

3 - 9 April 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 3 to 9 April 2016.

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

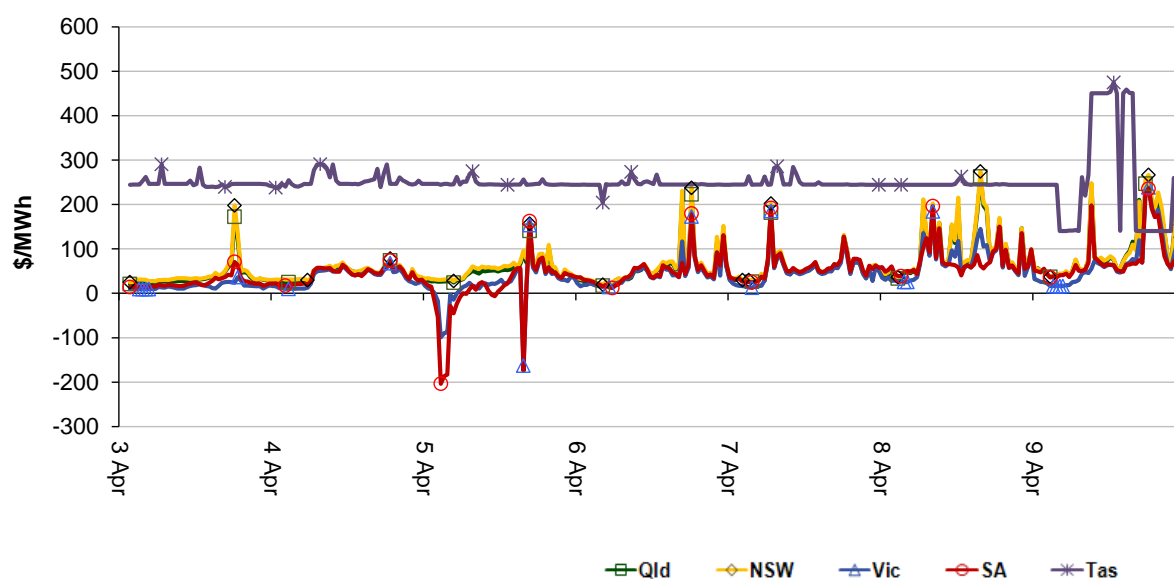


Figure 2 shows the volume weighted average (VWA) prices for the current week (with prices shown in Table 1) and the preceding 12 weeks, as well as the VWA price over the previous 3 financial years.

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

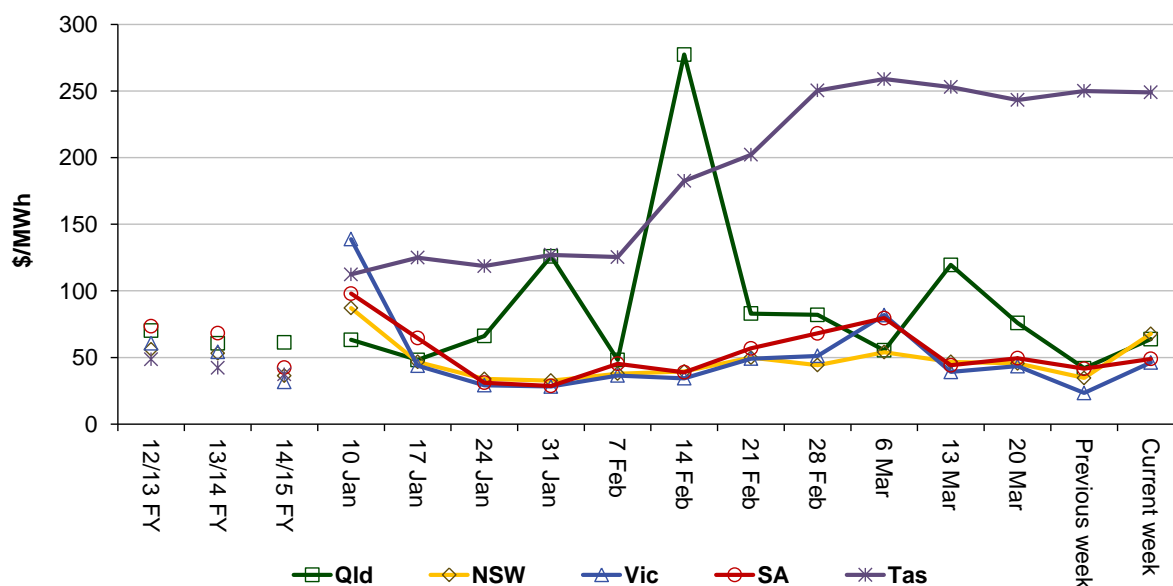


Table 1: Volume weighted average spot prices by region (\$/MWh)

Region	Qld	NSW	Vic	SA	Tas
Current week	64	68	46	49	249
14-15 financial YTD	69	36	31	40	38
15-16 financial YTD	60	46	44	60	96

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 176 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

