

15 – 21 September 2019

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 15 to 21 September 2019.

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

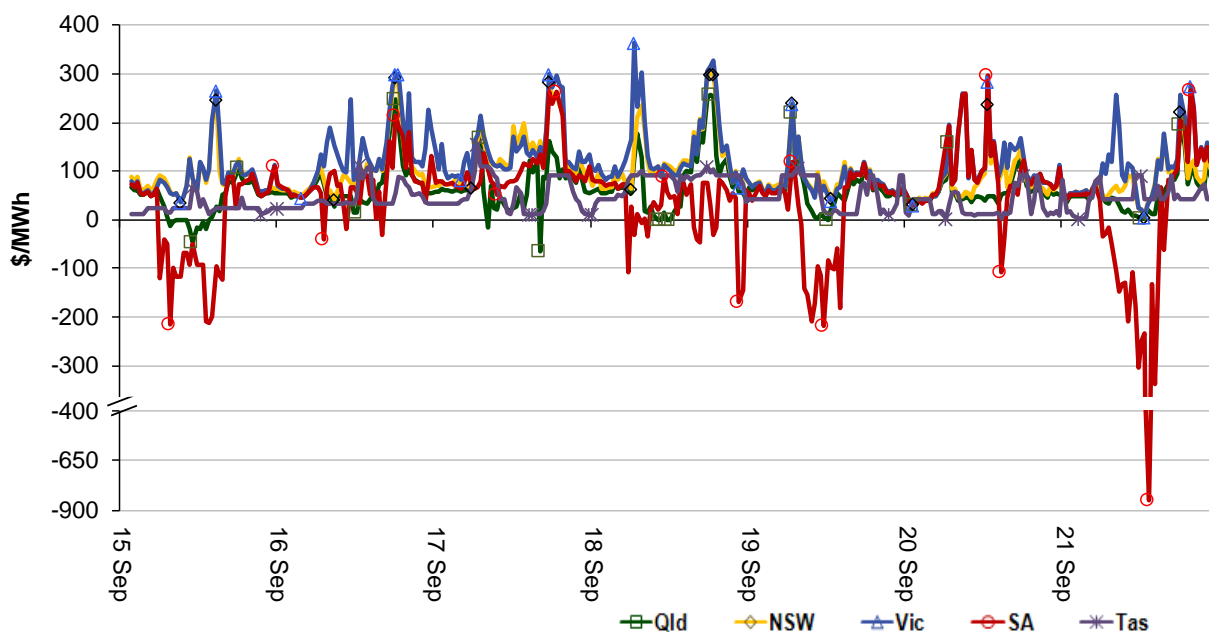


Figure 2 shows the volume weighted average (VWA) prices for the current week (with prices shown in Table 1) and the preceding 12 weeks, as well as the VWA price over the previous 3 financial years.

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

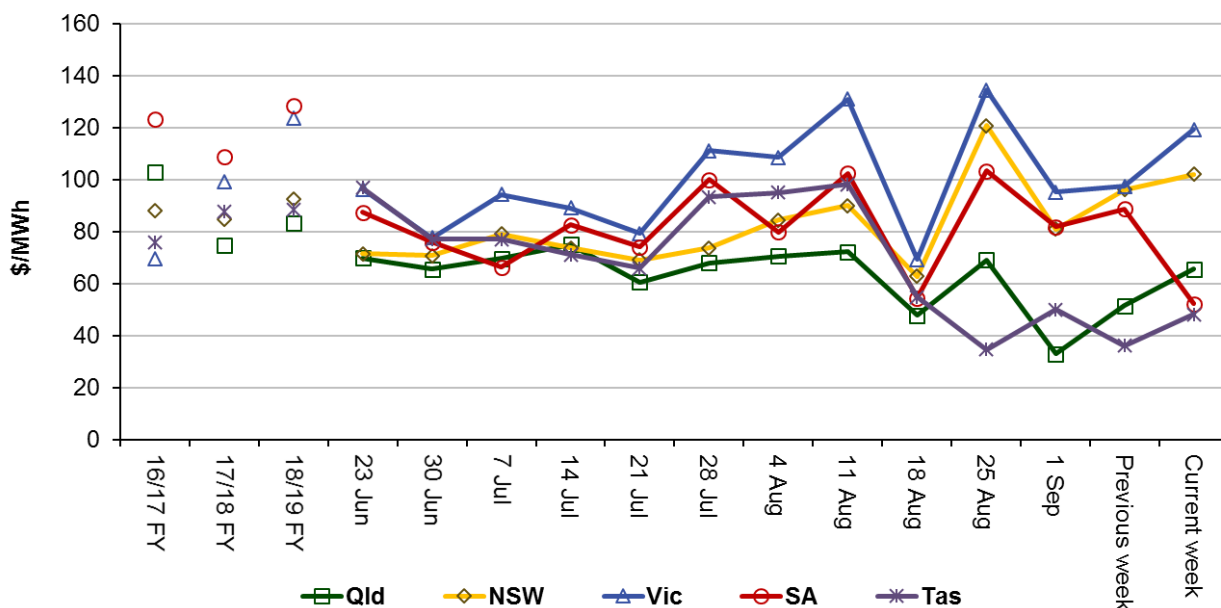


Table 1: Volume weighted average spot prices by region (\$/MWh)

Region	Qld	NSW	Vic	SA	Tas
Current week	65	102	119	52	48
18-19 financial YTD	81	91	83	95	33
19-20 financial YTD	63	84	101	81	68

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 285 trading intervals throughout the week where actual prices varied significantly from forecasts. This compares to the weekly average in 2018 of 199 counts and the average in 2017 of 185. 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	7	26	0	2
% of total below forecast	10	47	0	8

