

15 – 21 May 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 15 to 21 May 2016.

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

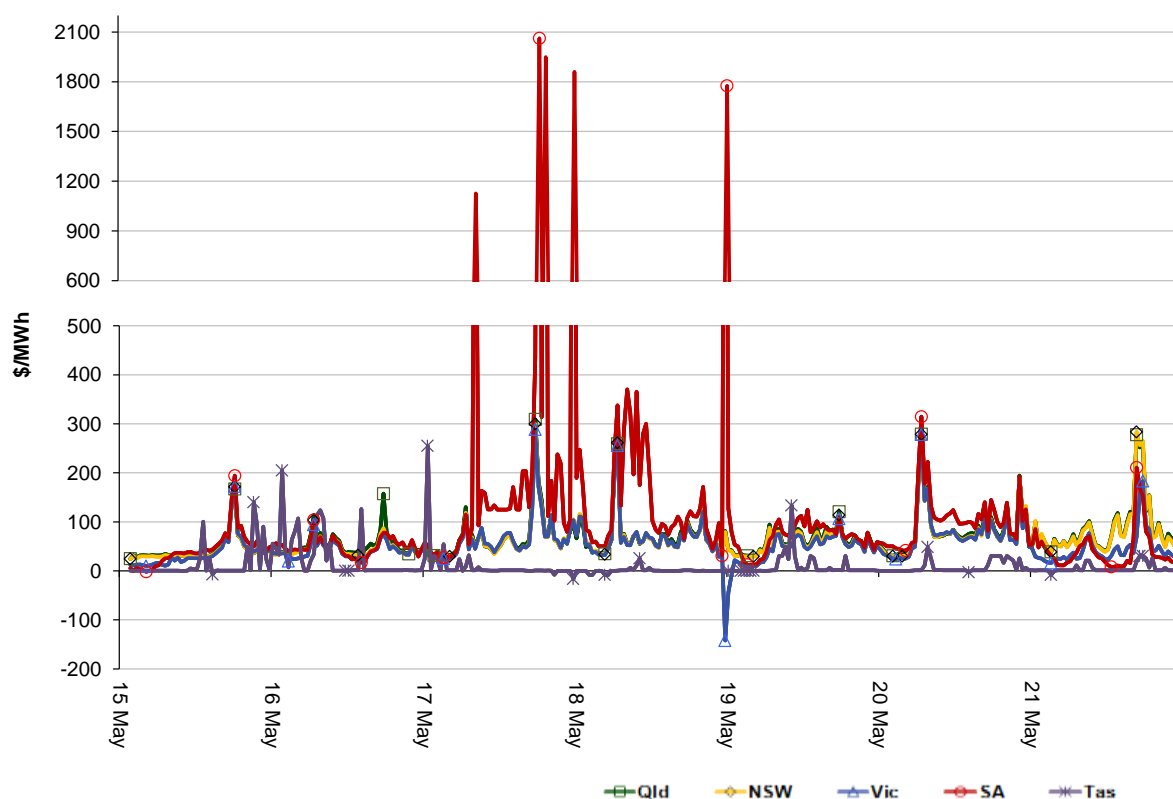


Figure 2 shows the volume weighted average (VWA) prices for the current week (with prices shown in Table 1) and the preceding 12 weeks, as well as the VWA price over the previous 3 financial years.

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

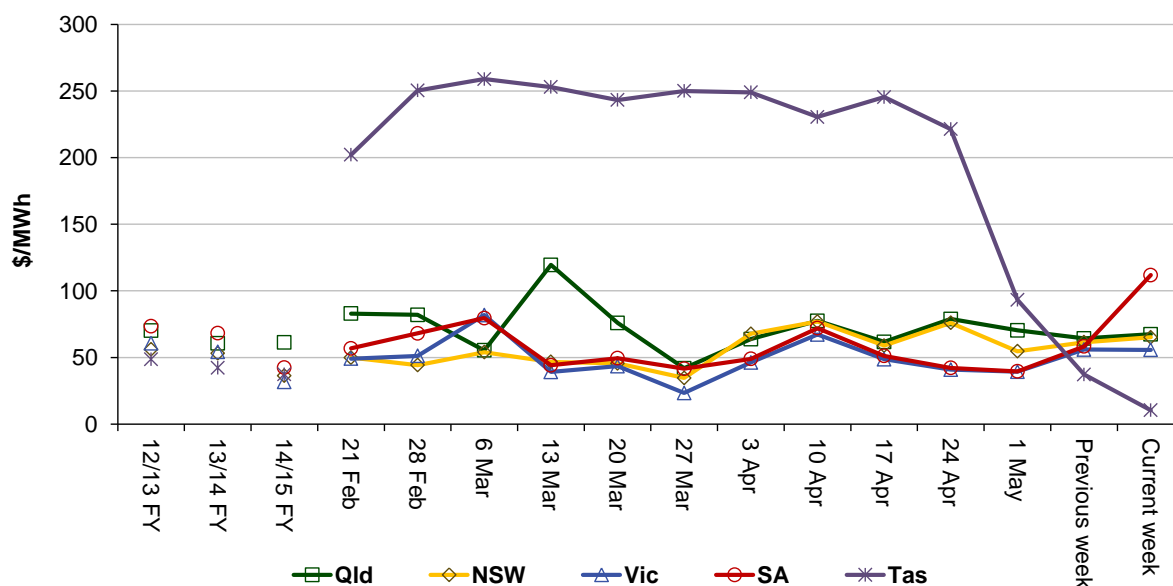


Table 1: Volume weighted average spot prices by region (\$/MWh)

