Electricity Report

AUSTRALIAN ENERGY REGULATOR

26 January – 1 February 2020

Weekly Summary

Average prices for the week ranged from $24/MWh in Tasmania up to $744/MWh in Victoria. Weekly average prices were also high in New South Wales and South Australia (at $399/MWh and $317/MWh respectively). These prices in New South Wales, Victoria and South Australia were driven by a number of spot prices above $5000/MWh on 30 and 31 January.

On Friday 31 January, six 500 kV transmission towers in south western Victoria were blown over causing South Australia to be separated from the rest of the NEM. Throughout the afternoon following the separation, spot prices exceeded $5000/MWh in South Australia, New South Wales and Victoria.

The separation of South Australia from the rest of the market meant the region had to supply its own frequency control ancillary services. This led to the price for multiple services exceeding $5000/MW overnight on 31 January to 1 February. The cumulative price threshold was breached on Saturday morning for raise 6 second, lower 60 second and lower 6 second services.

Purpose

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 26 January to 1 February 2020.

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

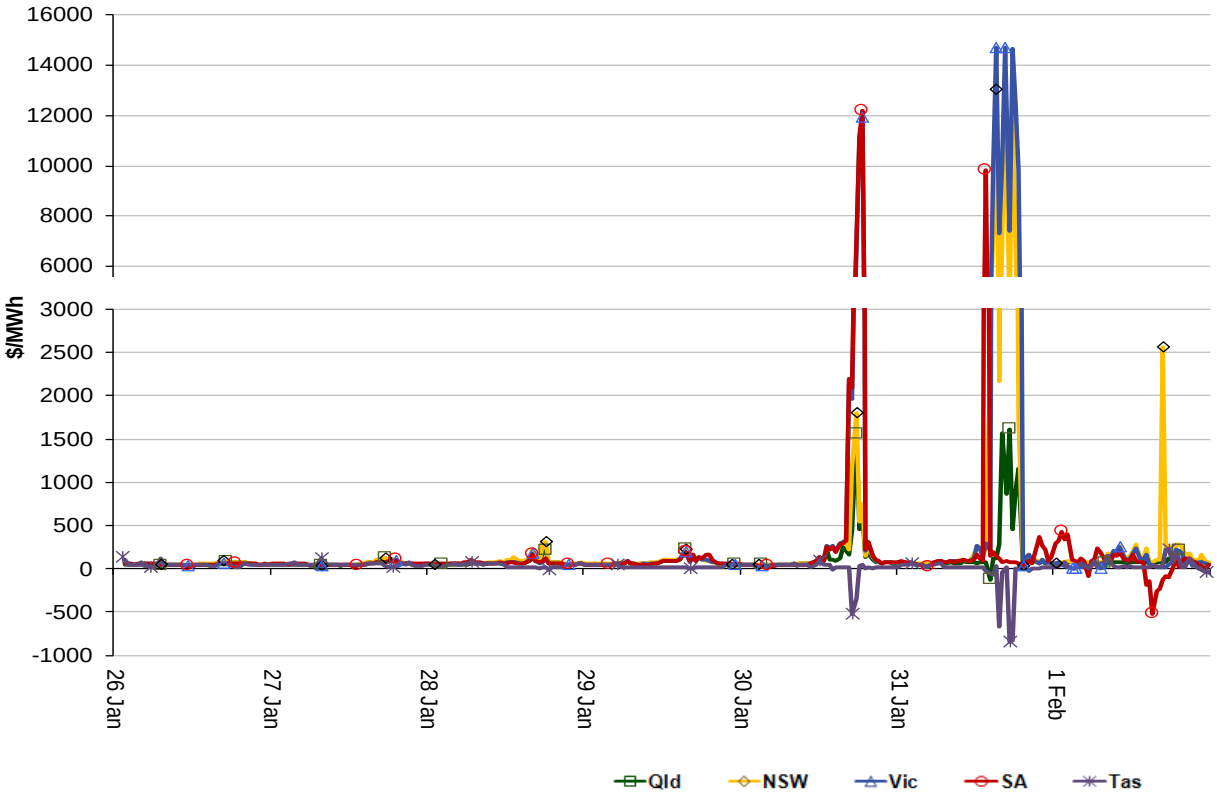


Figure 2 shows the volume weighted average (VWA) prices for the current week (with prices shown in Table 1) and the preceding 12 weeks, as well as the VWA price over the previous 3 financial years.

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

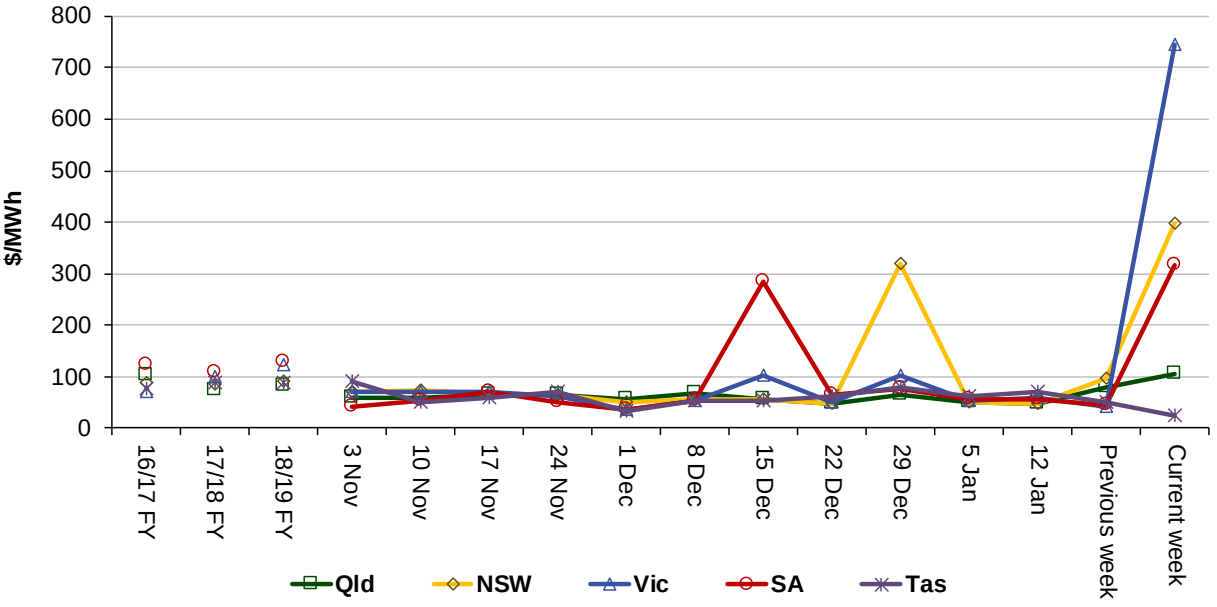


Table 1: Volume weighted average spot prices by region ($/MWh)

