Electricity Report

AUSTRALIAN ENERGY REGULATOR

20 – 26 November 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 – 26 November 2016.

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

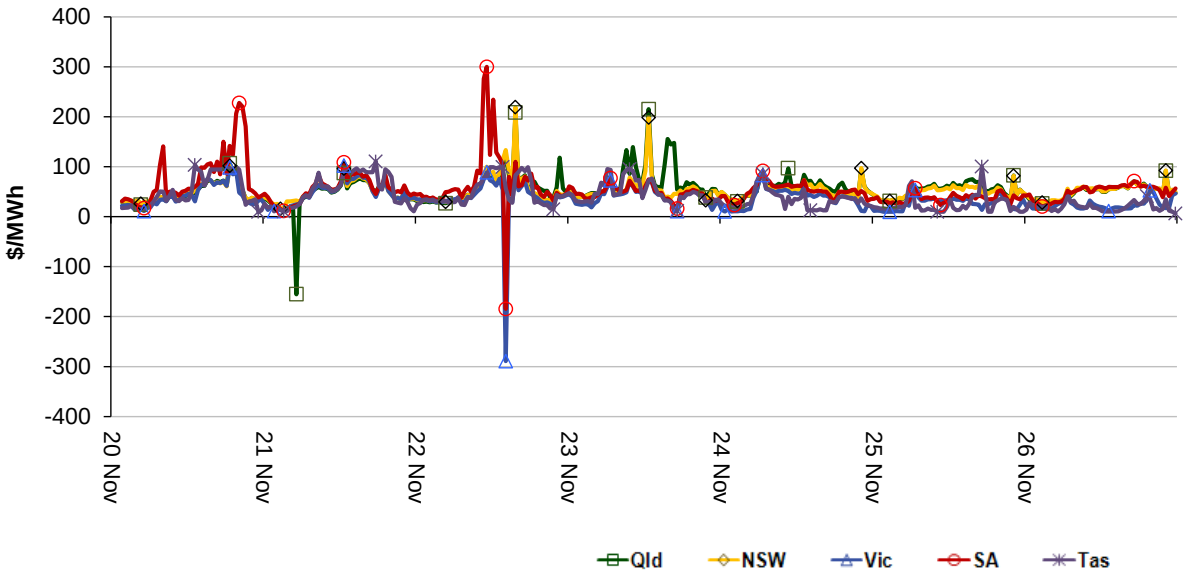


Figure 2 shows the volume weighted average (VWA) prices for the current week (with prices shown in Table 1) and the preceding 12 weeks, as well as the VWA price over the previous 3 financial years.

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

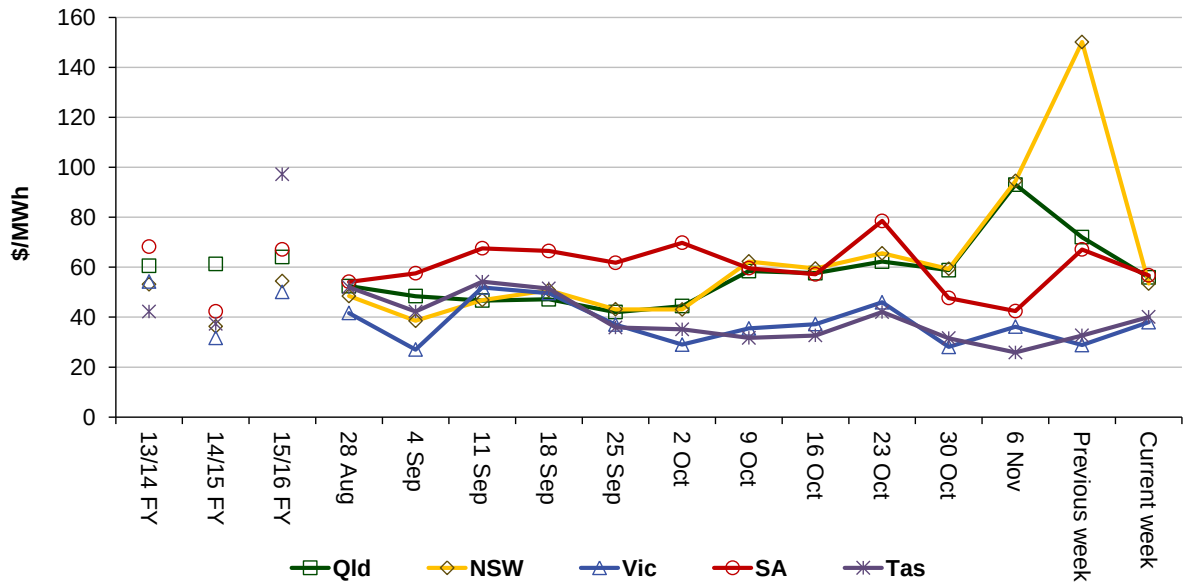


Table 1: Volume weighted average spot prices by region ($/MWh)