Region	Qld	NSW	Vic	SA	Tas
Current week	67	65	56	112	10
14-15 financial YTD	65	36	31	40	38
15-16 financial YTD	61	48	45	61	101

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 333 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	15	14	0	4
% of total below forecast	37	22	0	8

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

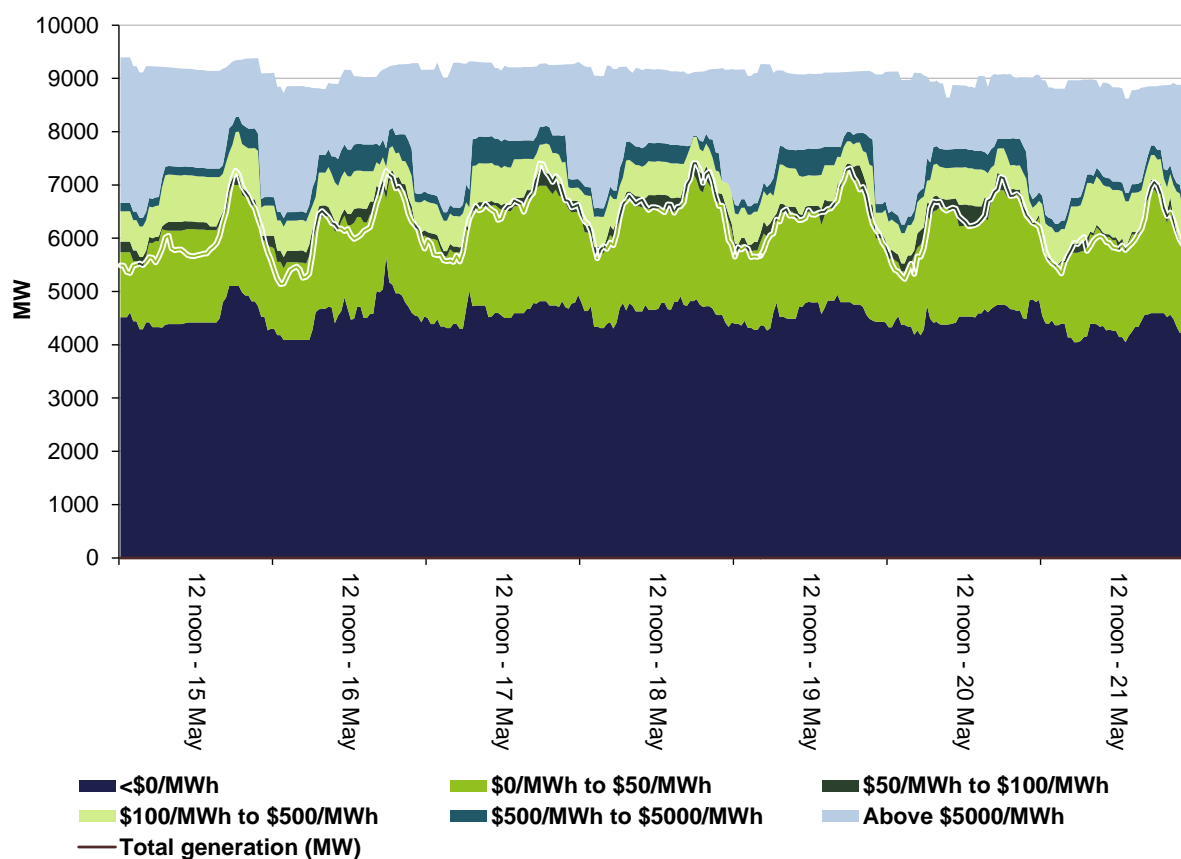


Figure 4: New South Wales generation and bidding patterns

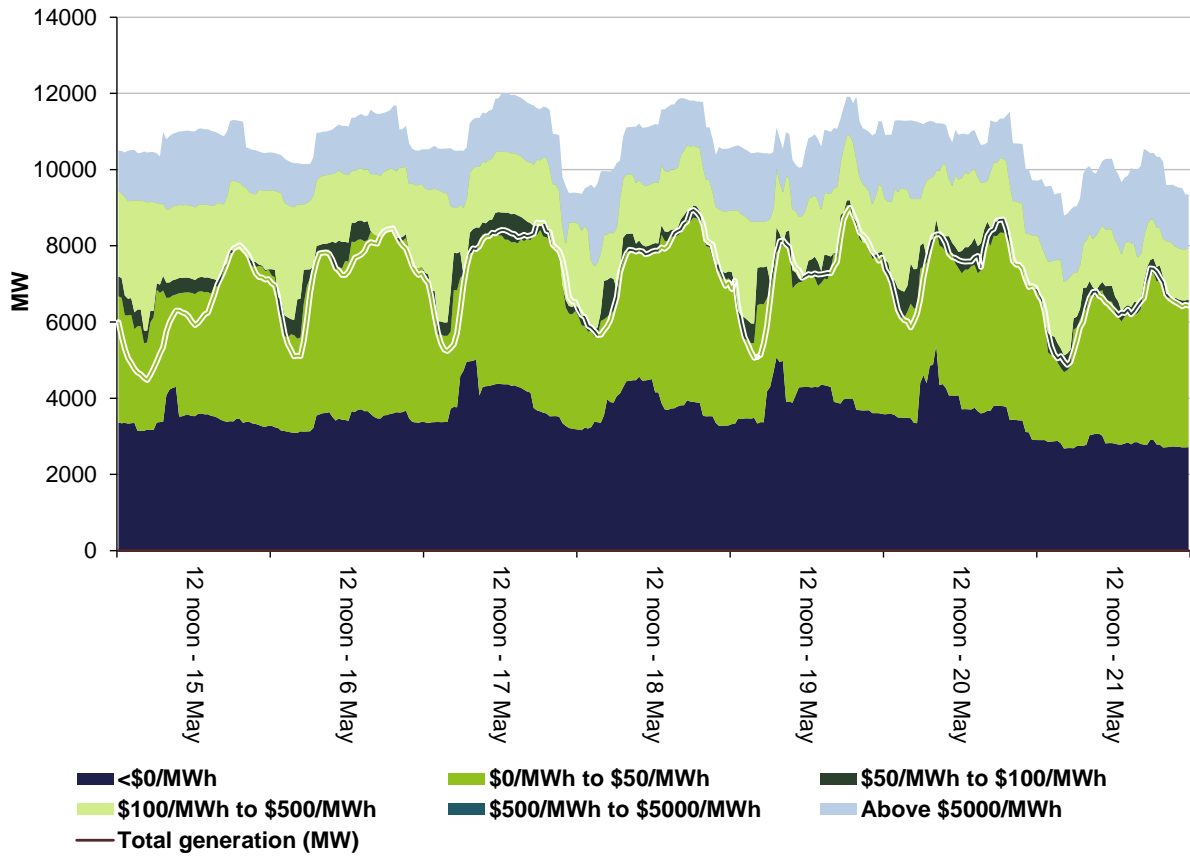


Figure 5: Victoria generation and bidding patterns