Region	Qld	NSW	Vic	SA	Tas
Current week	105	399	744	317	24
18-19 financial YTD	85	95	130	139	74
19-20 financial YTD	66	100	111	90	70

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 190 trading intervals throughout the week where actual prices varied significantly from forecasts. This compares to the weekly average in 2019 of 204 counts and the average in 2018 of 199. 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	47	0	1
% of total below forecast	8	24	0	15

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

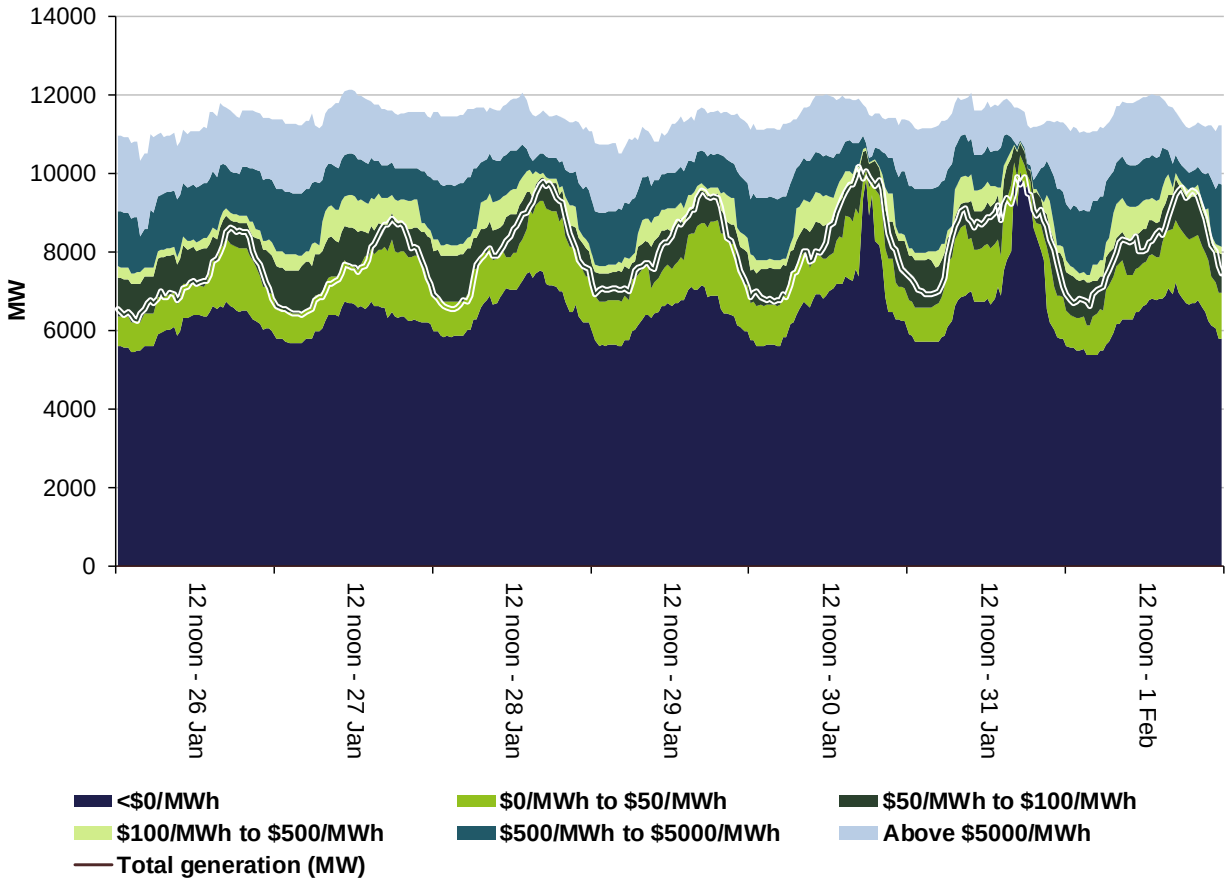


Figure 4: New South Wales generation and bidding patterns