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

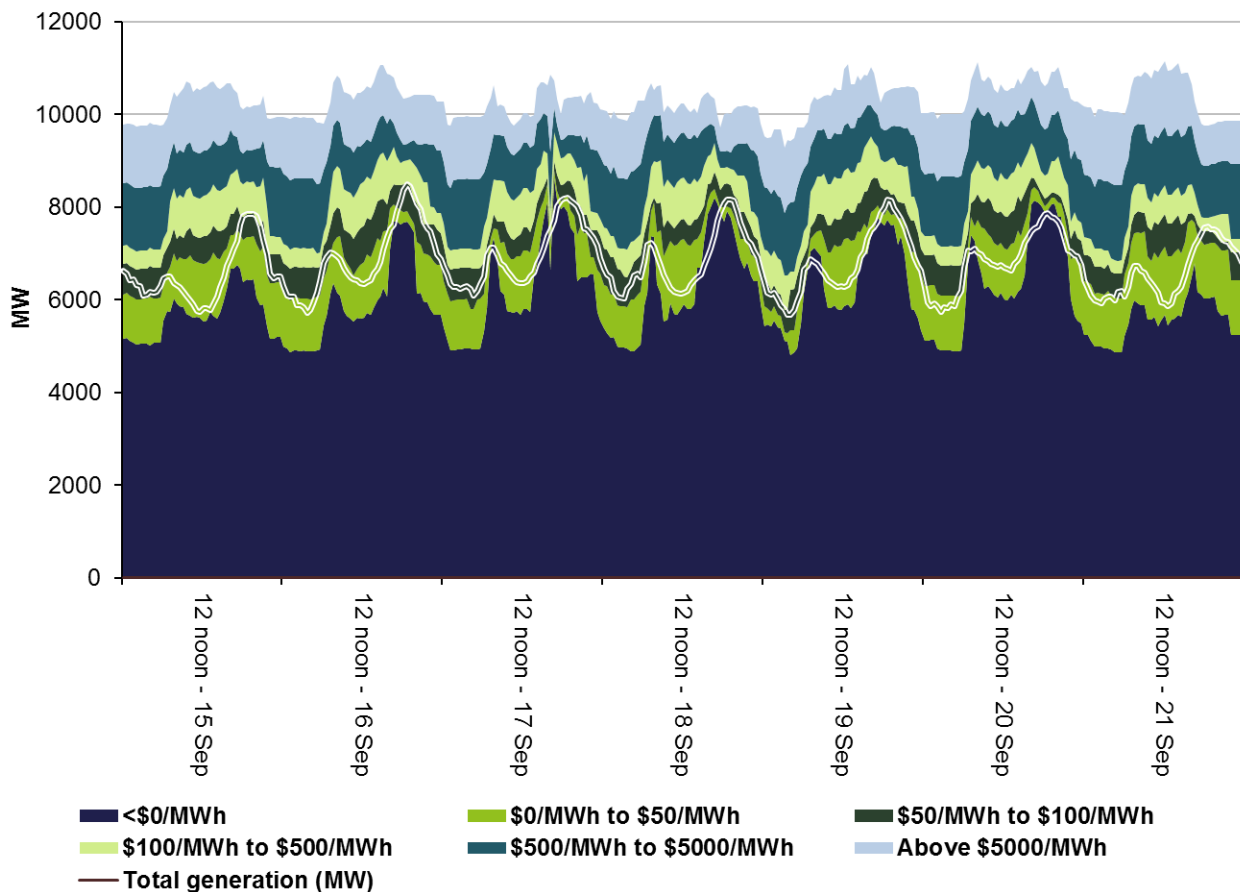


Figure 4: New South Wales generation and bidding patterns

