Electricity Report

AUSTRALIAN ENERGY REGULATOR

22 – 28 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 22 to 28 May 2016.

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

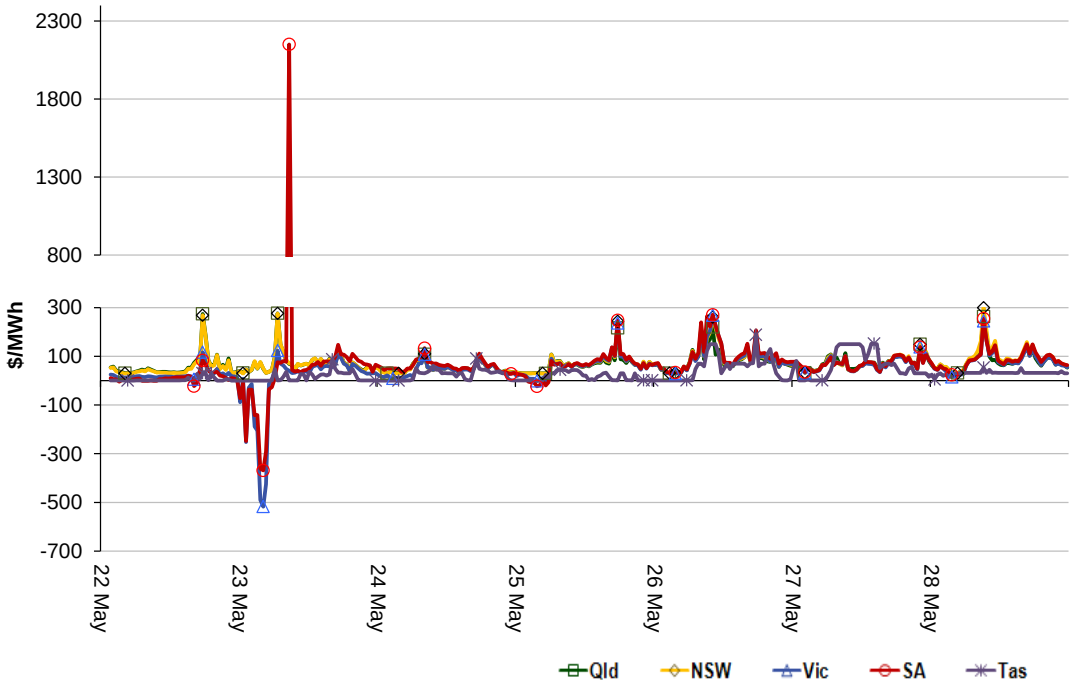


Figure 2 shows the volume weighted average (VWA) prices for the current week (with prices shown in Table 1) and the preceding 12 weeks, as well as the VWA price over the previous 3 financial years.

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

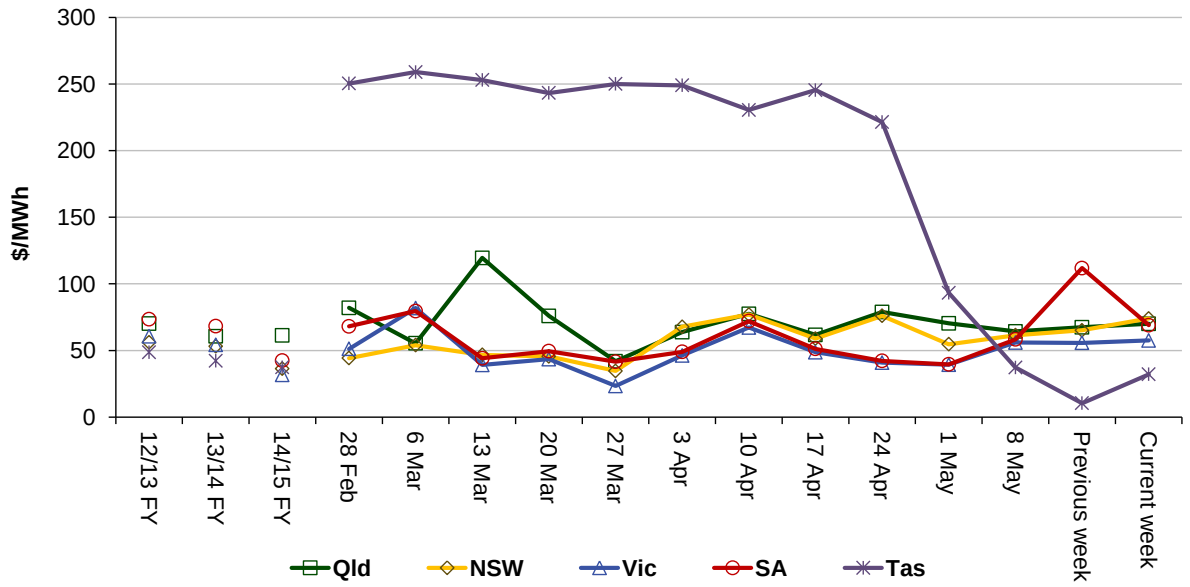


Table 1: Volume weighted average spot prices by region ($/MWh)

Region	Qld	NSW	Vic	SA	Tas
Current week	70	74	58	69	32
14-15 financial YTD	64	36	31	41	38
15-16 financial YTD	61	49	45	61	99

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 325 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	14	18	0	9
% of total below forecast	33	18	1	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.

