

## 20 – 26 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 20 to 26 March 2016. There were seven occasions where the spot price in Queensland was greater than three times the Queensland weekly average price of \$76/MWh and above \$250/MWh.

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

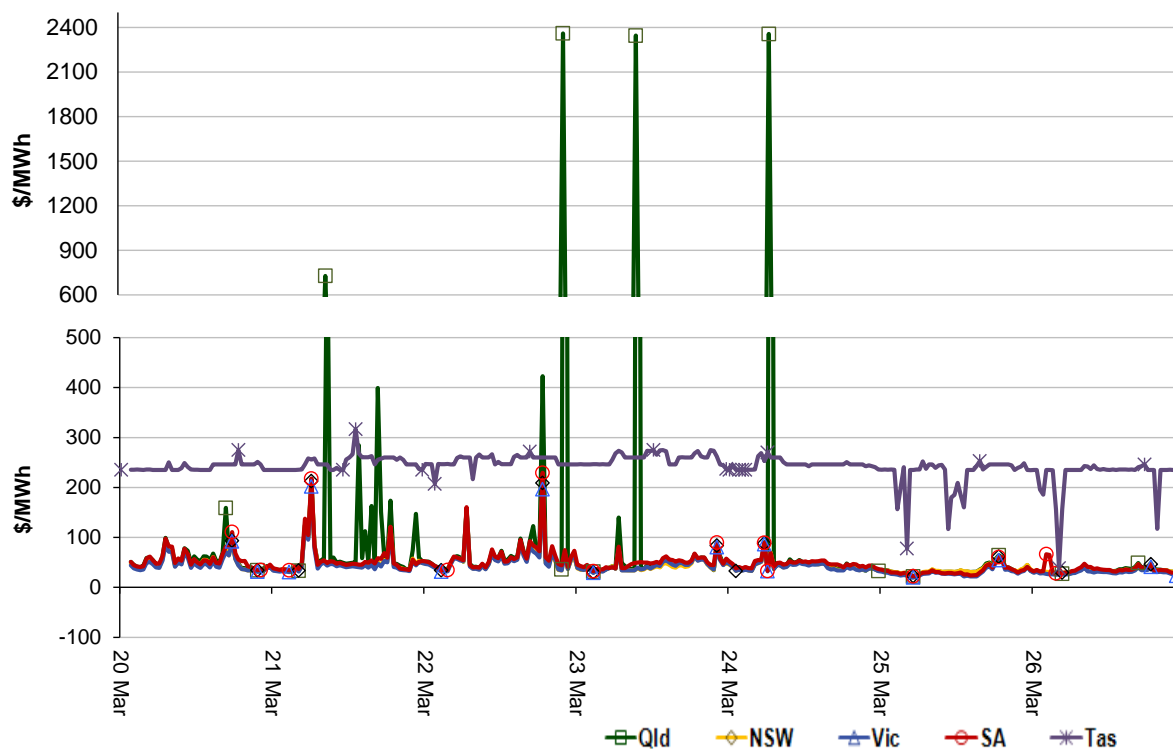
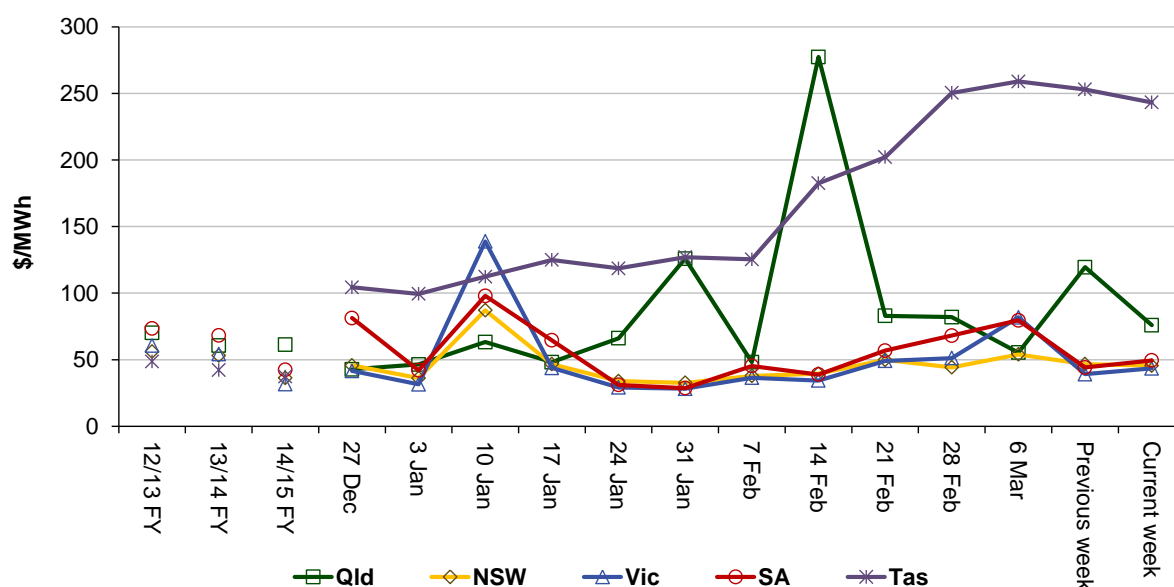


Figure 2 shows the volume weighted average (VWA) prices for the current week (with prices shown in Table 1) and the preceding 12 weeks, as well as the VWA price over the previous 3 financial years.

