Electricity Report

AUSTRALIAN ENERGY REGULATOR

27 November – 3 December 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 27 November - 3 December 2016. The spot price in South Australia exceeded $5000/MWh on four occasions on 1 December. As required under the Electricity Rules, we will publish reports into these events by 2 February 2017 within the required 40 business days.

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

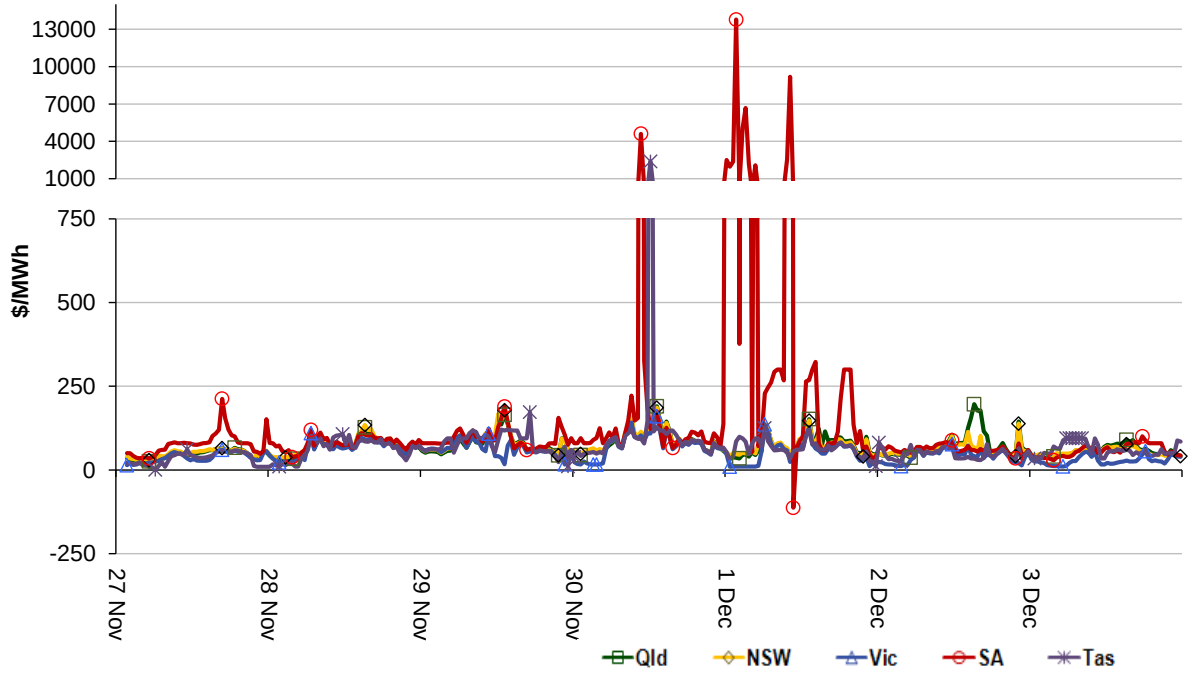


Figure 2 shows the volume weighted average (VWA) prices for the current week (with prices shown in Table 1) and the preceding 12 weeks, as well as the VWA price over the previous 3 financial years.

