrawing capacity at Gordon from FCAS.

Energy prices then returned to previous levels of around \$270/MWh for the remainder of the trading interval.

## 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.

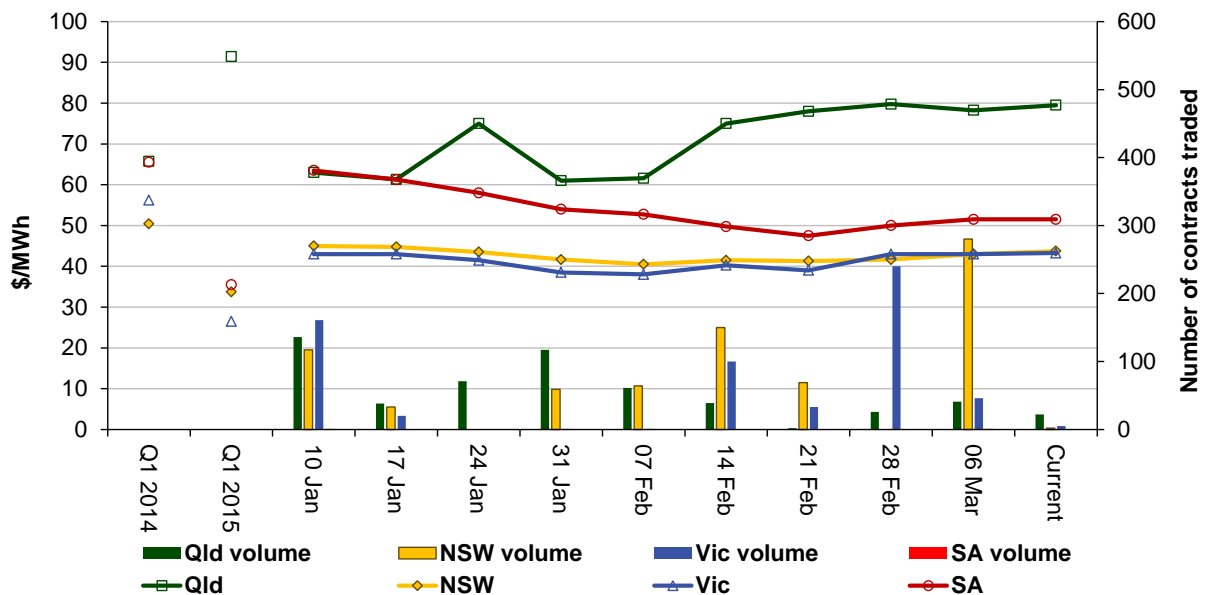
**Figure 9: Quarterly base future prices Q1 2016 – Q4 2019**



Source: ASXEnergy.com.au

Figure 10 shows how the price for each regional Quarter 1 2016 base contract has changed over the last 10 weeks (as well as the total number of trades each week). The closing quarter 1 2014 and quarter 1 2015 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 2016 base contracts over the past 10 weeks (and the past 2 years)**



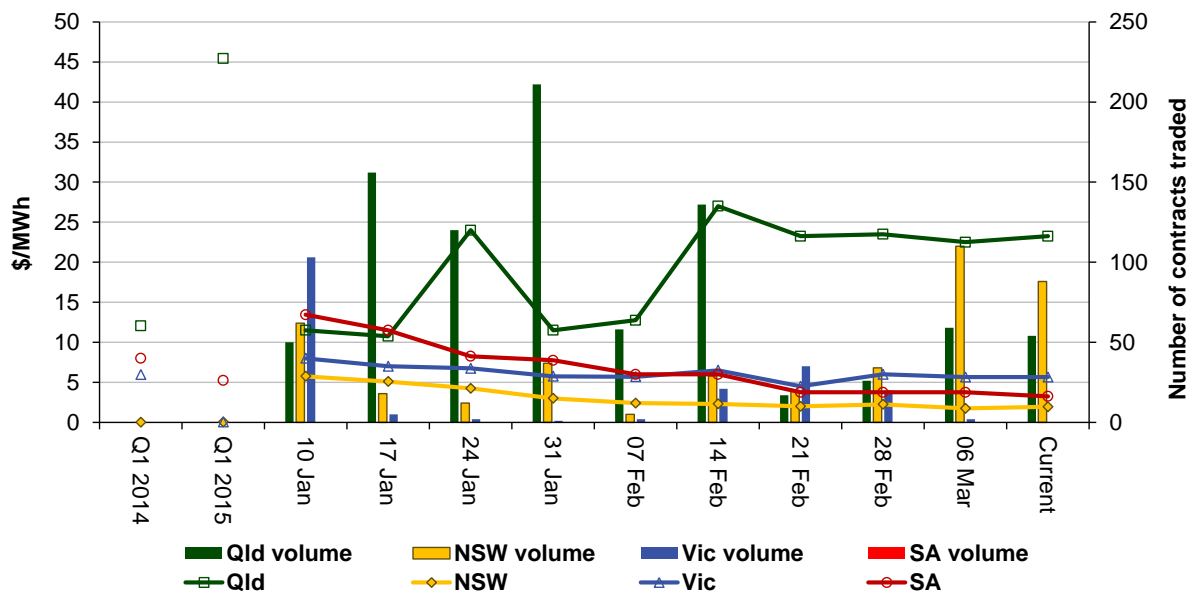
Note. Base contract prices are shown for each of the current week and the previous 9 weeks, with average prices shown for periods 1 and 2 years prior to the current year.

Source: ASXEnergy.com.au

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

Figure 11 shows how the price for each regional Quarter 1 2016 cap contract has changed over the last 10 weeks (as well as the total number of trades each week). The closing quarter 1 2014 and quarter 1 2015 prices are also shown.

**Figure 11: Price of Q1 2016 cap contracts over the past 10 weeks (and the past 2 years)**



Source: ASXEnergy.com.au

**Australian Energy Regulator**  
**April 2016**