

21 – 27 February 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 21 to 27 February 2016. There were eight occasions where the spot price in Queensland was greater than three times the Queensland weekly average price of \$83/MWh and above \$250/MWh. There were three occasions where the spot price in Victoria was greater than three times the Victoria weekly average price of \$49/MWh and above \$250/MWh. There were three occasions where the spot price in South Australia was greater than three times the South Australia weekly average price of \$57/MWh and above \$250/MWh and there was one occasion where the spot price was below -\$100/MWh.

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

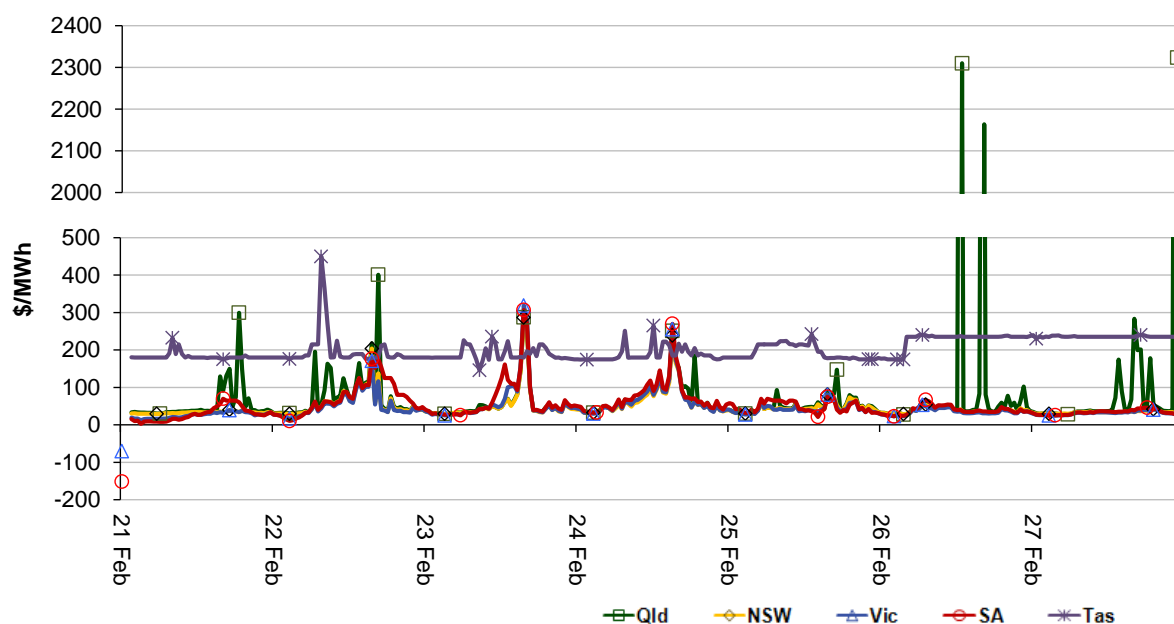


Figure 2 shows the volume weighted average (VWA) prices for the current week (with prices shown in Table 1) and the preceding 12 weeks, as well as the VWA price over the previous 3 financial years.

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

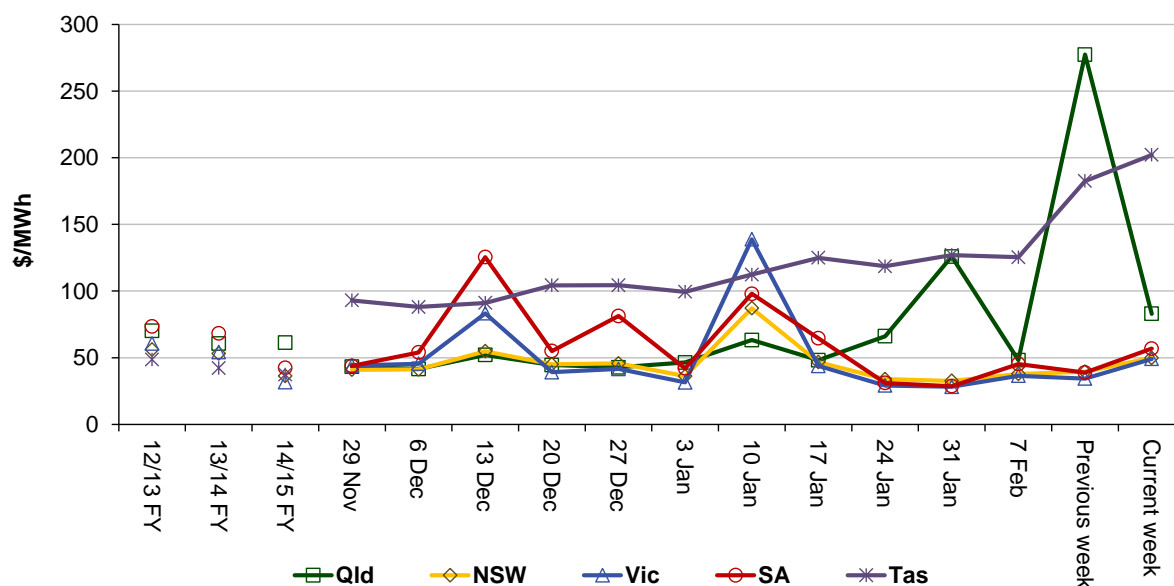


Table 1: Volume weighted average spot prices by region (\$/MWh)

Region	Qld	NSW	Vic	SA	Tas
Current week	83	50	49	57	202
14-15 financial YTD	61	37	32	42	38
15-16 financial YTD	57	46	43	61	74

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 257 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