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

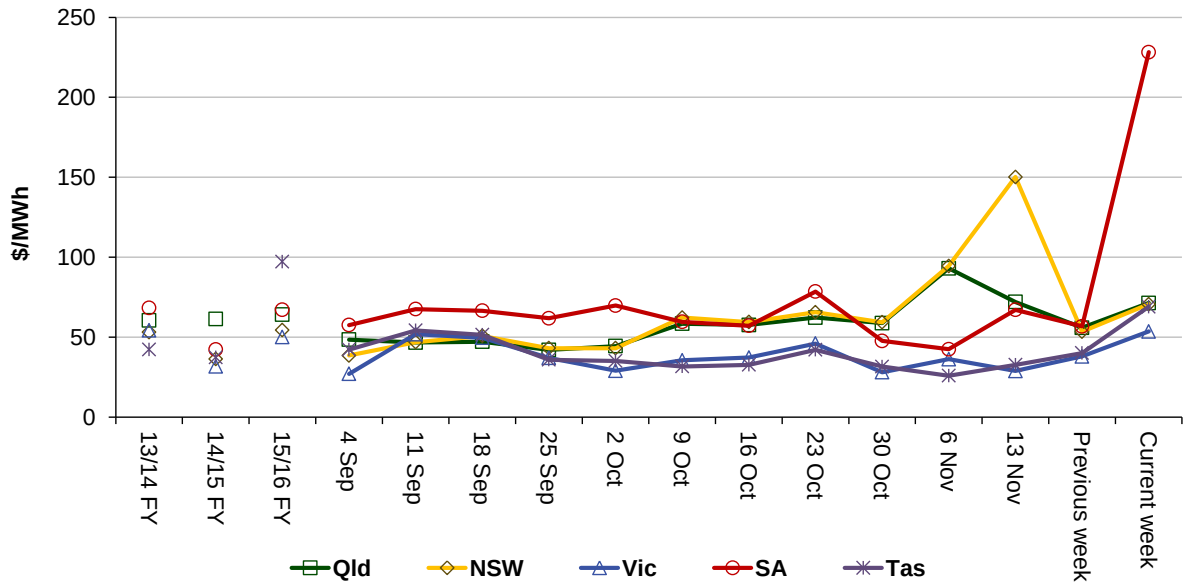


Table 1: Volume weighted average spot prices by region ($/MWh)

Region	Qld	NSW	Vic	SA	Tas
Current week	71	71	54	228	69
15-16 financial YTD	44	45	38	60	51
16-17 financial YTD	58	63	46	113	48

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 284 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	5	38	1	3
% of total below forecast	35	13	0	4