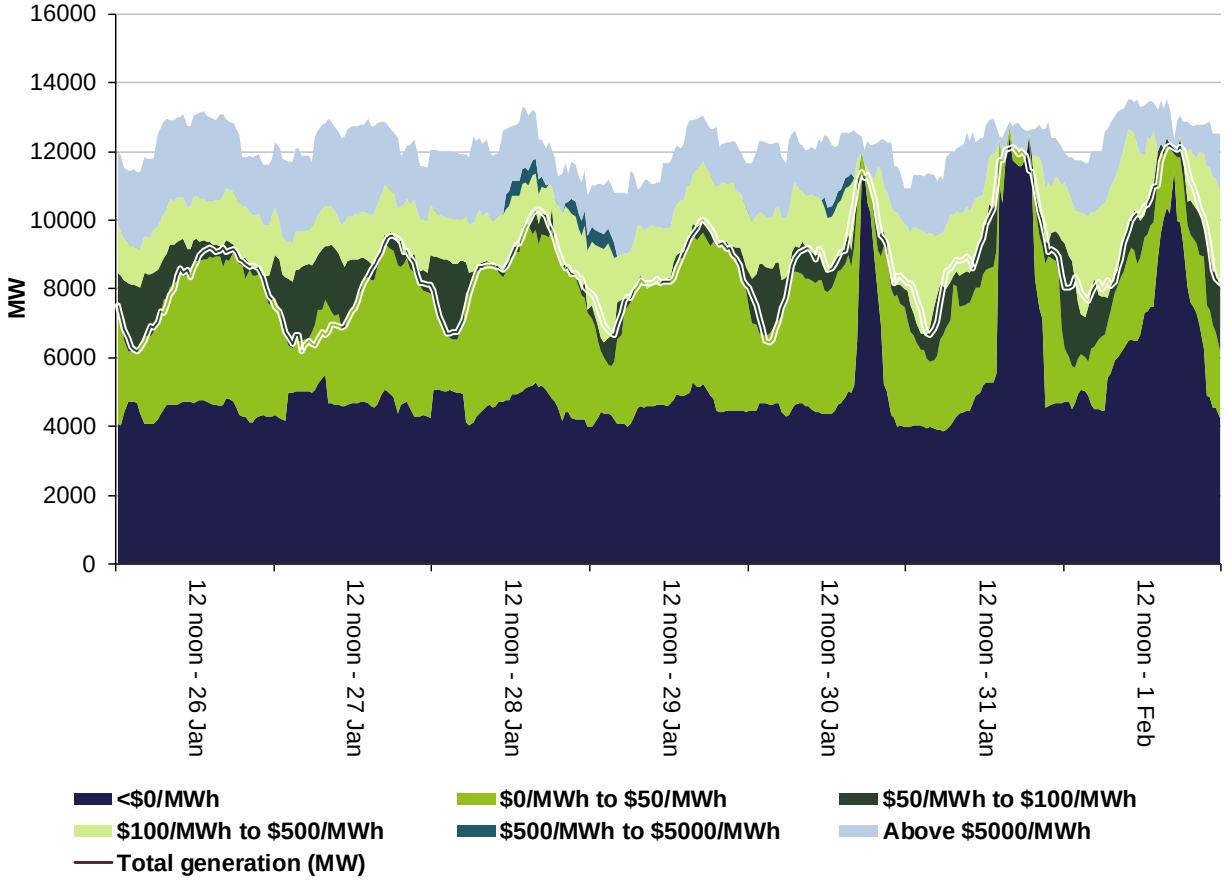


Figure 5: Victoria generation and bidding patterns

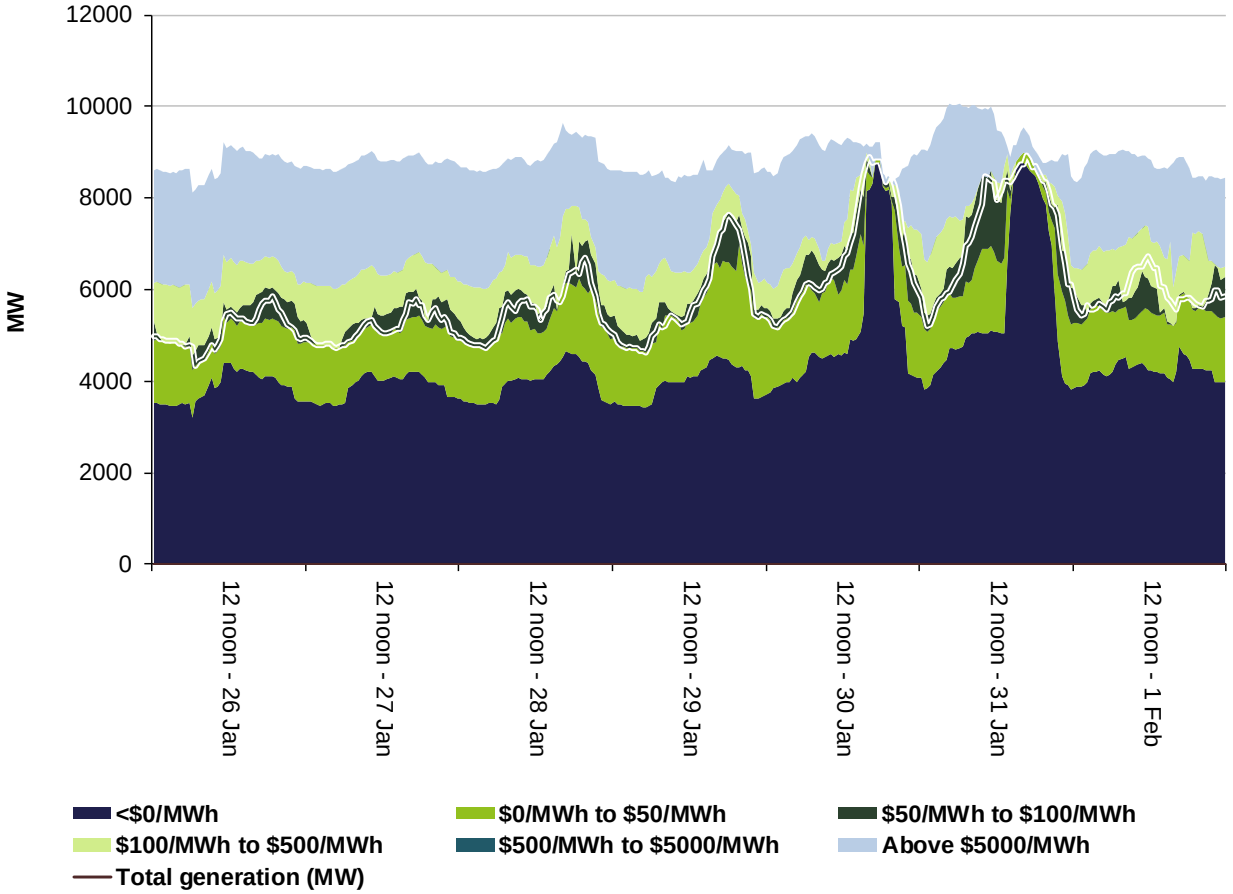


Figure 6: South Australia generation and bidding patterns

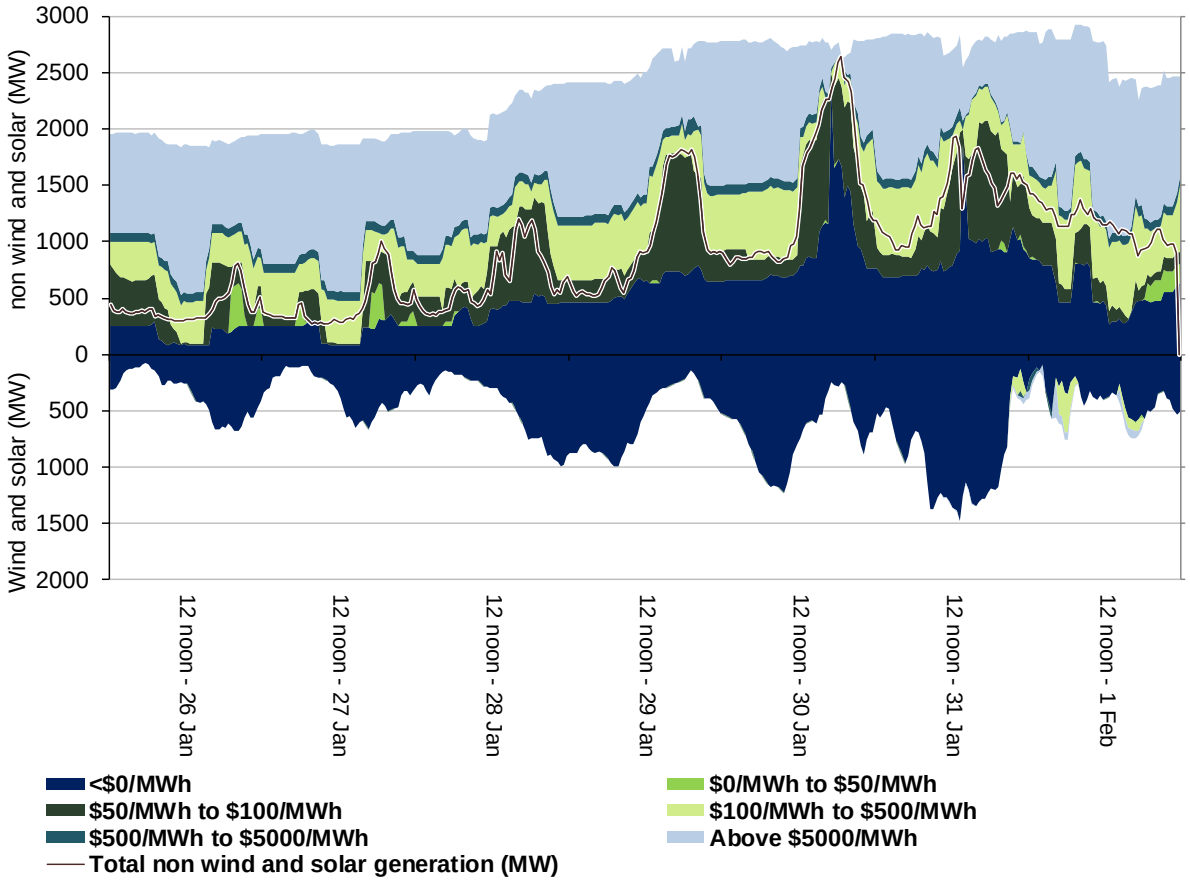
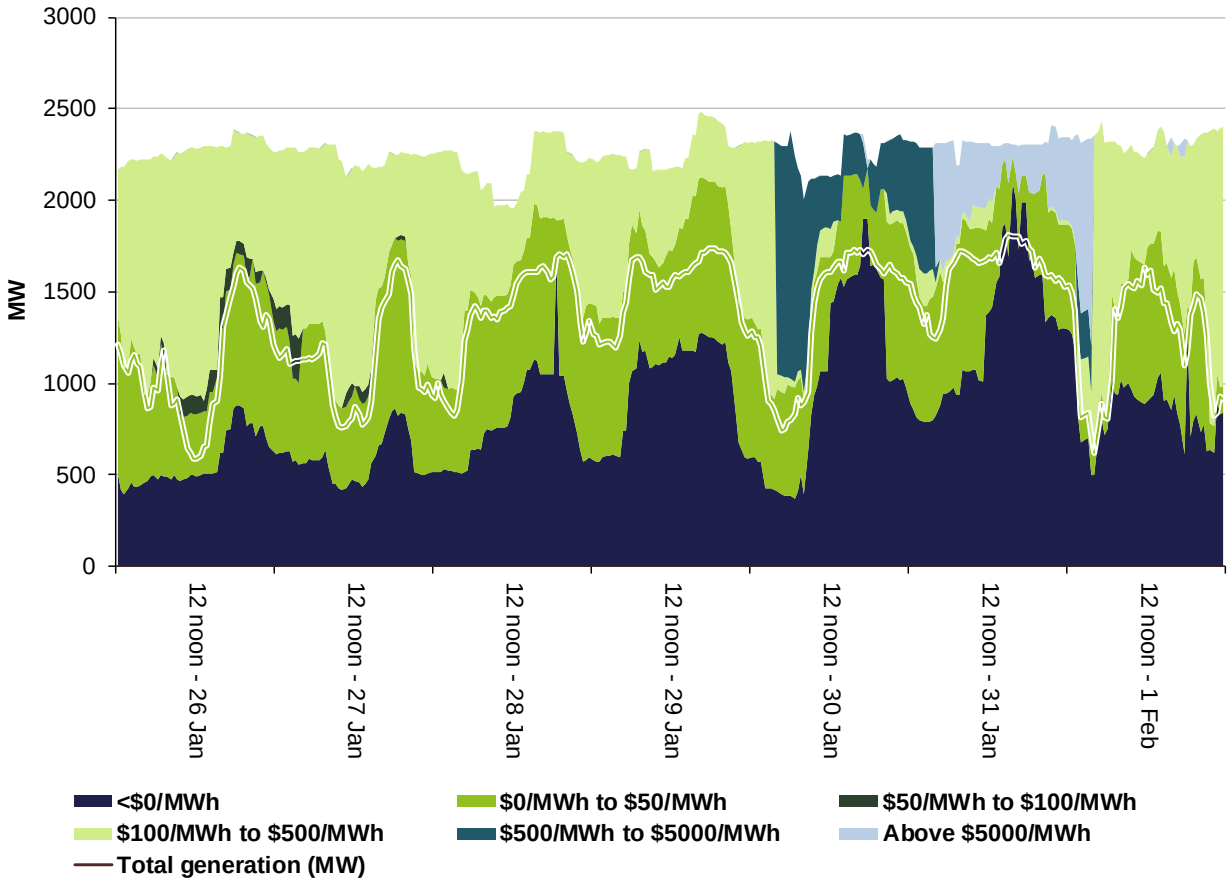