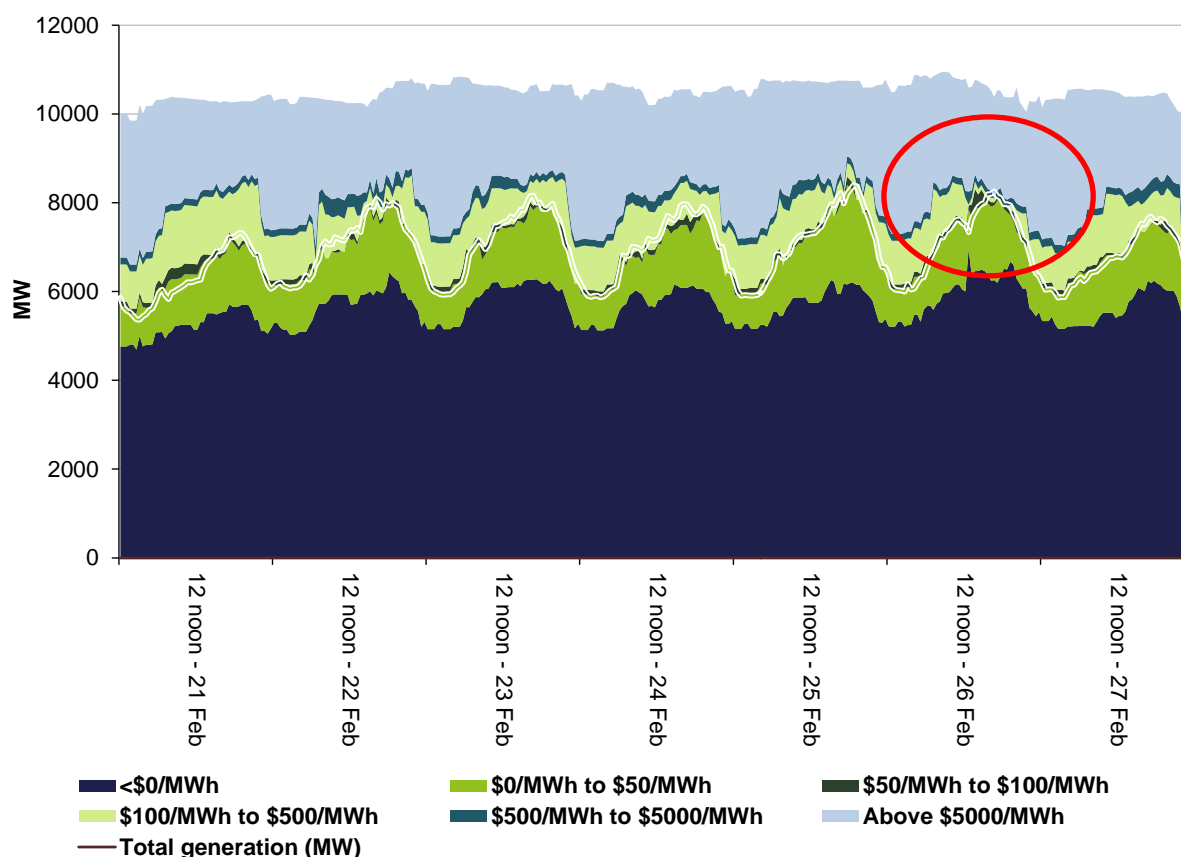
	Availability	Demand	Network	Combination
% of total above forecast	7	26	0	3
% of total below forecast	52	6	0	5

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 ellipse on Figure 3 highlights the period during the week where rebidding by participants led to high prices. This event is covered in detail in the section below.