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

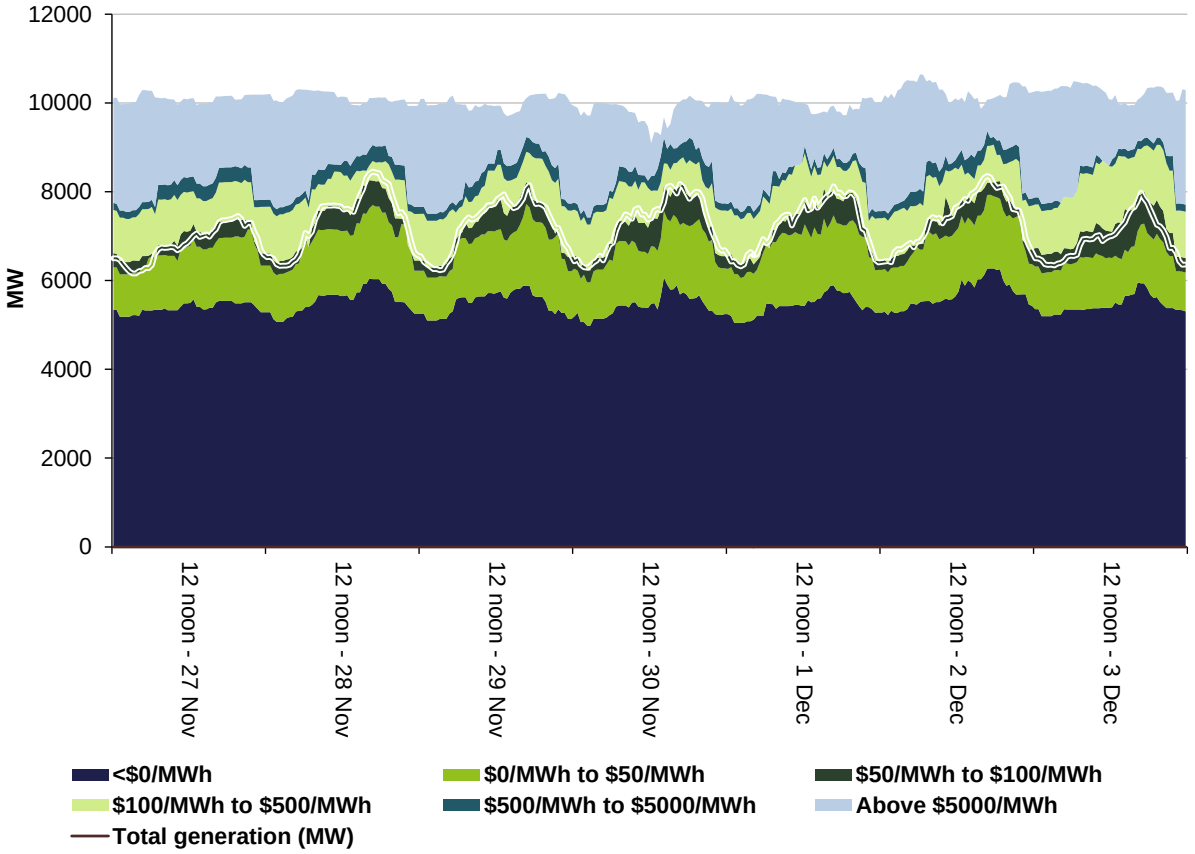


Figure 4: New South