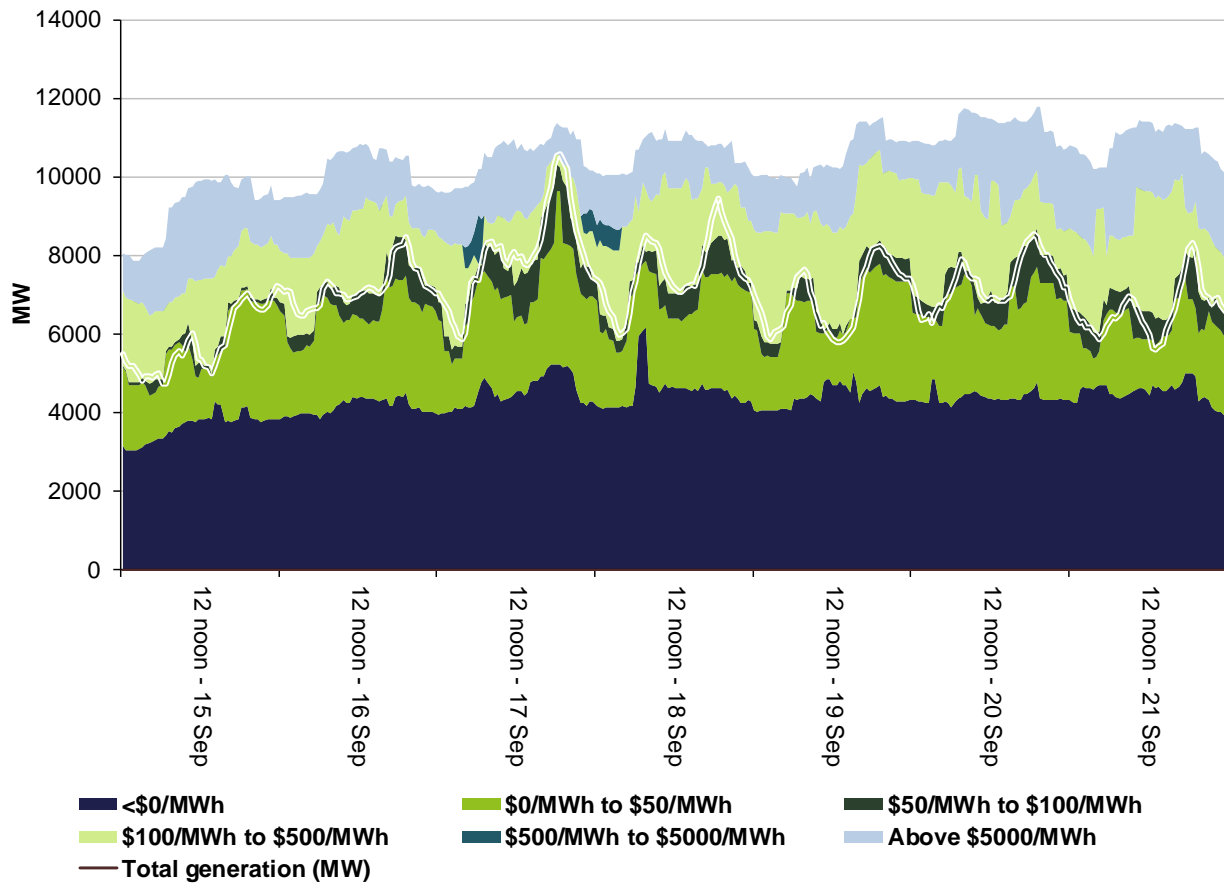


Figure 5: Victoria generation and bidding patterns

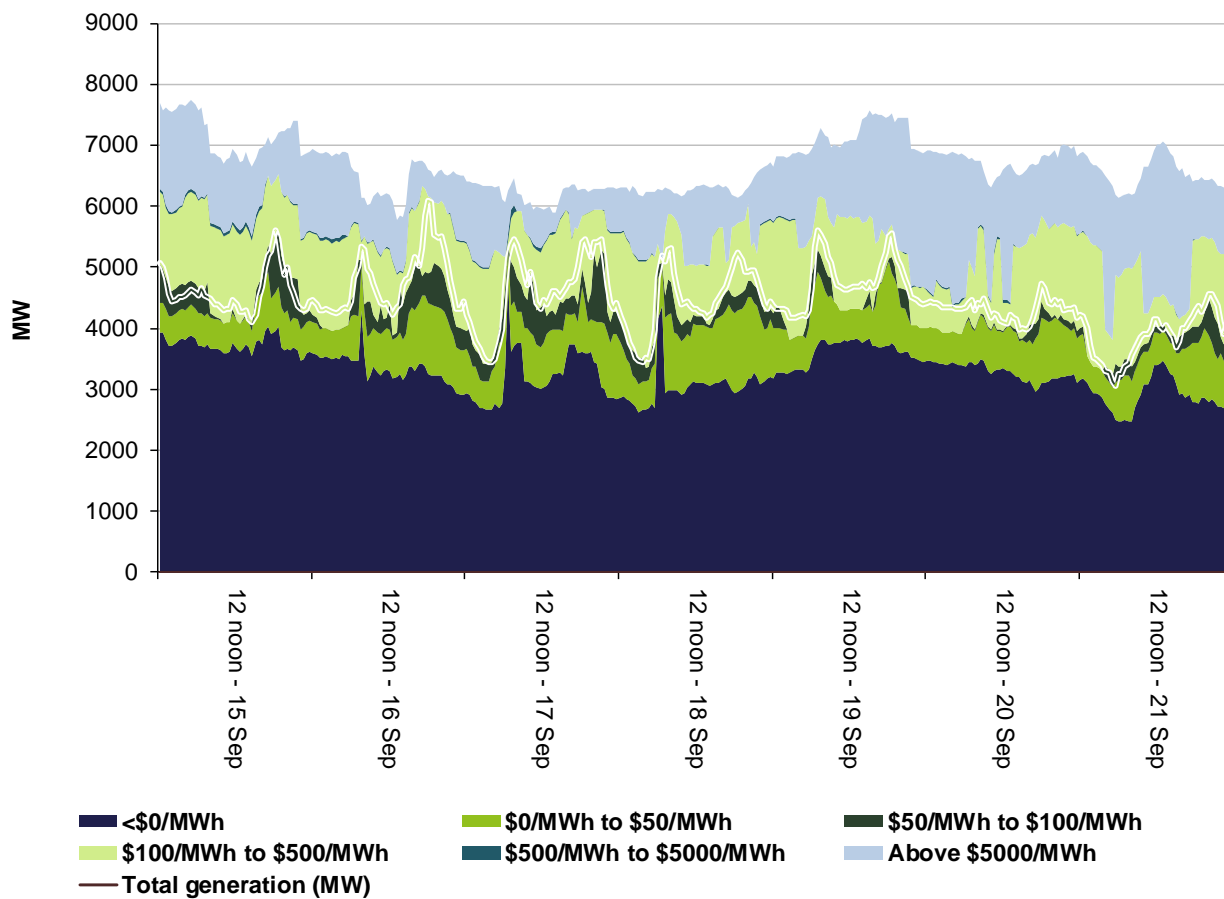


