Electricity Report

AUSTRALIAN ENERGY REGULATOR

2 – 8 October 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.

System Black in South Australia

Wednesday, 28 September

At 4.18 pm EST, a System Black event occurred in South Australia. South Australia separated from the NEM, all generation in the State ceased and all State load was shed. In accordance with the Rules, AEMO suspended the market in South Australia, from 4.25 pm EST. Further to this, there was Ministerial direction under the Essential Services Act 1981 (SA) to continue with market suspension until 10.30 pm 11 October. During this time, most participants continued to be dispatched according to their bids for generation and ancillary services. Market pricing during the suspension was determined in accordance with the market suspension pricing schedule, where AEMO determines reasonable estimates of typical market prices for the region for participants[1]. The pricing schedule is published 14 days before the first day the schedule is effective. The energy and ancillary service prices are an average of the weekday and weekend spot prices for each trading interval 28 days prior to publishing the schedule.[2]

While the administered market pricing was in place, there was one spot price that exceeded our reporting threshold in South Australia at midnight on 2 October of $325/MWh (see Figure 1). This was a result of a high spot price in South Australia on 5 September at midnight of $2361/MWh which contributed to the spike in the weekend average calculation. This high price was due to increased demand due to hot water load and is discussed in the Electricity Report 4 – 10 September 2016.

Spot market prices

Figure 1 shows the spot prices that occurred in each region during the week 2 to 8 October 2016.

[1] See: AEMO's Market Suspension Pricing Schedule

[2] For documentation on Market Suspension Pricing see Automation of Market Suspension Pricing Schedules:

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

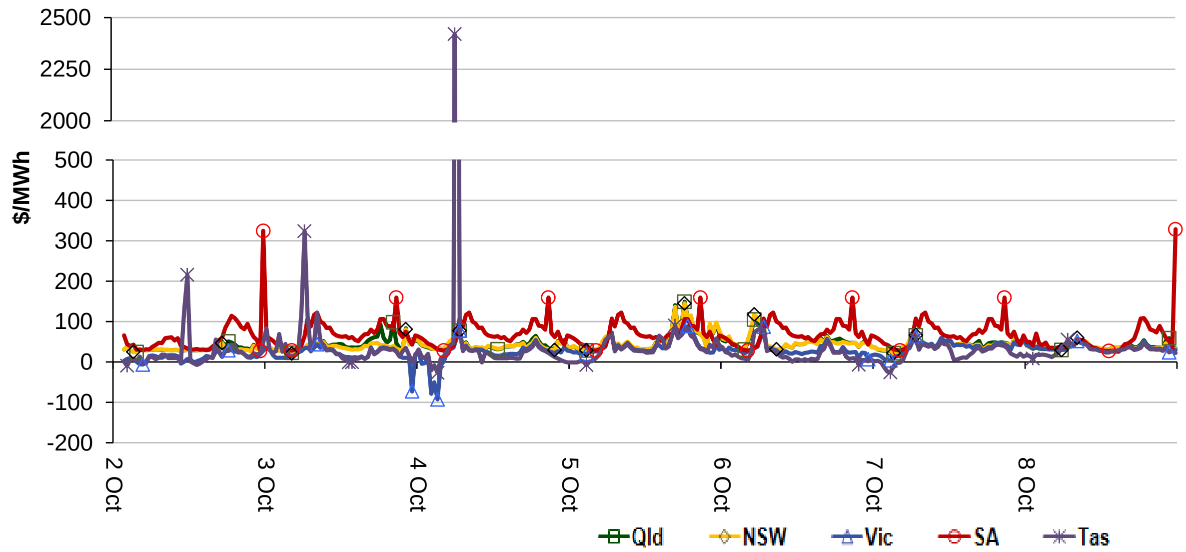


Figure 2 shows the volume weighted average (VWA) prices for the current week (with prices shown in Table 1) and the preceding 12 weeks, as well as the VWA price over the previous 3 financial years.