**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	76	46	43	49	243
14-15 financial YTD	71	36	31	40	38
15-16 financial YTD	60	46	44	61	89

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 173 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**

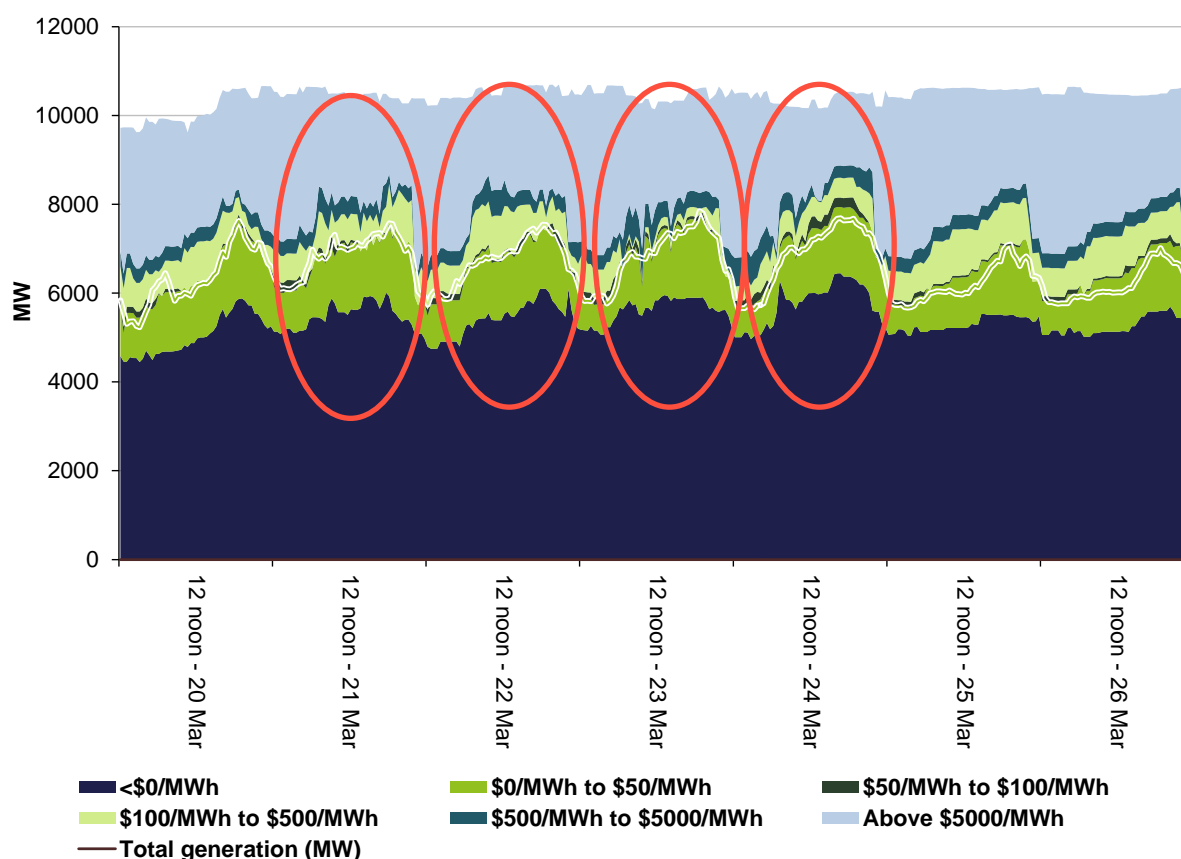
	Availability	Demand	Network	Combination
% of total above forecast	17	34	0	9
% of total below forecast	6	28	0	7

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

## Generation and bidding patterns

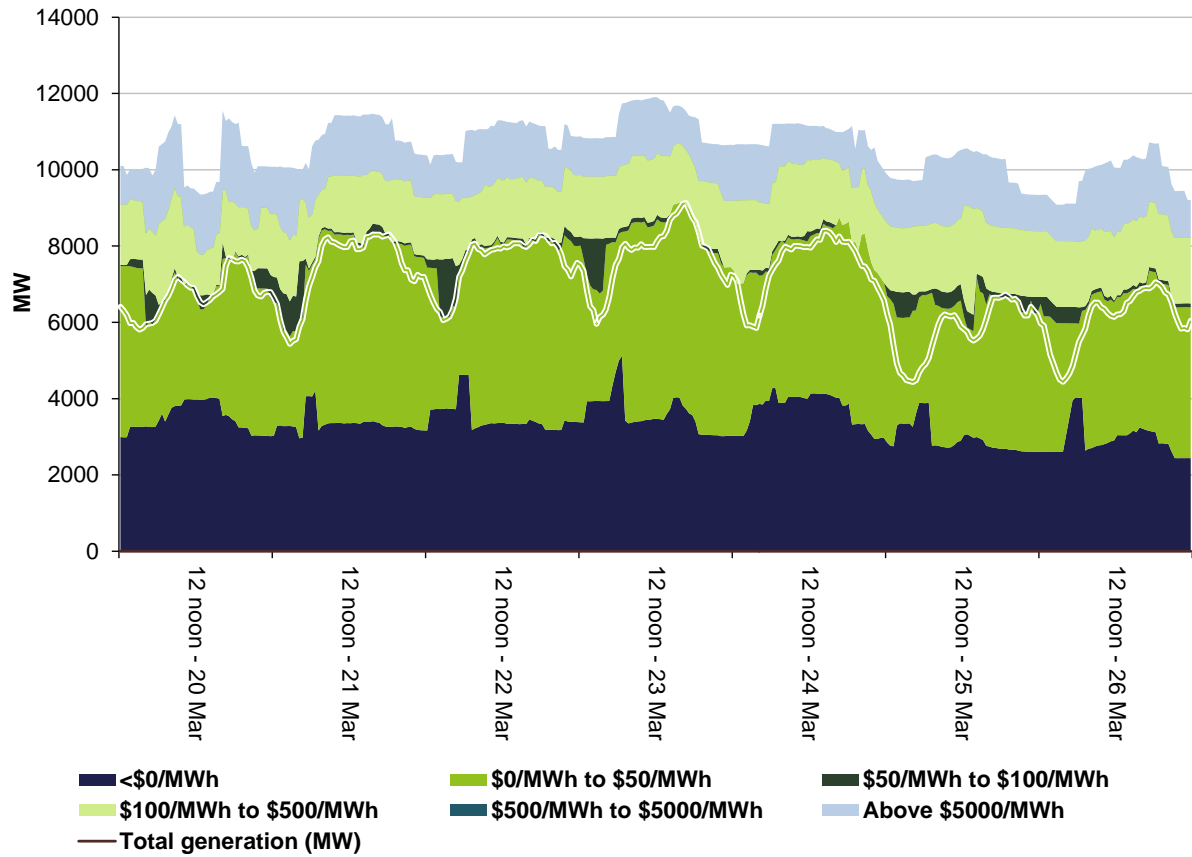
The AER reviews generator bidding as part of its market monitoring to better understand the drivers behind price variations. Figure 3 to Figure 7 show, the total generation dispatched and the amounts of capacity offered within certain price bands for each 30 minute trading interval in each region.