Figure 6: South Australia generation and bidding patterns

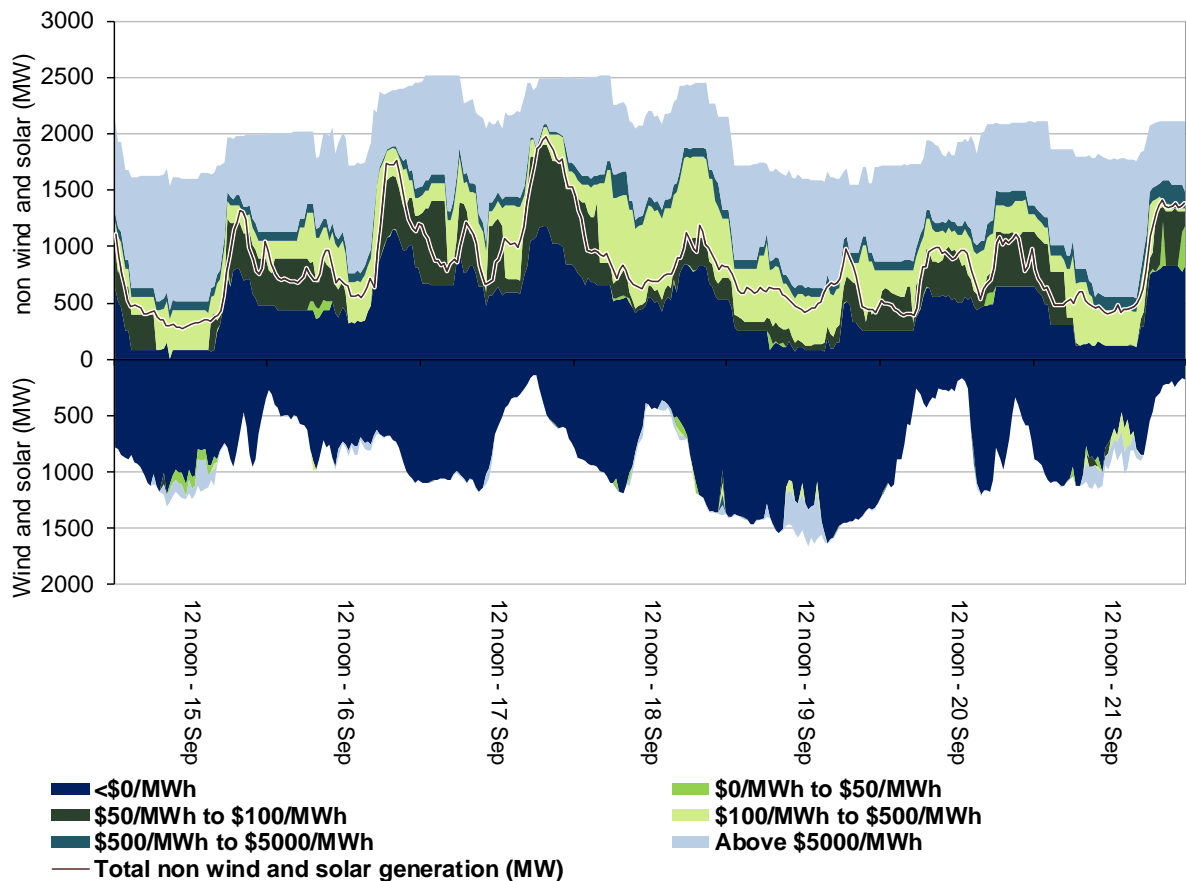
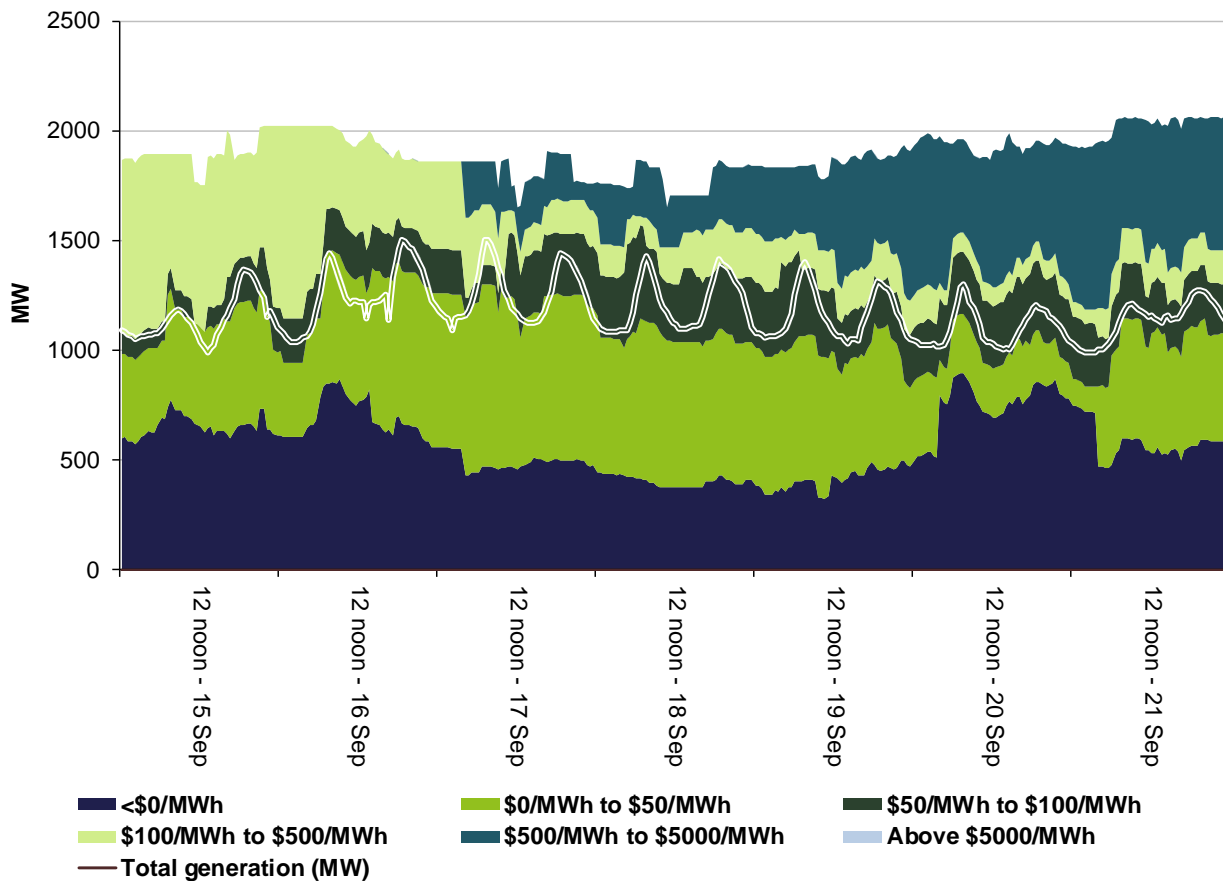