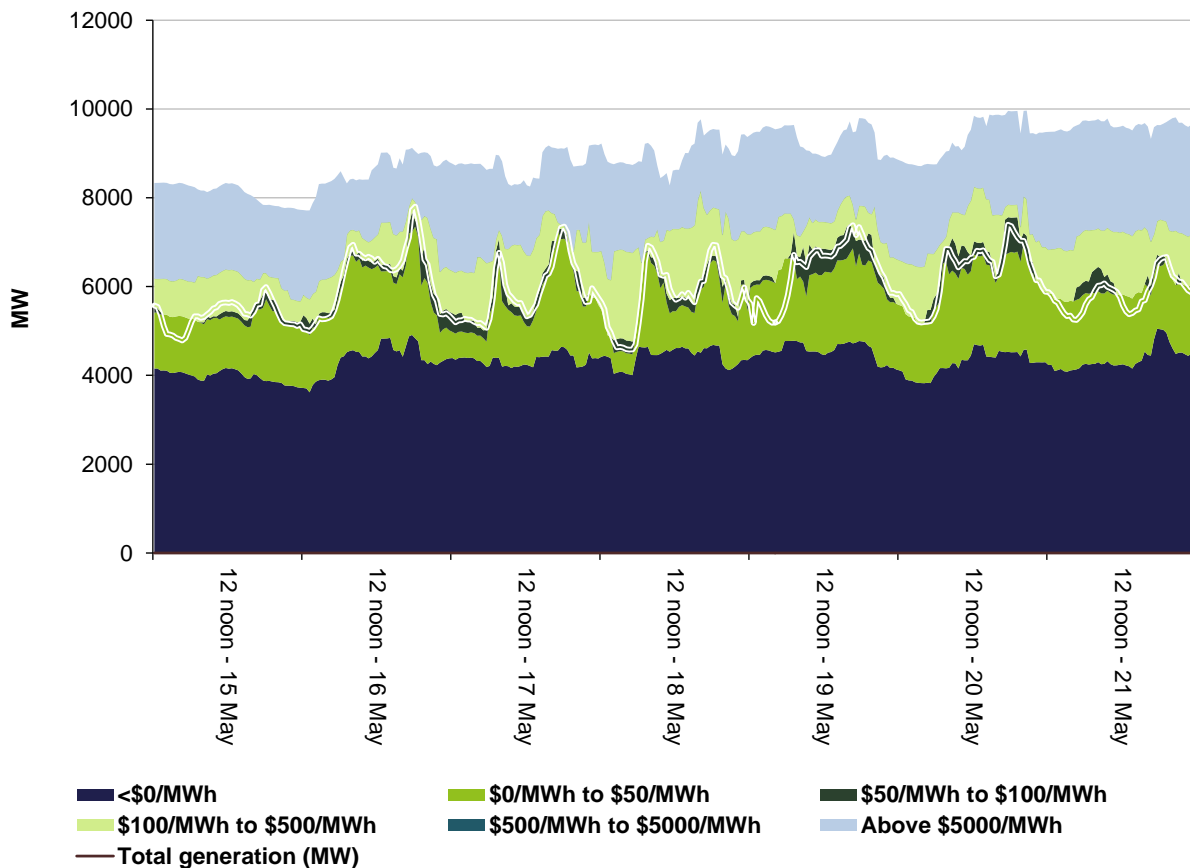


Figure 6: South Australia generation and bidding patterns

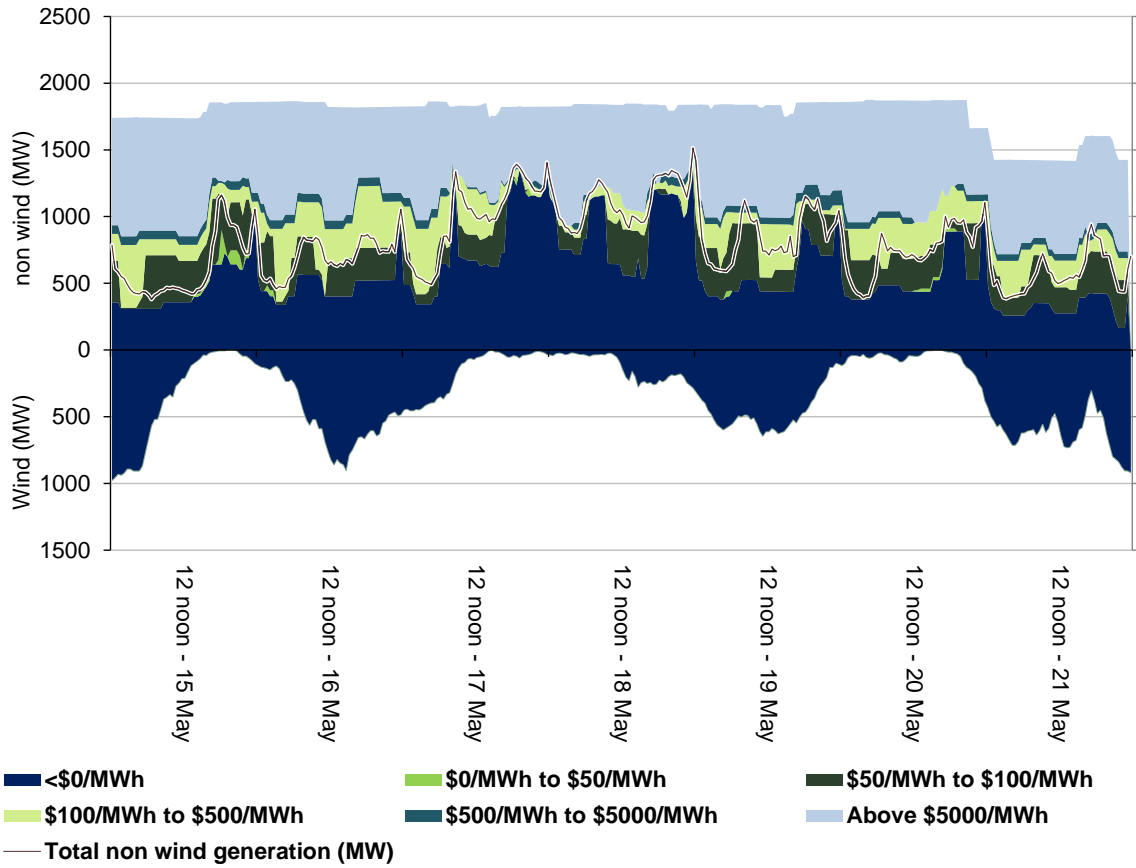
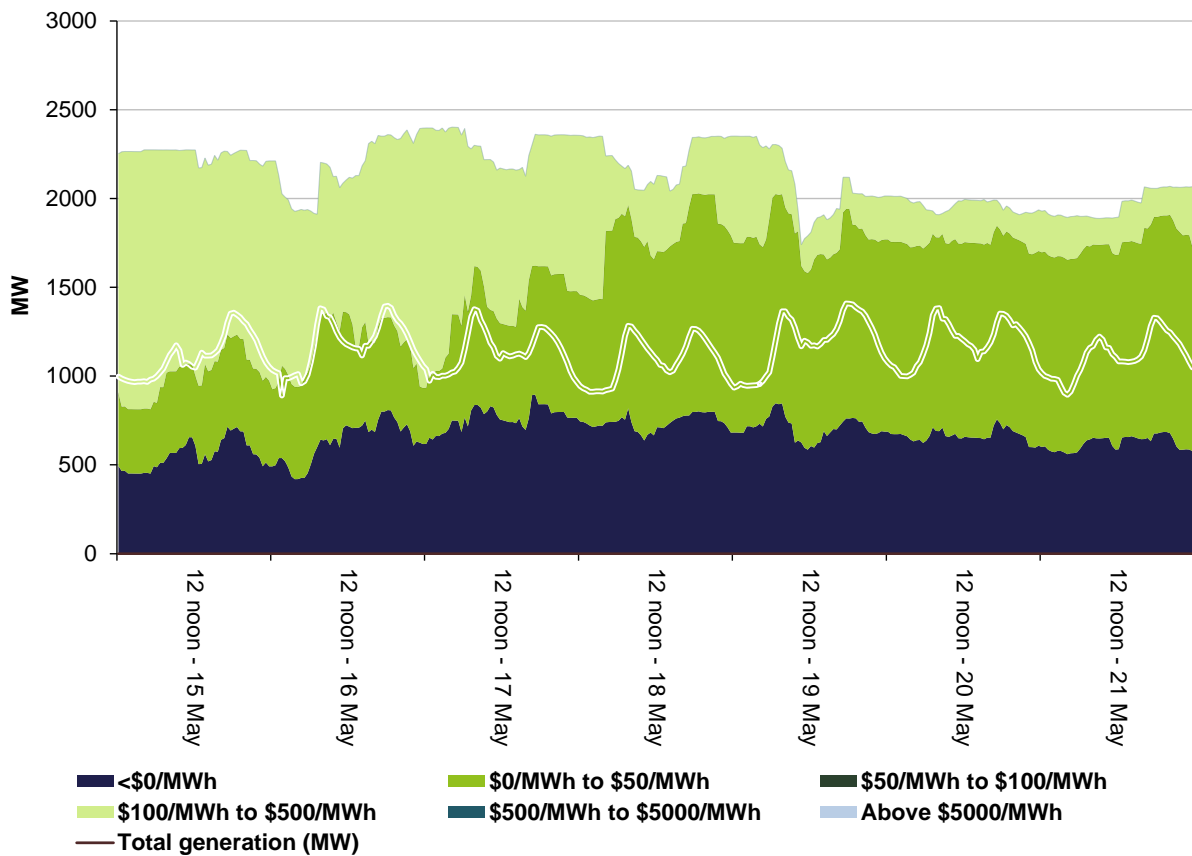


Figure 7: Tasmania generation and bidding patterns



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.