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

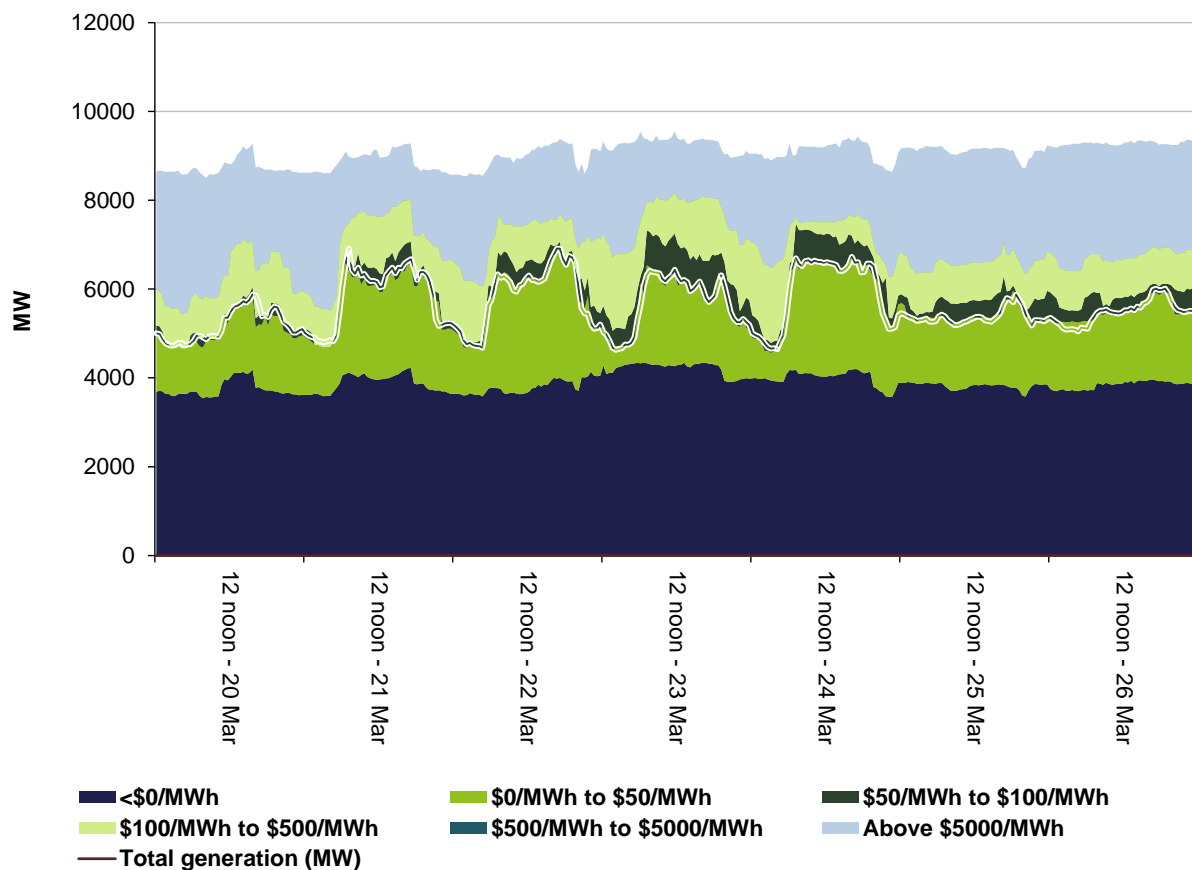


The red ellipses in Figure 3 highlight rebidding that resulted in high prices detailed in “Detailed market analysis of significant price events”