Region	Qld	NSW	Vic	SA	Tas
Current week	56	53	38	57	40
15-16 financial YTD	44	46	38	61	49
16-17 financial YTD	57	62	46	108	47

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 270 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	6	39	0	4
% of total below forecast	38	11	0	3

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

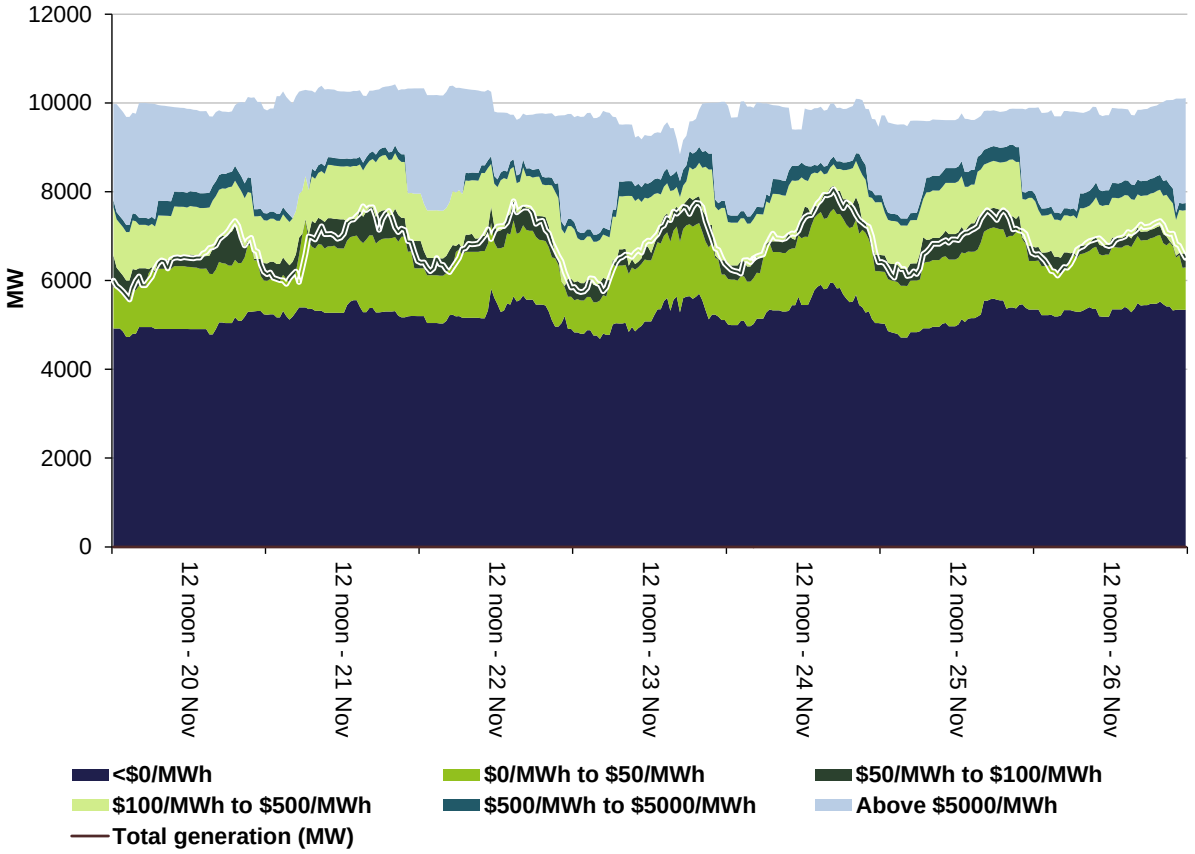


Figure 4: New South Wales generation and bidding patterns