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

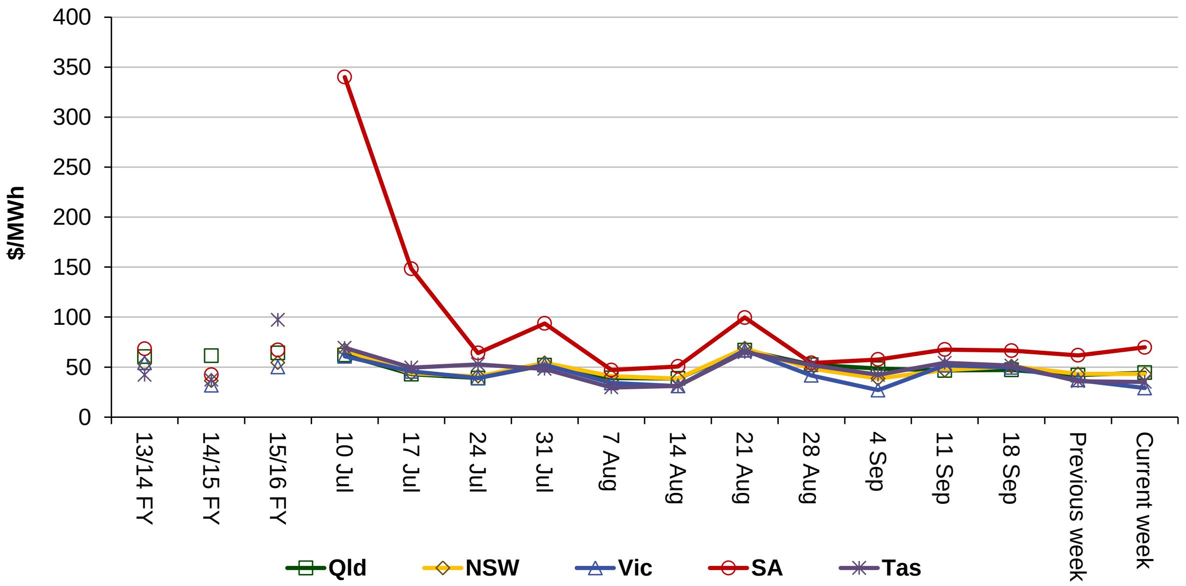


Table 1: Volume weighted average spot prices by region ($/MWh)

Region	Qld	NSW	Vic	SA	Tas
Current week	44	43	29	70	35
15-16 financial YTD	45	45	39	67	39
16-17 financial YTD	53	55	51	130	53

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 324 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	12	34	0	6
% of total below forecast	26	19	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