Figure 7: Tasmania generation and bidding patterns



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.

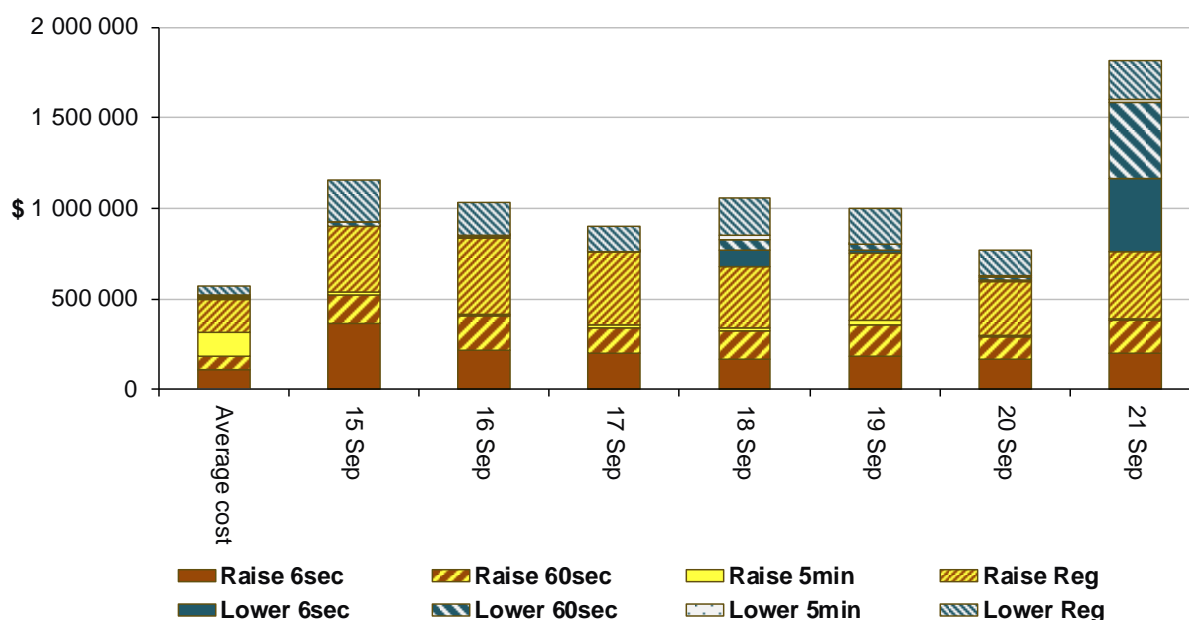
The Electricity Rules stipulate that generators pay for raise contingency services and customers pay for lower contingency services. Regulation services are paid for on a “causer pays” basis determined every four weeks by AEMO.

The total cost of FCAS on the mainland for the week was \$7 120 000 or around 2.5 per cent of energy turnover on the mainland.

The total cost of FCAS in Tasmania for the week was \$609 000 or around 7 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 21 September prices for lower 6 and 60 second services reached close to or the price cap for three dispatch intervals resulting in the high costs. At 6.35 am a planned outage of the Heywood to Mortlake line in Victoria meant that South Australia was at risk of becoming electrically islanded and had to source lower services locally. This resulted in price varying between the price cap and \$0.39/MWh until the outage was complete at 7 pm.

Detailed market analysis of significant price events

Queensland

There were three occasions where the spot price in Queensland was greater than three times the Queensland weekly average price of \$65/MWh and above \$250/MWh.

Wednesday, 18 September

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 pm	252.07	248.68	201.00	6812	6828	6834	9724	9767	9852
6.30 pm	255.93	275.77	201.00	6983	7022	7008	9994	10 113	10 178
7 pm	254.36	293.65	201.00	7052	7099	7070	10 034	10 179	10 180

Prices were close to those forecast.

Victoria

There was one occasion where the spot price in Victoria was greater than three times the Victoria weekly average price of \$119/MWh and above \$250/MWh.

Wednesday, 18 September

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
7 am	363.72	13 050.60	14 499.99	5636	5751	5831	6261	6308	6299

Conditions at the time saw demand and availability lower than forecast.

Imports into Victoria across the Victoria to New South Wales interconnector were 126 MW higher than forecast four hours ahead. This combined with capacity rebid from high prices to the price floor by Snowy Hydro and AGL led to the lower than forecast prices.