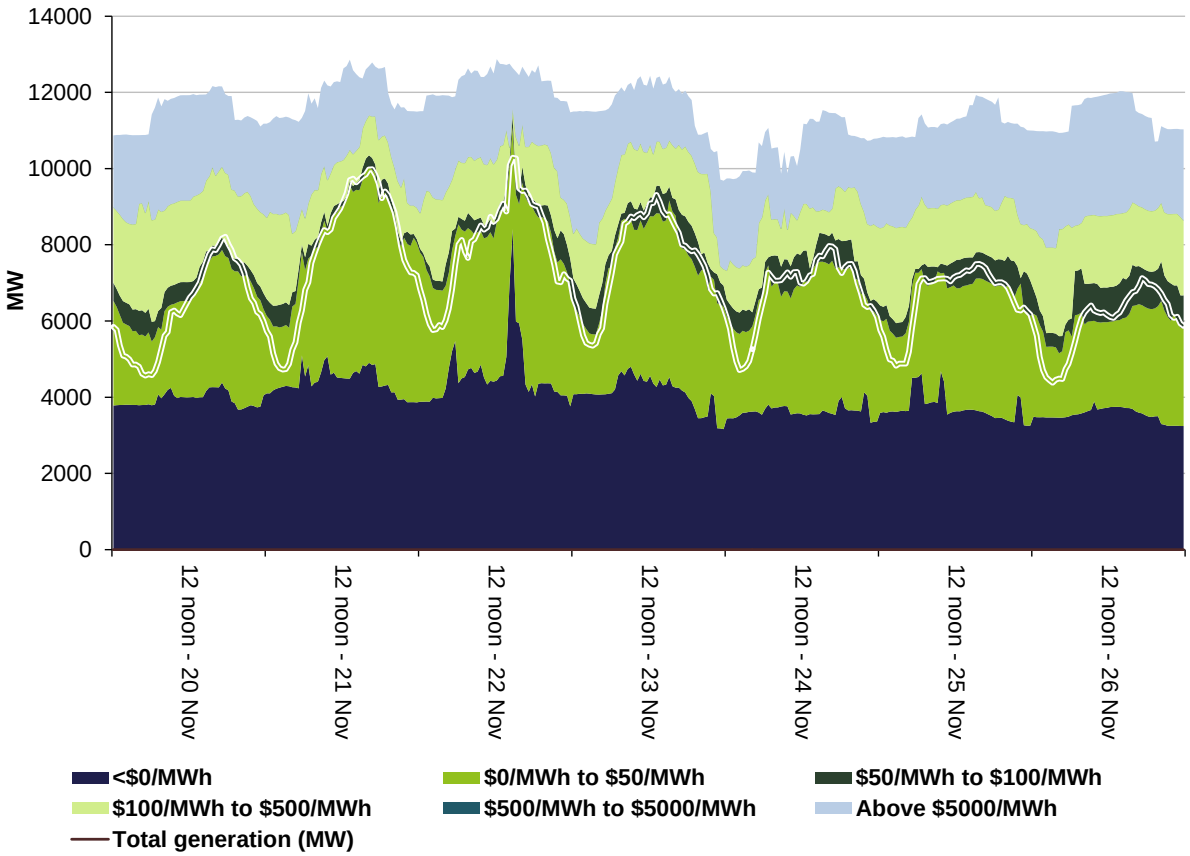


Figure 5: Victoria generation and bidding patterns

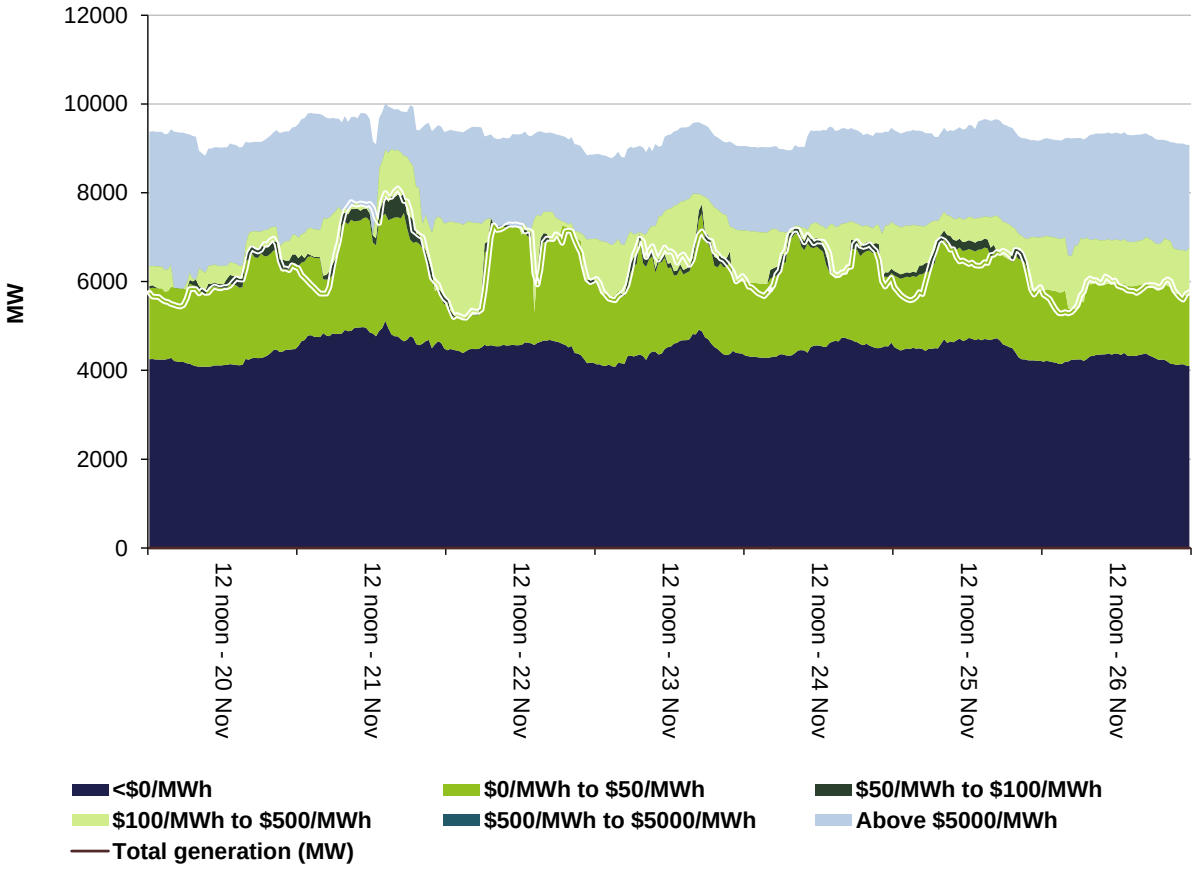


Figure 6: South Australia generation and bidding patterns