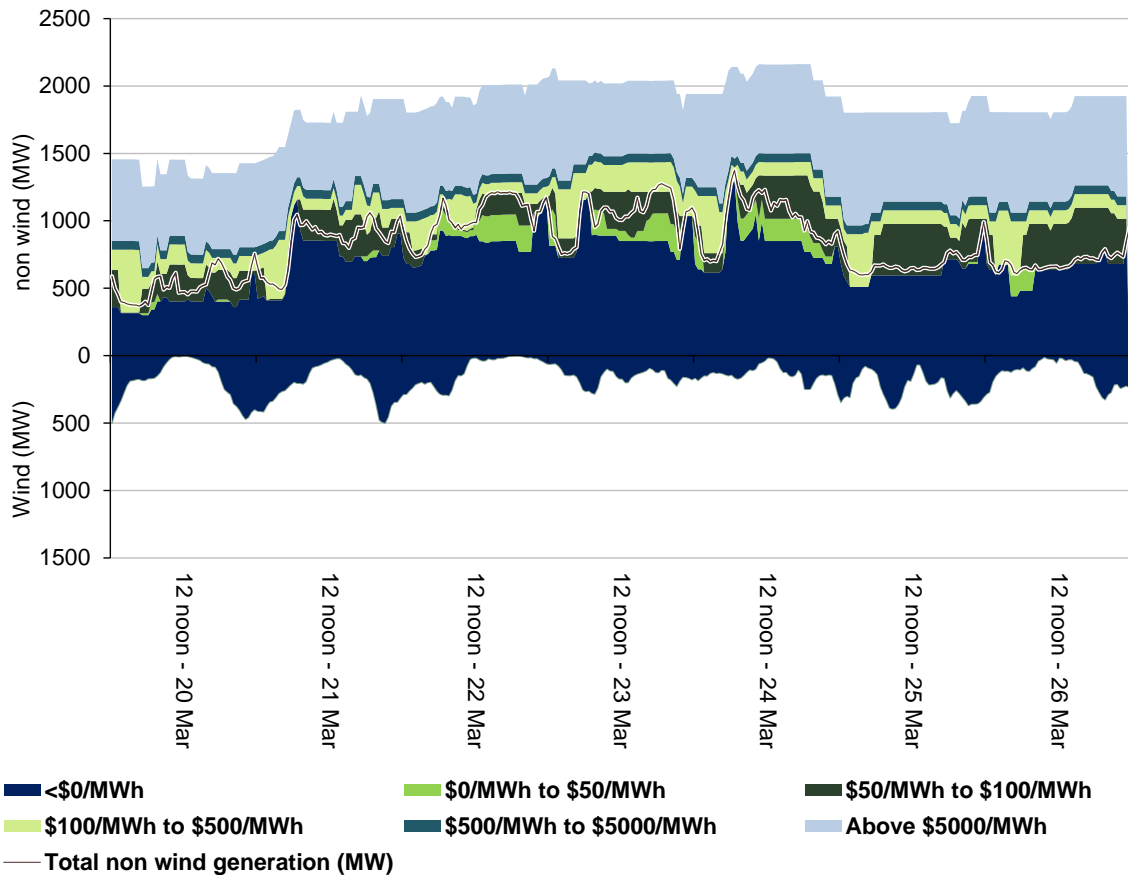
**Figure 4: New South Wales generation and bidding patterns**



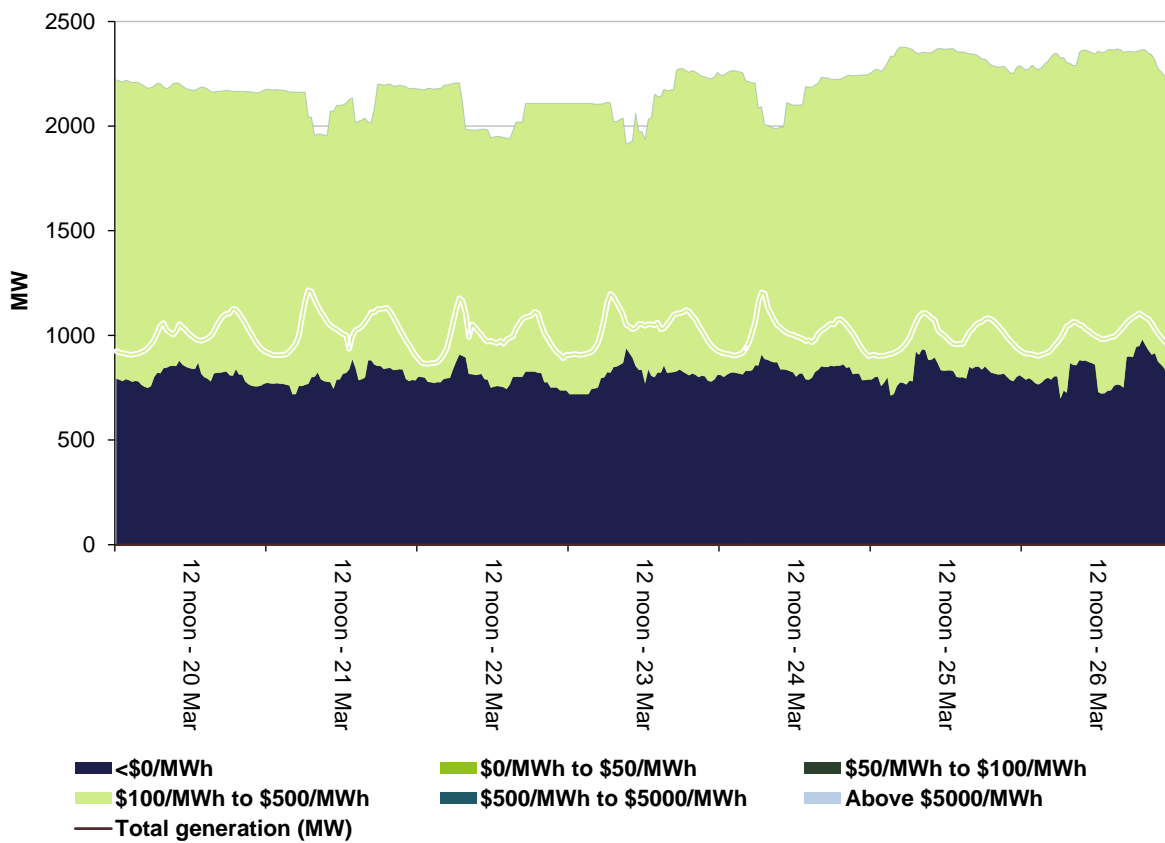
**Figure 5: Victoria generation and bidding patterns**



