Electricity Report

AUSTRALIAN ENERGY REGULATOR

20 – 26 January 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 20 to 26 January 2019. The high spot prices on 24 and 25 January led to the highest ever weekly average price in Victoria and second highest in South Australia. Two additional reports describing in detail the circumstances surrounding the high spot prices on those days were published by the AER on 26 March 2019.[1]

[1] https://www.aer.gov.au/wholesale-markets/market-performance/prices-above-5000-mwh-24-january-2019-vic-and-sa
https://www.aer.gov.au/wholesale-markets/market-performance/prices-above-5000-mwh-25-january-2019-vic-and-sa

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

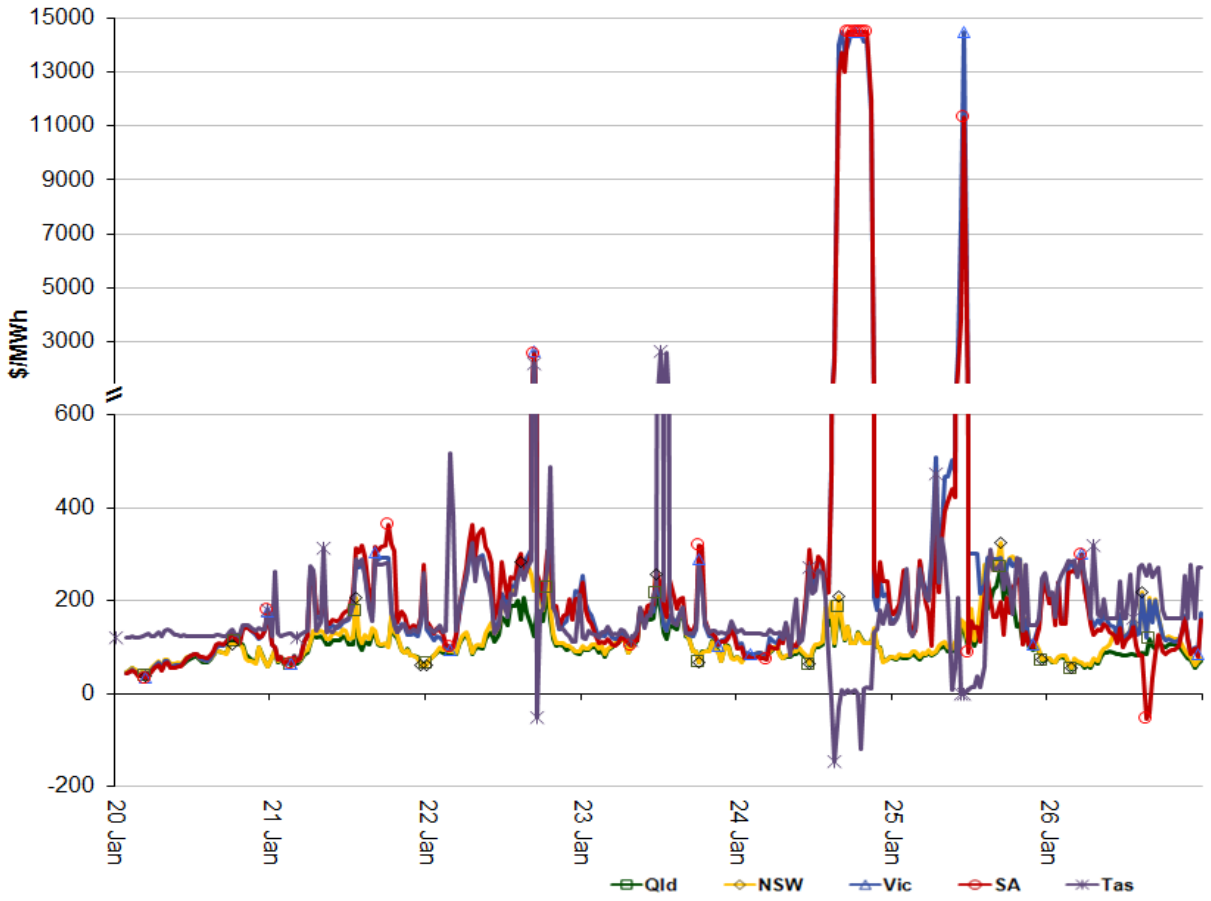


Figure 2 shows the volume weighted average (VWA) prices for the current week (with prices shown in Table 1) and the preceding 12 weeks, as well as the VWA price over the previous 3 financial years.