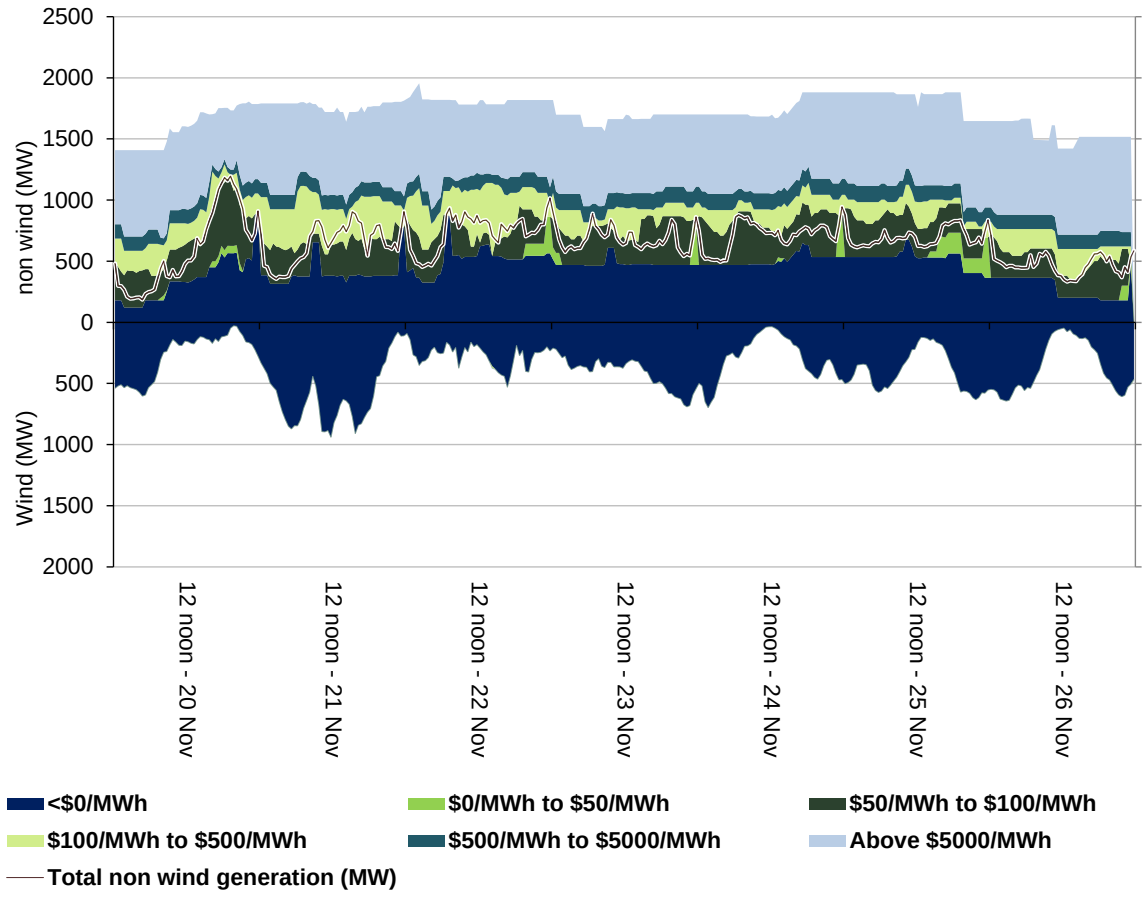
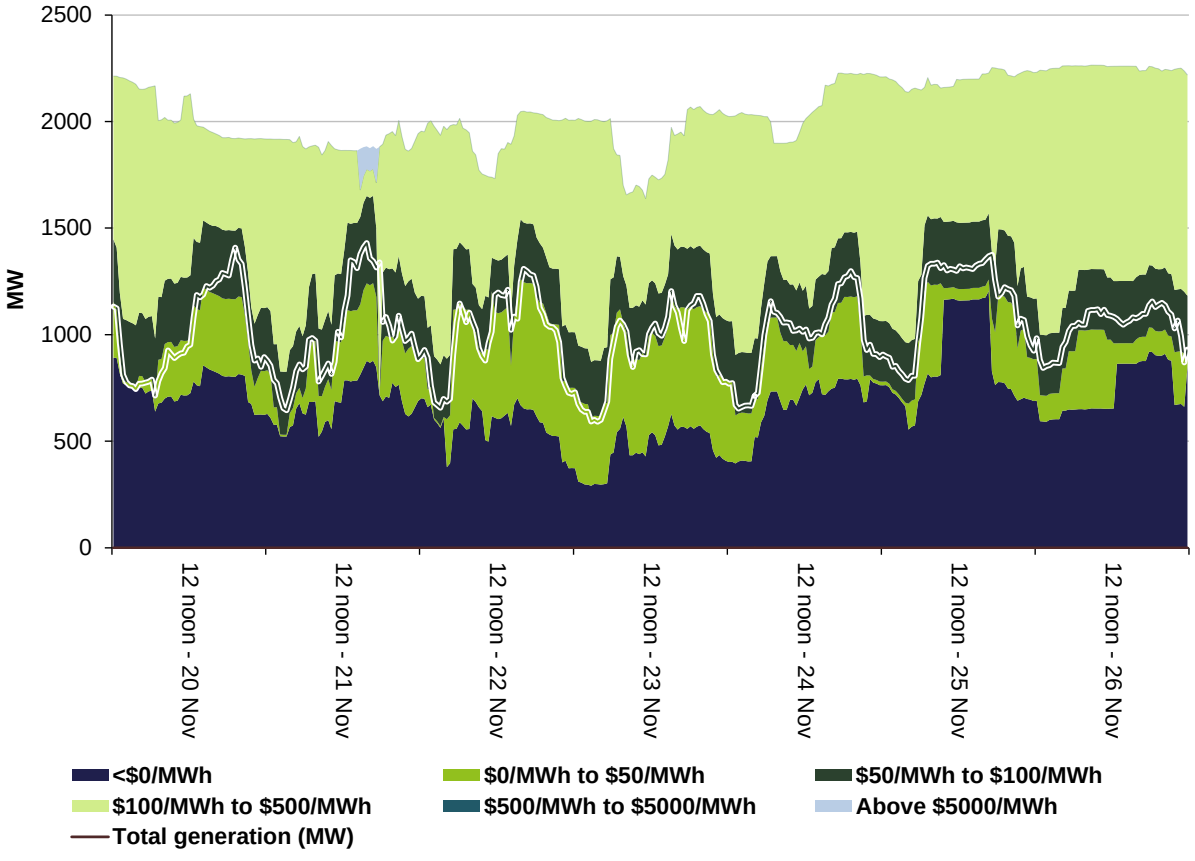


Figure 7: Tasmania generation and bidding patterns



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.