**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.

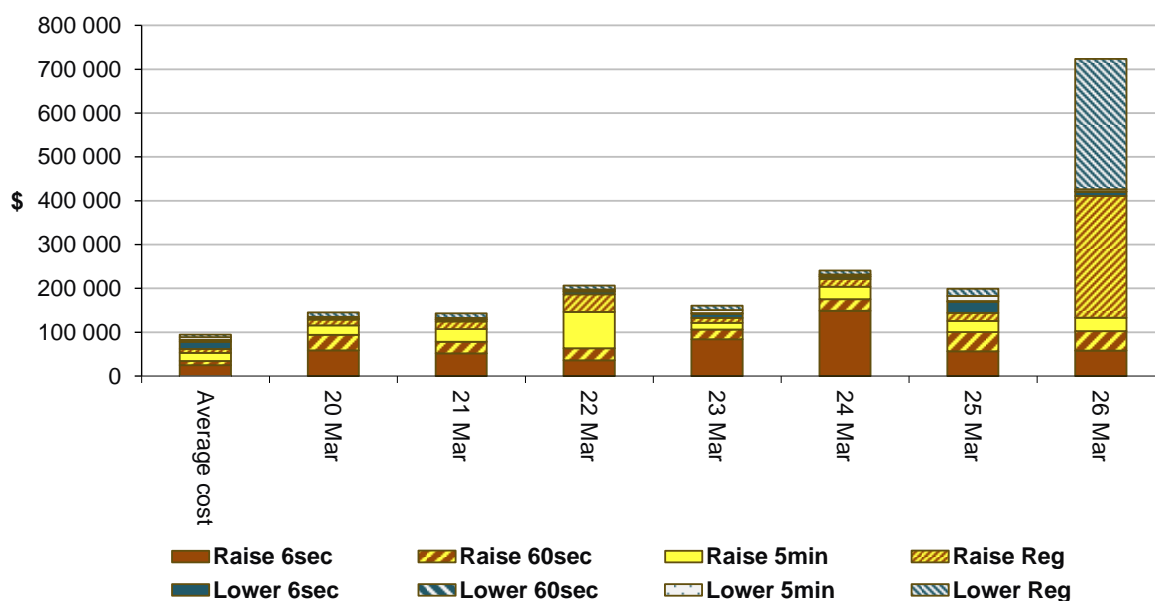
The Electricity Rules stipulate that generators pay for raise contingency services and customers pay for lower contingency services. Regulation services are paid for on a “causer pays” basis determined every four weeks by AEMO.

The total cost of FCAS on the mainland for the week was \$1 676 500 or less than 1 per cent of energy turnover on the mainland.

The total cost of FCAS in Tasmania for the week was \$142 000 or less than 0.5 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**



During the week the price of local raise 6 second services in Queensland exceeded \$12 000/MW on two occasions, once at 10 am on Wednesday 23 March and another at 7 am on Thursday 24 March. Local raise 6 second services were required in Queensland on both occasions due to a line outage in Northern New South Wales, near the Queensland – New South Wales interconnector, which increased the risk that Queensland would synchronously separate from the rest of the NEM. Specifically

- on 23 March, the price of local raise 6 second services reached \$12 124/MW at 10 am. This was a result of a rebid by CS Energy at 9.48 am, effective from 9.58 am, withdrawing 150 MW of raise 6 second services at Gladstone and a 20 MW increase in raise 6 second services at 10 am. The reason given by CS Energy for the rebid was ‘0947F FCAS/ENERGY CO-OPTIMISATION-SL’. At 10 am there was also a 20 MW increase in local raise 60 second services, which resulted in the price of local raise 60 second services reaching \$1200/MW.
- on 24 March, the price of local raise 6 second services reached \$13 176/MW at 7 am when 102 MW’s of the service were required in the dispatch interval. During this time there was a steep supply curve for local raise 6 second services, with no capacity priced between \$1200/MW and \$12 999/MW.

Both FCAS price events coincided with significant price events in Queensland. Details of the significant price events are provided in the section below.

On Saturday 26 March, between 2.20 am to 2.50 am, local raise and lower regulation services in South Australia exceed \$5000/MW, for 7 dispatch intervals. This event resulted in \$567 000 of regulation service cost on the mainland for the day. As required by clause 3.8.17 of the National Electricity Rules, the AER will publish a separate \$5000/MW report into this event.

## 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 seven occasions where the spot price in Queensland was greater than three times the Queensland weekly average price of \$76/MWh and above \$250/MWh.

### Monday, 21 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>9:00 am</b>	727.01	70.50	105.77	6875	6919	6873	10 562	10 633	11 148

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

**Table 4: Rebids for the 7 pm trading interval**

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
8.01 am		Millmerran Energy Trader	Millmerran	115	7	13800	07:59 A 115 MW CHANGE IN 5MPD DEMAND D1 07:55 RUNS 0720/0725
8.39 am	8.45 am	Stanwell Corporation	Stanwell	40	49	1400	0838A QLD: 5MINPD PRICE VIS 30MIN PRICE TI0900 SL
8.39 am	8.45 am	Stanwell Corporation	Tarong	130	<61	1400	0838A QLD: 5MINPD PRICE VIS 30MIN PRICE TI0900 SL
8.41 am	8.50 am	Arrow Energy	Braemar 2	-160	346	N/A	0840A QLD PRICE HIGHER THAN FORECAST: AVOID UNECONOMIC START SL
8.41 am	8.50 am	Millmerran Energy Trader	Millmerran	60	7	13800	08:41 A RRP ABOVE 5MIN PD FOR DI 845
8.42 am	8.50 am	Callide Power Trading	Callide C	90	-1000	13800	0841A PRICE ABOVE PD – SL

As a result of the above rebidding and a 141 MW increase in demand at 8.45 am, the dispatch price increased from \$63/MWh at 8.40 am to \$1400/MWh at 8.45 am and remained at this level until 8.55 am. The price then dropped to \$46/MWh at 9 am due to ERM rebidding capacity at Oakey from high to low prices.

**Table 5: 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>2:00 pm</b>	284.43	40.27	51.34	7278	7132	7211	10 380	10 638	10 673

Conditions at the time saw demand up to 146 MW higher than that forecast four hours ahead and availability up to 258 MW less than forecast four hours ahead.