South Australia

There were six occasions where the spot price in South Australia was greater than three times the South Australia weekly average price of \$52/MWh and above \$250/MWh and there were thirty-five occasions where the spot price was below -\$100/MWh.

Sunday, 15 September

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
6.30 am	-120.27	78.00	43.09	1011	939	955	2737	2637	2683
8 am	-215.56	59.85	23.44	1009	954	962	2827	2663	2739
9 am	-116.95	44.85	-50.85	946	890	911	2878	2659	2786
9.30 am	-116.67	-50.85	-50.85	885	838	858	2828	2670	2784
1.30 pm	-209.04	-50.86	-1000.00	762	730	754	2732	2863	2846
2 pm	-212.50	-50.85	-1000.00	794	745	781	2821	2827	2817
2.30 pm	-200.16	-50.85	-50.85	881	809	815	2805	2788	2778
3.30 pm	-113.18	.00	-3.09	973	930	884	2727	2730	2694
4 pm	-124.01	56.66	31.46	979	984	925	2771	2698	2648

There was little capacity priced between \$100/MWh and the price floor so small changes in demand, generator availability or rebids saw prices swing between zero and the price floor for most of these times. For the 9 m and 9.30 am trading intervals prices were between -\$51/MWh and -\$150/MWh. The remaining intervals had one dispatch interval reaching the price floor. In response almost all wind or solar farms at some point rebid capacity to higher prices driving the price back to forecast level for the remainder of the interval.

Tuesday, 17 September

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	262.63	281.06	280.55	1417	1444	1413	2578	2742	2734
7 pm	264.24	12 860.00	318.91	1739	1729	1698	2759	2783	2819

Prices were close to forecast for the 6 pm trading interval.

For the 7 pm trading interval there was significant rebidding of capacity from high to low prices resulting in the lower than forecast price, see Table 7 for details.

Table 7: Significant rebids for 7 pm

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
4.43 pm		Origin Energy	Ladbroke Grove	85	319	-1000	1642A inc vic dem 5pd 5387mw > 30pd 5244mw @1700 sl
4.54 pm		Origin Energy	Quarantine	125	319	<78	1652A inc nem dem 5pd 25236 mw > 30pd 25047 mw @ 1720 sl
4.59 pm		EnergyAustralia	Hallett	60	579	-1000	1650-A~band adj nem demand tracking 400mw>p30 fcst sl~
5.19 pm		Origin Energy	Quarantine	72	14 700	-1000	1717A inc vic dem 5pd 5837 mw > 30pd 5676 mw @ 1800 sl

Wednesday, 18 September

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
6 am	-109.13	77.50	84.98	1197	1116	1100	3614	3463	3245
11 pm	-168.71	77.50	77.50	1203	1193	1152	3528	3264	3302
11.30 pm	-143.46	77.50	77.50	1170	1153	1147	3547	3317	3329

Conditions at the time saw demand close to forecast and availability up to 264 MW higher than forecast because wind output was higher than forecast (generally priced below zero). There was little capacity available priced between \$77/MWh and the price floor so small changes in demand, generator availability and minor rebidding led to one dispatch price at the price floor in each interval.

Thursday, 19 September

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
9 am	-142.38	61.43	67.66	1102	941	954	3144	3023	3053
9.30 am	-155.56	12.79	-150.00	1093	870	892	3108	3051	3076

Conditions at the time saw demand and availability higher than forecast. With little capacity available priced between \$77/MWh and the price floor, a 50 MW drop in demand saw the dispatch price fall to the price floor at 9 am and 9.05 am. In response participants rebid around

430 MW of capacity at various wind farms from the price floor to above -\$50/MWh, see Table 10 for details.

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
10 am	-209.04	-975.27	-1000.00	995	799	814	3088	3065	3086
10.30 am	-173.73	-1000.00	-1000.00	946	724	742	3090	3087	3121
11.30 am	-115.80	-1000.00	-1000.00	819	652	663	3214	3122	3143
Midday	-217.23	-1000.00	-1000.00	759	639	656	3127	3143	3141
1.30 pm	-100.98	-1000.00	-1000.00	745	644	649	3180	3147	3133
2.30 pm	-183.11	-494.79	-1000.00	904	693	686	3193	3135	3128

Conditions at the time saw demand up to 222 MW higher than forecast four hours ahead. Availability was close to forecast four hours ahead.

Participants rebid capacity from low to higher prices, mainly at their wind farms, close to dispatch in response to either a forecast or actual low negative prices. This combined with the higher than forecast demand result in the higher than forecast prices.

Friday, 20 September

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
9 am	255.80	68.85	78.00	1337	1317	1335	2248	2523	2507
9.30 am	259.94	68.50	78.00	1339	1298	1314	2148	2478	2480
1 pm	298.19	78.00	94.40	1259	1252	1253	2098	2403	2488
3 pm	-108.60	75.28	68.50	1278	1252	1236	2923	2672	2904

Conditions at the time saw demand higher and availability lower than forecast for all but the 3 pm trading interval. The reduced availability was due to wind output being up to 300 MW lower than forecast. This saw dispatch prices up to around \$400/MWh during these three trading intervals.

For the 3 pm trading interval wind output was 156 MW higher than forecast four hours ahead. At 2.40 pm the dispatch price fell to the price floor and in response around 500 MW of capacity was rebid to higher prices (see Table 12 for details) and the dispatch price reached \$69/MWh for the rest of the trading interval.