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

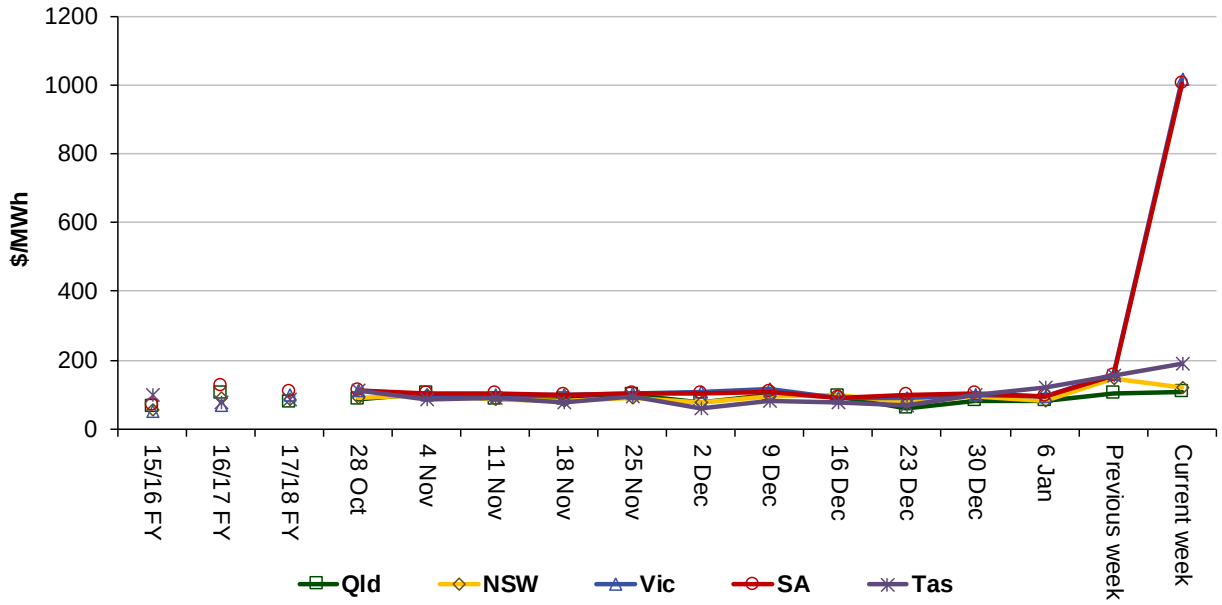


Table 1: Volume weighted average spot prices by region ($/MWh)

Region	Qld	NSW	Vic	SA	Tas
Current week	105	122	1019	1005	189
17-18 financial YTD	78	87	106	112	92
18-19 financial YTD	84	93	129	140	72

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 274 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	5	27	0	3
% of total below forecast	15	37	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