Figure 4: New South Wales generation and bidding patterns

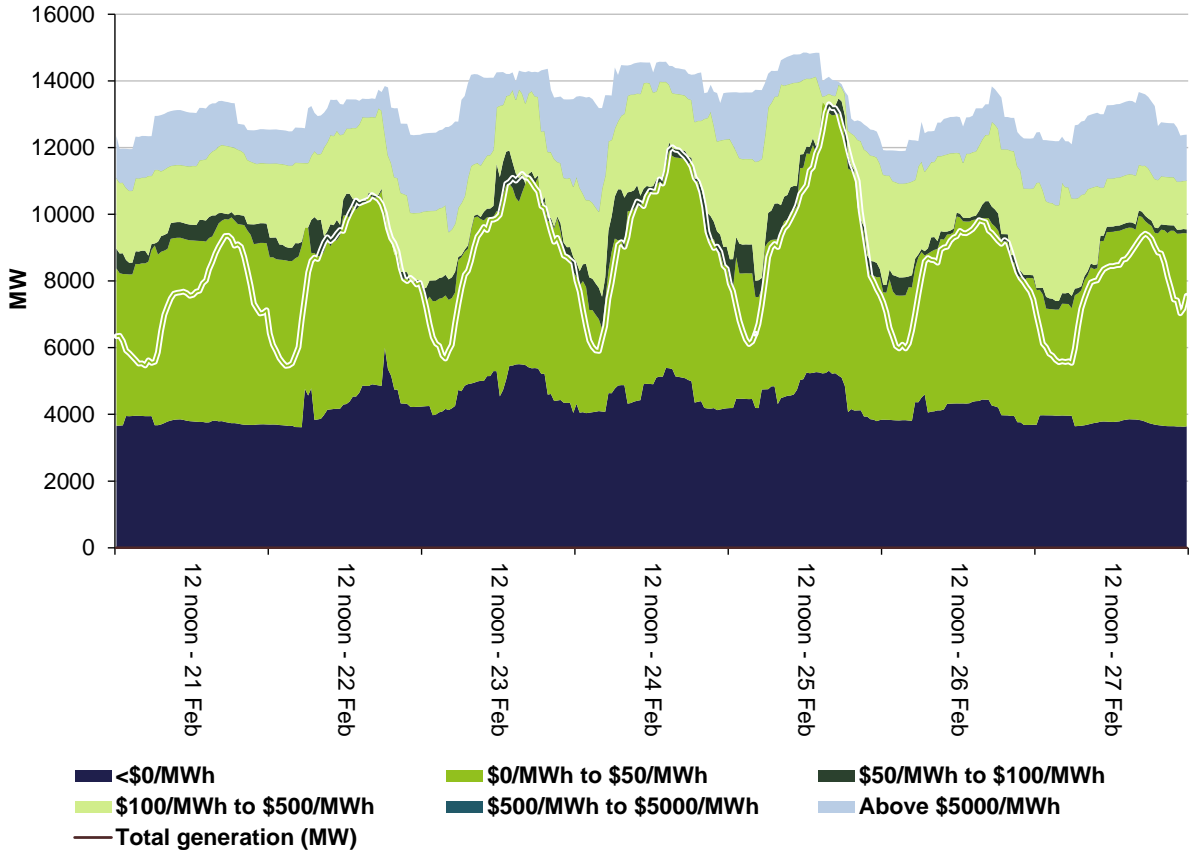


Figure 5: Victoria generation and bidding patterns

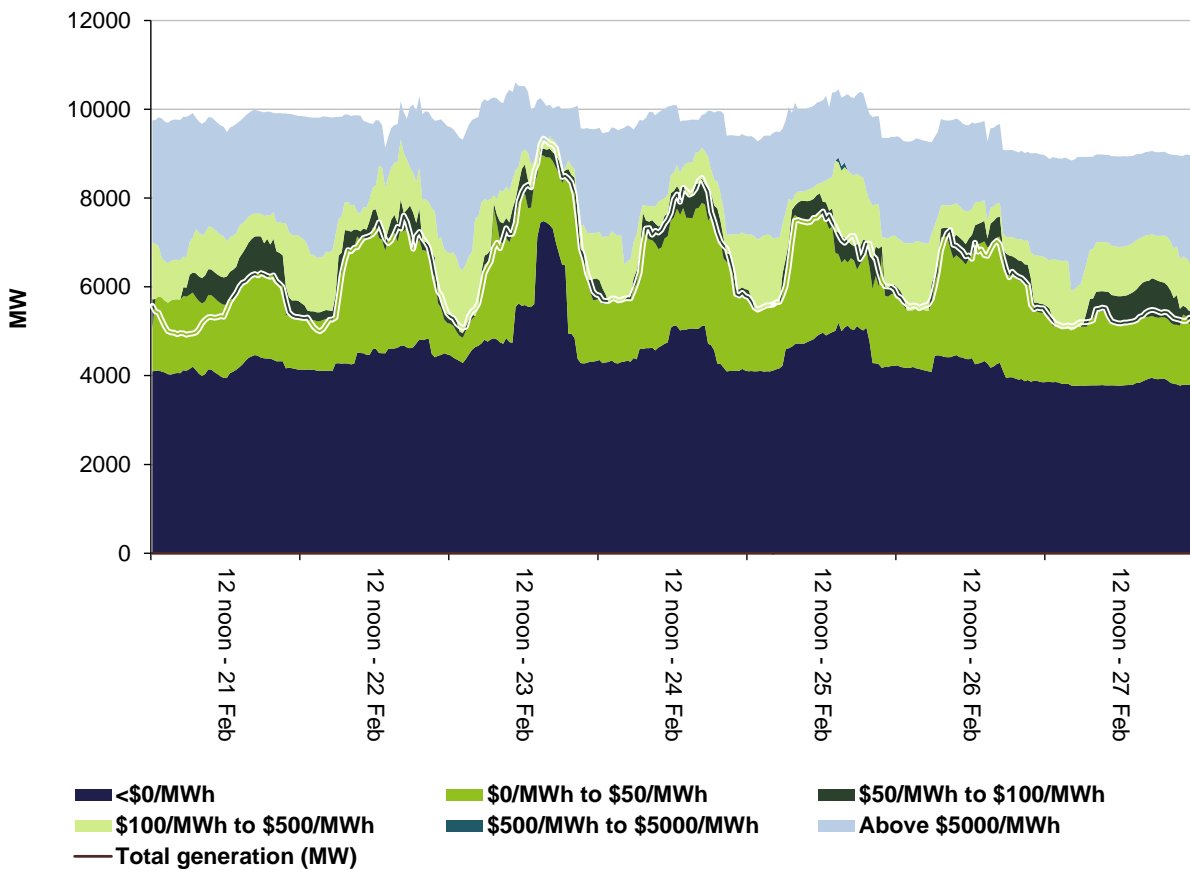