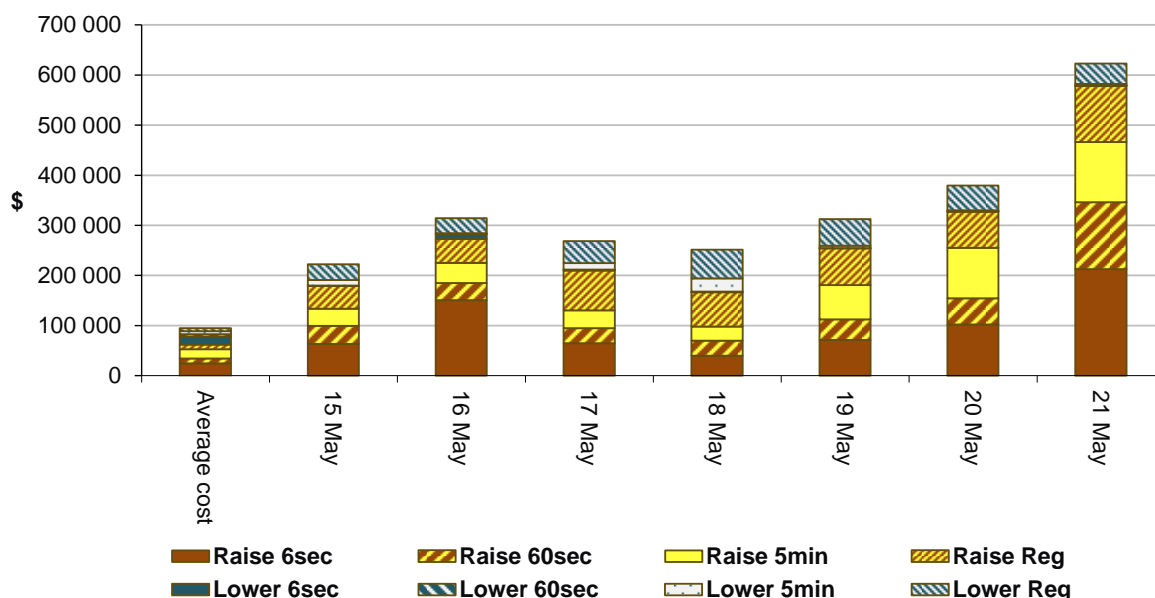
The Electricity Rules stipulate that generators pay for raise contingency services and customers pay for lower contingency services. Regulation services are paid for on a “causer pays” basis determined every four weeks by AEMO.

The total cost of FCAS on the mainland for the week was \$2 184 500 or less than 1 per cent of energy turnover on the mainland.

The total cost of FCAS in Tasmania for the week was \$186 500 or less than 11 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



The higher than average cost of FCAS was a result of limited availability of raise FCAS on the mainland and no ability to transfer FCAS across Basslink because of its long term outage.

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.

Mainland

There were three occasions where the spot price aligned nationally and the New South Wales price was greater than three times the New South Wales weekly average price of \$65/MWh and above \$250/MWh.

Tuesday, 17 May

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
6 pm	308	104	254	24 494	24 354	24 358	20 251	20 463	20 607

Conditions at the time saw demand and availability close to forecast. Prices across the mainland regions were aligned.

Table 4: Rebids for 6 pm trading interval

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
5.05 pm		Origin Energy	Uranquinty	320	<89	13 800	1700A AVOID SHORT RUN - SL
5.43 pm	5.50 pm	Snowy Hydro	Upper Tumut	89	26	450	17:32 A NSW: 30MPD PRICE \$164.84 HGR THN 30MPD 17:45@17:02
5.43 pm	5.50 pm	Snowy Hydro	Murray	150	<100	13 794	17:32 A NSW: 30MPD PRICE \$164.84 HGR THN 30MPD 17:45@17:02

There were tight supply conditions, with limited capacity available at between \$100/MWh and \$300/MWh across all mainland regions. As a result of the above rebids, with cheaper generation fully dispatched or stranded in FCAS the dispatch price was around \$300/MWh for the duration of the trading interval.

Wednesday, 18 May

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
7 am	264	298	271	20 911	20 862	20 634	19 812	19 911	20 232

Price, demand, and availability were close to forecast across all the mainland regions.

Friday, 20 May

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
7 am	278.28	74.44	71.26	22 040	21 922	21 739	32 760	32 991	33 099

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

There were tight supply demand conditions on the mainland with around 5200 MW of base load generation offline and around 500 MW of capacity priced between \$78/MWh and \$270/MWh. As the morning demand increased minor amounts of rebidding of capacity from low to high prices saw the dispatch price between \$260/MWh and \$336/MWh in every mainland region for the entire trading interval.

Queensland

There were six occasions where the spot price in Queensland was greater than three times the Queensland weekly average price of \$67/MWh and above \$250/MWh. A number of these prices occurred when prices were aligned nationally and are outlined in the mainland section of this analysis.