**Table 6: Rebids for the 2 pm trading interval**

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
10.05 am		AGL Energy	Yabulu	155	<61	2149	0941-P-080 CHG IN PIPELINE COND-801 CHANGE IN IMBAL POS NQGP
10.07 am		Origin Energy	Darling Downs	107	-1	12497	1005P MW REDISTRIBUTION-DDPS TO ER - SL



Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
10.21 am		Origin Energy	Darling Downs	20	-1	12497	1018P PLANT CONDITIONS - AVOID INTERMITTENT DB DISPATCH SL
10.46 am		CS Energy	Gladstone	40	<50	>300	1045P PORTFOLIO REARRANGEMENT DUE TO-CALLIDE INCREASES-SL
11.34 am		Callide Power Trading	Callide C	120	<14	N/A	1133P CC4 - EXTEND DE-LOAD TIME FOR CLINKER MANAGEMENT
12.52 pm		Origin Energy	Darling Downs	27	-1	N/A	1250P CHANGE IN AVAIL – amBIENT CONDITIONS SL
1.36 pm	1.45 pm	Millmerran Energy Trader	Millmerran	115	7	13800	13:36 A A 83MW CHANGE Q P5M DISPGEN DI 1415 RUN 1330/1325
1.37 pm	1.45 pm	Stanwell Corporation	Stanwell	40	49	1400	1337A CHANGE IN QNI FLOW SL
1.37 pm	1.45 pm	Stanwell Corporation	Tarong	140	<61	1400	1337A CHANGE IN QNI FLOW SL
1.42 pm	1.50 pm	Callide Power Trading	Callide C	63	-1000	13800	1341A RRP ABOVE 5MIN PD FOR DI 1345
1.42 pm	1.50 pm	Origin Energy	Darling Downs	100	-1	12497	1340A CONSTRAINT MANAGEMENT - N^Q_NIL_A SL

As a result of the above rebidding, the dispatch price increased from \$54/MWh at 1.40 pm to \$121/MWh at 1.45 pm and then to \$1400/MWh at 1.50 pm when Callide Power and Origin Energy's rebids became effective. At 1.55 pm the dispatch price dropped to \$43/MWh due to rebidding of capacity from high to low prices and a 151 MW change in demand.

**Table 7: 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>5:00 pm</b>	399.22	48.90	71.43	7585	7556	7562	10 473	10 662	10 603

Conditions at the time saw demand close to forecast four hours ahead and availability 189 MW less than forecast four hours ahead.

**Table 8: Rebids for the 5 pm trading interval**

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
3.18 pm		Millmerran Energy Trader	Millmerran	58	7	13800	15:17 A 46MW CHANGE Q P5M DEMAND DI 1525 RUN 1520/1515
3.38 pm		CS Energy	Gladstone	90	<300	>1400	1536A DISPATCH PRICE HIGHER THAN 5MIN FORECAST-SL
3.40 pm		Stanwell Corporation	Stanwell	20 *	49	400	1530A CHANGE IN QLD AND NSW DEMAND PD 1530 HIGHER THAN PD 1500
3.40 pm		Stanwell Corporation	Tarong	60	<61	1400	1530A CHANGE IN QLD AND NSW DEMAND PD 1530 HIGHER THAN PD 1500
4.22 pm		Millmerran Energy Trader	Millmerran	25	7	13800	16:22 A \$ 296 CHANGE Q P5M RRP DI 1645 RUN 1625/1620
4.33 pm	4.40 pm	Callide Power Trading	Callide C	150	-1000	13800	1633A A \$ -149 CHANGE Q P5M RRP DI 1650 RUN 1635/1630
4.38 pm	4.45 pm	Millmerran Energy Trader	Millmerran	95	7	13800	16:38 A RRP ABOVE 5MIN PD DI1640

Note \* combination of a pair of bids

As a result of the above rebidding, the dispatch price increased from \$56/MWh at 4.45 pm to \$346/MWh at 4.50 pm and then to \$1400/MWh at 4.55 pm. The increase in price at 4.55 pm also coincided with a demand increase of 104 MW. In the following dispatch interval, the dispatch price reduced to \$346/MWh following a 77 MW decrease in demand.

**Tuesday, 22 March**

**Table 9: Price, Demand and Availability**

Time	Price (\$/MWh)			Demand (MW)			Availability (MW)		
	Actual	4 hr foreca st	12 hr forecast	Actual	4 hr forecast	12 hr forecast	Actual	4 hr forecast	12 hr forecast
<b>7:00 pm</b>	422.71	67.01	67.56	7631	7423	7547	10 633	10 681	10 721

Conditions at the time saw demand 208 MW more than forecast four hours ahead and availability close to forecast four hours ahead.

**Table 10: Rebids for the 7 pm trading interval**

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
6.31 pm	6.40 pm	Millmerran Energy Trader	Millmerran	155	7	13800	18:30 A \$ 174 CHANGE Q P5M RRP DI 1845 RUN 1830/1825
6.41 pm	6.50 pm	Callide Power Trading	Callide C	120	-1000	13800	1838A 208MW CHANGE QNI P5M FLOW DI 1850 RUN 1840/1835
6.43 pm	6.50 pm	Stanwell Corporation	Stanwell	40	49	13800	1841A CHANGE QLD 5 MIN PD PRICE 1835 V 1840
6.43 pm	6.50 pm	Stanwell Corporation	Tarong	100	<61	1400	1841A CHANGE QLD 5 MIN PD PRICE 1835 V 1840

As a result of the above rebidding, the dispatch price increased from \$109/MWh at 6.35 pm to around \$290/MWh for the 6.40 pm and 6.45 pm dispatch intervals before reaching \$1400/MWh at 6.50 pm, when the rebids by Callide Power Trading and Stanwell became effective and there was a 40 MW increase in demand. The dispatch price fell in the next two dispatch intervals, falling to \$119/MWh at 7 pm following rebidding of capacity from high to low prices and a total 112 MW reduction in demand over the two dispatch intervals.

**Table 11: 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>10:30 pm</b>	2359.62	38.62	52.15	6413	6474	6484	10 452	10 592	10 737

Conditions at the time saw demand 60 MW less than forecast four hours ahead and availability 140 MW less than forecast four hours ahead.