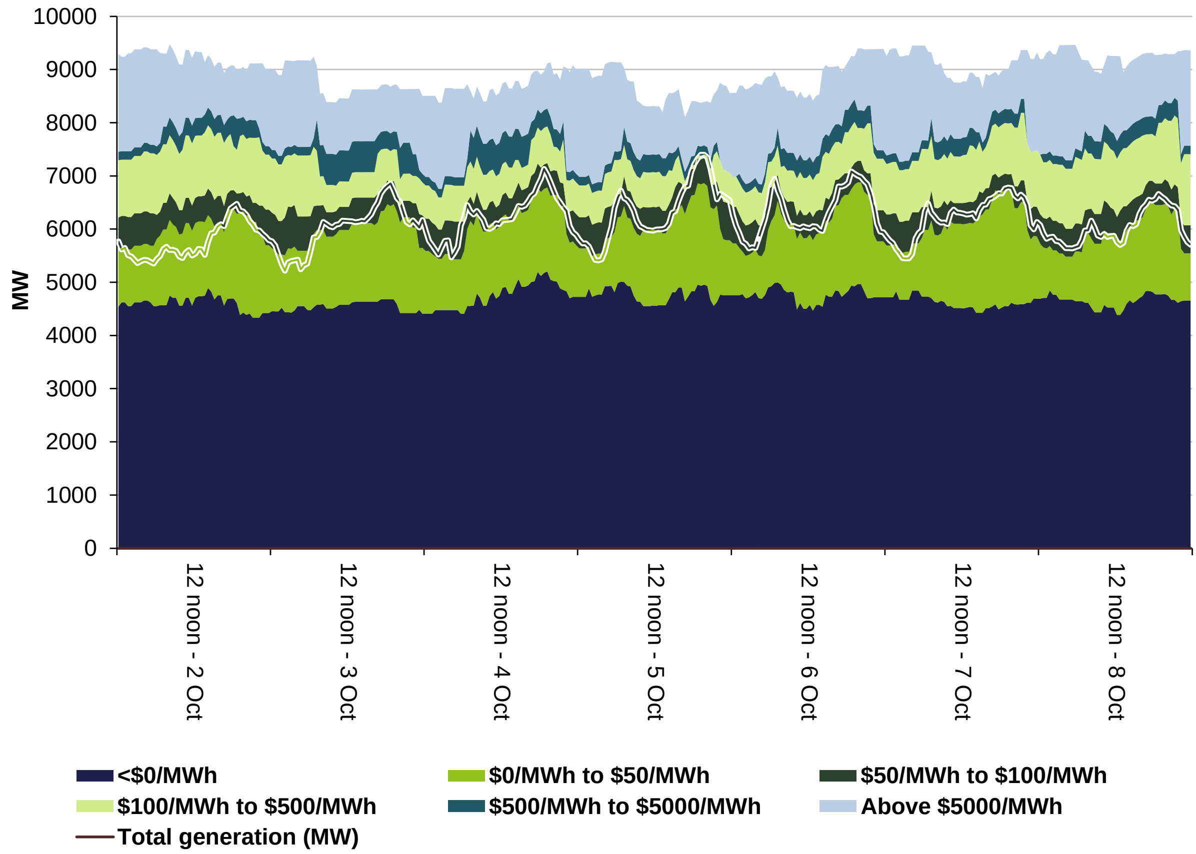


Figure 4: New South Wales generation and bidding patterns

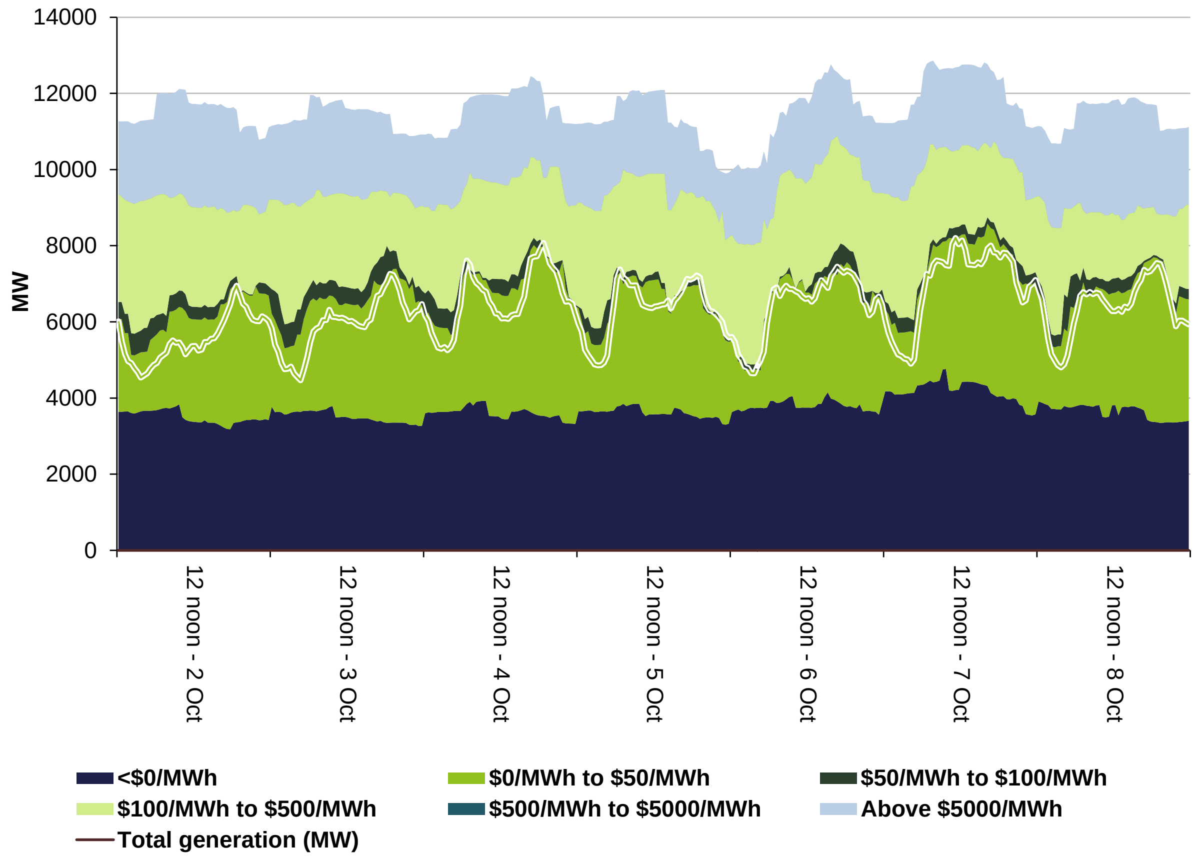