Saturday, 21 May

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
5 pm	277.73	103.81	75.78	6348	6333	6311	8848	8840	8920
5.30 pm	251.75	109.69	107.96	6519	6472	6485	8851	8848	8923
6 pm	256.74	323.38	200.15	6533	6561	6597	8852	8846	8926

Conditions at the time saw demand and available capacity close to that forecast. Prices in New South Wales were aligned with those in Queensland.

Table 8: Rebids for the 5 pm and 5.30 pm trading intervals

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
3.32 pm		Origin Energy	Uranquinty	320	98	13 450	1530A CONSTRAINT MANAGEMENT - V>>V_NIL_2A_R SL

There were tight supply and demand conditions in Queensland and New South Wales with very little capacity priced between the four-hour forecast and the actual price for the 5 pm and 5.30 pm trading intervals. As the afternoon demand increased, rebidding of capacity from low to high prices saw the dispatch price rise to \$295/MWh for the 4.35 pm dispatch

interval and remain above \$260/MWh for the majority of the dispatch intervals from 4.35 pm to 5.50 pm.

Table 9: Rebids for the 6 pm trading interval

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
4.18 pm		CS Energy	Wivenhoe	160	13 800	0	1618A DISPATCH PRICE HIGHER THAN 30MIN FORECAST-SL
4.53 pm		CS Energy	Wivenhoe	160	13 800	0	1651A DISPATCH DEMAND HIGHER THAN 30MIN FORECAST-SL
5.16 pm		Origin Energy	Shoalhaven	200	13 800	-1000	1714A CONSTRAINT MANAGEMENT - V>>V_NIL_2A_R SL
5.21 pm		CS Energy	Wivenhoe	90	13 800	0	1720A DISPATCH DEMAND HIGHER THAN 30MIN FORECAST-SL
5.46 pm	5.55 pm	CS Energy	Wivenhoe	90	13 800	0	1745A CHANGE IN SENSITIVITIES-UNEXPECTED ADDITIONAL HYDRO GENERATION-SL

The price for the 6 pm trading interval was slightly lower than forecast four hours ahead. The above rebidding saw the dispatch price fall from \$291/MWh at 5.50 pm to \$176/MWh at 5.55 pm.

New South Wales

There were six occasions where the spot price in New South Wales was greater than three times the New South Wales weekly average price of \$65/MWh and above \$250/MWh. A number of these prices occurred when prices were aligned nationally and are outlined in the mainland section of this analysis.

Saturday, 21 May

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
5 pm	283.36	98.00	70.47	7897	7665	7771	10 325	10 097	10 711
5.30 pm	256.19	101.08	98.00	8266	8152	8168	10 558	10 581	11 197
6 pm	264.97	299.80	118.08	8613	8644	8578	10 452	10 590	11 200

Prices in New South Wales and Queensland were aligned during these trading intervals and events on the day are described in the Queensland section.

Victoria

There were three occasions where the spot price in Victoria was greater than three times the Victoria weekly average price of \$56/MWh and above \$250/MWh and there was one occasion where the spot price was below -\$100/MWh. Two of these prices occurred when prices were aligned nationally and are outlined in the mainland section of this analysis.

Thursday, 19 May

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
Midnight	-142.28	10.50	9.18	4962	5046	4920	9369	9440	9504

At 11.35 pm a constraint managing the over load of the Buangor to Arrarat 66kV line on the loss of the Ballarat to Waubra to Horsham line saw imports into Victoria from New South Wales fall from 633 MW to 132 MW. Flows into South Australia were limited to 7 MW across Heywood and 4 MW across Murraylink. This resulted in excess generation in Victoria and the dispatch price fell from \$30/MWh at 11.30 pm to -\$899/MWh at 11.35 pm.

South Australia

There were nine occasions where the spot price in South Australia was greater than three times the South Australia weekly average price of \$112/MWh and above \$250/MWh. Two of these prices occurred when prices were aligned nationally and are outlined in the mainland section of this analysis.

Tuesday, 17 May

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
8.30 am	1126.17	64.99	100.67	1436	1440	1507	2080	2077	2063

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

In preparation for a Tailem Bend line and bus outage, a soft ramping constraint was invoked that resulted in a significant reduction in the import flows on the Heywood interconnector. Heywood interconnector imports reduced from 191 MW at 8 am to 77 MW at 8.05 am and then exporting 11 MW at 8.10 am.

Following a 50 MW increase in demand, with cheaper priced generation ramp rate limited, stranded in FCAS, or fully dispatched the price increased from \$125/MWh at 8.05 am to \$6480/MWh at 8.10 am.

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
6.30 pm	2062.18	350.97	590.07	1619	1716	1774	1863	2056	2108
7.30 pm	1949.43	10 759.20	359.07	1614	1706	1750	1884	1927	2109

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

Constraints managing the outage of the Tailem Bend line and bus limited imports into South Australia to around 85 MW across the Heywood interconnector. There was no capacity in South Australia priced between \$112/MWh and \$10 758/MWh meaning small changes in demand or rebidding could lead to high prices.

Following a 60 MW increase in demand at 6.30 pm, with cheaper priced generation fully dispatched or stranded in FCAS the price increased from \$127/MWh at 6.25 pm to \$10 759/MWh at 6.30 pm.