Figure 7: Tasmania generation and bidding patterns



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.

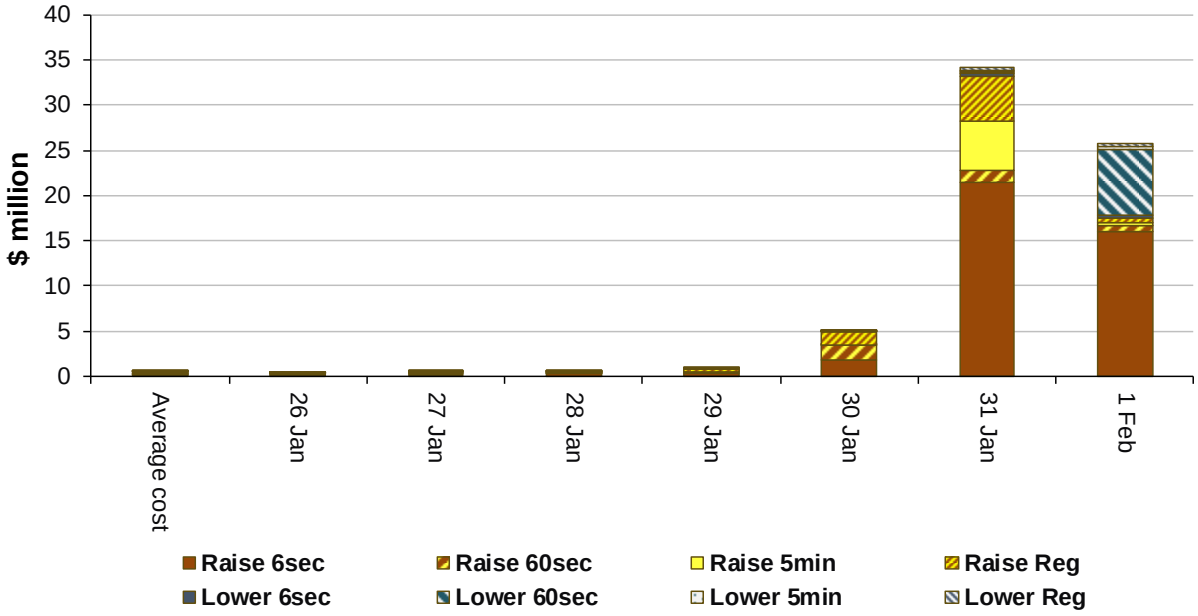
The Electricity Rules stipulate that generators pay for raise contingency services and customers pay for lower contingency services. Regulation services are paid for on a “causer pays” basis determined every four weeks by AEMO.

The total cost of FCAS on the mainland for the week was $67 078 000 or around 4 per cent of energy turnover on the mainland.

The total cost of FCAS in Tasmania for the week was $455 000 or more than 10 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



South Australia supplied its own FCAS from 31 January following an unplanned outage on the Heywood interconnector. On 31 January and 1 February, there were prices above $5000/MW in FCAS for a number of trading intervals across both raise and lower services. As a result, the cumulative price threshold for raise 6 second, lower 60 second and lower 6 second services in South Australia was breached. Analysis of prices above $5000/MW is covered in our FCAS prices above $5000/MW report.

Detailed market analysis of significant price events

Queensland

There were ten occasions where the spot price in Queensland was greater than three times the Queensland weekly average price of $105/MWh and above $250/MWh and there was one occasion where the spot price was below -$100/MWh.

Thursday, 30 January

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 pm	446.71	208.17	258.63	8804	8720	8709	11 753	11 876	11 767
6 pm	1556.43	258.73	269.46	8836	8735	8732	11 687	11 749	11 641
6.30 pm	460.42	262.16	273.05	8841	8696	8706	11 528	11 640	11 526
7 pm	653.55	269.51	278.79	8870	8744	8760	11 482	11 589	11 468

For the 5.30 pm trading interval, demand was 84 MW higher than forecast while availability was 120 MW lower than forecast. Lower availability was due to removal of 170 MW of capacity across a number of generators relating to technical issues.

At 5.05 pm, demand increased by 100 MW. With lower-priced capacity ramp-constrained and unable to set price, the dispatch price reached $2670/MWh for one dispatch interval.

For the 6pm to 7 pm trading intervals, prices were aligned with those in New South Wales but the 6.30 pm and 7 pm intervals did not breach the New South Wales price threshold as the weekly average price there was around $400/MWh.

Cumulatively, demand was between 670 MW to 1000 MW higher than forecast, while availability was between 360 MW to 570 MW lower than forecast, four hours prior. Lower availability was mainly due to removal of 580 MW of capacity across Liddell (120 MW priced at $0/MWh), Tumut (300 MW priced at the ceiling), and Mount Piper (160 MW priced at $43/MWh) power stations in New South Wales. With a number of generators in both Queensland and New South Wales ramp rate constrained or trapped/stranded in FCAS and unable to set price, the dispatch price between $1900/MWh and $10 000/MWh for one dispatch interval in each trading interval.