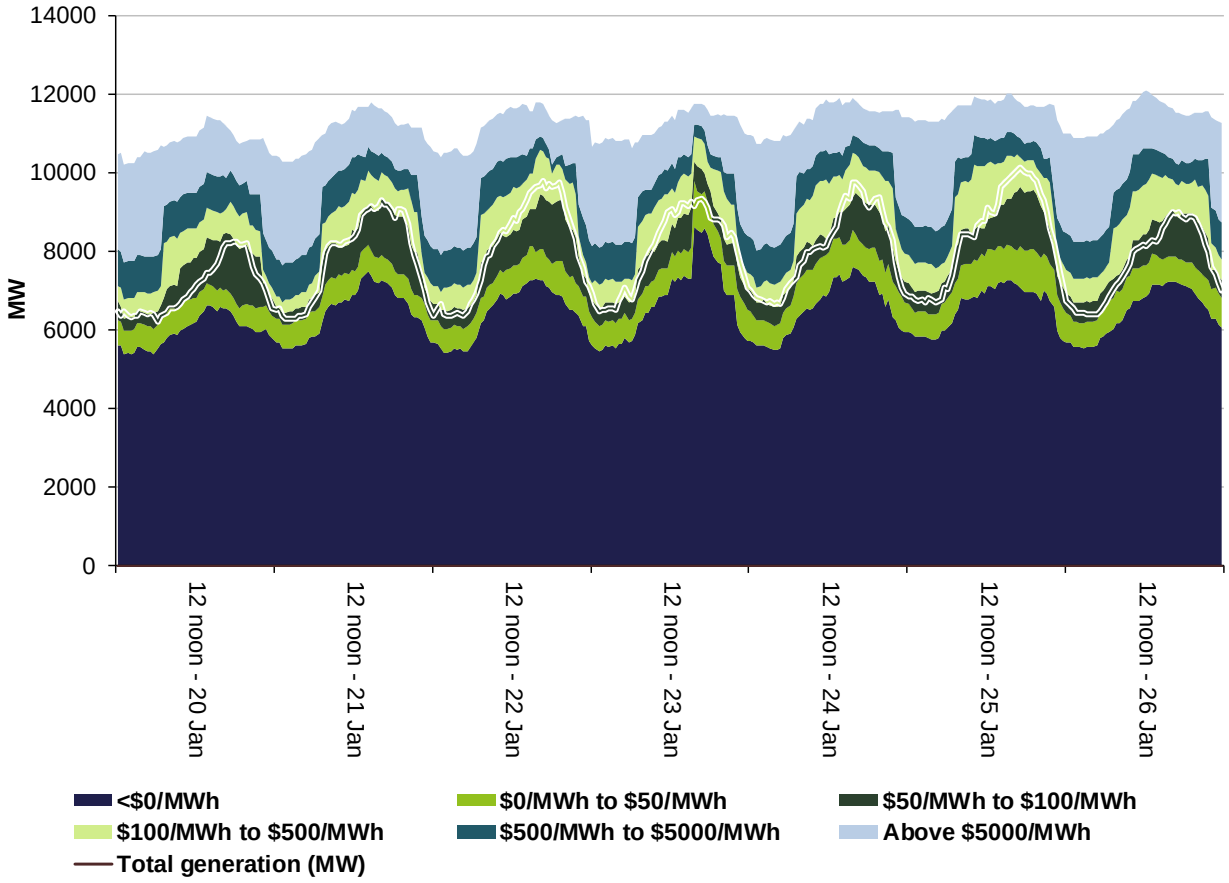


Figure 4: New South Wales generation and bidding patterns

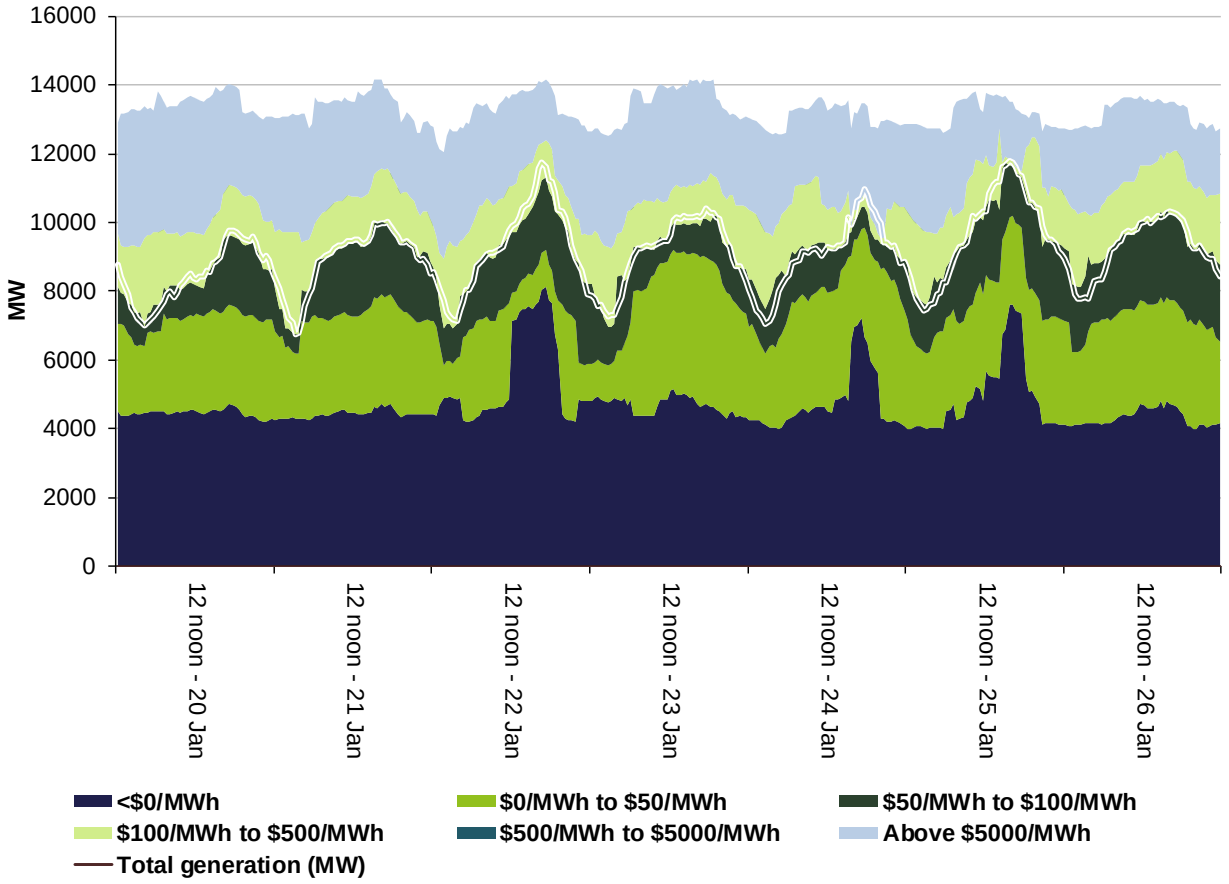