Figure 6: South Australia generation and bidding patterns

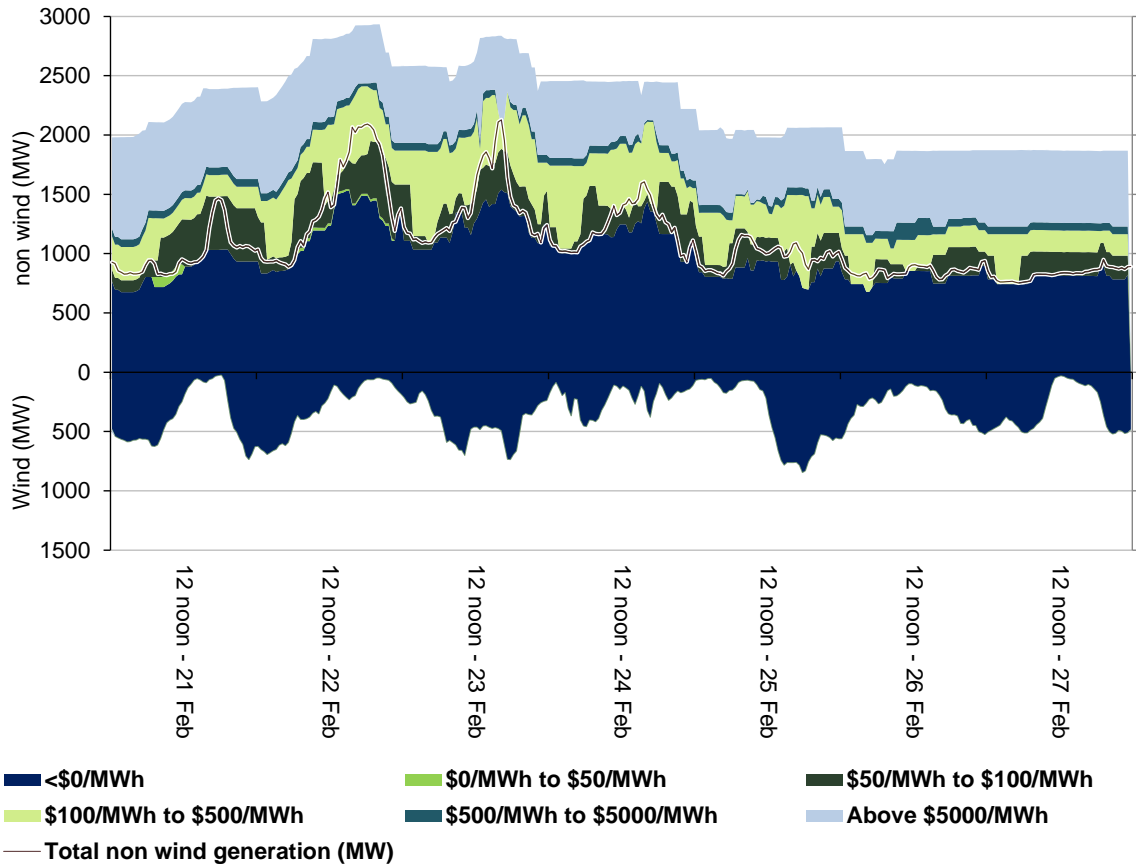
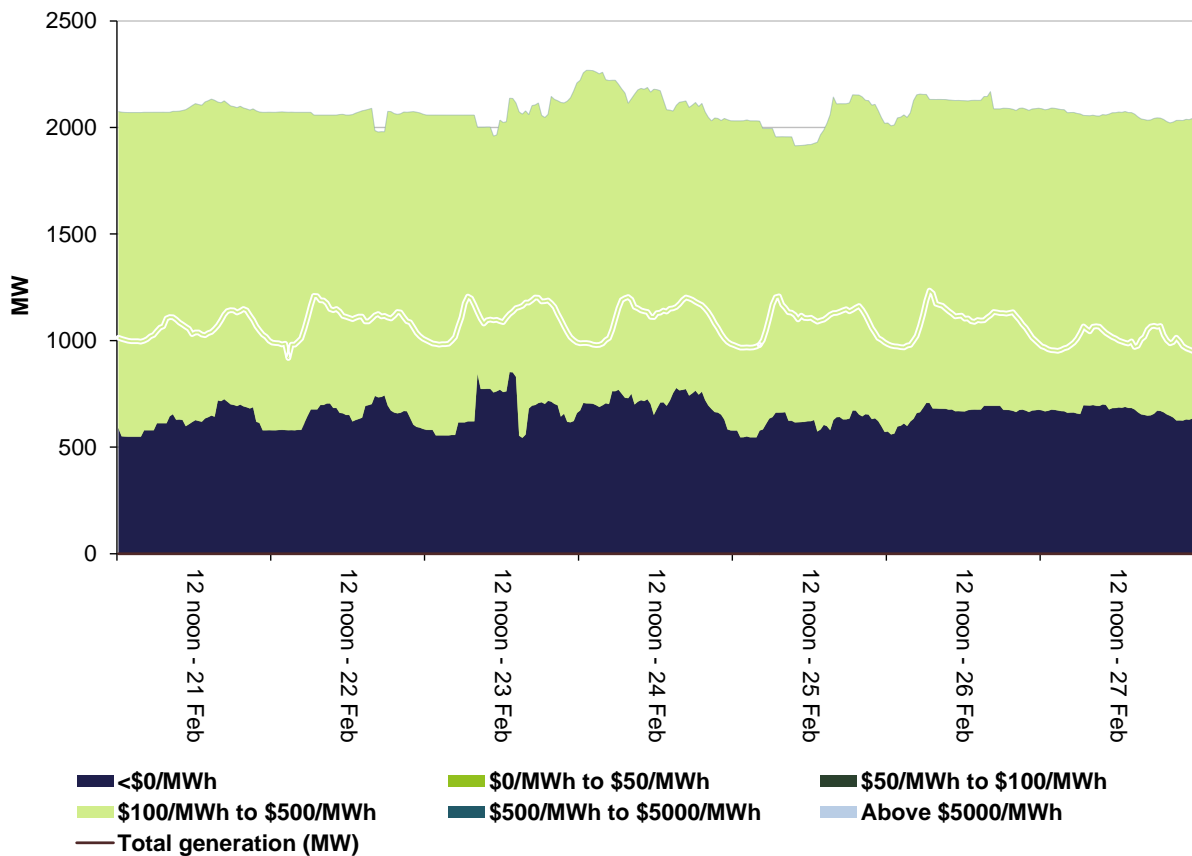


Figure 7: Tasmania generation and bidding patterns



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.