Friday, 31 January

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	-121.06	68.73	70.99	7711	7566	7591	11 938	12 436	12 434
4.30 pm	1569.42	74.71	70.99	8250	8307	8248	11 717	12 323	12 312
5 pm	866.89	91.35	82.99	8484	8496	8419	11 699	12 222	12 211
5.30 pm	1609.87	94.99	82.99	8558	8509	8452	11 611	12 035	12 096
6 pm	463.42	143.32	82.99	8500	8483	8441	11 566	11 879	11 956
6.30 pm	898.48	143.32	80.98	8320	8401	8372	11 246	11 712	11 834
7 pm	1162.85	123.79	82.76	8314	8442	8405	11 151	11 682	11 762

For the 2.30 pm trading interval, demand was 145 MW higher than forecast while availability was almost 500 MW lower than forecast, both four hours prior. Lower availability was mainly due to removal of capacity at Callide C (200 MW priced at the floor), Clermont Solar Farm (75 MW priced above $2000/MWh), Tarong (50 MW priced at the ceiling), and Callide B (50 MW priced above $79/MWh) power stations.

At 2.15 pm, exports into New South Wales from Queensland over the QNI interconnector were backed off by almost 170 MW. This caused Queensland generation to be backed off, and with many generators ramped down constrained, the dispatch price fell to $-930/MWh for one dispatch interval.

For the 4 pm to 7 pm trading intervals, availability was between 300 MW to 600 MW lower than forecast. Lower availability was mostly due to removal of 420 MW of capacity from Callide C (priced at the floor) due to a delayed return to service.

Due to the actual Lack of Reserve level 2 declared in New South Wales at 3 pm, exports from Queensland into New South Wales was flowing at the nominal maximum limits for these trading intervals. Combined with the lower than forecast availability, the dispatch price reached between $1000/MWh to $10 000/MWh at least once during each trading interval.

New South Wales

There were twelve occasions where the spot price in New South Wales was greater than three times the New South Wales weekly average price of $399/MWh and above $250/MWh.

Thursday, 30 January

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 pm	1805.28	299.60	299.60	11 811	10 944	11 018	12 056	12 560	13 020

Prices were aligned with Queensland, see analysis in Queensland section.

Friday, 31 January

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	2307.81	96.76	89.63	12 509	12 017	12 011	12 541	12 544	12 995
3 pm	7262.95	96.77	108.75	12 785	12 402	12 410	12 429	12 797	13 147
3.30 pm	13 063.52	94.44	11 935.44	13 144	12 652	12 649	12 439	12 789	13 097
4 pm	2167.20	12 158.50	13 422.15	12 967	12 895	12 887	12 821	12 817	13 048
4.30 pm	6958.18	13 753.36	13 895.78	13 063	13 041	13 042	12 722	12 758	13 054
5 pm	12 562.75	13 753.40	13 551.97	13 053	13 023	13 028	12 805	12 691	13 084
5.30 pm	4368.40	13 138.98	11 672.28	12 718	12 612	12 607	12 805	12 725	13 130
6 pm	12 821.51	14 700	11 156.52	13 049	12 223	12 252	12 702	12 734	12 998
6.30 pm	6886.02	14 700	111.52	12 793	11 962	11 879	12 631	12 529	12 979
7 pm	1758.67	14 700	94.87	12 467	11 676	11 613	12 609	12 483	12 827

Analysis of the 2.30 pm to 7 pm trading intervals is discussed in Electricity spot prices above $5000/MWh, Victoria, New South Wales and South Australia – 31 January 2020 report.

Saturday, 1 February

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
5 pm	2559.22	74.50	168.59	13 622	13 341	13 148	13 011	13 626	13 408

Demand was 281 MW higher than forecast while availability was 615 MW lower than forecast, four hours prior. Lower than forecast availability was mainly due generation being withdrawn from the market for technical reasons including mill and feeder issues. Most of this capacity was priced below $100/MWh. The dispatch price reached the market price cap of $14 700/MWh for one dispatch interval at 4.55 pm when EnergyAustralia reduced offers at Mt Piper by 160 MW.

Victoria

There were twelve occasions where the spot price in Victoria was greater than three times the Victoria weekly average price of $744/MWh and above $250/MWh.

Thursday, 30 January

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 pm	4589.99	379.64	12 374.69	9284	8659	8635	9218	9069	9089
6.30 pm	11 096.38	375.84	12 069.01	9268	8572	8574	8729	9039	9096
7 pm	11 948.35	349.98	11 500.80	9031	8361	8343	8426	9069	9063

Analysis of the 6 pm to 7 pm trading intervals is discussed in Electricity spot prices above $5000/MWh, Victoria and South Australia – 30 January 2020 report.

Friday, 31 January

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
3 pm	10 033.56	110	121.92	8885	9322	9151	9127	9440	9422
3.30 pm	14 700	105.03	13 098.94	9096	9462	9317	9122	9493	9471
4 pm	7322.47	13 098.94	14 449.94	9134	9577	9550	9413	9475	9473
4.30 pm	10 110.91	14 700	14 700	9303	9639	9555	9541	9439	9408
5 pm	14 700	14 700	14 700	9507	9619	9566	9454	9384	9333
5.30 pm	7430.59	14 449.94	13 325.75	9305	9558	9375	9367	9332	9260
6 pm	14 658.32	14 700	13 303.86	9238	9453	9277	9124	9103	9163
6.30 pm	12 492.44	14 700	13 098.94	9180	9368	9114	9036	9084	9094
7 pm	9821.81	14 700	434.47	9024	9218	8888	8920	9076	9084

Analysis of the 3 pm to 7 pm trading intervals is discussed in Electricity spot prices above $5000/MWh, Victoria, New South Wales and South Australia – 31 January 2020 report.

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 $317/MWh and above $250/MWh and there were six occasions where the spot price was below -$100/MWh.