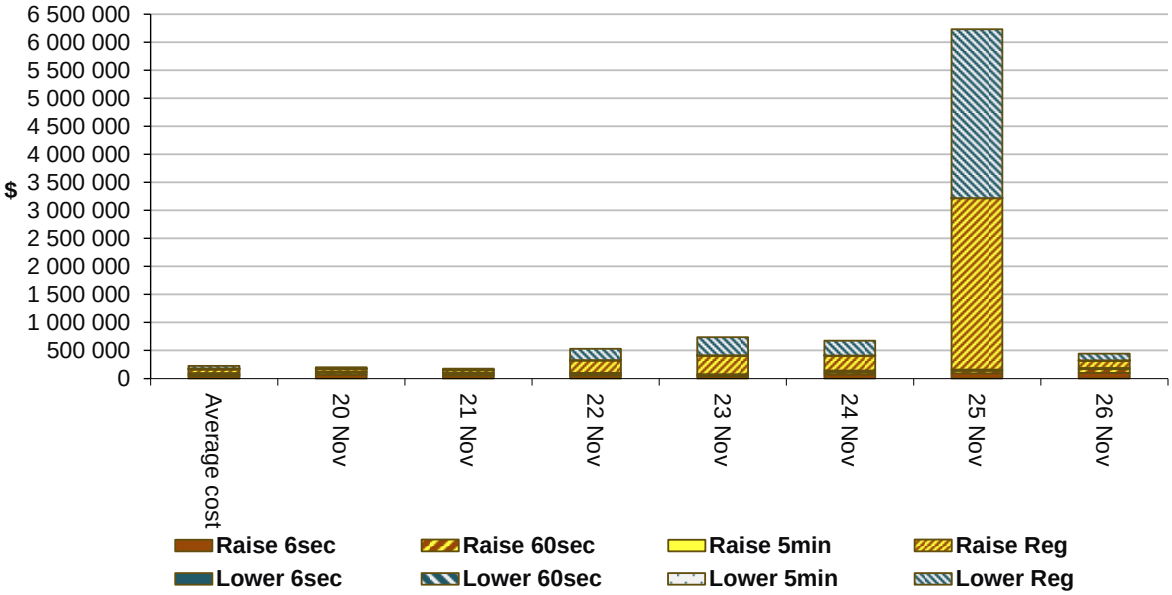
The Electricity Rules stipulate that generators pay for raise contingency services and customers pay for lower contingency services. Regulation services are paid for on a “causer pays” basis determined every four weeks by AEMO.

The total cost of FCAS on the mainland for the week was $8 682 500 or around five per cent of energy turnover on the mainland.

The total cost of FCAS in Tasmania for the week was $276 500 or around four 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



On 25 November the price of raise and lower regulation services in South Australia exceeded $7900/MW for 91 consecutive dispatch intervals from 4.05 am to 11.35 am at a cost of around $6 million. The Cumulative Price Threshold of $1.26 million was breached and prices were capped at $300/MW from 11.40 am. Planned outages by Electranet and Ausnet of the Heywood South East 1 275kV line and Sydneham to Moorabool No. 2 500 kV line, which started on 22 November 2016, created a single contingency which if occurs

separates South Australia from the rest of the NEM. This would mean that South Australia has to source its regulation services locally.

In accordance with clause 3.13.7 of the Electricity Rules, the AER will issue a separate report into the circumstances that led to FCAS prices above $5000/MW.

Detailed market analysis of significant price events

Queensland

There was one occasion where the spot price in Queensland was below -$100/MWh.

Monday, 21 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
5.30 am	-155.28	13.80	13.80	5329	5350	5406	10 166	10 344	10 404

Conditions at the time saw demand close to what was forecast while availability was around 180 MW less than forecast four hours ahead.

Prices were forecast to be low, however a small decrease in demand at 5.05 am along with no capacity priced between -$1/MWh and -$950/MW and a number of generators trapped in FCAS, ramp rate limited or at their max avail, the dispatch price decreased to -$1000/MWh. There was 109 MW increase in demand at 5.10 am, which saw the price increase, and continued to do so, for the remainder of the trading interval.

Victoria

There was one occasion where the spot price in Victoria was below -$100/MWh.