Figure 5: Victoria generation and bidding patterns

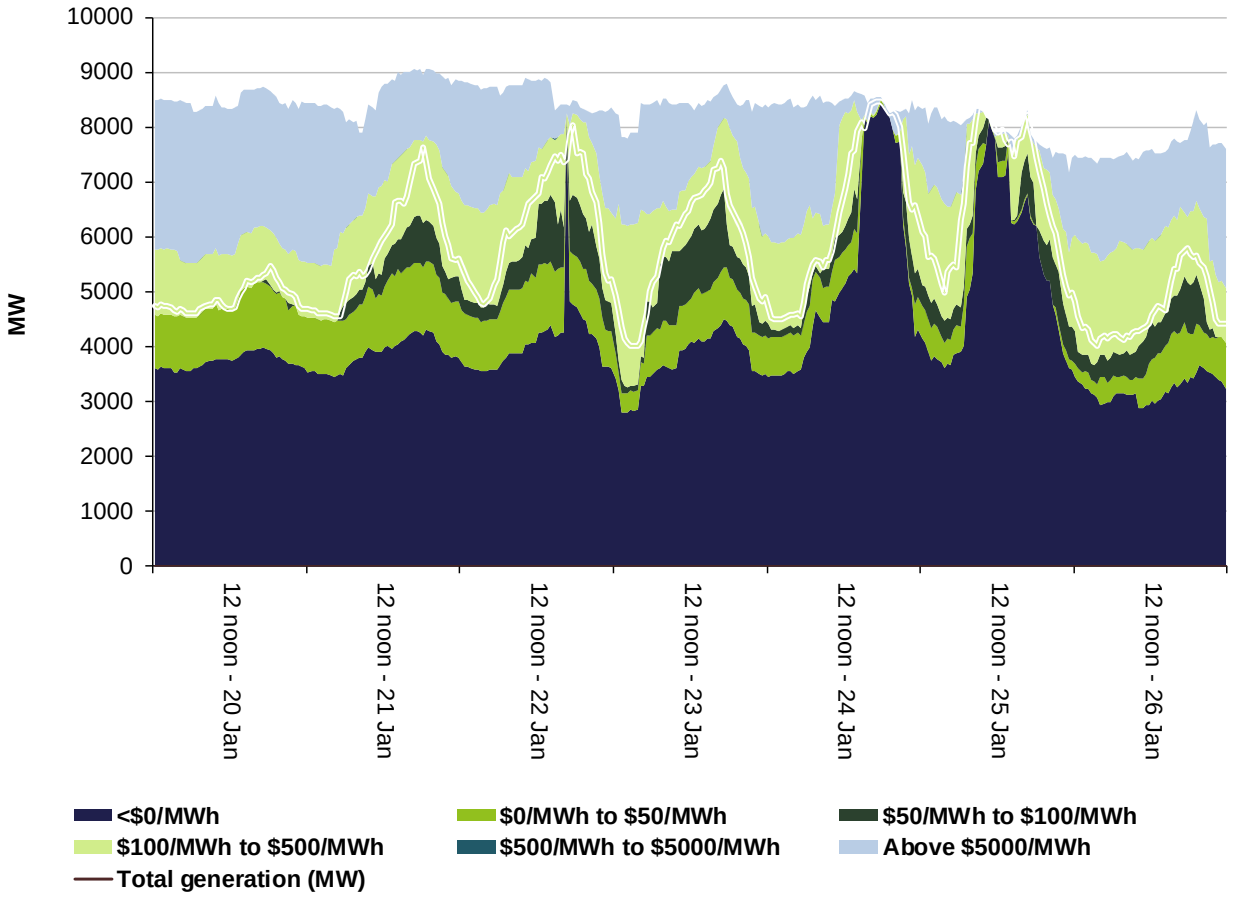