Thursday, 30 January

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
5 pm	2192.56	395.15	12 247.25	2787	2757	2730	3119	3156	3132
5.30 pm	2093.95	406.05	13 100.02	2889	2834	2811	3016	3135	3086
6 pm	4981.58	412.32	13 100.02	2953	2872	2858	3044	3108	3064
6.30 pm	11 203.96	409.66	13 100.02	3030	2919	2911	3053	3100	3026
7 pm	12 217.13	397.88	12 427.36	3085	2899	2904	2980	3088	3013

Analysis of the 6 pm to 7 pm trading intervals is discussed in Electricity spot prices above $5000/MWh, Victoria and South Australia – 30 January 2020 report.

Friday, 31 January

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
2 pm	9832.06	277.28	284.04	2687	2584	2542	3819	3876	3928

Analysis of the 2 pm trading interval is discussed in Electricity spot prices above $5000/MWh, Victoria, New South Wales and South Australia – 31 January 2020 report.

Saturday, 1 February

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
2.30 pm	-184.16	-1000	114	1191	1113	1208	2864	3371	3283
3 pm	-138.36	-1000	25.09	1205	1119	1215	2978	2847	3272
3.30 pm	-526.27	11.38	62.82	1242	1138	1225	3102	2873	3265
4 pm	-258.47	68.50	97.62	1294	1177	1237	3162	2883	3286
4.30 pm	-232.27	60.99	61.26	1323	1177	1215	3193	2843	3304
5 pm	-122.71	-1000	-89.14	1319	1186	1227	3191	3179	3422

For the 2.30 pm trading interval, the lower availability was due to AGL withdrawing 560 MW of capacity at Torrens Island due to a forecast price at the price floor.

For the 2.30 pm, 3 pm and 5 pm trading intervals the price at the start of the intervals were less than -$900/MWh, in response participants rebid over 600 MW of capacity priced at the floor to above $250/MWh. This saw the price in the remaining dispatch intervals above -$100/MWh.

For the 3.30 pm to 4.30 pm trading intervals, demand was around 110 MW higher than forecast while availability was between 230 MW and 280 MW higher than forecast, four hours prior. Higher availability was mostly due to Engie adding in 180 MW of capacity priced at the cap in response to a direction from AEMO at 2.30 pm. With little capacity priced between the price floor and $60/MWh, the dispatch price dropped below to $-100/MWh for the majority of the trading intervals.

Tasmania

There were five occasions where the spot price in Tasmania was below -$100/MWh.

Thursday, 30 January

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
5.30 pm	-521.03	12.00	12.03	1232	1188	1193	2226	2256	2268
6 pm	-340.93	12.00	12.06	1241	1187	1199	2205	2249	2255

Conditions at the time saw demand higher than forecast and availability close to forecast.

At 5.02 pm, effective at 5.10 pm, Hydro Tasmania rebid 195 MW of capacity at Poatina from above $0/MWh to -$470/MWh and the price fell to -$70/MWh until 5.20 pm when a further rebid was effective. This rebid shifted around 280 MW of capacity across their portfolio to the price floor and the price went to the floor for the rest of the 5.30 pm trading interval. All rebid reasons related to the Victorian price being different from forecast.

For the 6 pm trading interval a similar pattern of rebidding occurred with the price falling to the floor at 5.55 pm and 6 pm.

Friday, 31 January

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
4 pm	-664.40	11.79	12.03	1296	1156	1185	2172	2199	2193
5.30 pm	-844.65	11.79	11.79	1251	1210	1199	2159	2194	2191
6 pm	-831.02	11.79	11.79	1274	1196	1192	2159	2186	2198

Conditions at the time saw demand higher than forecast and availability close to forecast.

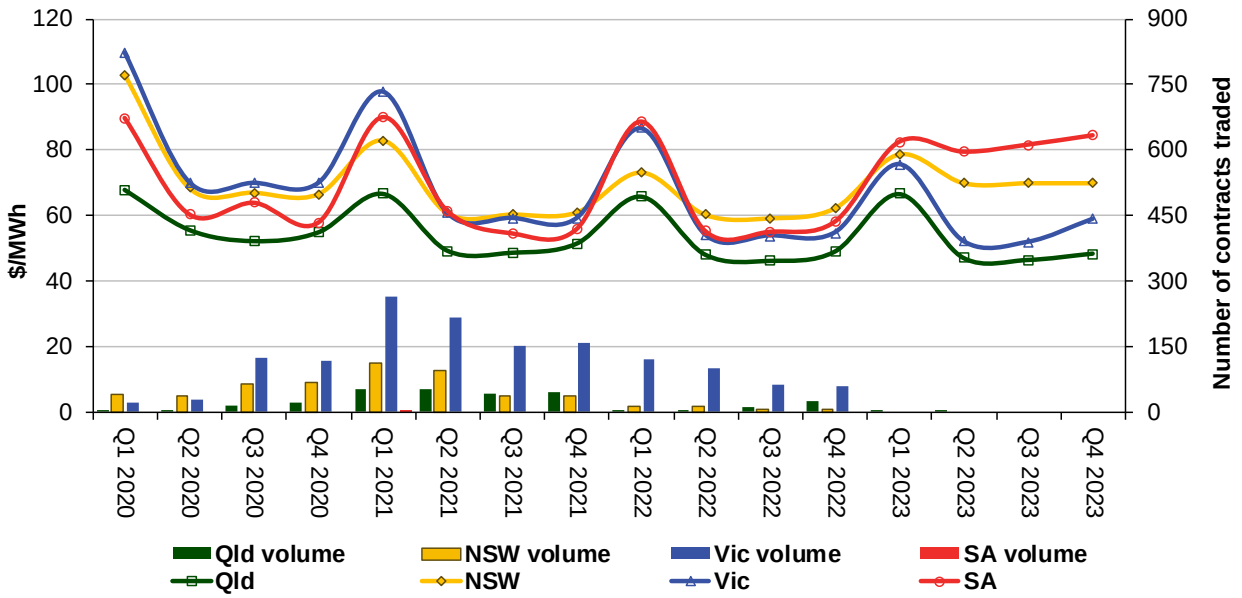
At 3.38 pm, effective 3.45 pm, Hydro Tasmania rebid around 750 MW of capacity across its portfolio from above -$70/MWh to the price floor and the price went to the floor and stayed there for the rest of the trading interval. The reason was because the Victorian price was higher than forecast because of the loss of the Heywood interconnector between South Australia and Victoria.