Tuesday, 22 November

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
2.30 pm	-289.19	85.50	54.04	5664	5625	5660	9367	9335	9310

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

A constraints managing an outage in New South Wales[1] and rebidding by participants in New South Wales forced flows out of New South Wales into Victoria. Flows changed from 1211 MW into New South Wales at 2 pm to 387 MW into Victoria at 2.10 pm.

This step change in interconnector flow combined with generation in Victoria either ramp rate down constrained, trapped or stranded in FCAS, the price decreased to around -$1000/MWh for the 2.05 pm and 2.10 pm dispatch intervals. The price events coincide with the low price event in South Australia.

[1] Planned outage of the Upper Tumut to Canberra line in New South Wales.

South Australia

There were two 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.

Tuesday, 22 November

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
11 am	275.84	49.99	299.99	1349	1171	1161	1942	1949	1948
11.30 am	299.84	49.99	299.99	1361	1156	1153	1980	1947	1956

Conditions at the time saw demand up to 205 MW higher than forecast while availability was close to what was forecast four hours ahead.

At 10.40 am a small increase in demand, combined with no capacity priced between $160/MWh and $278/MWh saw the price increase from $156/MWh to around $300/MWh where it remained for the rest of the high price period.

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
2.30 pm	-184.53	122.00	299.69	1383	1270	1185	2159	2056	2067

Conditions at the time saw demand (113 MW) and availability (103 MW) higher than was forecast four hours ahead.

The 2.05 pm and 2.10 pm dispatch intervals was at the price floor. This is largely due to the significant reduction in exports across the Vic-NSW interconnector at the time.

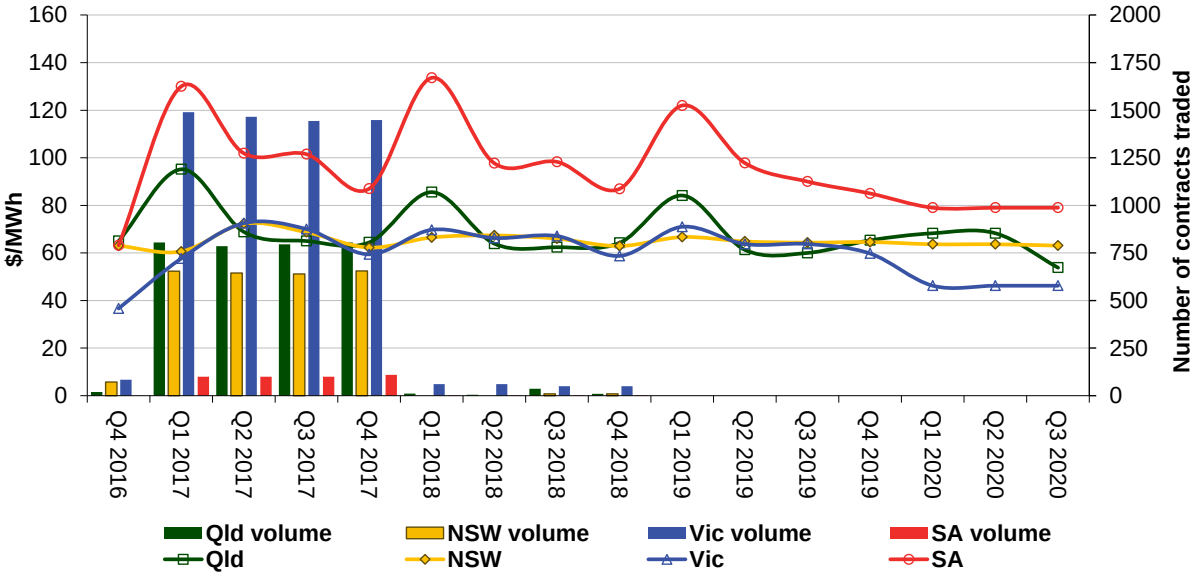
This event coincided with the low price event in Victoria and is explained in the Victoria section.

Financial markets

The high volume of trades in Figure 9, 10 and 11 are due to options on calendar year base load expiring on Monday 21 November 2016.

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.