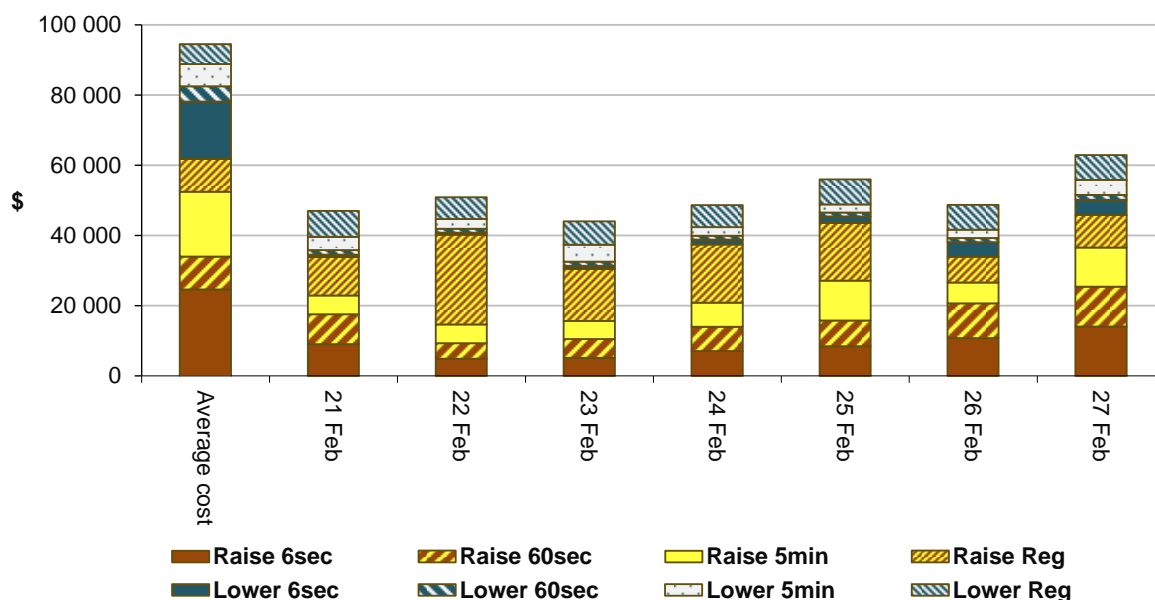
The Electricity Rules stipulate that generators pay for raise contingency services and customers pay for lower contingency services. Regulation services are paid for on a “causer pays” basis determined every four weeks by AEMO.

The total cost of FCAS on the mainland for the week was \$241 000 or less than 1 per cent of energy turnover on the mainland.

The total cost of FCAS in Tasmania for the week was \$117 000 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



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 \$83/MWh and above \$250/MWh. Two of these occasions are assessed under the 'Mainland' section.

Sunday, 21 February

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
7 pm	299.64	200.15	200.15	7465	7388	7388	10 277	10 442	10 443

Conditions at the time saw demand close to forecast and availability more than 150 MW below 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
5.29 pm		CS Energy	Wivenhoe	160	0	13 800	1728A DISPATCH PRICE LOWER THAN 30MIN FORECAST-SL
5.31 pm		CS Energy	Callide B	-140	<17	N/A	1731P TECHNICAL ISSUES-PRECIP ISSUE-SL
6.13 pm		CS Energy	Gladstone	40	<50	300	1812A DISPATCH PRICE LOWER THAN 30MIN FORECAST-SL

The spot price was forecast to be \$200/MWh four hours ahead. As a result of the rebids outlined in Table 4, the price was around \$300/MWh for the duration of the 7 pm trading interval.

Monday, 22 February

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
5 pm	400.90	69.05	299.91	7947	7887	7953	10 396	10 451	10 412

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

Table 6: Rebids for the 5 pm trading interval

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
4.20 pm		Stanwell Corporation	Tarong	150	25	1400	1619A QLD 5MIN DEMAND ABOVE 30MIN PD @ 1620HRS
4.37 pm	4.45 pm	Millmerran Energy Trader	Millmerran	60	7	13 800	16:36 A INCREASE IN 5MIN PD RRP FOR DI 1645
4.38 pm	4.45 pm	Callide Power Trading	Callide C	40	-1000	13 800	1637A SIG CHANGE IN 5MIN PD RRP FOR DI 1645
4.47 pm	4.55 pm	CS Energy	Gladstone	200	<36	13 800	1646A DISPATCH DEMAND HIGHER THAN 30MIN FORECAST-SL

As a result of the rebids outlined in Table 6, and with lower priced generation fully dispatched, prices remained above \$120/MWh from 4.35 pm to 4.50 pm. The dispatch price then increased from \$345/MWh at 4.55 pm to \$1400/MWh at 5 pm.

Friday, 26 February

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
1.00 pm	2309.86	48.94	59.60	7414	7630	7725	10 667	10 729	10 725
4.30 pm	2163.68	389.68	300.00	8238	8185	8302	10 592	10 687	10 716

Conditions for the 1 pm trading interval saw demand around 200 MW below forecast four hours ahead and availability was close to forecast. For the 4.30 pm trading interval, demand and availability were close to forecast four hours ahead.