Wales generation and bidding patterns

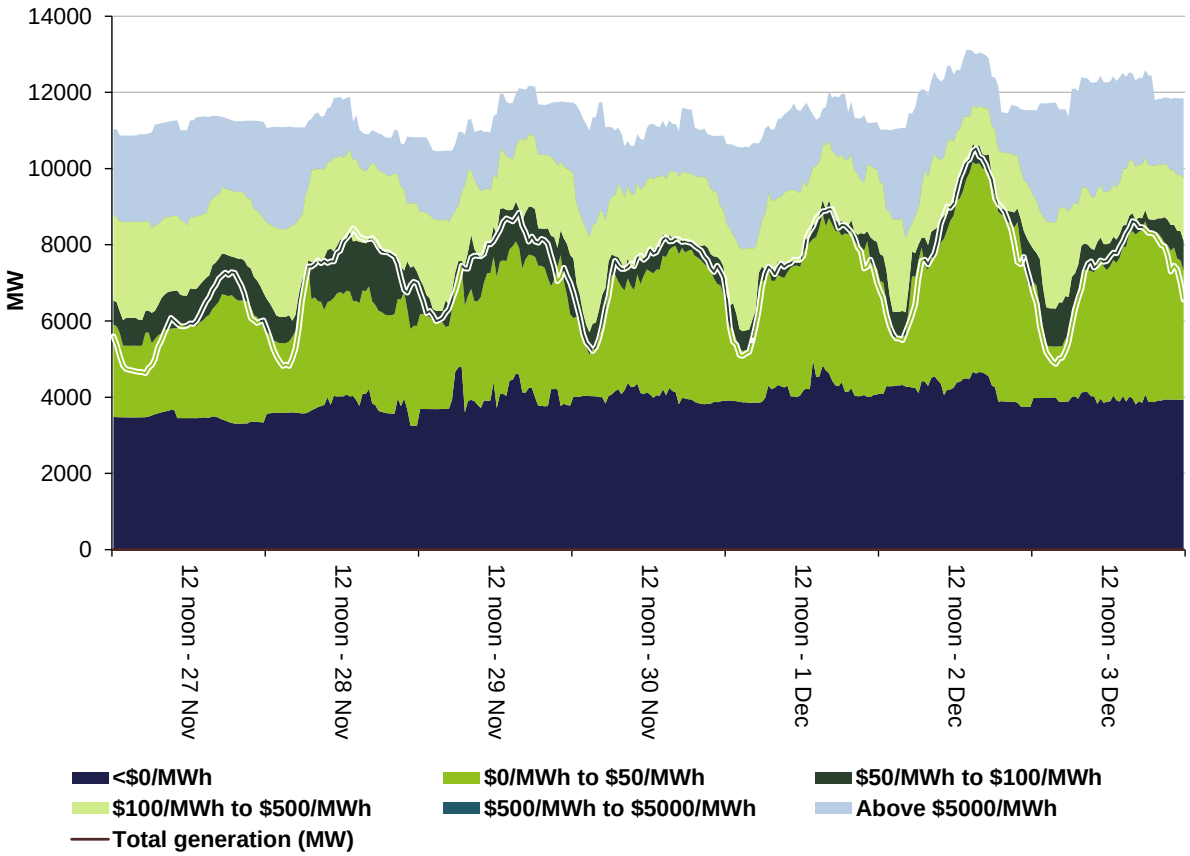
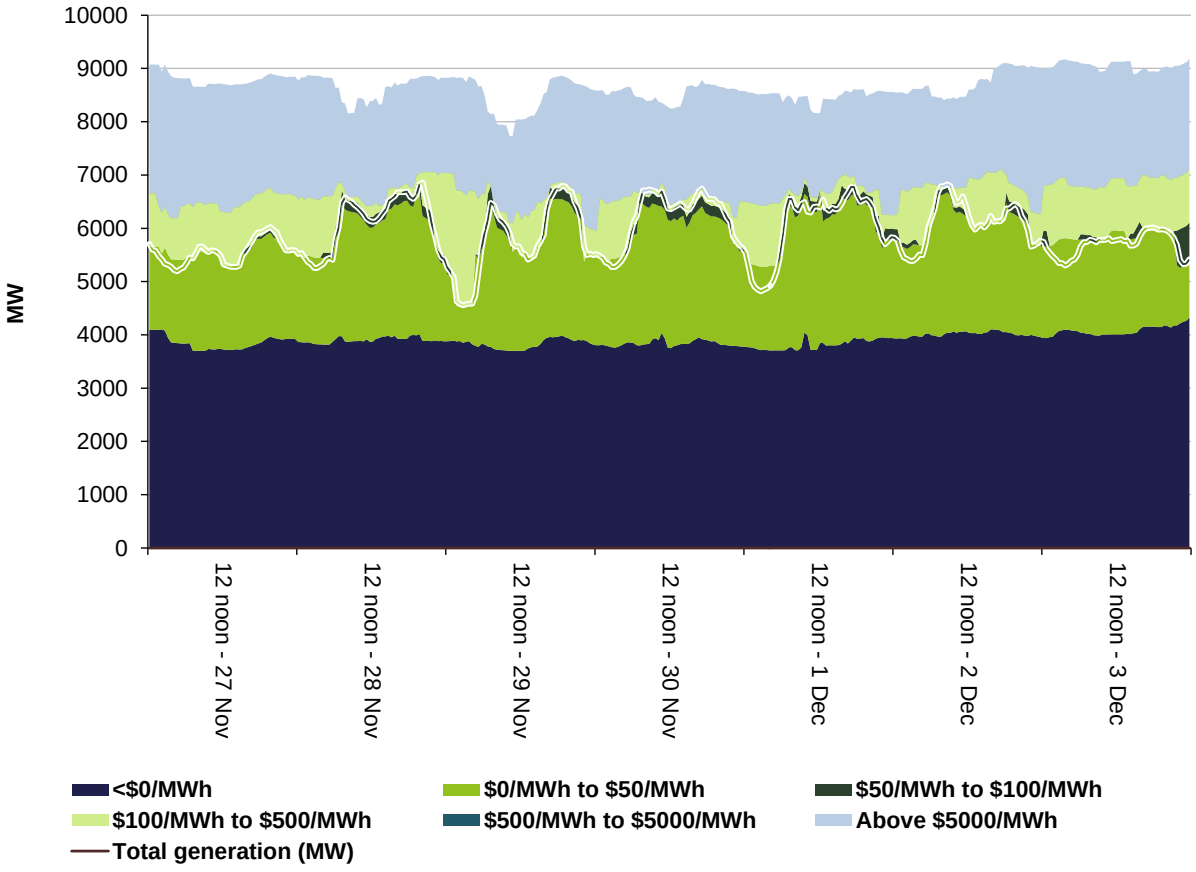