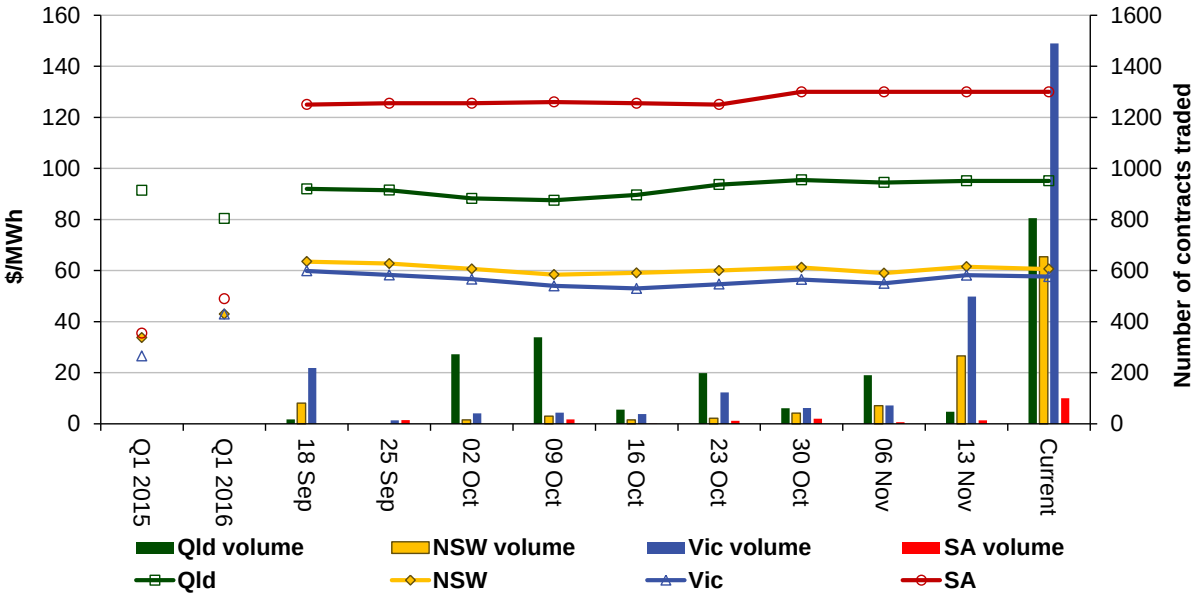
Figure 9: Quarterly base future prices Q4 2016 – Q3 2020



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)



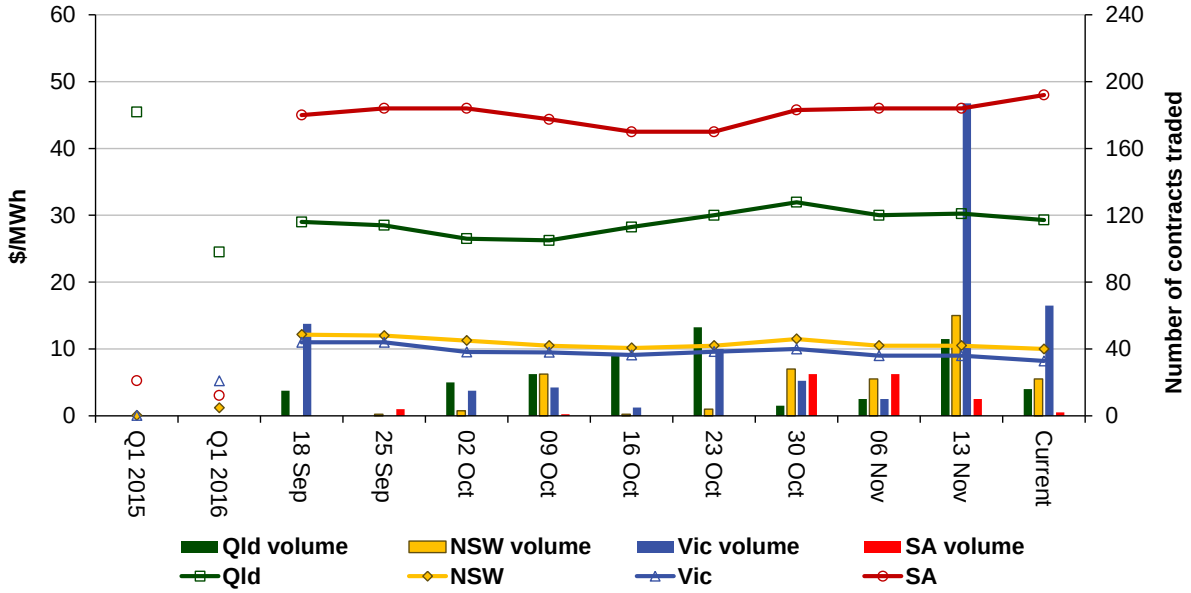
Note. Base contract prices are shown for each of the current week and the previous 9 weeks, with average prices shown for periods 1 and 2 years prior to the current year.

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