Table 8: Rebids for the 1 pm trading interval

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
12.18 pm		CS Energy	Gladstone	200	<36	13 800	1217P PORTFOLIO REARRANGEMENT DUE TO-GPS 2 AND GPS 5 OFFLINE UNIT SWAP-SL
12.34 pm	12.45 pm	Arrow Energy	Braemar 2	-150	<346	N/A	1234P UNIT TRIP SL
12.36 pm	12.45 pm	Millmerran Energy Trader	Millmerran	-10	7	N/A	12:36 P: CONDENSATE POLISHER INLET TEMPERATURE

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
12.37 pm	12.45 pm	Arrow Energy	Braemar 2	30	346	>12 700	1236P REARRANGE RUNNING ORDER FOLLOWING BRAEMAR7 TRIP SL
12.42 pm	12.50 pm	Callide Power Trading	Callide C	126	-1000	13 800	1241A RRP ABOVE 5MIN PD FOR DI 1245
12.42 pm	12.50 pm	CS Energy	Gladstone	150	<300	13 800	1241A DISPATCH PRICE HIGHER THAN 5MIN FORECAST-SL
12.43 pm	12.50 pm	CS Energy	Callide B	40	17	13 800	1241A DISPATCH PRICE HIGHER THAN 5MIN FORECAST-SL
12.45 pm	12.55 pm	Alinta Energy	Braemar A	35	N/A	<12 499	1240~P~REVISE UNIT OUTPUT BASED ON AMBIENT CONDITIONS~
12.47 pm	12.55 pm	Origin Energy	Mt Stuart	115	13 800	<50	1245A CONSTRAINT MANAGEMENT - N^Q_NIL_B1 SL
12.47 pm	12.55 pm	Millmerran Energy Trader	Millmerran	85	7	13 800	12:47 A RRP ABOVE 5MIN PD FOR DI 1245

As a result of the rebids outlined in Table 8, with lower priced generation fully dispatched and marginal increases in local generation requirements, prices rose from \$44/MWh at 12.40 pm to \$400/MWh at 12.50 pm, and then to \$12 948/MWh at 12.55 pm. the dispatch price returned to \$32/MWh for the final dispatch interval following rebids by a number of participants from high to low prices.

Table 9: 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
3.20 pm		CS Energy	Gladstone	150	<36	13 800	1520P PORTFOLIO REARRANGEMENT DUE TO-DELAYED GPS 2 OOS-SL
3.34 pm		CS Energy	Gladstone	-30	36	N/A	1533P UNIT OFFLINE REVISED-UPDATED UNIT RAMP DOWN SCHEDULE-SL
3.53 pm		CS Energy	Gladstone	-35	0	N/A	1552P UNIT OFFLINE REVISED-UPDATED UNIT RAMP DOWN SCHEDULE-SL
4.13 pm	4.20 pm	Callide Power Trading	Callide C	56	-1000	13 800	1611A CHANGE IN 5MPD DEMAND - SL

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
4.13 pm	4.20 pm	CS Energy	Gladstone	-25	0	N/A	1613P UNIT RAMPING REBID TO MATCH-SL
4.15 pm	4.25 pm	Millmerran Energy Trader	Millmerran	-10	7	N/A	16:15 P: CONDENSATE POLISHER INLET TEMPERATURE
4.19 pm	4.30 pm	CS Energy	Gladstone	-20	0	N/A	1619P UNIT RAMPING REBID TO MATCH-SL
4.21 pm	4.30 pm	RTA Yarwun	Yarwun	-25	-971	N/A	ALUMINA REFINERY CONSTRAINTS
4.22 pm	4.30 pm	Alinta Energy	Braemar A	140	34	12 499	1615~A~DISPATCH \$59.65 V 5PD \$49.00~

As a result of the rebids outlined in Table 9 and with lower priced generation fully dispatched or stranded in FCAS, prices rose from \$49/MWh at 4.15 pm to \$300/MWh at 4.20 pm. The price then fell to \$60/MWh at 4.25 pm and increased to \$12 499/MWh at 4.30 pm when Alinta Energy's rebid became effective.

Saturday, 27 February

Table 10: 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
4.30 pm	283.28	37.45	92.11	7730	7521	7702	10 401	10 434	10 472
11 pm	2323.21	41.98	38.27	6494	6728	6609	10 123	10 208	10 259

Conditions for the 4.30 pm trading interval saw demand 200 MW above forecast four hours ahead and availability close to forecast.

Conditions for the 11 pm trading interval saw demand 200 MW below forecast four hours ahead and availability marginally below forecast four hours ahead.

Table 11: 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
3.25 pm		CS Energy	Gladstone	50	<36	>300	1525A 5MIN PD HIGHER THAN 30MIN FORECAST-SL
3.40 pm		Millmerran Energy Trader	Millmerran	40	7	13 800	15:38 A A - \$145.69/MWH CHANGE IN 5MPD RRP DI 16:00 RUNS 1520/152

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
3.58 pm	4.05 pm	Callide Power Trading	Callide C	40	-1000	13800	1557A QLD RRP ABOVE 5MIN PD FOR DI 1600

As a result of rebids outlined in Table 11 and higher than expected demand, with a limited availability of cheaper priced generation, the dispatch prices reached \$300/MWh and remained around there for the duration of the trading interval.