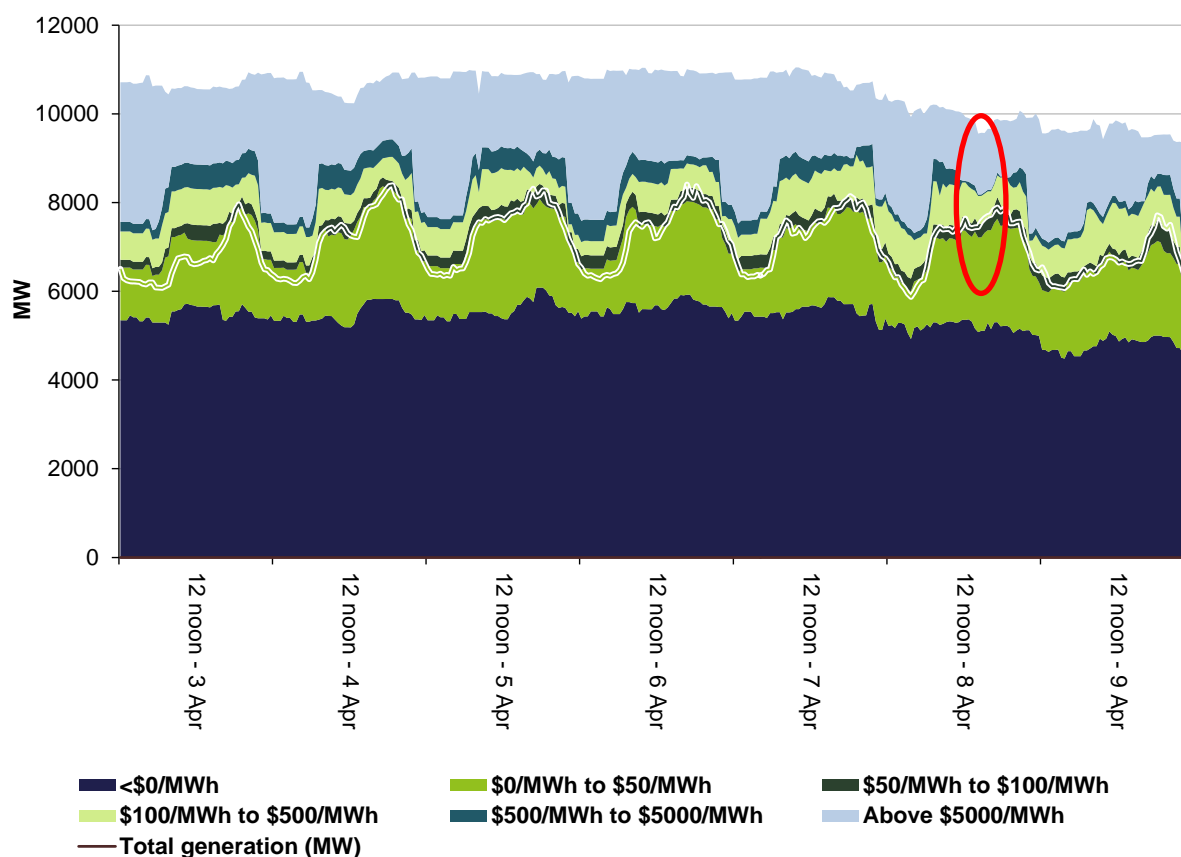
	Availability	Demand	Network	Combination
% of total above forecast	13	27	0	8
% of total below forecast	12	28	0	12

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



The red ellipse in Figure 3 and Figure 4 highlights the period during the week where the spot price was exceeded the reporting threshold. Queensland and NSW prices were aligned during this period. This event is covered in detail in “Detailed market analysis of significant price events”.