Figure 5: Victoria generation and bidding patterns

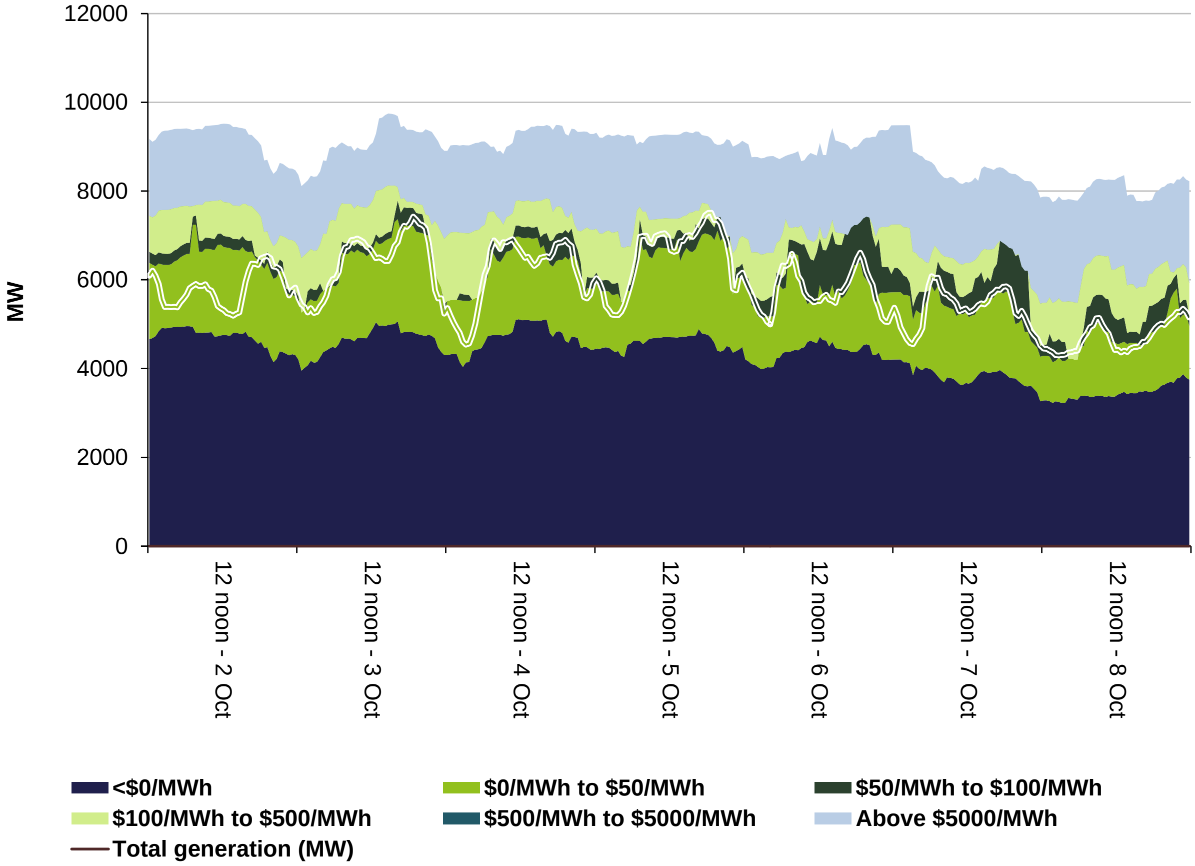