Table 12: Rebids for the 11 pm trading interval

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
8.26 pm		ERM Power	Oakey	230	<1400	>12 889	2024A CHANGE IN QLD DEMAND 5M DISPATCH 7564MW VS 30M PD 7509MW
9.52 pm		CS Energy	Gladstone	150	<27	13 800	2150A CHANGE IN QLD GENERATION-BRAEMAR-SL
10.07 pm		Millmerran Energy Trader	Millmerran	195	7	13 800	22:07 A INCREASE IN P5MIN RRP FOR DI 2250
10.12 pm		Callide Power Trading	Callide C	106	-1000	13 800	2204A INCREASE IN P5MIN RRP FOR DI 2255
10.13 pm		ERM Power	Oakey	20	12 889	-1000	2213A CHANGE IN NSW DEMAND 5M DISPATCH 7910MW VS 30M PD 7704MW
10.31 pm	10.40 pm	ERM Power	Oakey	180	>12 889	-1000	2230A RESPONSE TO UNFORECAST MARKET VOLATILITY
10.31 pm	10.40 pm	Alinta Energy	Braemar A	110	12 499	-1000	2230~A~SPOT PRICE 5PD HIGHER THAN 30PD~
10.31 pm	10.40 pm	Callide Power Trading	Callide C	106	13 800	-1000	2231A RRP ABOVE 5MIN PD DI 2235
10.32 pm	10.40 pm	Millmerran Energy Trader	Millmerran	115	13 800	7	22:32 A RRP ABOVE 5MIN PD DI 2235
10.33 pm	10.40 pm	Arrow Energy	Braemar 2	346	>663	-1000	2232A QLD PRICE HIGHER THAN FORECAST SL

As a result of the rebids outlined in Table 12 and a small increase in demand, and with lower priced generation fully dispatched, prices rose from \$38/MWh at 10.30 pm to \$13 789/MWh at 10.35 pm. Following rebids of high priced capacity to lower prices, outlined in Table 12, the price returned to around \$30/MWh for the duration of the trading interval.

South Australia

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

Sunday, 21 February

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
12.30 pm	-151.29	17.71	18.30	1327	1382	1365	2491	2718	2689

Conditions at the time saw demand close to forecast and availability 200 MW below forecast four hours ahead.

At 12.10 am there was a 249 MW decrease in demand in Victoria at the same time as a system normal constraint which limited northerly flows in Victoria. As a result of this, flows were forced into South Australia across Heywood at 420 MW. South Australian generation was constrained-off and the dispatch price fell to the price floor. Prices returned to previous levels of around \$20/MWh for the remainder of the trading interval.

Mainland

There were three occasions where the spot price aligned nationally. For two of three events the New South Wales price was greater than three times the New South Wales weekly average price of \$50/MWh and above \$250/MWh. The remaining event on 24 February saw the New South Wales price just under \$250/MWh, but the prices in the other mainland regions were around \$250/MWh.

Tuesday, 23 February

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
4 pm	286.60	79.90	84.40	31 882	31 015	31 415	40 229	40 653	40 878
4.30 pm	253.80	62.96	79.90	31 892	31 334	31 447	40 297	40 535	40 982

Conditions at the time saw demand more than 550 MW above forecast four hours ahead and availability more than 200 MW below forecast four hours ahead.

With limited available capacity priced between \$100/MWh and \$260/MWh this meant that changes in demand, available capacity and rebidding could lead to significant shifts in dispatch prices. Rebidding of capacity from low to high prices as well as around 200 MW of capacity priced less than \$70/MWh bid unavailable saw the price rise from \$120/MWh at 3.25 pm to \$294/MWh at 3.30 pm. The reasons given included lake temperature management, change if forecast prices and change in sensitivities. Prices remained at around \$300/MWh until 4.35 pm.

Tuesday, 24 February

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
3.30 pm	238.53	61.38	79.96	30 379	29 753	30 447	39 303	39 977	40 660

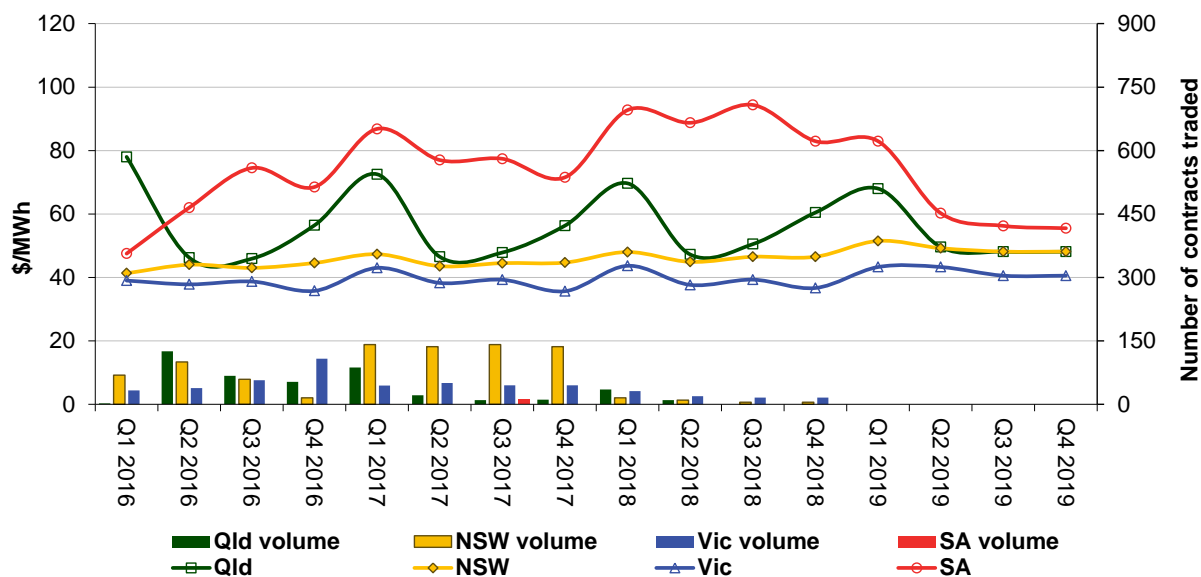
Conditions at the time saw demand around 600 MW greater than forecast four hours ahead and availability 600 MW less than that forecast four hours ahead.