The red elipses on Figure 5 and Figure 6 highlight periods which are discussed in greater detail in the detailed market analysis section.

Figure 3: Queensland generation and bidding patterns

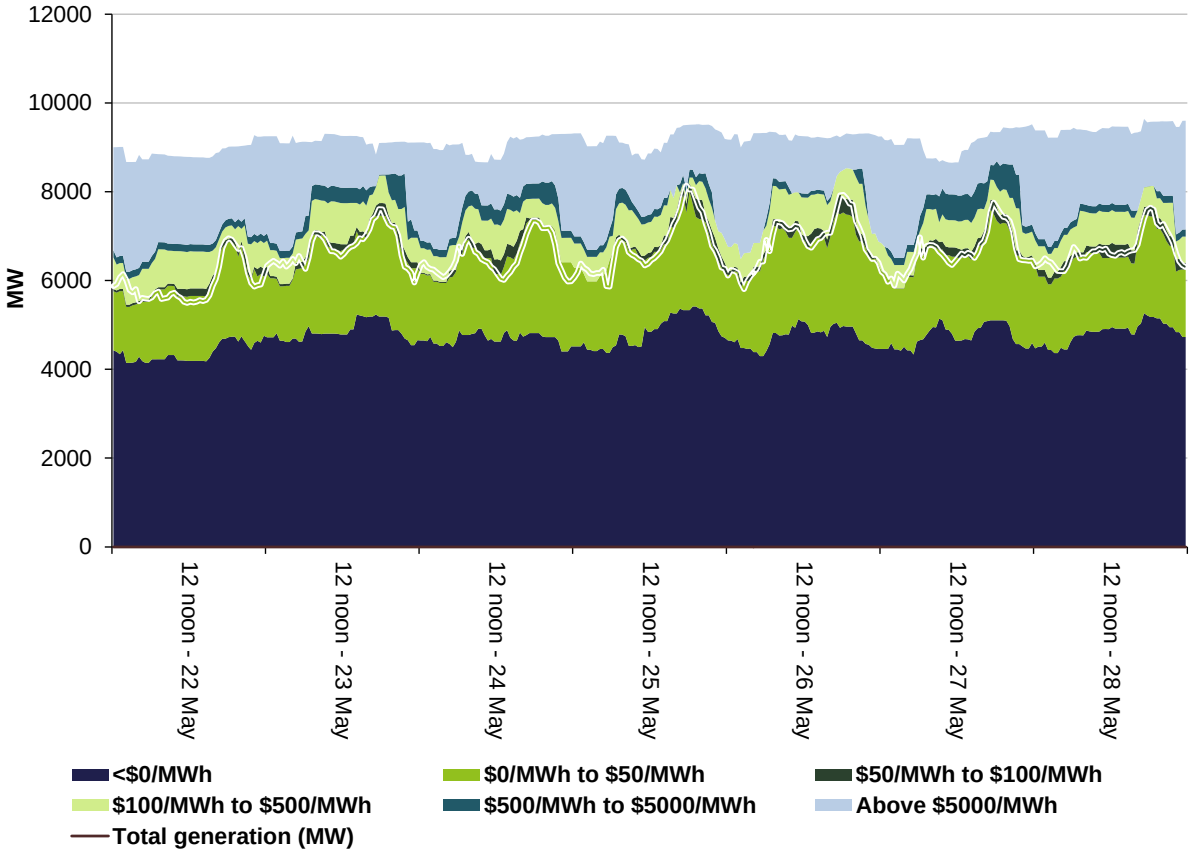


Figure 4: New South Wales generation and bidding patterns

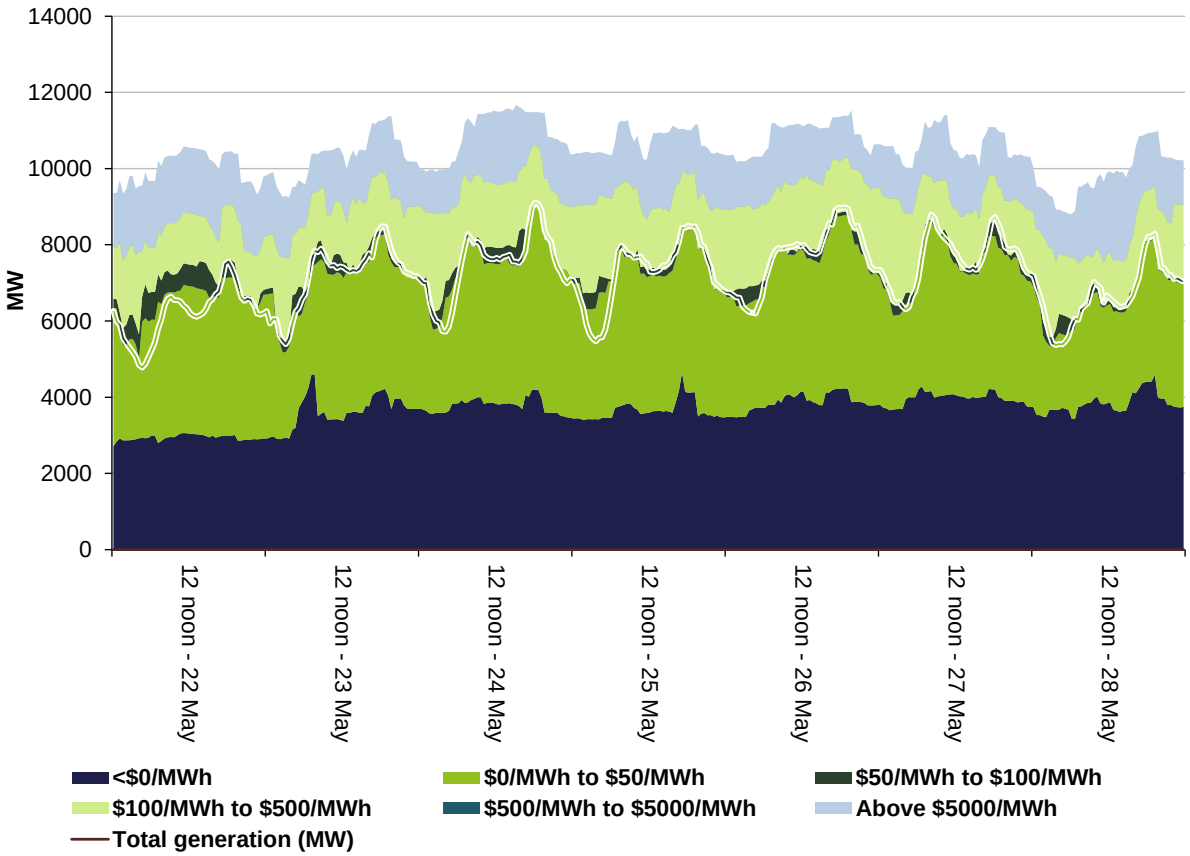


Figure 5: Victoria generation and bidding patterns