Table 12: Significant rebids for 3 pm

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
2.37 pm	2.45 pm	Infigen	Lake Bonney 2 WF	159	-3	12 879	1440~A~sa price dp@1440 for 1440 1075 lwr thn 5pd@1435 sl~
2.38 pm	2.45 pm	EnergyAustralia	Waterloo WF	130	-1000	73	14:38 ~ A ~ band adj to 5min negaative dp ~ abs1
2.38 pm	2.45 pm	Origin Energy	Quarantine	29	-1000	14 700	1437P change in avail - seagas meter station maintenance sl
2.38 pm	2.45 pm	Trustpower	Snowtown WF	99	-1000	5000	1435 A sa1 5min pd rrp for 1445 (\$-1000.0) published at 1435 is 1359.85% lower than 5min pd rrp published at 1430 (\$68.5) - time of alert: 1438
2.41 pm	2.50 pm	Vena Energy Services (Australia) Pty Ltd	Tailem Bend Solar Project 1	95	-1000	14 700	14:42 A prices negative

Friday, 21 September

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
8.30 am	-105.96	-1000.00	77.59	976	989	1026	2867	2862	2820
9 am	-148.29	-1000.00	51.37	994	966	999	2921	2897	2834
9.30 am	-134.15	-1000.00	10.36	982	929	961	2926	2946	2841
10 am	-130.75	-1000.00	-3.09	939	879	910	2878	2926	2838
10.30 am	-209.04	-1000.00	-1000.00	847	834	869	2924	2954	2953
11 am	-109.17	-1000.00	-1000.00	844	779	791	2904	2938	2950
11.30 am	-179.93	-1000.00	-1000.00	826	731	739	2723	2946	2937
Midday	-303.66	-1000.00	-1000.00	753	672	684	2757	2926	2917
12.30 pm	-250.00	-1000.00	-1000.00	680	650	652	2677	2907	2899
1 pm	-233.50	-1000.00	-1000.00	647	624	637	2559	2891	2879

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 pm	-850.00	-1000.00	-1000.00	586	623	632	2674	2865	2847
2 pm	-131.62	-1000.00	-1000.00	638	635	636	2597	2837	2813
2.30 pm	-339.62	-1000.00	-1000.00	648	653	661	2795	2918	2781
3 pm	-140.95	-1000.00	-1000.00	724	679	685	2743	2870	2740

AEMO had issued a direction to thermal plant in South Australia to stay on to maintain system strength. Forecast prices were at the price floor most of the time. Prices were higher than forecast because participants would wait to close to dispatch to see if the low price was still forecast or would actually occur and the rebid capacity to higher prices. As a result you would see one or two prices at the price floor followed by participants with wind farms rebidding up to 630 MW of capacity in total to higher prices increasing the price for the remainder of the trading interval.

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
8 pm	266.18	318.91	344.59	1548	1614	1627	2403	2517	2500

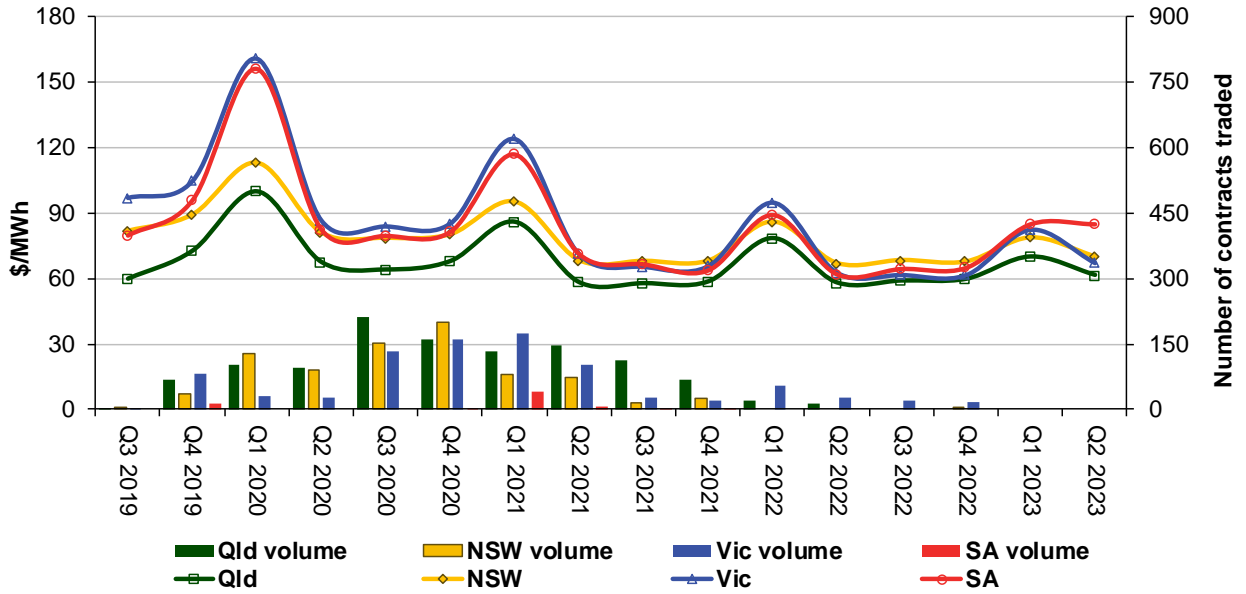
Conditions at the time saw demand and availability lower than forecast.

At 5.25 pm, Origin rebid a total of 240 MW of capacity at Quarantine and Ladbroke Grove from prices above \$319/MWh to the price floor because of an increase in NEM demand. This resulted in the lower 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.