Figure 4: New South Wales generation and bidding patterns

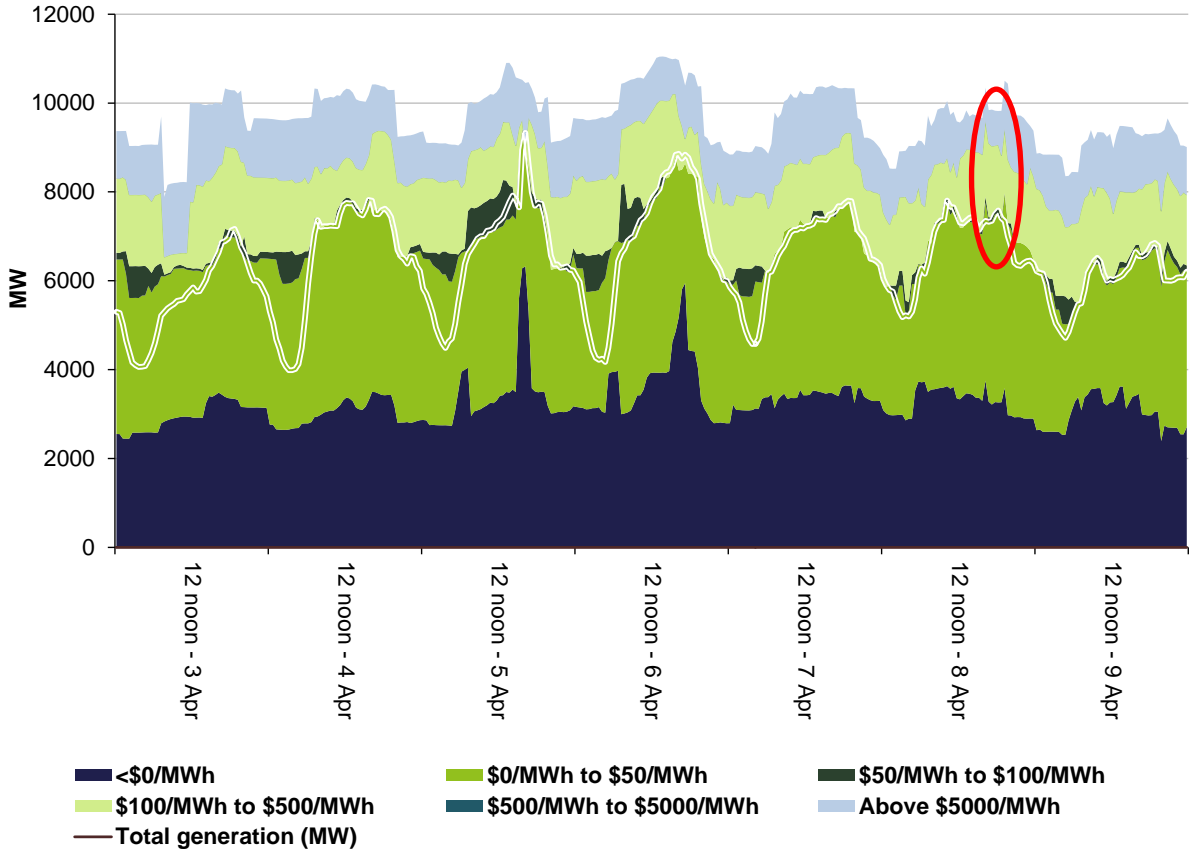
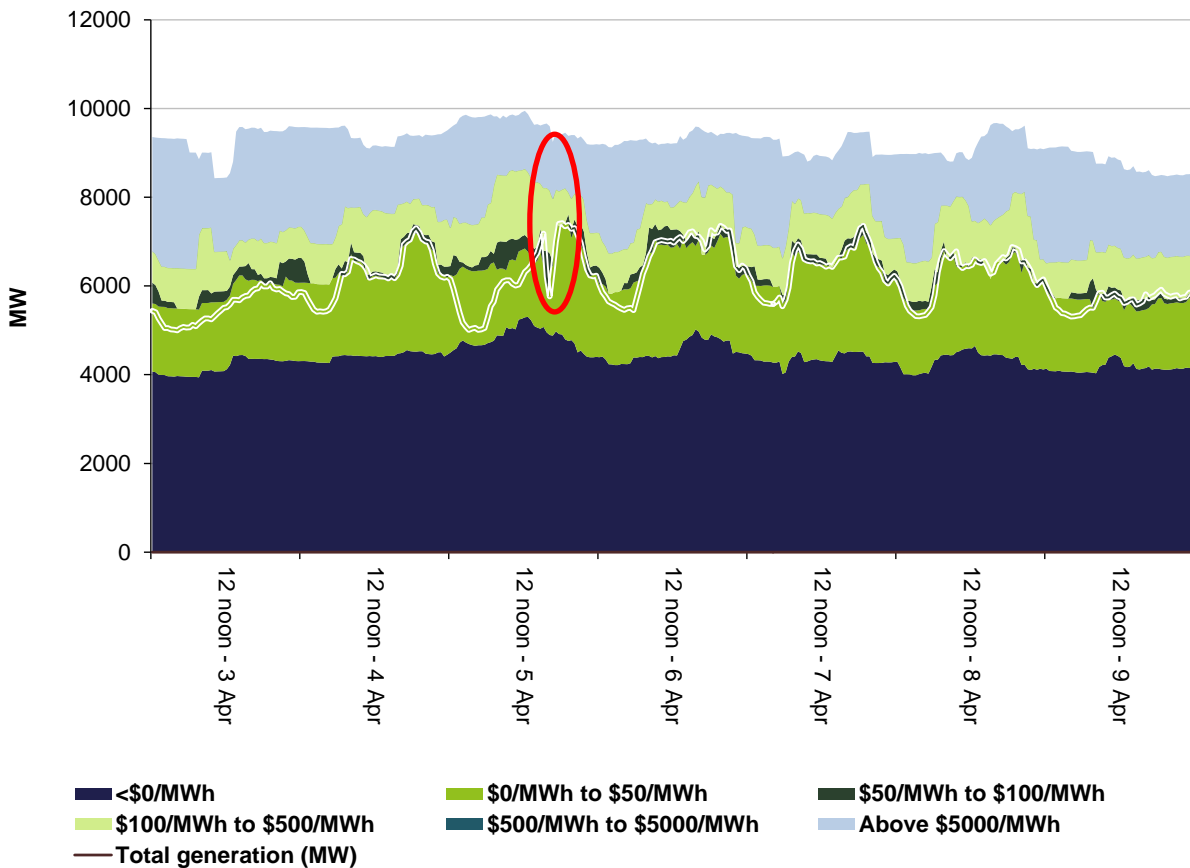
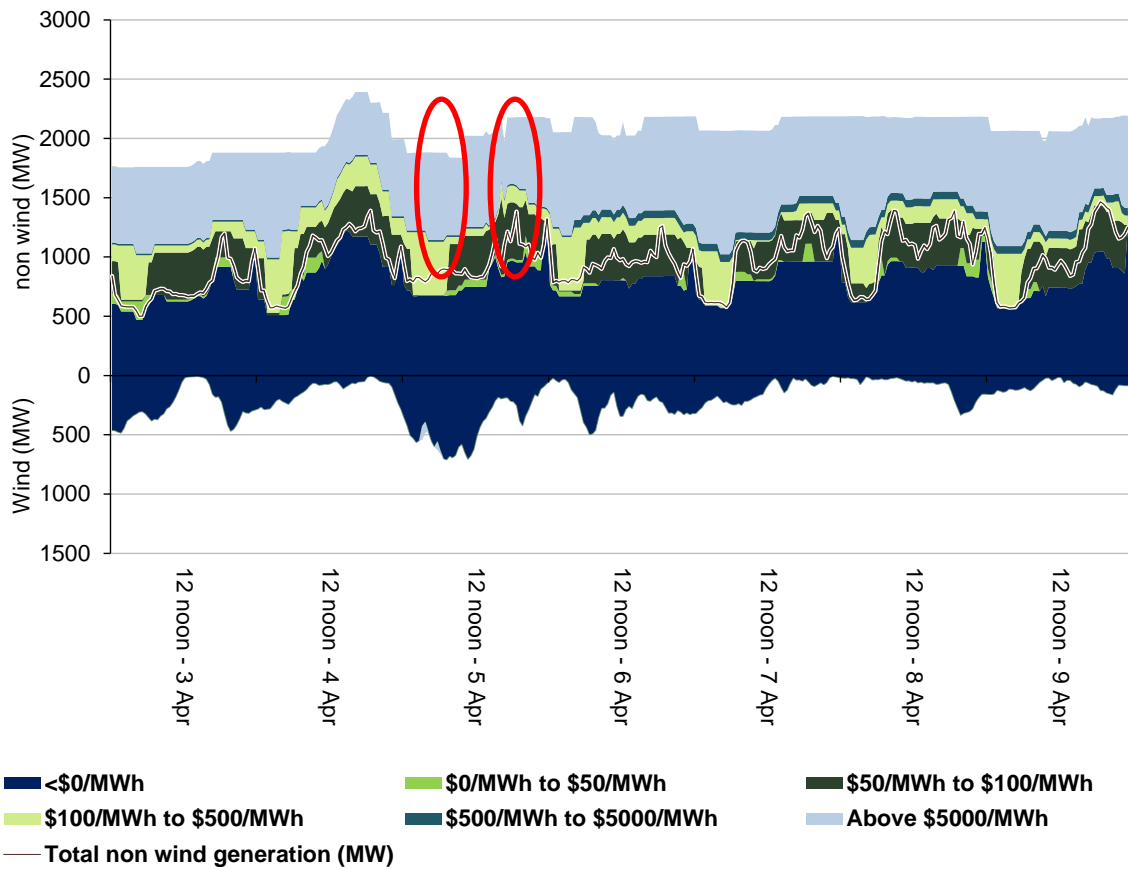