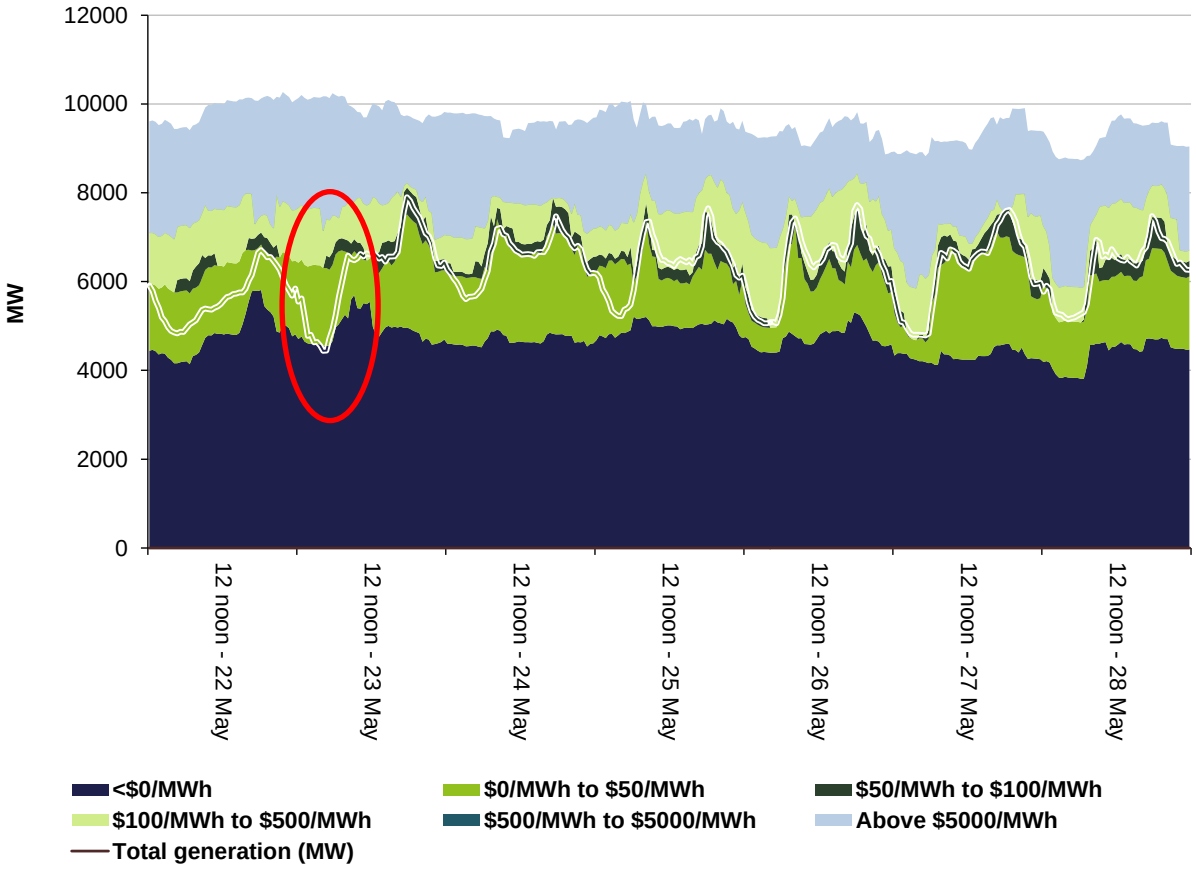


Figure 6: South Australia generation and bidding patterns

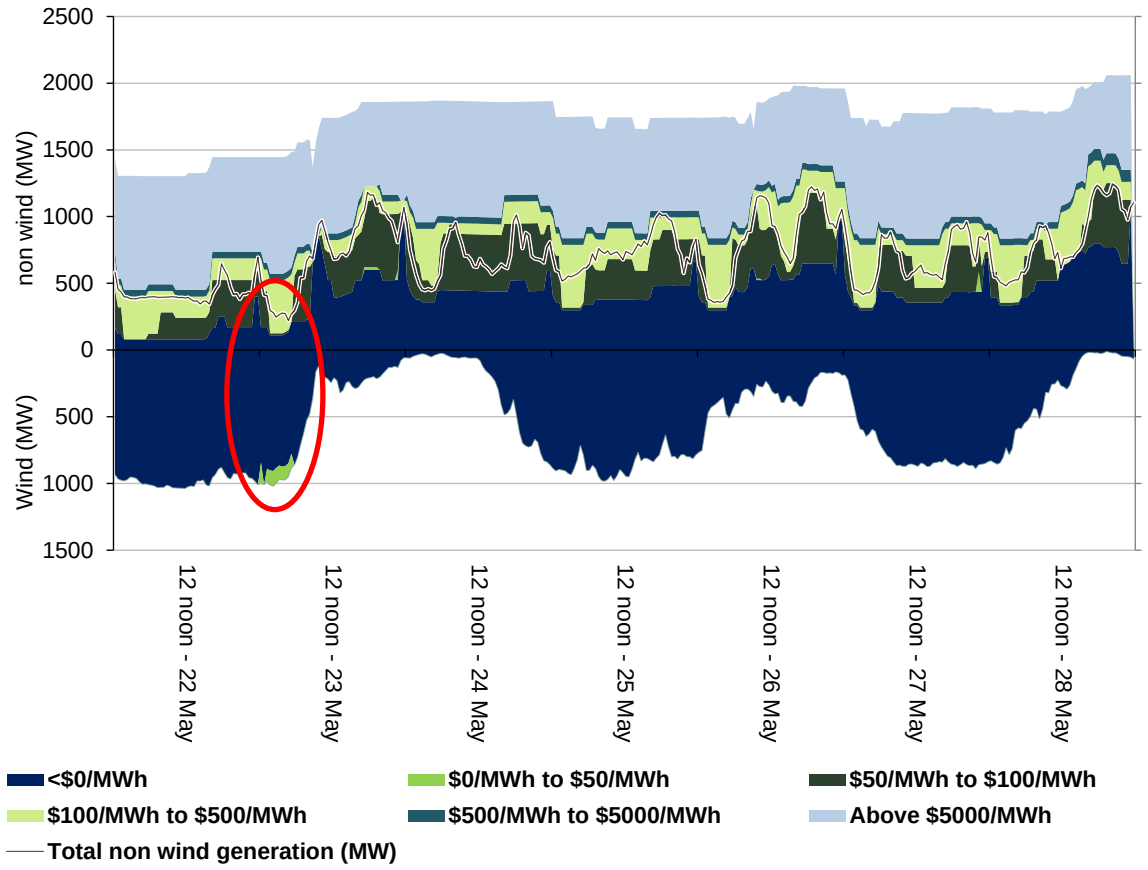
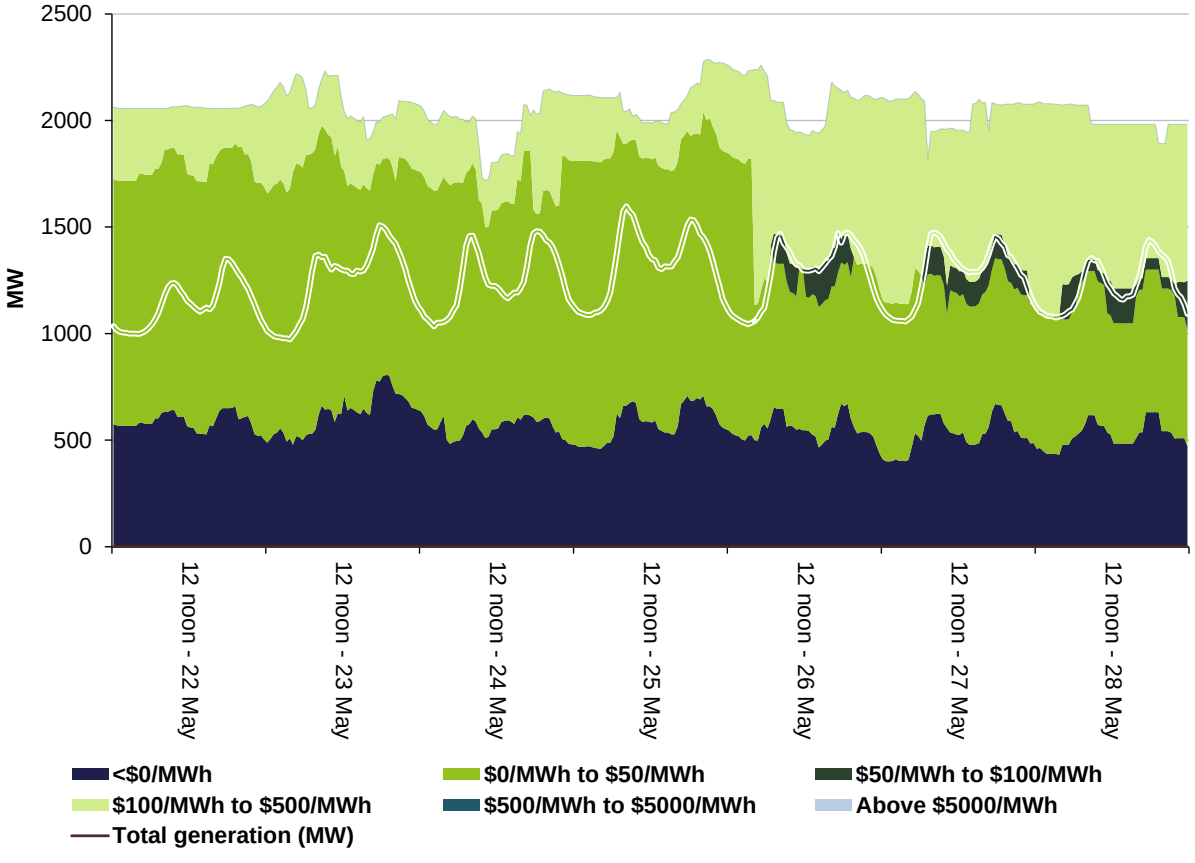