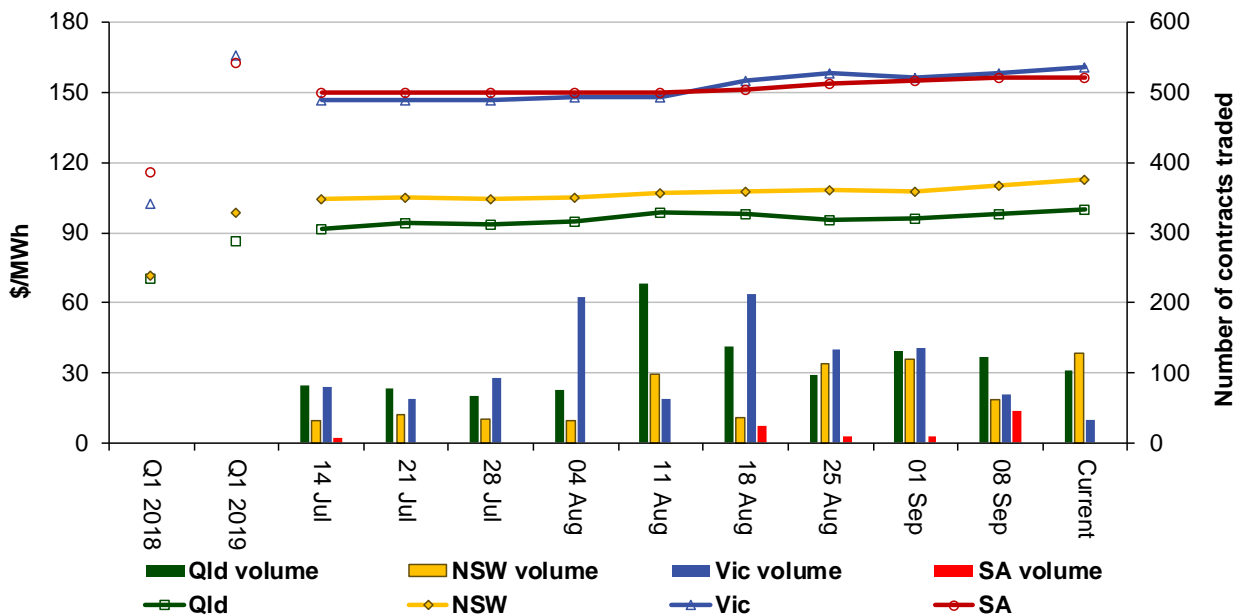
Figure 9: Quarterly base future prices Q3 2019 – Q2 2023



Source. ASXEnergy.com.au

Figure 10 shows how the price for each regional Q1 2020 base contract has changed over the last 10 weeks (as well as the total number of trades each week). The closing quarter 1 2018 and quarter 1 2019 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 2020 base contracts over the past 10 weeks (and the past 2 years)



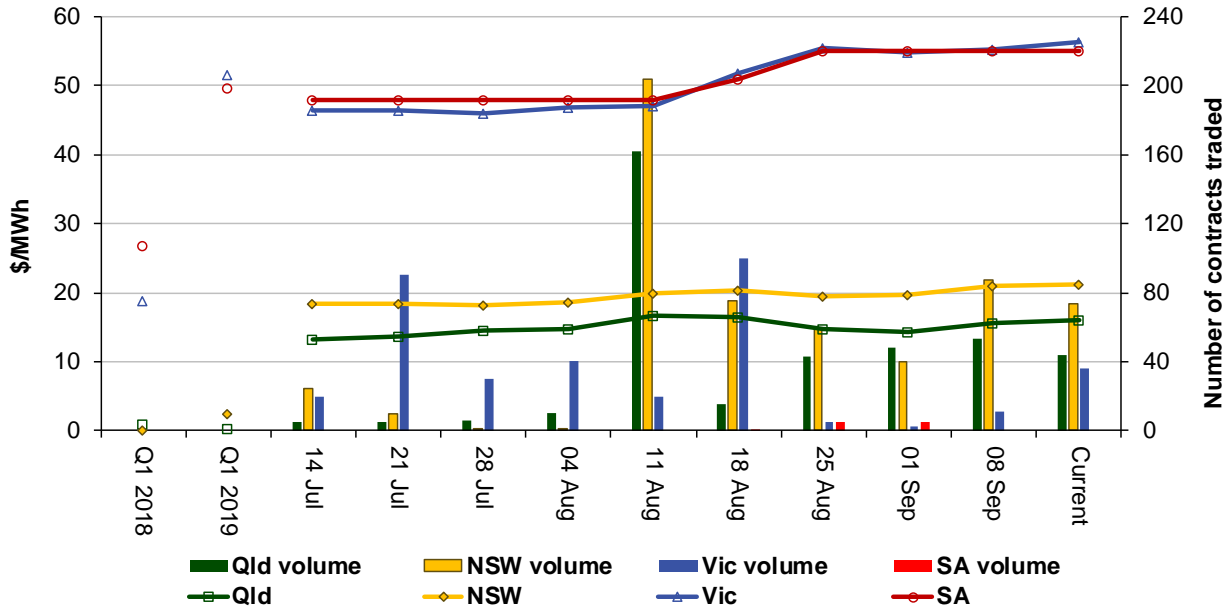
Note. Base contract prices are shown for each of the current week and the previous 9 weeks, with average prices shown for periods 1 and 2 years prior to the current year.

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 2020 cap contract has changed over the last 10 weeks (as well as the total number of trades each week). The closing quarter 1 2018 and quarter 1 2019 prices are also shown.

Figure 11: Price of Q1 2020 cap contracts over the past 10 weeks (and the past 2 years)



Source. ASXEnergy.com.au

Australian Energy Regulator
October 2019