Figure 5: Victoria generation and bidding patterns



The red ellipse in Figure 6Figure 4 shows the period during which the spot prices in South Australia exceeded $5000/MWh on 1 December.

Figure 6: South Australia generation and bidding patterns

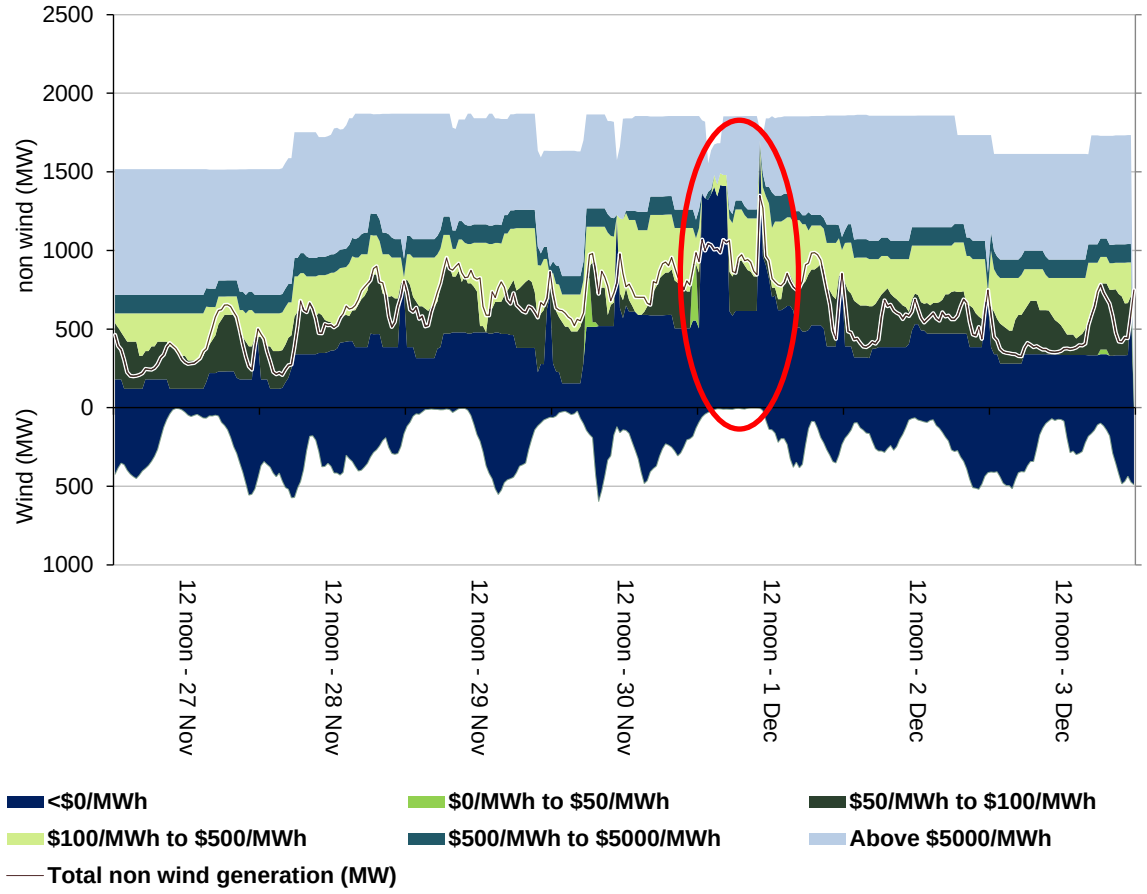
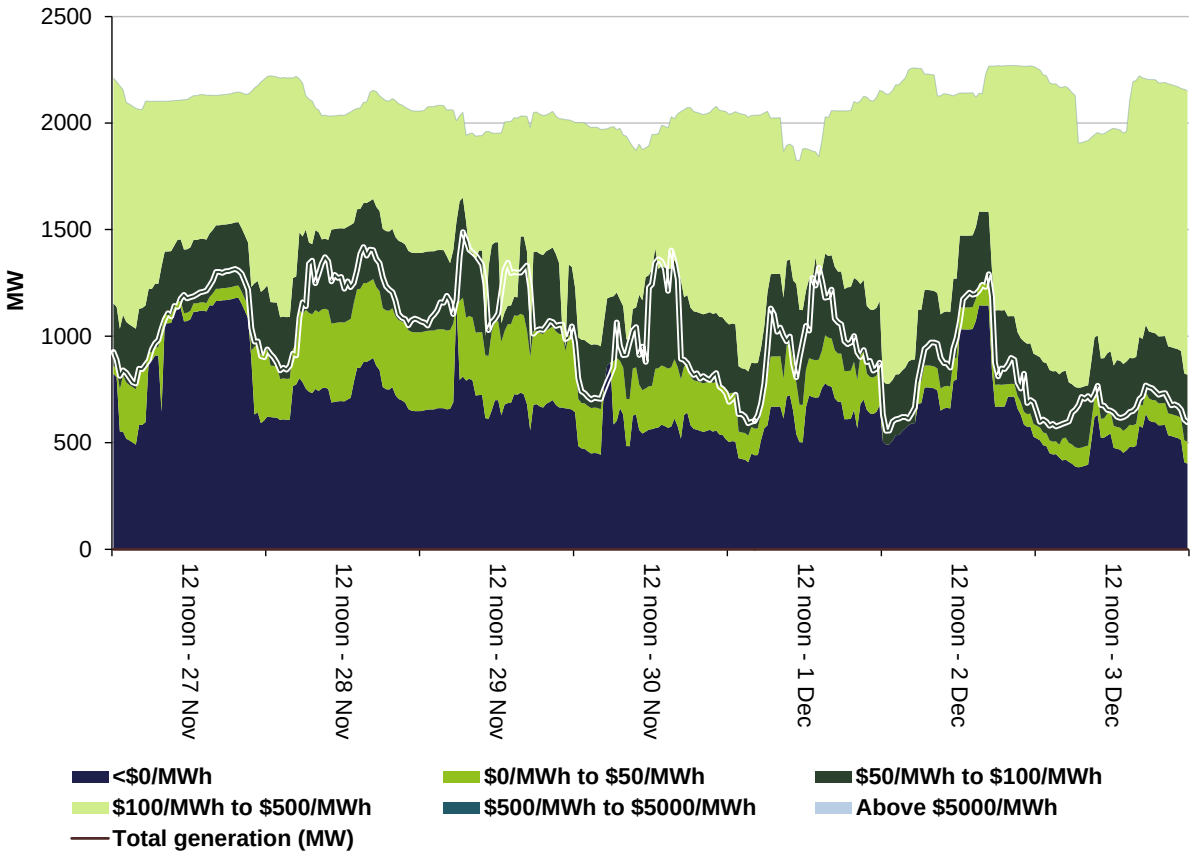


Figure 7: Tasmania generation and bidding patterns



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.