Figure 6: South Australia generation and bidding patterns

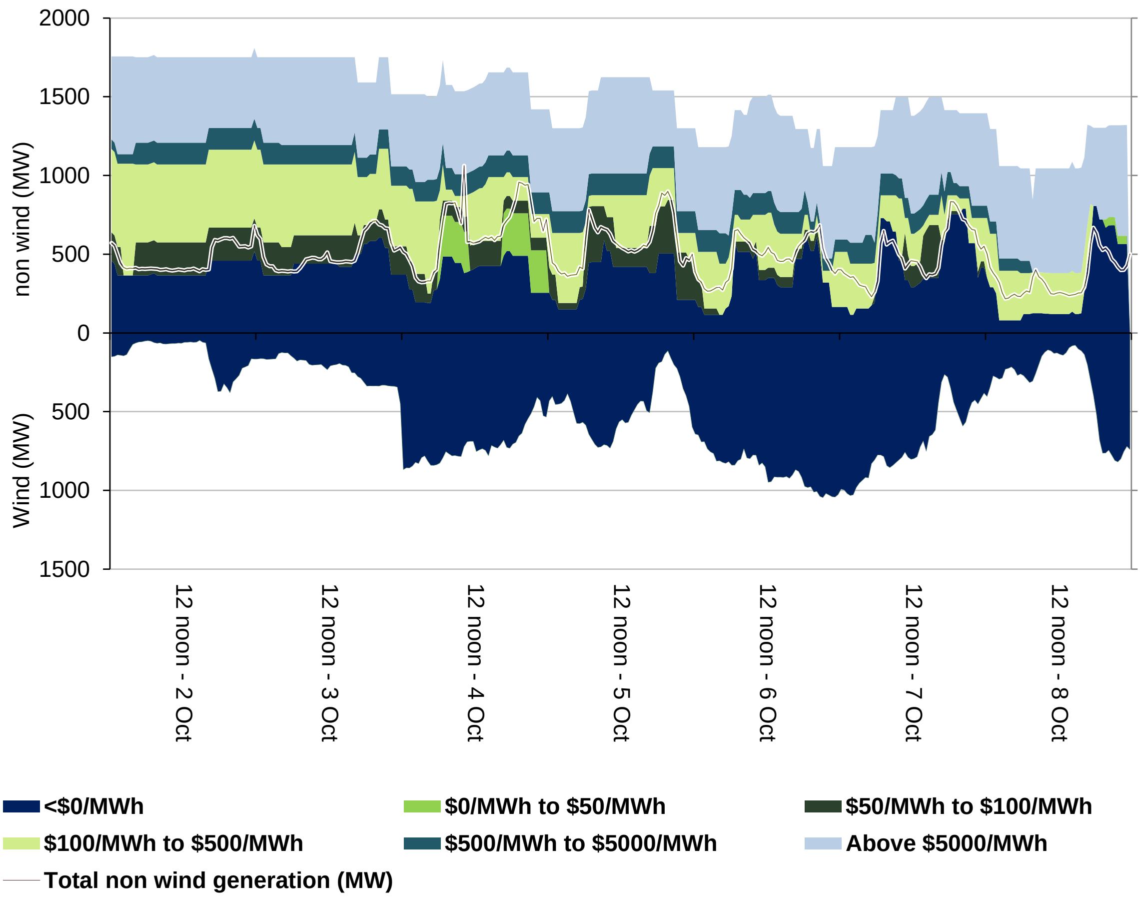
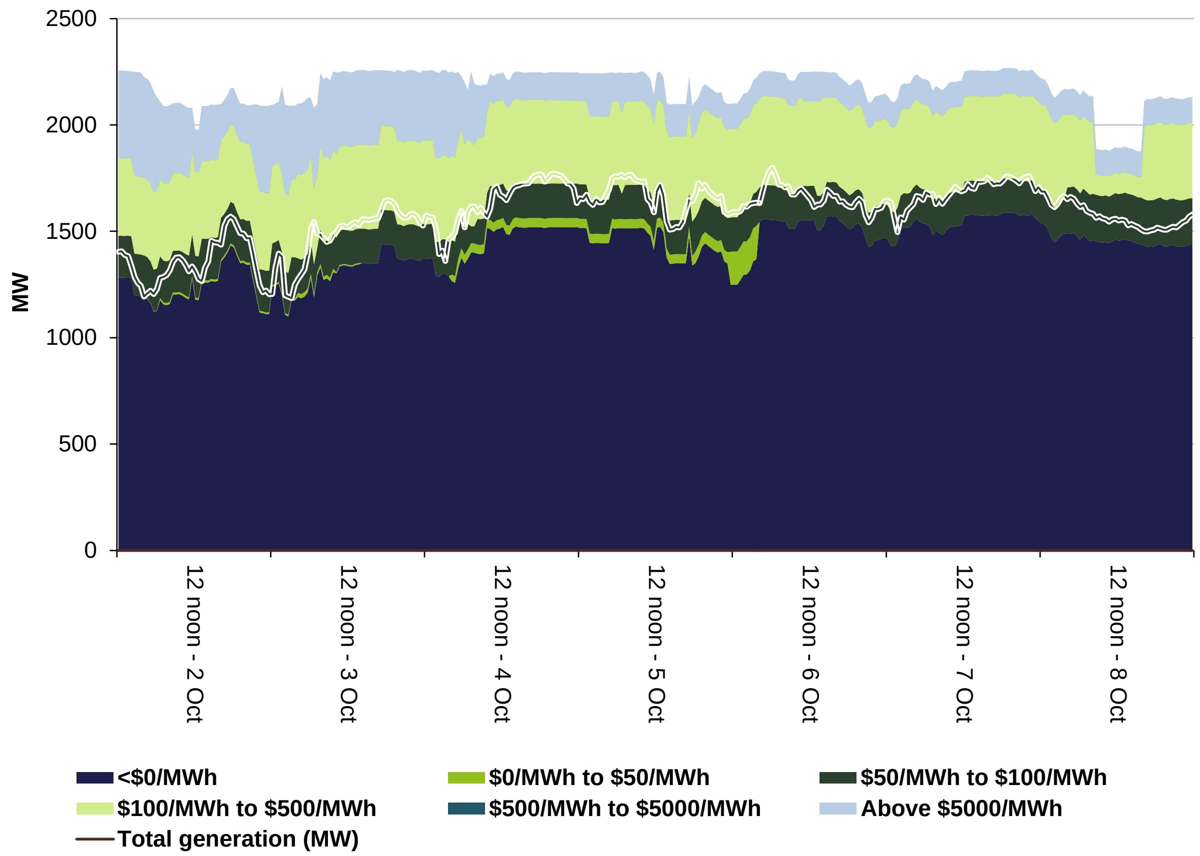