Figure 6: South Australia generation and bidding patterns

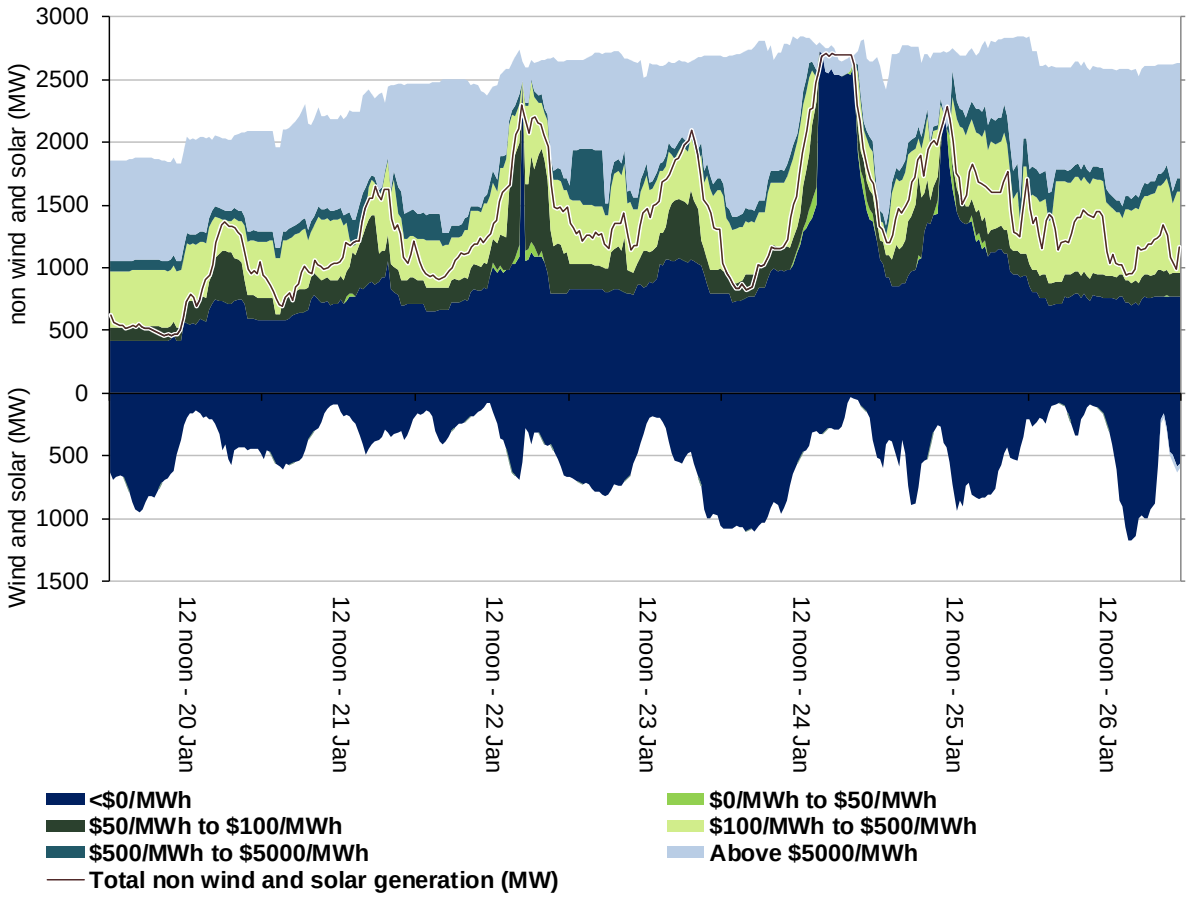
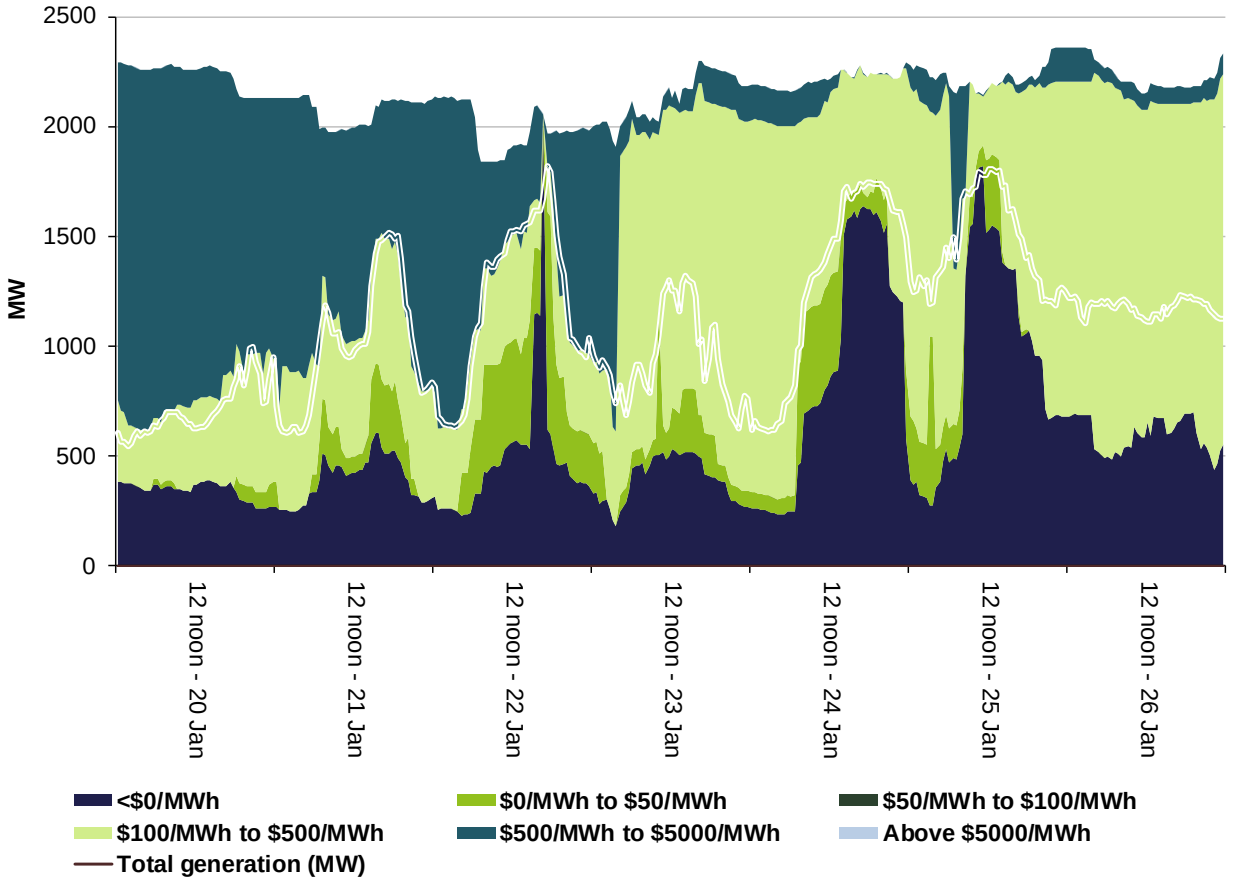


Figure 7: Tasmania generation and bidding patterns



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.