Figure 5: Victoria generation and bidding patterns



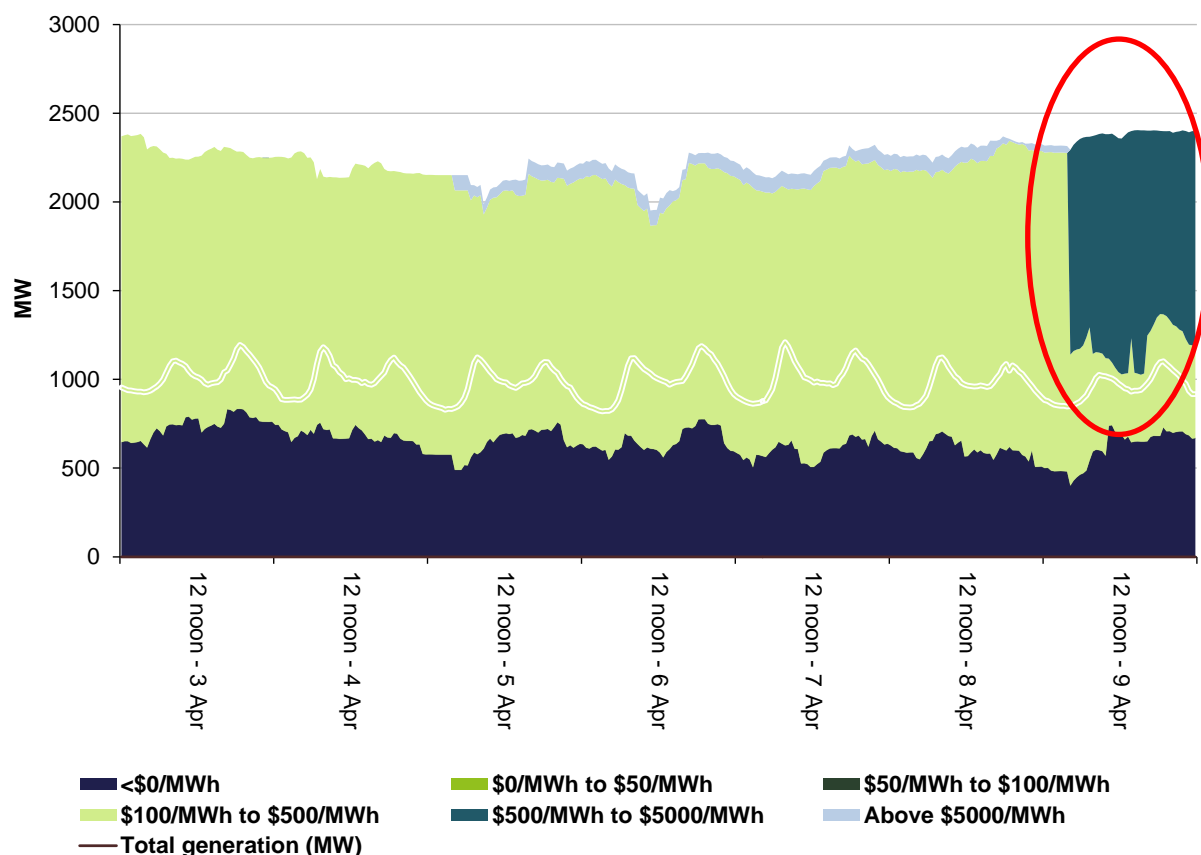
The red ellipse in Figure 5 highlights the period during the week where the spot price was less than $-\$100/\text{MWh}$. This event is covered in detail in “Detailed market analysis of significant price events”.