**Table 12: Rebids for the 10.30 pm trading interval**

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
10.02 pm	10.10 pm	Millmerran Energy Trader	Millmerran	160	7	13800	22:00 A 164MW CHANGE Q P5M DEMAND DI 2210 RUN 2140/2135
10.07 pm	10.15 pm	CS Energy	Gladstone	145	<27	13800	2207A DISPATCH PRICE HIGHER THAN 5MIN FORECAST-SL

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
10.11 pm	10.20 pm	Callide Power Trading	Callide C	60	-1000	13800	2209A \$ 308 CHANGE Q P5M RRP DI 2225 RUN 2210/2205
10.13 pm	10.20 pm	ERM Power	Oakey	171	1401	13800	2212A REDUCTION IN STANWELL PORTFOLIO BY 97MW

As a result of the above rebidding, and with lower price generation either fully dispatched or stranded, the dispatch price increased from \$113/MWh at 10.15 pm to \$13 789/MWh at 10.20 pm. Prices reduced to below \$30/MWh in the 10.25 pm dispatch interval following rebidding of capacity from high to low prices as well as a 388 MW demand side response.

### Wednesday, 23 March

**Table 13: 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>10:00 am</b>	2344.16	49.50	36.00	6728	6724	6666	10 278	10 335	10 405

Conditions at the time saw demand close to forecast four hours ahead and availability 57 MW to forecast four hours ahead.

**Table 14: Rebids for the 10 am trading interval**

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
6.30 am		Stanwell Corporation	Barron Gorge	33	-1	13800	0629F MANAGE DECREASING INFLOWS
9.37 am	9.45 am	Stanwell Corporation	Stanwell	30	49	13800	0940A QNI TRANSMISSION CONSTRAINT DI0940
9.37 am	9.45 am	Stanwell Corporation	Tarong	180	<49	>1400	0940A QNI TRANSMISSION CONSTRAINT DI0940
9.47 am	9.55 am	CS Energy	Gladstone	200	<36	13800	0946A DISPATCH DEMAND HIGHER THAN 30MIN FORECAST-SL
9.48 am	9.55 am	CS Energy	Callide B	160	17	13800	0947A DISPATCH DEMAND HIGHER THAN 30MIN FORECAST-SL

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
9.52 am	10 am	Callide Power Trading	Callide C	43	-1000	13800	0951A RRP ABOVE 5MIN PD FOR DI 955
9.52 am	10 am	Millmerran Energy Trader	Millmerran	160	7	13800	0951 A RRP ABOVE 5MIN PD FOR DI 955

As a result of the rebidding, and an increase in local demand of 40 MW at 10 am, the dispatch price increased from \$94/MWh at 9.55 pm to \$13 800/MWh at 10 am. In the following dispatch interval, prices reduced to below \$30/MWh as some of the above rebids were no longer effective and there was also a 354 MW reduction in demand.

## Thursday, 24 March

**Table 15: 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>7:00 am</b>	2355.62	123.83	103.42	6430	6432	6324	10 266	10 775	10 775

Conditions at the time saw demand close to forecast and availability up to 509 MW less than forecast four hours ahead.

The reduction in forecast availability was primarily associated with a reduction in available capacity at Tarong due to technical issues and the trip of Kogan Creek.

**Table 16: Rebids for the 7 am trading interval**

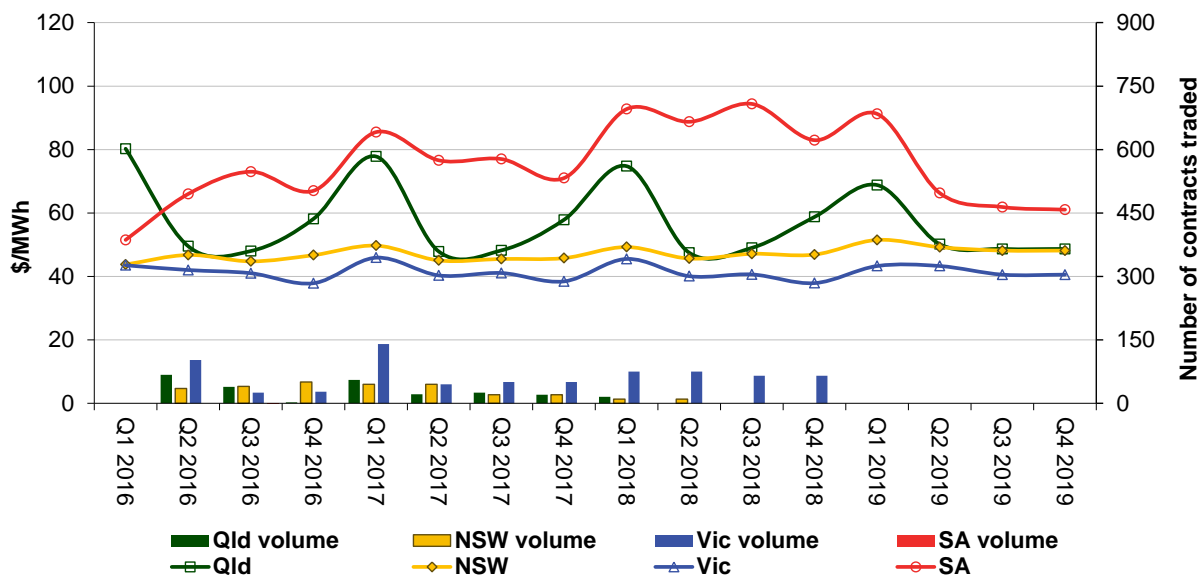
Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
4.08 am		Stanwell Corporation	Tarong	205	13800	N/A	0405P FD FAN OIL LEAK
5.50 am		CS Energy	Kogan Creek	320	320	N/A	0549P TECHNICAL ISSUES-UNIT TRIP-SL
6.27 am	6.35 am	Callide Power Trading	Callide C	226	-1000	13800	0613A SCADA KOGAN TRIPPED
6.28 am	6.35 am	Millmerran Energy Trader	Millmerran	195	7	13800	06:27 A SCADA KOGAN TRIPPED
6.40 am	6.50 am	CS Energy	Gladstone	120	<36	13800	0639A DISPATCH PRICE LOWER THAN 30MIN FORECAST-SL
6.50 am	7.00 am	ERM Power	Oakey	176	<1401	13800	0649A CHANGE IN QLD PRICE 5M DISPATCH \$93.67 VS 30M PD \$345.72

With lower price generation either fully dispatched or stranded, the dispatch price increased from \$108/MWh at 6.55 am to \$13 800/MWh at 7 am. This was also when ERM Power's rebid became effective. In the follow dispatch interval prices reduced to below \$34/MWh as some of the above rebids were no longer effective and there was also a 262 MW reduction in demand.