Figure 7: Tasmania generation and bidding patterns



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.

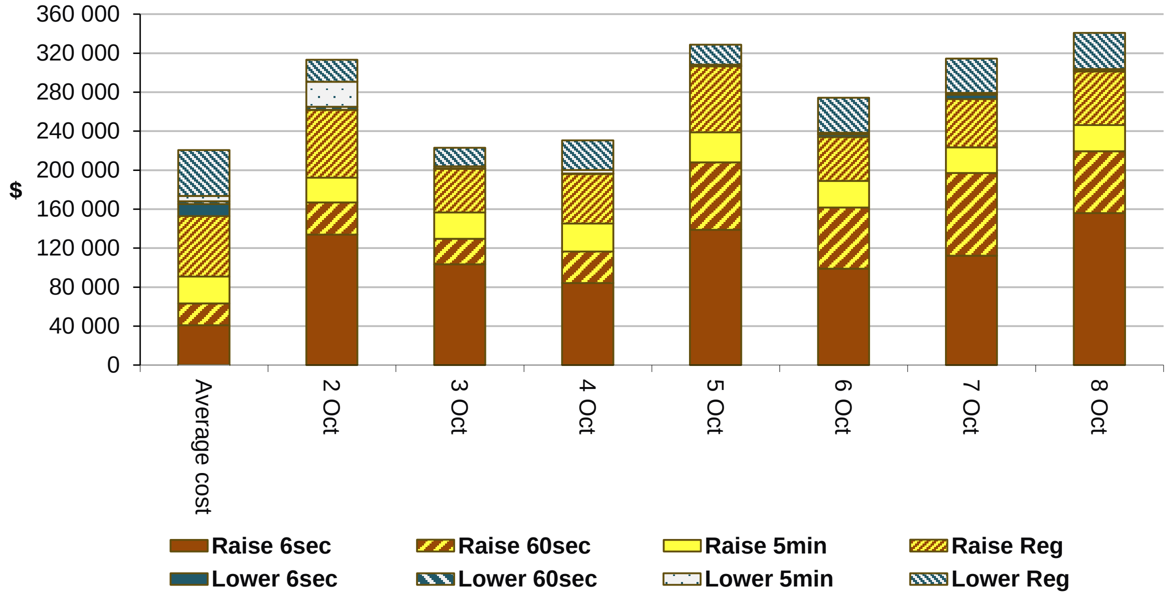
The Electricity Rules stipulate that generators pay for raise contingency services and customers pay for lower contingency services. Regulation services are paid for on a "causer pays" basis determined every four weeks by AEMO.

The total cost of FCAS on the mainland for the week was $1 819 500 or around 1 per cent of energy turnover on the mainland.

The total cost of FCAS in Tasmania for the week was $205 000 or around 3 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

Tasmania

There were two occasions where the spot price in Tasmania was greater than three times the Tasmania weekly average price of $35/MWh and above $250/MWh.