Table 14: Rebids for the 7.30 pm trading interval

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
3.24 pm		GDF Suez	Mintaro	84	13 800	<371	1521A CHANGE IN 30MIN PD 19:30 NOW \$10,759.20 SL
7.04 pm	7.15 pm	Snowy Hydro	Pt Stanvac	63	0	13 800	19:02 A SA: 30MPD PRICE \$227.53 LWR THN 30MPD 19:30@18:32

The rebid at Mintaro saw forecast prices fall from the four hour forecast. When the rebid at Pt Stanvac became effective at 7.15 pm the actual price increased to \$10 759/MWh. There was a 45 MW decrease in demand at 7.20 pm and the dispatch price fell to \$103/MWh.

Wednesday, 18 May

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
Midnight	1860.31	359.07	590.07	1529	1621	1642	1857	1926	2057

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

At 11.35 pm, demand increased by 182 MW due to hot water load. With lower priced generation either fully dispatched or stranded in FCAS the price increased from \$124/MWh at 11.30 pm to \$10 759/MWh.

Table 16: 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
8.30 am	370.30	13 481.81	13 481.81	1479	1495	1503	1878	1929	1973

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

Table 17: Rebids for the 8.30 pm trading interval

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
5.27 am		Origin Energy	Quarantine	80	13 800	-1000	0525A CONSTRAINT MANAGEMENT - S>>X_TB-EBUS+CGTB_3 SL
7.08 am		GDF Suez	Dry Creek	56	13 800	<370	0707A SA ACT PRICE \$62.22 > \$45.38 30 MPD HHE 07:30
7.26 am		EnergyAustralia	Hallett	10	13 482	-1000	07:25 A BAND ADJ FOR MAT CHAGNE IN SA 5PD DEMAND SL

The above rebids resulted in the actual spot price being lower than that forecast four hours ahead.

Table 18: 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
10 am	365.31	370.57	367.82	1397	1383	1386	1865	1928	1956

Demand and the spot price were close to forecast.

Thursday, 19 May

Table 19: 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
Midnight	1775.46	370.50	978.82	1374	1529	1539	2122	2165	2151

At 11.35 pm, demand increased from 1238 MW to 1406 MW (168 MW increase), due to hot water load. The sudden increase in demand could not be met by low-priced generation as there was a constraint managing the outage of the Cherry Gardens to Tailem Bend line that resulted in limited imports and generation to be constrained down. There were also a number of generators trapped in FCAS. This saw the dispatch price increased from \$41/MWh at 11.30 pm to \$10 782/MWh at 11.35 pm. The price then reduced to \$31/MWh in the following dispatch interval when capacity was rebid to low prices.

Tasmania

There was one occasion where the spot price in Tasmania was greater than three times the Tasmania weekly average price of \$10/MWh and above \$250/MWh.

Tuesday, 17 May

Table 20: 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 am	255.00	180.22	180.22	791	841	848	2397	2371	2376

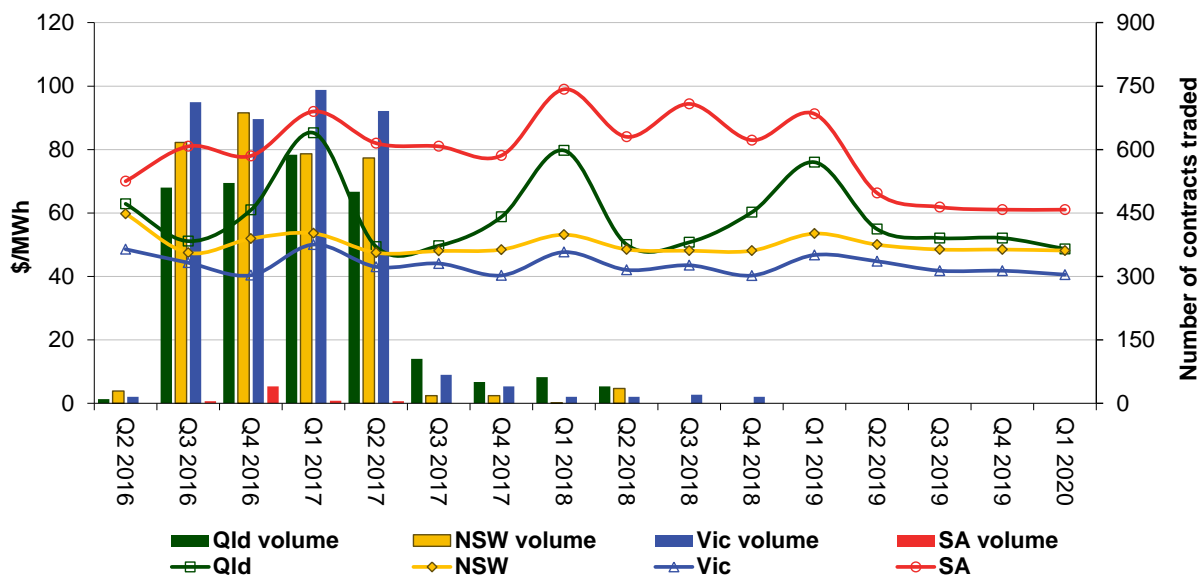
Conditions at the time saw demand and availability close to forecast four hours ahead.

The spot price increased from \$0/MWh at 12.35 am to \$1387/MWh at 12.40 am due to the co-optimisation of the energy and FCAS markets.

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. The high volumes for Q3 2016 to Q2 2017 were a result of the conversion of 2016/17 financial year base load options to base future contracts.