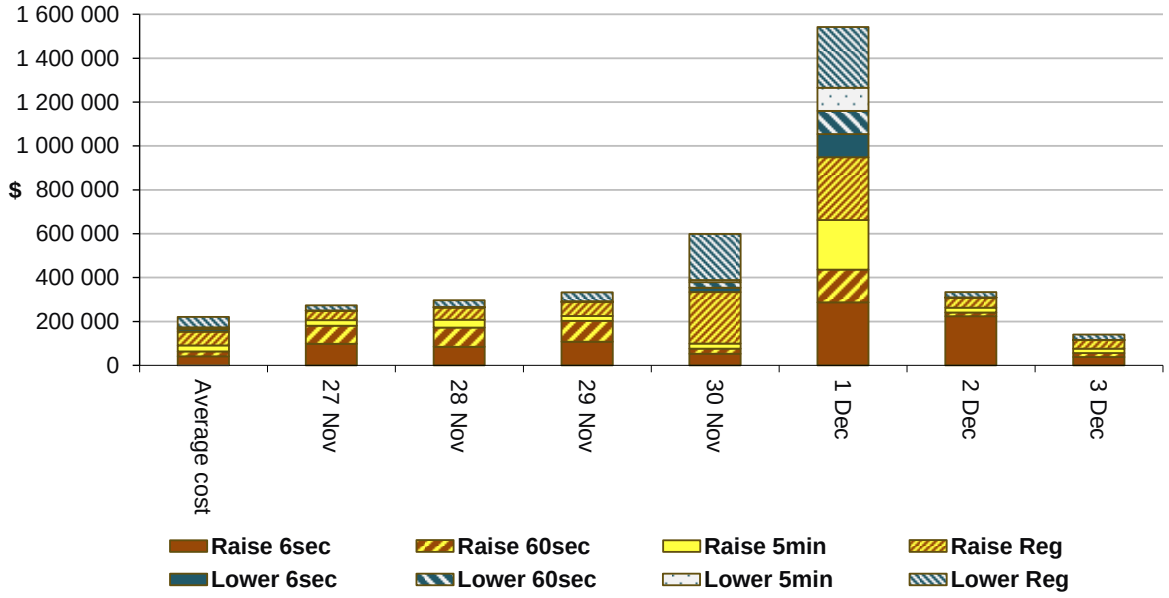
The Electricity Rules stipulate that generators pay for raise contingency services and customers pay for lower contingency services. Regulation services are paid for on a “causer pays” basis determined every four weeks by AEMO.

The total cost of FCAS on the mainland for the week was $2 792 500 or around one per cent of energy turnover on the mainland.

The total cost of FCAS in Tasmania for the week was $723 000 or around six 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



As shown in Figure 8, the combined cost of all ancillary services in South Australia reached $1 066 000 on 1 December 2016. The reason for the high FCAS costs on this day related to maintenance outages on, and the loss of the Vic-SA interconnector in the early hours of the morning on 1 December, to be discussed in detail in the relevant *Spot Prices above $5000/MWh* report.

Detailed market analysis of significant price events

South Australia

There were eleven occasions where the spot price in South Australia was greater than three times the South Australia weekly average price of $228/MWh and above $250/MWh and there was one occasion where the spot price was below $-100/MWh.

Wednesday, 30 November

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
11 am	4605.06	124.99	79.99	1235	1143	1117	1898	1911	1914

Conditions at the time saw demand around 90 MW greater than forecast four hours ahead and available capacity close to forecast.

At 10.33 am, effective from 10.40 am, Origin Energy rebid 270 MW at its Mortlake Power Station from the price cap to low prices in response to an increase in forecast demand in Victoria. At the time, the V-HYMO2_1 constraint (designed to manage voltage imbalances at the APD smelter in Victoria) was in place. The constraint works by reducing flow on the

Heywood interconnector into South Australia as generation at Mortlake increases and, once a certain level of output is reached, flow will be forced from South Australia into Victoria.

At 10.45 am, 250 MW was being imported from Victoria into South Australia across the Heywood interconnector. At 10.50 am the V-HYMO2_1 constraint bound when Mortlake's target increased to 90 MW. This caused flow on the interconnector to reverse and 147 MW was exported from South Australia into Victoria, counter price. With all available capacity in South Australia dispatched, the price reached the market cap for two dispatch intervals. At 11 am, demand decreased by 68 MW and rebids of capacity by a number of participants to the price floor following the high price became effective. This caused the dispatch price to decrease to -$1000/MWh for the last dispatch interval of the trading interval.

Thursday, 1 December

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
12.30 am	2507.30	79.99	81.84	1322	1388	1379	1946	2035	2028
1 am	1963.32	79.99	79.99	1098	1314	1313	1904	2015	2007
1.30 am	2373.30	79.99	79.99	1062	1245	1238	1866	2002	1992
2 am	13 766.58	61.90	68.05	1146	1178	1178	1775	1985	1977
3 am	5065.91	62.59	61.88	1008	1154	1143	1676	1955	1949
3.30 am	6674.32	79.99	79.99	989	1142	1132	1682	1946	1941
4 am	2191.30	79.99	79.99	975	1138	1123	1684	1933	1935
5 am	2083.63	79.99	79.99	1038	1169	1158	1862	1911	1922

We will analyse all of the above prices as part of the *Spot Prices above $5000/MWh* report into the events of the day.