## 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. No trades were recorded for the week for base Q1 contracts probably due to the proximity of the end of the quarter.

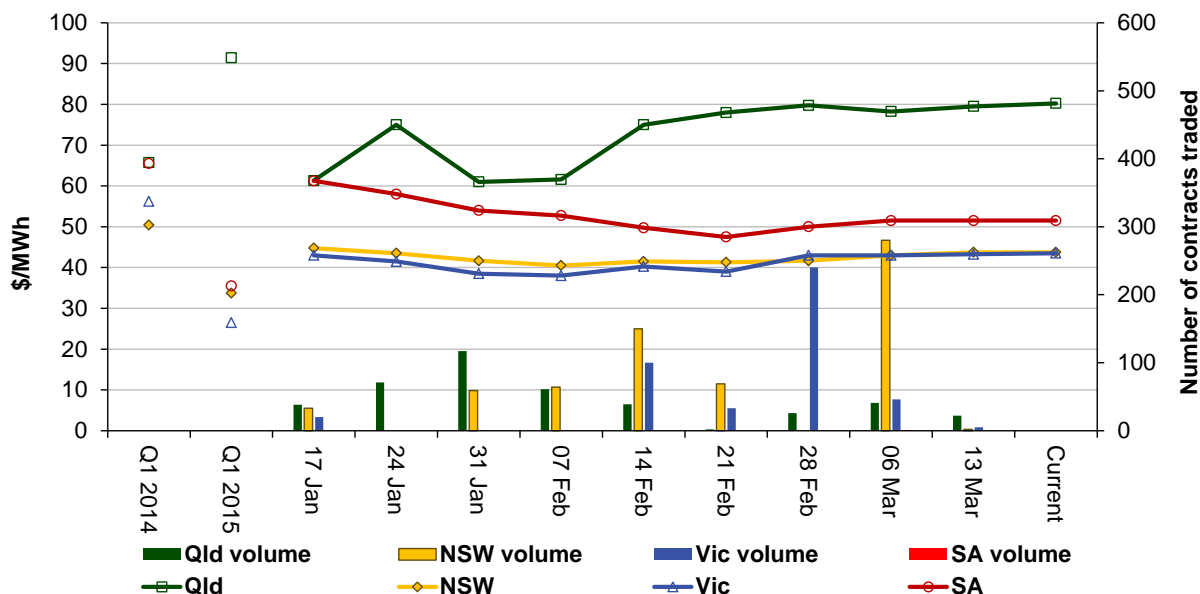
**Figure 9: Quarterly base future prices Q1 2016 – Q4 2019**



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)**



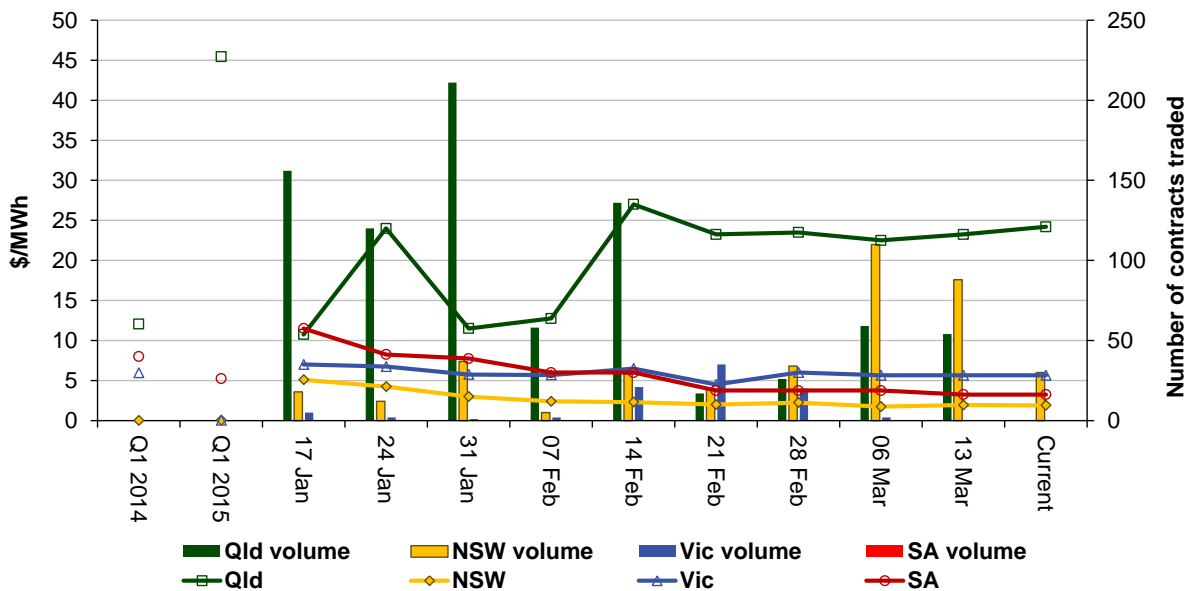
Note. Base contract prices are shown for each of the current week and the previous 9 weeks, with average prices shown for periods 1 and 2 years prior to the current year.

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**