Monday, 3 October

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
6.30 am	323.71	113.70	117.85	1142	1122	1159	2127	2183	2167

Conditions at the time saw demand close to forecast while availability was slightly lower than forecast four and twelve hours ahead.

An increase in flows across the Sheffield to Georgetown 220 kV line caused the T>>T_NIL_BL_EXP_6E constraint to bind, causing generation in Tasmania to be constrained off. The constraint (which is a system normal constraint) manages post contingent flows on the Sheffield to Georgetown 220 kV lines, preventing an overload on the parallel line in the event of a trip. The constraint affects Tasmanian generation and forces exports into Victoria across Basslink.

At 5.55 am the constraint bound forcing flows into Victoria by up to 233 MW at 6.05 am. This saw the dispatch price increase to around $320/MWh for most of the 6.30 am trading interval.

Tuesday, 4 October

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
6.30 am	2419.85	100.62	112.32	1150	1156	1151	2199	2246	2240

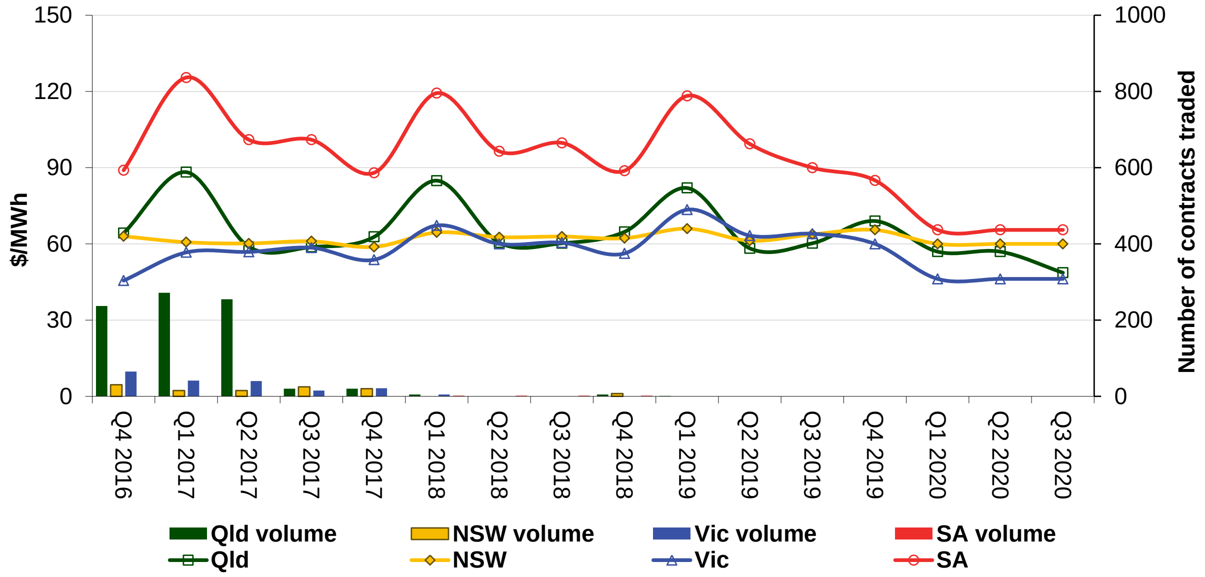
Conditions at the time saw demand close to forecast while availability was slightly lower than forecast four and twelve hours ahead.

At 6.25 pm, similar to the day before, the T>>T_NIL_BL_EXP_6E constraint bound. This resulted in the dispatch price increasing from around $60/MWh to the price cap of $14 000/MWh. At 6.30 pm, the constraint was no longer binding and the price decreased to around $60/MWh again.

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.