Figure 6: South Australia generation and bidding patterns



The red ellipse in Figure 6 highlights the periods during the week where the spot price was less than $-\$100/\text{MWh}$. These event is covered in detail in “Detailed market analysis of significant price events”.

Figure 7: Tasmania generation and bidding patterns



The red ellipse in Figure 7 shows the period during the week where the spot price exceeded \$250/MWh. However while this is evident as a change to the bidding strategies from Hydro Tasmania the spot prices did not exceed the AER's reporting threshold.

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.

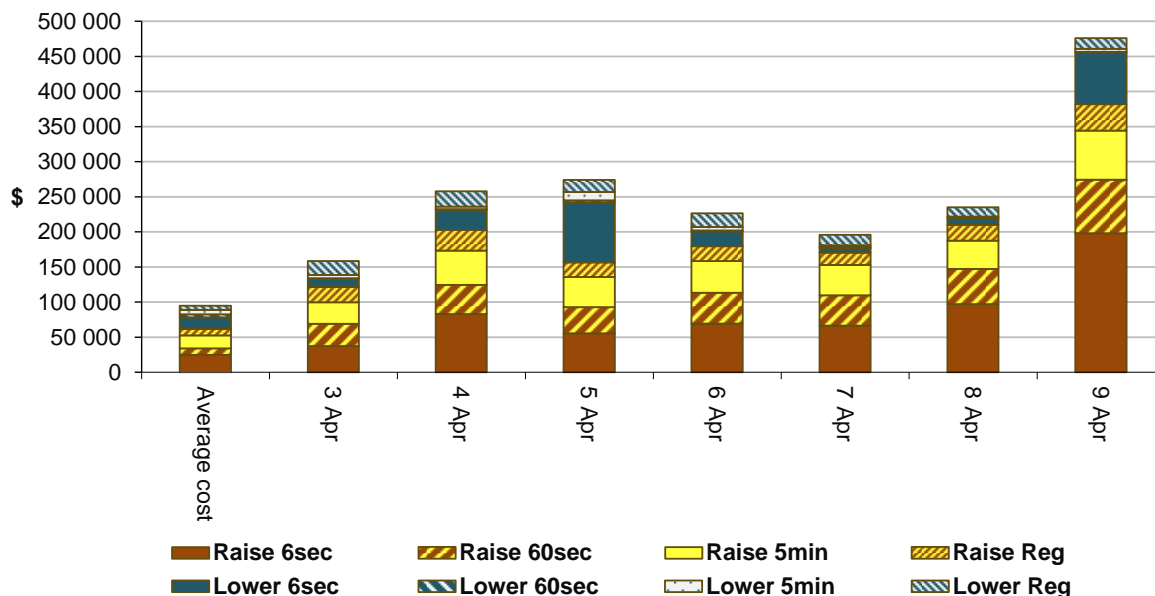
The Electricity Rules stipulate that generators pay for raise contingency services and customers pay for lower contingency services. Regulation services are paid for on a “causer pays” basis determined every four weeks by AEMO.

The total cost of FCAS on the mainland for the week was \$1 517 500 or less than 1 per cent of energy turnover on the mainland.

The total cost of FCAS in Tasmania for the week was \$305 000 or less than 1 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 9 April lower six second services in Tasmania reached \$1530/MW when a system normal constraint managing the requirement for lower 6 second service for the loss of two Comalco potlines was binding. With Basslink still out of service, lower six second services for Tasmania had to be sourced locally.

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.

Queensland

There was one occasion where the spot price in Queensland was greater than three times the Queensland weekly average price of \$64/MWh and above \$250/MWh.

Friday, 8 April

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
4 pm	262.83	50.03	236.24	7121	7205	7310	9638	9868	10 263

Conditions at the time saw demand 84 MW less than forecast four hours ahead and availability 230 MW less than forecast four hours ahead. Prices were aligned with those in New South Wales.