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
10 am	2551.44	79.99	138.01	1294	1173	1229	1856	1883	1888
10.30 am	9175.47	64.33	84.20	1239	1175	1191	1753	1890	1907
11 am	-112.62	83.64	113.68	1192	1131	1154	1761	1899	1915

We will analyse all of the above prices as part of the *Spot Prices above $5000/MWh* report into the events of the day.

Tasmania

There was one occasion where the spot price in Tasmania was greater than three times the Tasmania weekly average price of $69/MWh and above $250/MWh.

Wednesday, 30 November

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
12.30 pm	2392.93	89.23	94.42	1021	1080	1107	1947	2003	2010

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

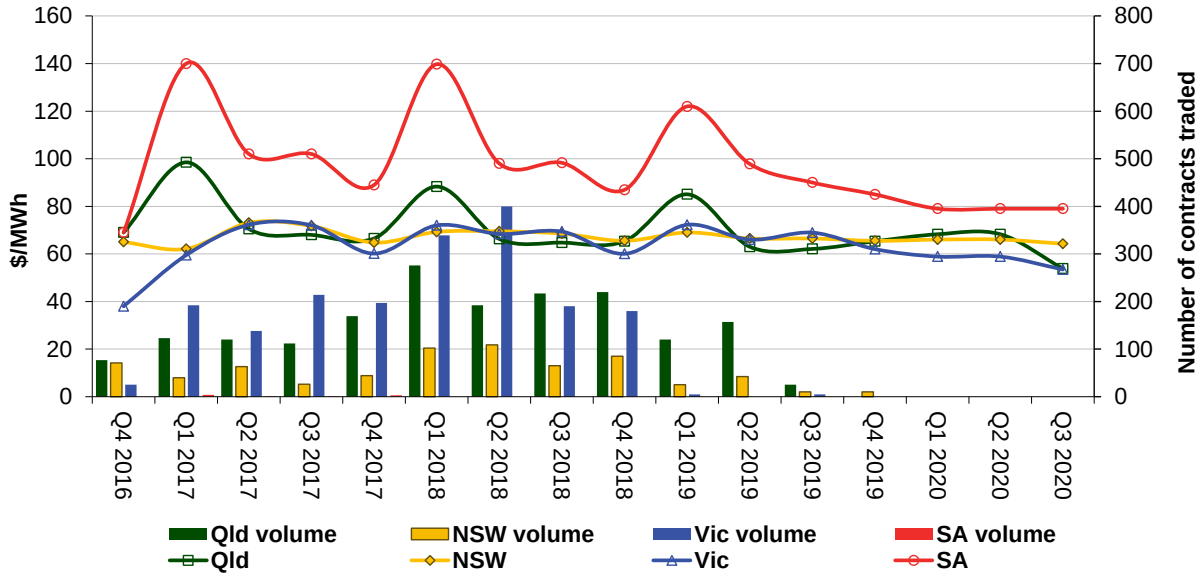
There was a constraint invoked to manage the planned outage of the Sheffield to Georgetown line which affects generation in Tasmania and flows across the Basslink Interconnector.

Just prior to the high price period, between 110 MW and 280 MW was forced into Victoria across Basslink. At 12.05 pm, the Sheffield to Georgetown constraint violated, a number of Tasmanian units were trapped or stranded in FCAS, and exports across Basslink were reduced by around 200 MW. As Tasmanian generators were either trapped or stranded in FCAS or limited by the constraint, the Tasmanian dispatch price increased from $348/MWh at 12 noon to the price cap at 12.05 pm set by high priced marginal generation on the mainland. Prices reduced to below $82/MWh at 12.10 pm, when a number of Tasmanian units were no longer trapped or stranded in FCAS.

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.