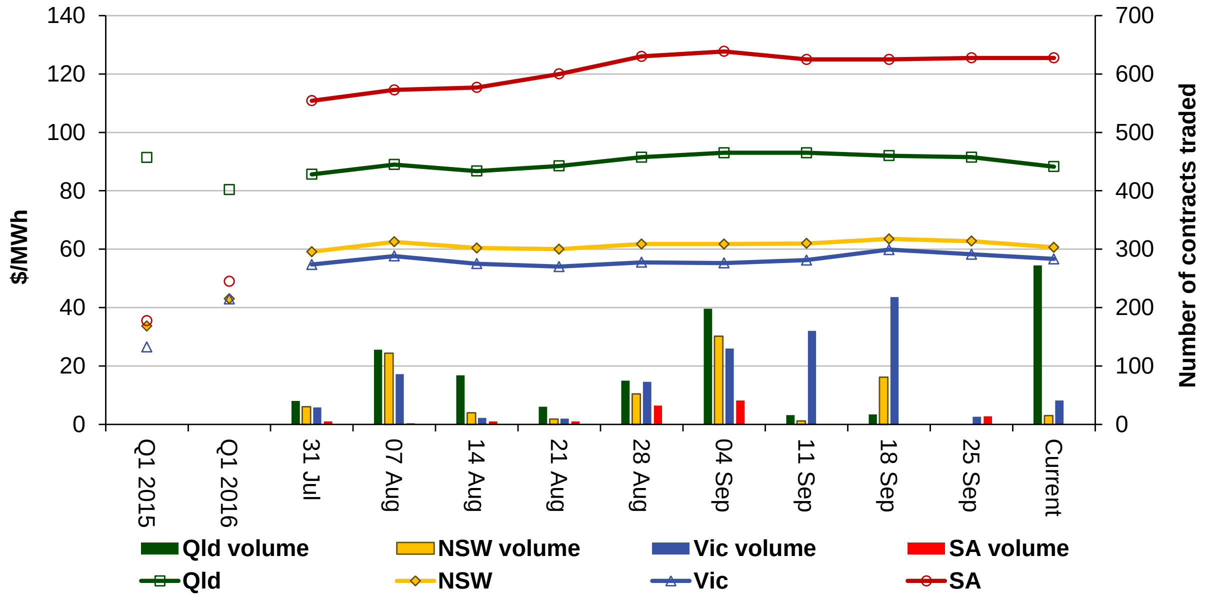
Figure 9: Quarterly base future prices Q3 2016 – Q2 2020



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)



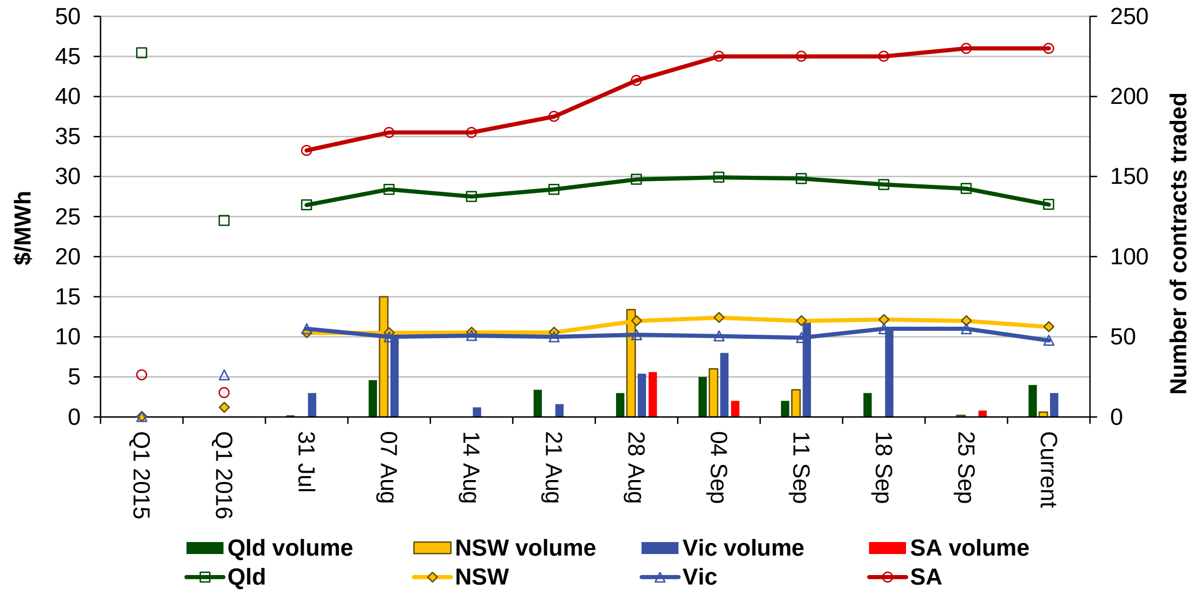
Note. Base contract prices are shown for each of the current week and the previous 9 weeks, with average prices shown for periods 1 and 2 years prior to the current year.

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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