Similar bidding behaviour occurred during the 5.30 pm and 6 pm trading intervals with the price at the floor from 5.10 pm and 5.40 pm respectively. The reasons related to Basslink flows being lower than forecast.

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.

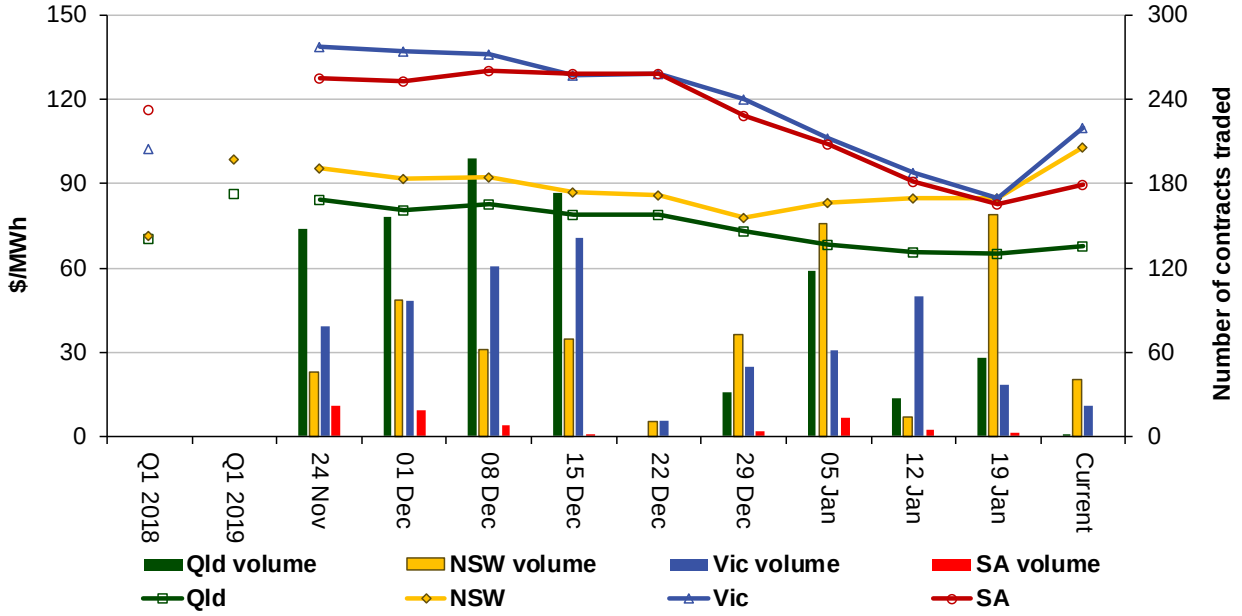
Figure 9: Quarterly base future prices Q1 2020 – Q4 2023



Source. ASXEnergy.com.au

Figure 10 shows how the price for each regional Q1 2019 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)



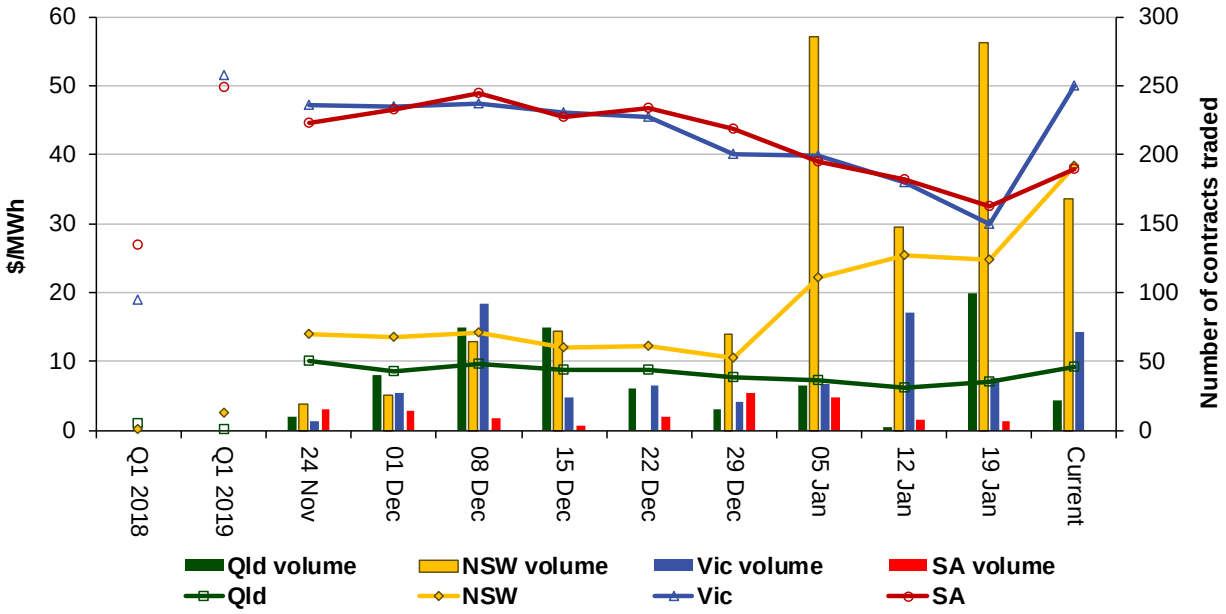
Note. Base contract prices are shown for each of the current week and the previous 9 weeks, with average prices shown for periods 1 and 2 years prior to the current year.

Source. ASXEnergy.com.au

Figure 11 shows how the price for each regional quarter 1 2019 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.

The high volume of trades and the doubling of prices for New South Wales cap contracts for the week starting 5 January 2020 is possibly due to market responses to high price events at the beginning of Q1 2020.

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



Source. ASXEnergy.com.au

Prices of other financial products (including longer-term price trends) are available in the Industry Statistics section of our website.

Australian Energy Regulator
February 2020