Table 4: Rebids for the 4 pm trading interval

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
12.08 pm		CS Energy	Gladstone	50	35	13 800	1207P INTRA REGIONAL CONSTRAINT-BI_FB CONSTRAINT MANAGEMENT-EXTENDED-SL
1.48 pm		CS Energy	Kogan Creek	-175	0	N/A	1347P UNIT OFFLINE REVISED-SL
1.58 pm		CS Energy	Callide	-70	17	N/A	1358P EMISSIONS LIMIT-SL
2.19 pm		CS Energy	Callide	-30	17	N/A	1418P EMISSIONS LIMIT-SL
3.26 pm	3.35 pm	Millmerran Energy Trader	Millmerran	51	7	13 800	15:25A A DISPATCH RRP DIFF TO P5M/1520 FOR DI 1525

Rebidding and small increases in demand saw five of the six dispatch intervals priced at around \$280/MWh.

New South Wales

There were three occasions where the spot price in New South Wales was greater than three times the New South Wales weekly average price of \$68/MWh and above \$250/MWh.

Friday, 8 April

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
4 pm	274.11	47.66	229.34	8506	8327	8255	9653	10 094	10 259

Conditions at the time saw demand 179 MW more than forecast four hours ahead and availability 441 MW less than forecast four hours ahead. Prices were aligned with those in Queensland.

Table 6: Rebids for the 4 pm trading interval

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
11.32 am		Delta	Vales Point	-660	<299	N/A	1130P UNIT TRIP - ACW PUMP ISSUE
1.04 pm		EnergyAustralia	Tallawarra	25	40	12711	13:03 P ADJ BANDS PLANT AMBIENT TEMP CONDS

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
2.09 pm		Snowy Hydro	Upper Tumut	55	34	300	14:06 A NSW: ACT PRICE \$39,08 LWR THN 5MPD 14:10@14:01

Rebidding and small increases in demand saw five of the six dispatch intervals priced at around \$300/MWh.

Saturday, 9 April

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
6 pm	256.90	89.00	89.00	7996	7932	8008	9297	10 341	10 362
6.30 pm	266.37	187.43	175.84	8219	8072	8092	9301	10 338	10 358

Conditions at the time saw demand up to 147 MW more than forecast four hours ahead and availability up to 1044 MW less than forecast four hours ahead.

Table 8: Rebids for the 6 pm and 6.30 pm trading interval

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
3.54 pm		Snowy Hydro	Upper Tumut	-69	300	N/A	15:54:P UPDATE AVAIL FOR CHANGE TO OUTAGE PLAN/PLANT CONDITIONS
4.23 pm*		Snowy Hydro	Tumut	105	300	13 799	16:16 A NSW: 5MPD PRICE \$101.54 HGR THAN 5MPD 17:00@16:11
4.23 pm**		Snowy Hydro	Tumut	120	300	>450	16:16 A NSW: 5MPD PRICE \$101.54 HGR THN 5MPD 17:00@16:11
4.29 pm		Delta Electricity	Vales Point	-660	<299	N/A	1627P UNIT TRIPPED
5.28 pm	5.35 pm	Origin Energy	Eraring	-420	26	N/A	1728P CHANGE IN AVAIL PLANNED OUTAGE EXTENDED SL

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
5.37 pm	5.45 pm	EnergyAustralia	Tallawarra	100	48	12 711	17:36 A BAND ADJ FOR MAT CHANGE IN NSW PRICE SL
5.46 pm	5.55 pm	EnergyAustralia	Tallawarra	100	12 711	290	17:45 A BAND ADJ FOR MAT CHANGE IN NSW PRICE SL

*this rebid was effective for the 6 pm trading interval only
**this rebid was effective from the 6.30 pm trading interval

The dispatch price increased from \$89/MWh at 5.30 pm to \$193/MWh at 5.35 pm when Eraring's outage was extended. The dispatch price increased to around \$300/MWh at 5.50 pm and stayed above \$215/MWh until 6.40 pm.

Victoria

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

Tuesday, 5 April

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
4 pm	-163.21	61.78	61.78	5691	6467	6503	9662	9827	9805

Conditions at the time saw demand 776 MW less than forecast four hours ahead and availability 165 MW less than forecast four hours ahead. Prices in Victoria and South Australia were aligned.

The Victoria to New South Wales interconnector was bound by a constraint managing the outage of the Marulan to Yass line in New South Wales.

Table 10: Rebids for the 4 pm trading interval in New South Wales

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
3.14 pm		Snowy Hydro	Tumut, Upper Tumut, Guthega	1762	>0	-1000	15:02 A NSW: 30MPD PRICE \$32.82 HGR THN 30 MPD 15:15@14:33
3.28 pm	3.35 pm	Snowy Hydro	Tumut	290	300	-1000	15:05 A NSW: +500 SENS \$13,150.49 HGR THN 30MPD
3.33 pm	3.40 pm	Origin Energy	Shoalhaven	200	13800	-1000	1530A CONSTRAINT MANAGEMENT – N::V_MNYS_2 SL

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
3.37 pm	3.45 pm	Snowy Hydro	Tumut	189	300	-1000	15:36 A NSW: 5MPD PRICE \$13,501.19 HGR THN 5MPD 15:55@15:31
3.39 pm	3.50 pm	Snowy Hydro	Upper Tumut	86	300	-1000	15:36 A NSW: 5MPD PRICE \$13,501.19 HGR THN 5MPD 15:55@15:31

The above rebidding increased the output from those units but as the units are south of the constraint the output could not flow north. The Snowy Hydro units also had their ramp down rate rebid to the minimum allowed. This resulted in the flow being force out of New South Wales and into Victorian counter-price from 3.30 pm. Flows across Vic-NSW went from 1014 MW into New South Wales at 3.25 pm to 490 MW into Victoria at 3.30 pm.