With limited available capacity priced between \$100/MWh and \$270/MWh, this meant that changes in demand, available capacity and rebidding could lead to significant shifts in dispatch prices. Rebidding of capacity from low to high prices and the reduction in available low-priced capacity saw the price rise from \$100/MWh at 2.55 pm to \$267/MWh at 3 pm and remain there for most of the 3.30 pm trading interval. The reasons given included changes in dispatch price and interconnector flows and temperature management.

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.

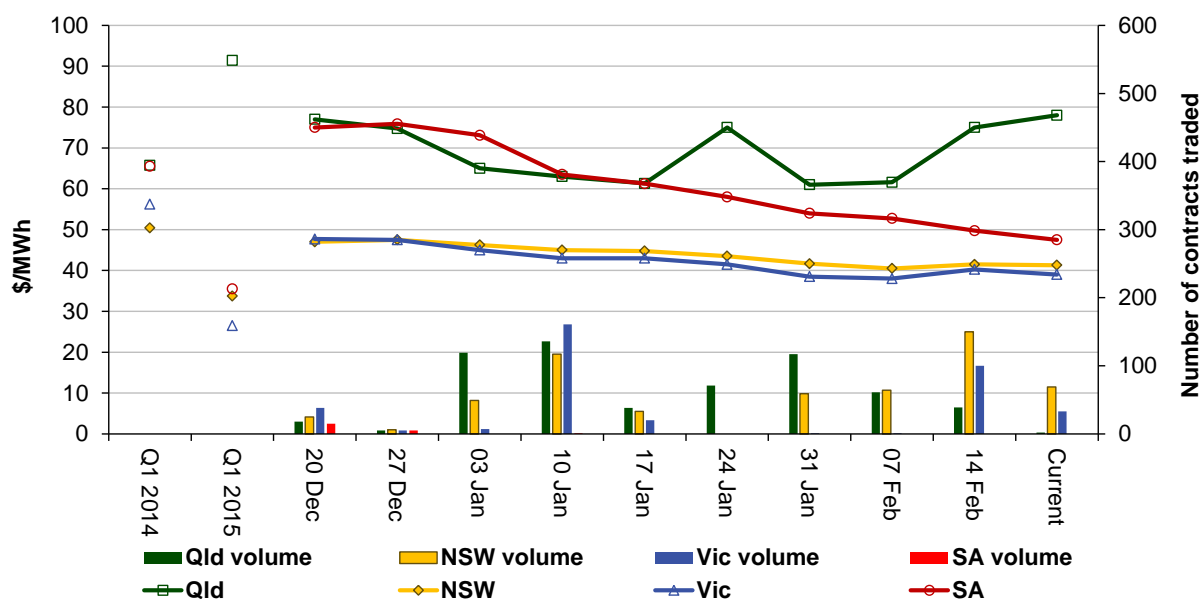
Figure 9: Quarterly base future prices Q1 2016 – Q4 2019



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. Queensland Q1 contract prices are increasing to almost \$80/MWh.

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



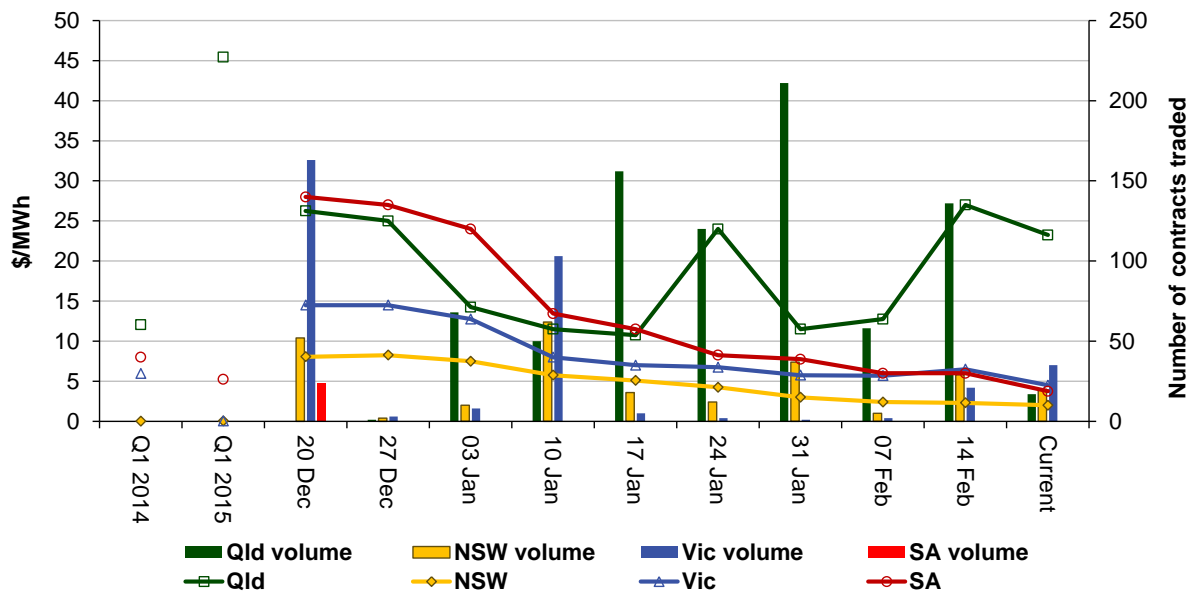
Note. Base contract prices are shown for each of the current week and the previous 9 weeks, with average prices shown for periods 1 and 2 years prior to the current year.

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
March 2016