Figure 7: Tasmania generation and bidding patterns



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.

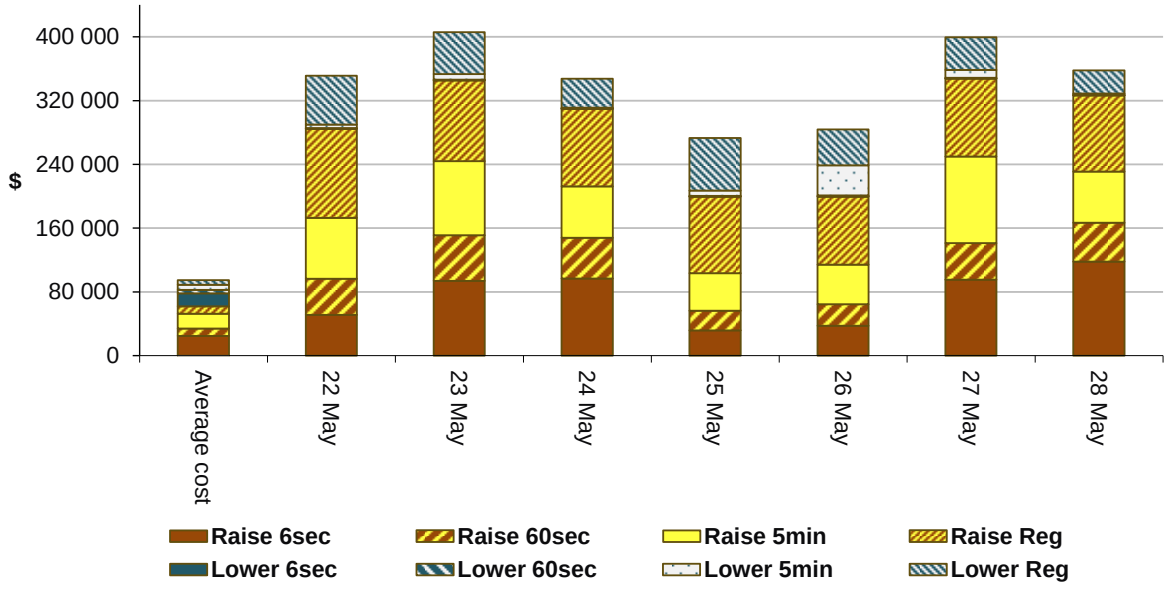
The Electricity Rules stipulate that generators pay for raise contingency services and customers pay for lower contingency services. Regulation services are paid for on a “causer pays” basis determined every four weeks by AEMO.

The total cost of FCAS on the mainland for the week was $2 340 000 or around 1 per cent of energy turnover on the mainland.

The total cost of FCAS in Tasmania for the week was $78 000 or less than 2 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 two occasions where the spot price aligned across the mainland and the New South Wales price was greater than three times the New South Wales weekly average price of $74/MWh and above $250/MWh.

Thursday, 26 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
10.30 am	260.86	74.63	89.45	23 822	23 304	23 634	33 445	34 234	34 292

Conditions on the day saw demand around 300 MW greater than that forecast four hours ahead and available capacity was close to forecast.

Table 4: Rebids for 10.30 am trading interval

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from ($/MWh)	Price to ($/MWh)	Rebid reason
7.13 am		AGL Energy	Loy Yang A	740	<25	500	0706~P~010 UNEXPECTED/PLANT LIMITS~COAL OFFLOADING
7.22 am		GDF Suez	Loy Yang B	410	11	299	0722P FUEL MANAGEMENT: COAL SHORTFALL SL

Following the above rebids in Victoria, the forecast prices for the mainland were revised up from around $70/MWh to around $300/MWh. With no other significant changes in market conditions, this forecast price eventuated.