The step change in the interconnector saw an excess of generation in Victoria and the dispatch price fell to \$0/MWh at 3.35 pm then to -\$928/MWh at 3.40 pm and stayed negative until 3.55 pm.

South Australia

There were four occasions where the spot price in Victoria was below -\$100/MWh.

Tuesday, 5 April

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
3 am	-203.61	1.96	-7.69	1044	1119	1124	2433	2376	2629
3.30 am	-186.57	-10.03	-12.46	1052	1079	1084	2425	2418	2643
4 am	-182.88	-21.49	-34.86	1019	1073	1074	2367	2445	2663

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

The spot price outcomes can be attributed to instances in the trading intervals where the dispatch price fell to the price floor.

During the trading intervals, flows on the Victoria to South Australia interconnector were affected by a system normal constraint preventing the overload of a South Morang transformer. To prevent the overload of the South Morang transformer, the constraint would reduce flows to New South Wales on the New South Wales to Victoria interconnector and increase flows to South Australia on the Victoria to South Australia (Heywood) interconnector.

At 2.50 pm, flows into South Australia across the Heywood interconnector increased by 126 MW. With all local generators either ramp rate down limited or trapped, the dispatch price fell from -\$34/MWh at 2.45 pm to -\$1000/MWh at 2.50 pm. The dispatch price

increased to -\$45/MWh in the following dispatch interval following a 120 MW increase in demand and a reduction in flows to South Australia on the Heywood interconnector.

At 3.10 pm, the dispatch price fell from -\$5/MWh at 3.05 pm to -\$998/MWh at 3.10 pm following a 78 MW decrease in demand (mostly attributed to an increase in non-scheduled generation). In the following dispatch interval the dispatch price increased to -\$45/MWh following a 44 MW increase in demand and a change in the direction of flows on the Heywood interconnector (going into Victoria instead of into South Australia)

At 3.15 pm, there was a 74 MW decrease in demand (mostly attributed to an increase in non-scheduled generation) and flows into South Australia across the Heywood interconnector increased by 88 MW. With all local baseload generation ramp rate down limited or trapped, the dispatch price decreased from -\$10/MWh to -\$1000/MWh. The dispatch price increased to -\$35/MWh following a 107 MW increase in demand and a 166 MW change in flows on the Heywood interconnector (going from exporting 154 MW into South Australia at 3.45 pm to importing 12 MW into Victoria at 3.50 pm).

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
4 pm	-174.40	64.79	64.99	1509	1466	1534	2282	2303	2233

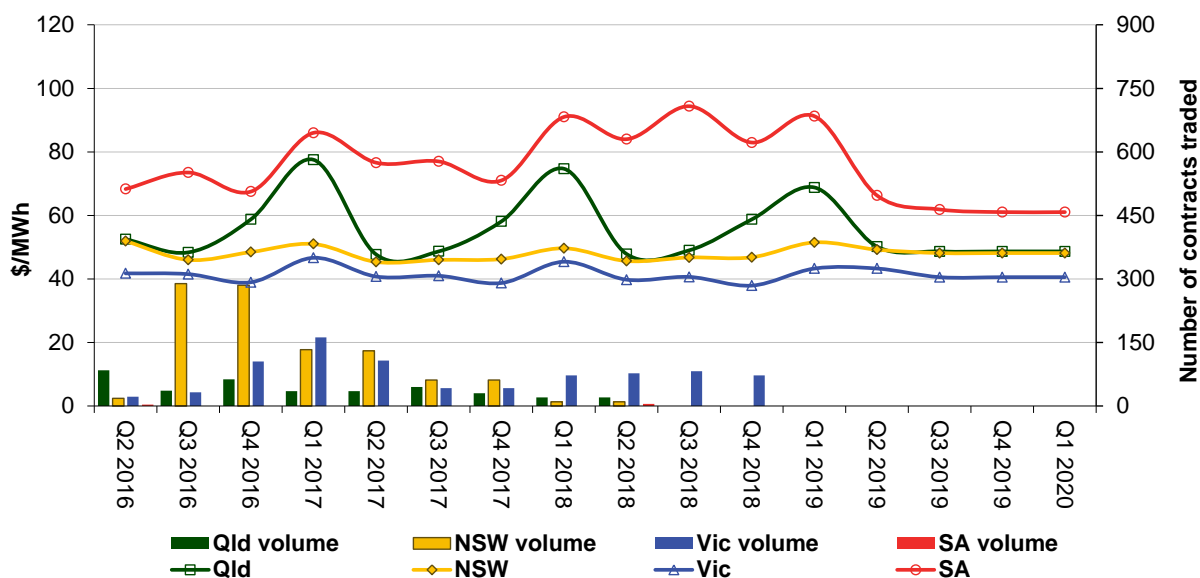
Conditions at the time saw demand 137 MW less than forecast four hours ahead and availability was close to forecast four hours ahead.