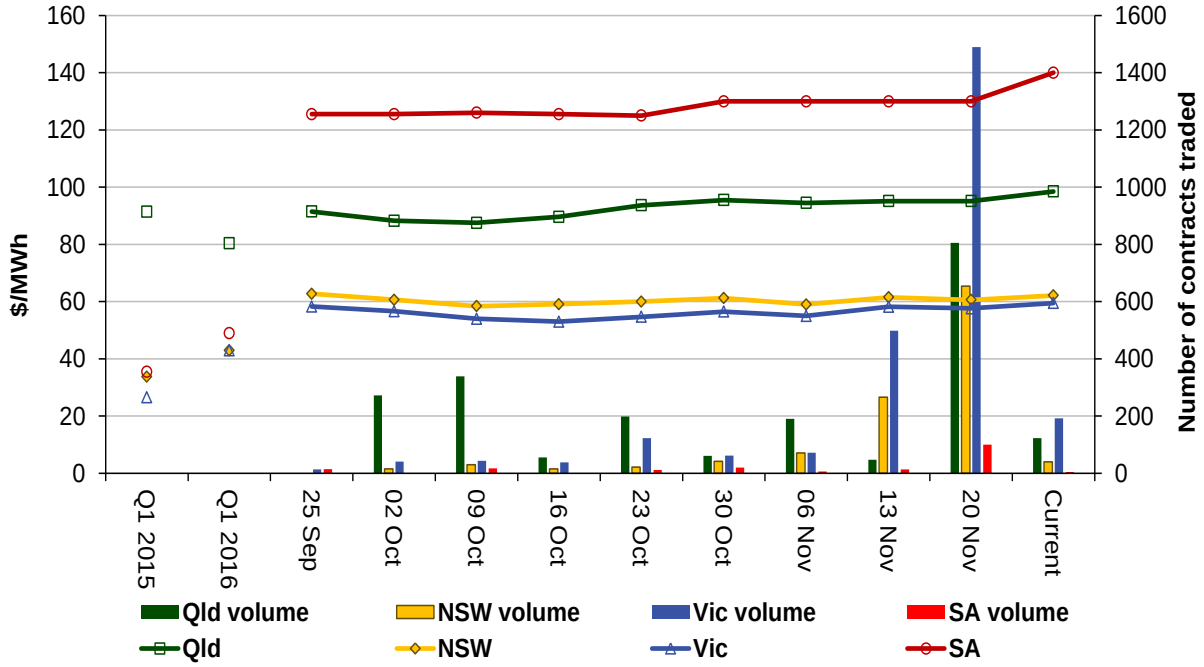
Figure 9: Quarterly base future prices Q4 2016 – Q3 2020



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)



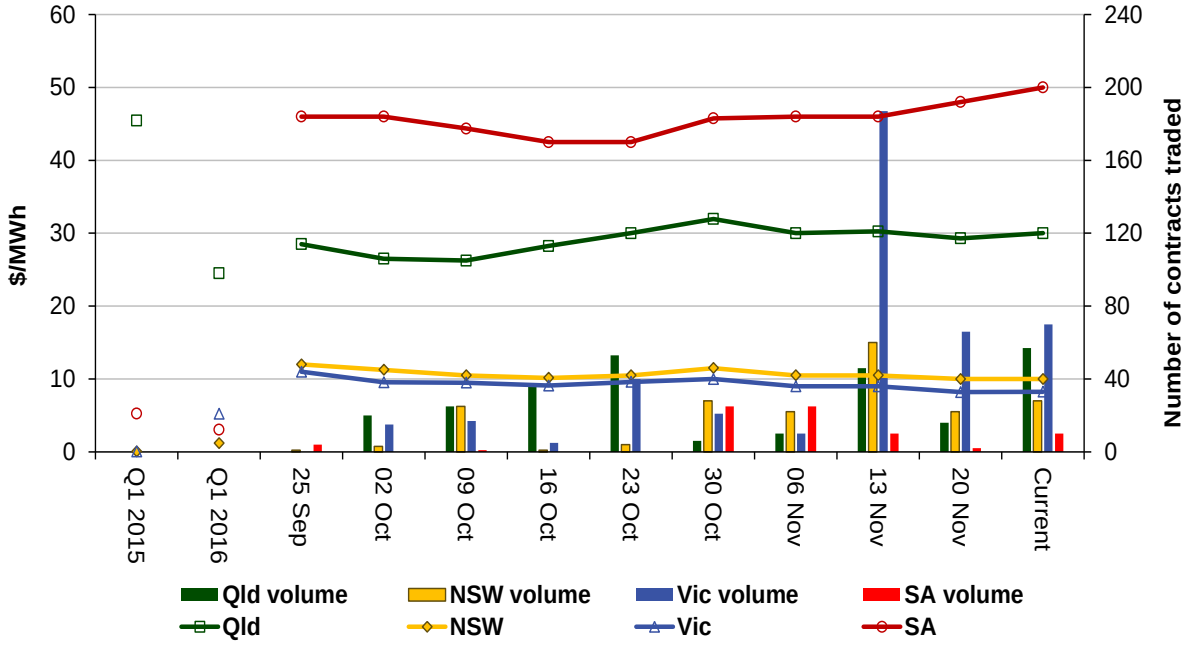
Note. Base contract prices are shown for each of the current week and the previous 9 weeks, with average prices shown for periods 1 and 2 years prior to the current year.

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
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