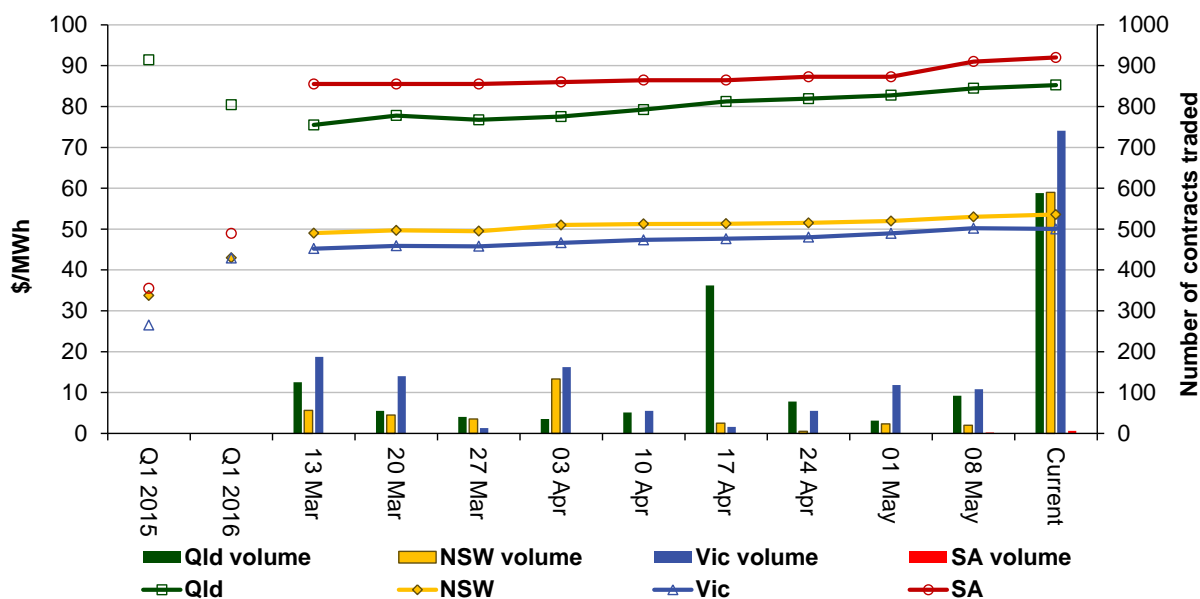
Figure 9: Quarterly base future prices Q2 2016 – Q1 2020



Source: ASXEnergy.com.au

Figure 10 shows how the price for each regional Quarter 1 2017 base contract has changed over the last 10 weeks (as well as the total number of trades each week). The closing quarter 1 2015 and quarter 1 2016 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 2017 base contracts over the past 10 weeks (and the past 2 years)



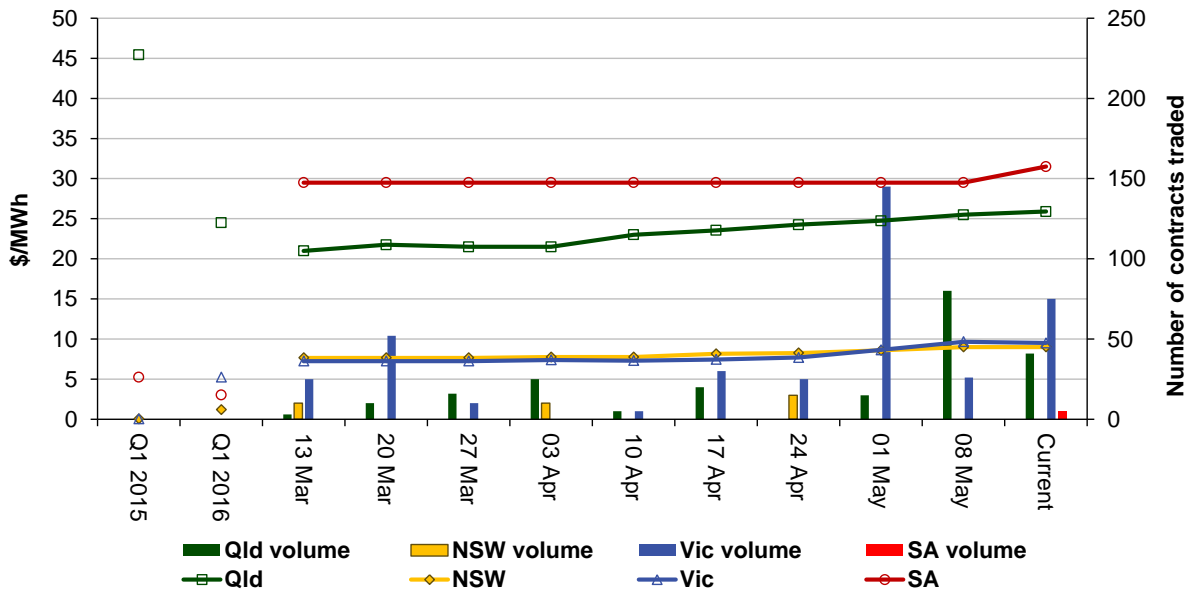
Note. Base contract prices are shown for each of the current week and the previous 9 weeks, with average prices shown for periods 1 and 2 years prior to the current year.

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 2017 cap contract has changed over the last 10 weeks (as well as the total number of trades each week). The closing quarter 1 2015 and quarter 1 2016 prices are also shown.

Figure 11: Price of Q1 2017 cap contracts over the past 10 weeks (and the past 2 years)



Source: ASXEnergy.com.au

Australian Energy Regulator
June 2016