As detailed in the detailed market analysis for Victoria above, prices in South Australia and Victoria were aligned during the trading interval.

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. No trades were recorded for the week for base Q2 contracts probably due to the proximity of the end of the quarter.

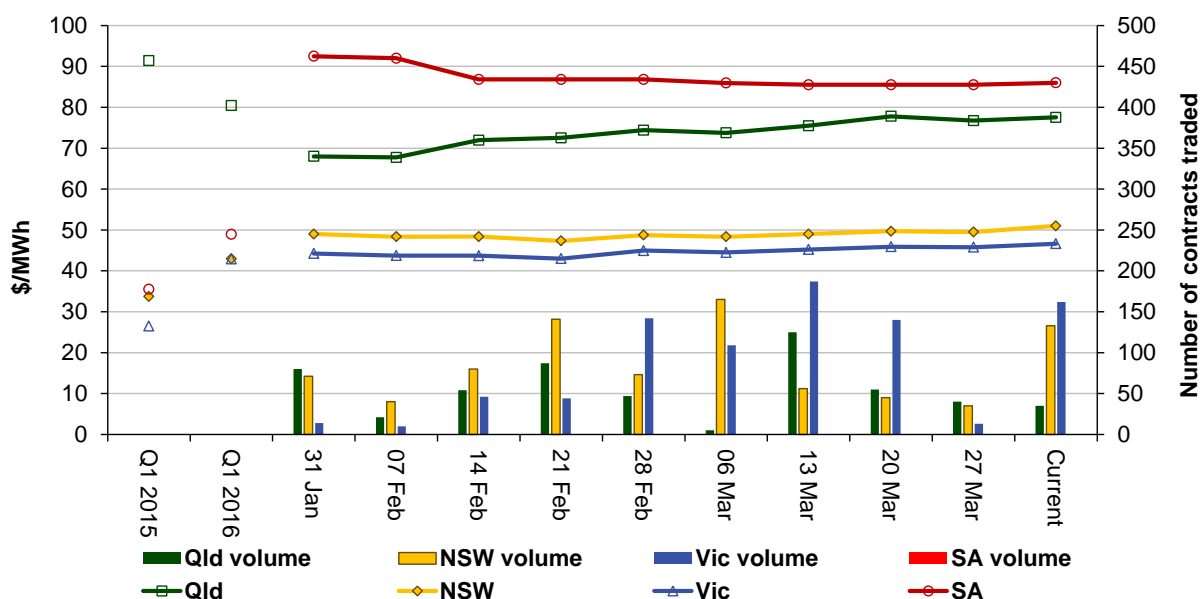
Figure 9: Quarterly base future prices Q2 2016 – Q1 2020



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)



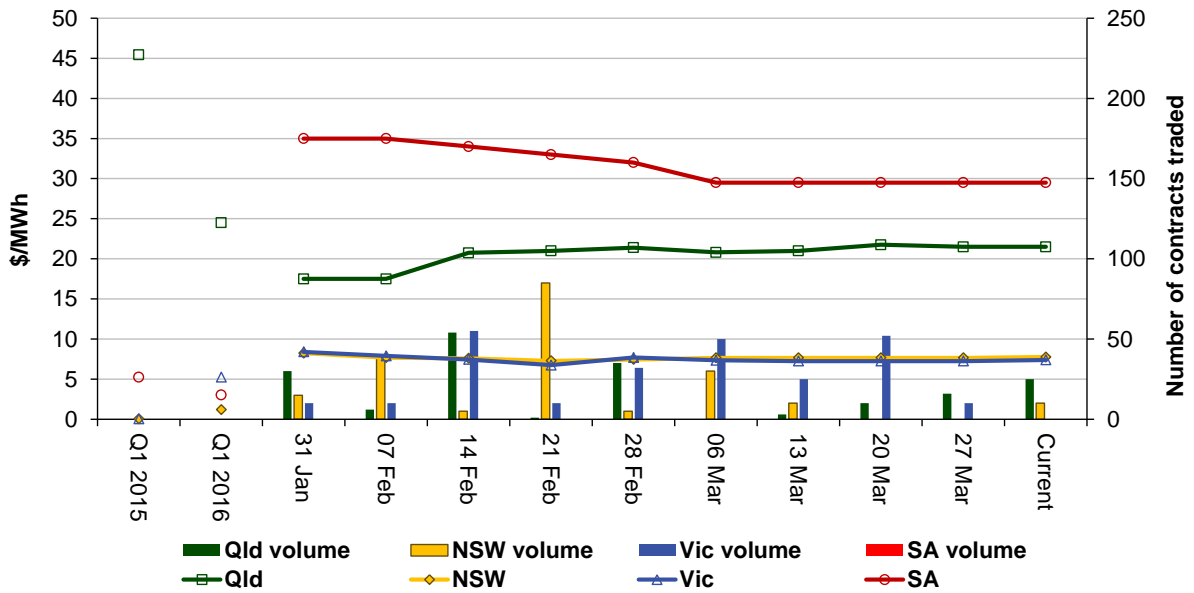
Note. Base contract prices are shown for each of the current week and the previous 9 weeks, with average prices shown for periods 1 and 2 years prior to the current year.

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
April 2016