Saturday, 28 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
9.30 am	299.70	299.60	289.00	22 361	21 824	21 871	32 140	32 894	33 304

Prices were close to forecast for all mainland regions.

Queensland

There were three occasions where the spot price in Queensland was greater than three times the Queensland weekly average price of $70/MWh and above $250/MWh. One of these occurred when prices were generally aligned on the mainland and is detailed in the national market outcomes section. The remaining two occasions are presented below.

Sunday, 22 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
6 pm	274.01	399.84	399.84	6692	6599	6609	8978	8848	8858

Conditions at the time saw demand around 100 MW higher than forecast and available capacity 130 MW greater than forecast.

Table 7: Rebids for 6 pm trading interval

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from ($/MWh)	Price to ($/MWh)	Rebid reason
3.55 pm		Millmerran Energy Trader	Millmerran	45	N/A	-1000	15:54 P: REVISED UNIT RTS
4.28 pm		Millmerran Energy Trader	Millmerran	25	N/A	-1000	16:27 P: REVISED UNIT RTS
4.36 pm		CS Energy	Wivenhoe	160	13 800	0	1635A DISPATCH PRICE HIGHER THAN 30MIN FORECAST-SL
4.37 pm		CS Energy	Wivenhoe	160	13 800	0	1635A DISPATCH PRICE HIGHER THAN 30MIN FORECAST-SL
4.57 pm		CS Energy	Wivenhoe	90	13 800	0	1654A DISPATCH PRICE DEMAND THAN 30MIN FORECAST-SL
5.02 pm		Millmerran Energy Trader	Millmerran	85	N/A	-1000	17:02 P: REVISED UNIT RTS

The above rebids saw the forecast price for the 6 pm trading interval was revised down from $400/MWh to around $300/MWh at 5 pm.

Monday, 23 May

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

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	276.71	76.58	36.89	6282	6211	6129	9120	9115	9380

Conditions at the time saw demand and available capacity close to that forecast four hours ahead. The Queensland and New South Wales prices were aligned during the 7 am trading interval. Details on why the price was different to forecast is detailed in the New South Wales section.

New South Wales

There were four occasions where the spot price in New South Wales was greater than three times the New South Wales weekly average price of $74/MWh and above $250/MWh. Two of these occurred when prices were generally aligned on the mainland and is detailed in the national market outcomes section. The remaining two occasions are presented below.

Sunday, 22 May

Table 9: 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	268.55	299.80	98.00	8569	8643	8498	10 407	10 671	11 316

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

Monday, 23 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
7 am	275.94	73.43	33.91	7739	7745	7563	9907	10 402	10 544

Conditions at the time saw demand close to forecast but available capacity around 500 MW lower than that forecast four hours ahead. The New South Wales and Queensland prices were aligned during the 7 am trading interval.

Table 11: Rebids for 7 am trading interval

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from ($/MWh)	Price to ($/MWh)	Rebid reason
3.50 am		AGL Energy	Liddell	-30	-1000	N/A	0348~P~010 UNEXPECTED/PLANT LIMITS~DELAYED UNIT RTS

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from ($/MWh)	Price to ($/MWh)	Rebid reason
4.32 am		AGL Energy	Liddell	-90	-1000	N/A	0430~P~010 UNEXPECTED/PLANT LIMITS~DELAYED UNIT RTS
5.21 am		AGL Energy	Bayswater	-240	<42	N/A	05:18P BW01 BLR WATER CHEMICALS AT LIMIT

The above rebidding saw the forecast price for the 7 am trading interval was revised up for both Queensland and New South Wales regions from around $100/MWh to around $300/MWh at 5.30 am.

Victoria

There was one occasion where the spot price in Victoria was greater than three times the Victoria weekly average price of $58/MWh and above $250/MWh. This event occurred when prices were generally aligned on the mainland and is detailed in the national market outcomes section. There were six occasions where the spot price was below -$100/MWh.

Monday, 23 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
1.30 am	-252.19	12.92	12.92	3914	3992	4034	10 189	10 116	10 049
3 am	-188.59	-7.67	-9.11	3567	3554	3650	10 155	10 173	10 179
3.30 am	-205.10	-9.90	-12.02	3525	3477	3600	10 147	10 218	10 234
4 am	-490.24	-11.92	-12.24	3461	3430	3568	10 143	10 220	10 252
4.30 am	-517.12	-11.14	-9.08	3485	3453	3595	10 183	10 274	10 255
5 am	-425.62	-9.03	-8.79	3569	3543	3661	10 187	10 271	10 249

Conditions at the time saw demand and availability close to forecast. The prices in Victoria and South Australia were aligned from 1 am to 5 am. The factors that contributed to the Victoria price being different to forecast also contributed to those in South Australia.

At 1.15 am, AEMO invoked constraints to manage the overloading of the South Morang Terminal Station (TS) on the trip of the lines connecting Mortlake power station and Tarrone TS to the ADP potlines. These constraints bound immediately after they were invoked and bound intermittently until 2.30 pm.

These constraints affect almost all the units in Victoria as well as the flow on the Heywood and the VIC-NSW interconnectors. The constraint resulted in a significant reduction of exports into New South Wales, from 1000 MW at 1.10 am to 164 MW at 1.35 am. This saw

excess low-priced generation in Victoria. This excess generation combined with high wind output in South Australia and Victoria (around 1210 MW at 1.30 am) and low off peak demand resulted large negatively dispatch prices in Victoria and South Australia.

South Australia

There were four occasions where the spot price in South Australia was greater than three times the South Australia weekly average price of $69/MWh and above $250/MWh and there were six occasions where the spot price was below -$100/MWh. Two of high prices occurred when prices were aligned on the mainland and is detailed in the mainland market outcomes section. The remaining two occasions are presented below.

Monday, 23 May

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
1.30 am	-248.03	3.59	3.43	1147	1108	1065	2427	2448	2446
3 am	-142.17	-34.86	-34.86	1067	919	902	2445	2469	2446
3.30 am	-140.99	-34.86	-34.86	998	891	878	2415	2461	2442
4 am	-361.57	-43.49	-34.86	999	875	872	2419	2447	2435
4.30 am	-368.47	-34.86	-34.86	1010	868	873	2419	2418	2418
5 am	-291.06	-43.49	-34.86	1065	878	889	2410	2411	2423

Conditions at the time saw demand and available capacity close to forecast. Prices were aligned with those in Victoria. See the Victoria section for a detailed explanation. We note that some of the wind generators in South Australia offered some of their capacity at prices between $0/MWh and $50/MWh.

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
9 am	2149.77	67.26	64.99	1333	1399	1375	1707	2155	2115

Conditions at the time saw demand close to forecast and availability around 350 MW less than that forecast four hours ahead.

With little capacity priced between $100/MWh and $11 900/MWh, and imports from Victoria across Heywood and Murraylink at their limits, small changes in demand and rebidding had a significant impact on price.

Table 15: Rebids for 7 am trading interval

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from ($/MWh)	Price to ($/MWh)	Rebid reason
8.26 am	8.35 am	AGL Energy	Torrens Island	-130	<126	N/A	0825~P~010 UNEXPECTED/PLANT LIMITS~106 AUX/PLANT FAILURE
8.34 am	8.45 am	AGL Energy	Torrens Island	-80	<65	N/A	0830~P~020 REDUCTION IN AVAIL CAP~204 UNIT TRIP
8.47 am	8.55 am	AGL Energy	Torrens Island	-60	-1000	N/A	0845~P~020 REDUCTION IN AVAIL CAP~204 UNIT TRIP

The above rebidding and a 44 MW increase in demand at 8.55 am, saw the dispatch price gradually increase from $69/MWh at 8.35 am to $12 195/MWh at 8.55 am. The price fell to previous level at 9 am following a reduction in demand and participants rebidding capacity from high to low prices

Thursday, 26 May

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
9.30 am	264.90	79.99	132.03	1463	1574	1660	2175	2212	2016

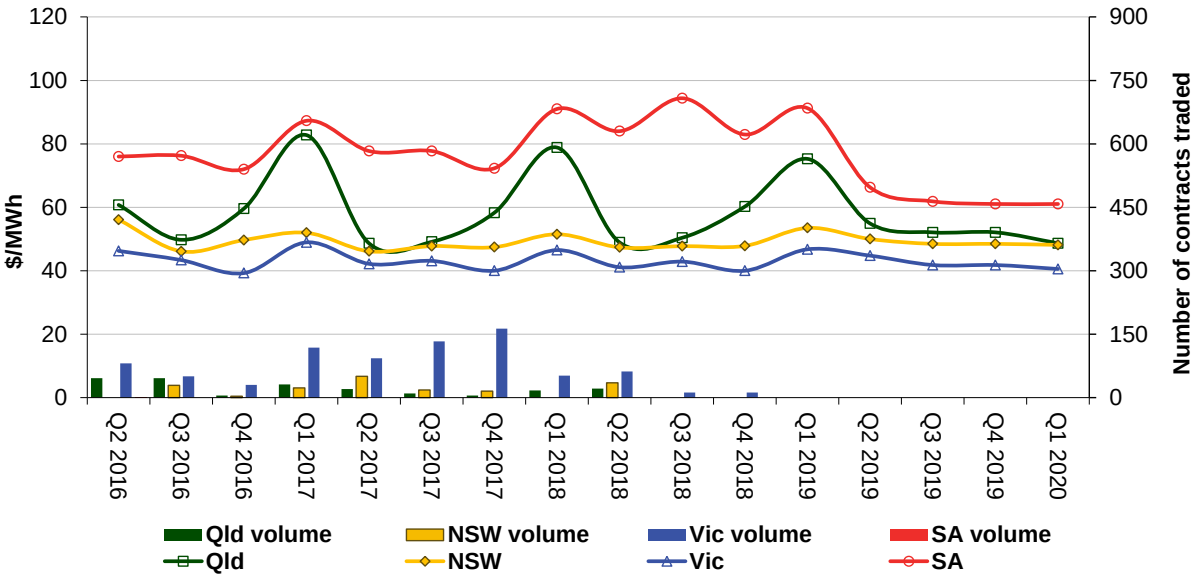
Conditions at the time saw demand 111 MW lower than forecast and availability close to forecast.

The reduction in low-priced capacity in Victoria detailed in the mainland section for the 10.30 am price was the main factor for the higher than forecast price.

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.

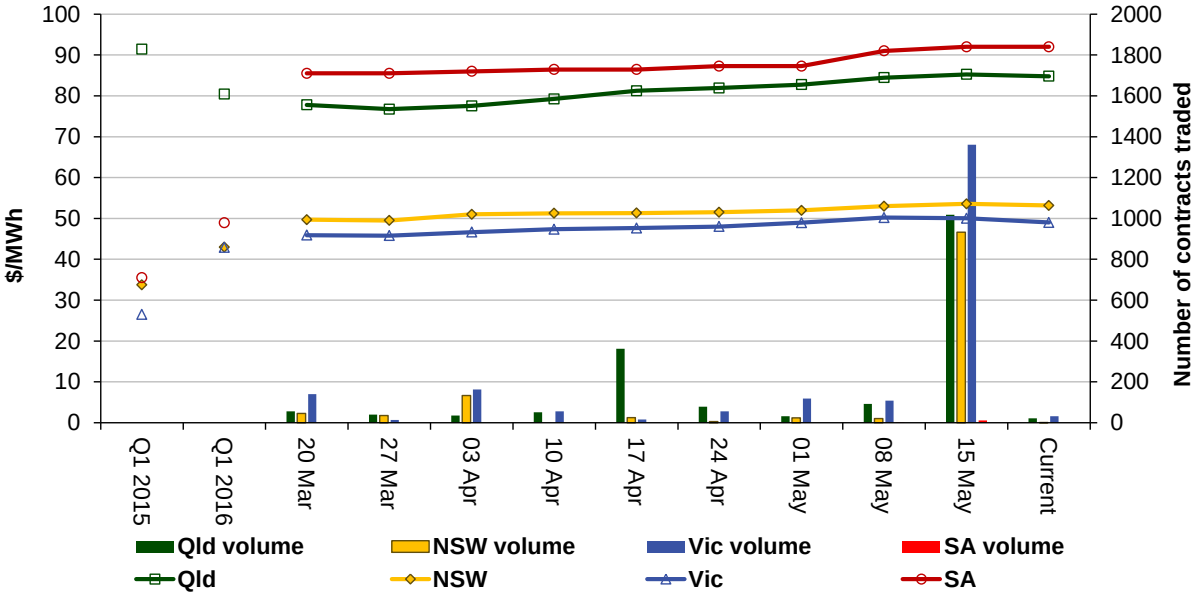
Figure 9: Quarterly base future prices Q2 2016 – Q1 2020



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)



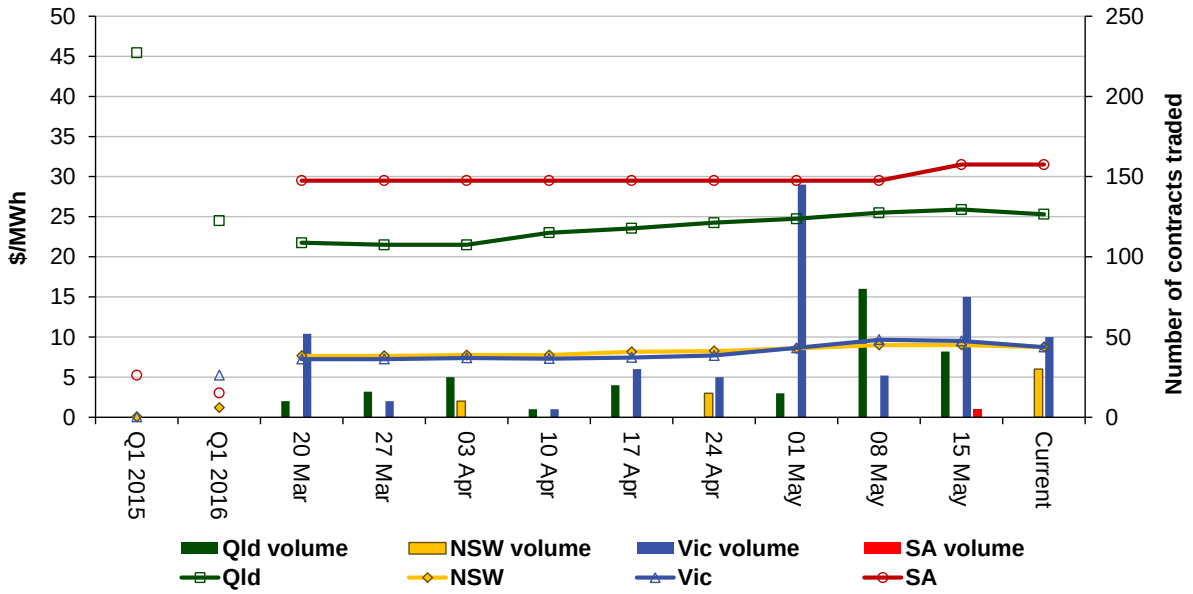
Note. Base contract prices are shown for each of the current week and the previous 9 weeks, with average prices shown for periods 1 and 2 years prior to the current year. ASX are reviewing the number of contracts traded.

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
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