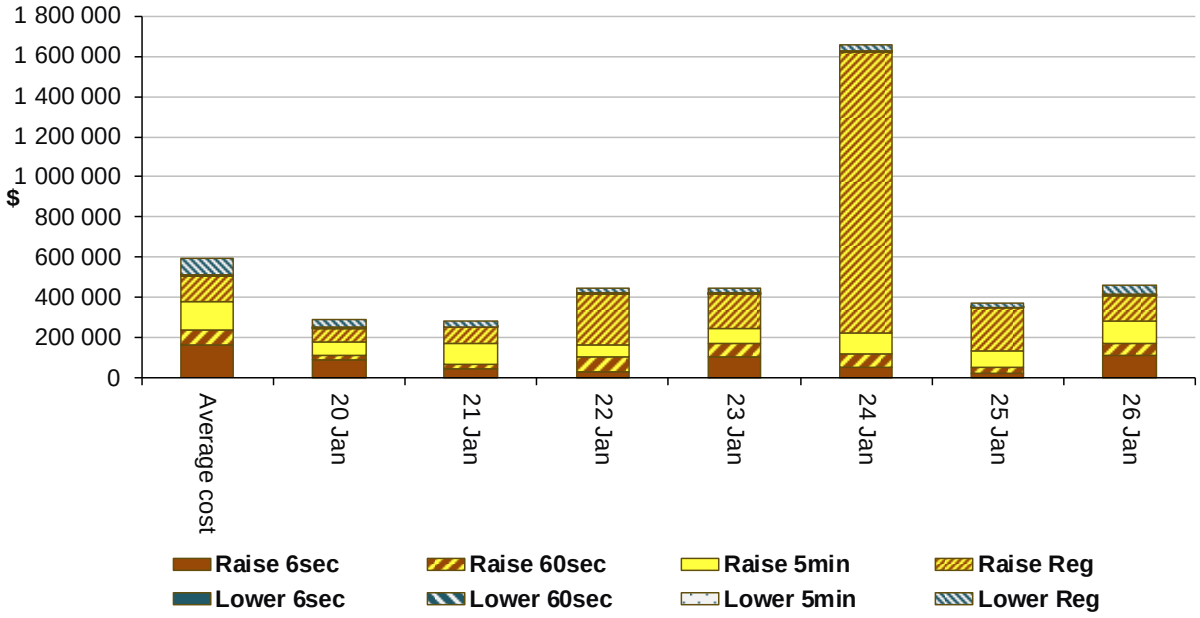
The Electricity Rules stipulate that generators pay for raise contingency services and customers pay for lower contingency services. Regulation services are paid for on a "causer pays" basis determined every four weeks by AEMO.

The total cost of FCAS on the mainland for the week was $3 465 500 or less than 1 per cent of energy turnover on the mainland.

The total cost of FCAS in Tasmania for the week was $485 000 or around 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 24 January, mainland raise regulation costs exceeded $1 300 000. Prices for global raise regulation services exceeded $1000/MWh for 11 intervals with two price spikes of $12 000/MWh at 4.45 pm and around $8480/MWh at 7.05 pm. Following the extreme price events in energy markets at the same time, global raise regulation services were being co-optimised with energy market for much of the afternoon and evening. This resulted in the high FCAS prices.

Detailed market analysis of significant price events

Victoria

There were 13 occasions where the spot price in Victoria was greater than three times the Victoria weekly average price of $1019/MWh and above $250/MWh.

Thursday, 24 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
4 pm	14 033.16	14 500	14 204.15	8807	8575	8226	8483	8498	8357
4.30 pm	14 496.63	14 500	14 500	8999	8753	8441	8494	8563	8374
5 pm	13 702.21	14 500	14 500	9159	8844	8595	8494	8515	8358
5.30 pm	13 998.86	14 500	14 500	9187	8877	8605	8544	8477	8312
6 pm	14 394.66	14 500	14 500	9281	8876	8643	8543	8416	8258
6.30 pm	14 500	14 500	14 500	9106	8841	8682	8463	8375	8206
7 pm	14 500	14 500	13 890.57	8852	8674	8524	8309	8320	8480
7.30 pm	14 444.62	14 500	14 345.02	8669	8493	8497	8250	8263	8437
8 pm	14 134.88	10 062.99	14 484.45	8556	8215	8291	8247	8253	8297
8.30 pm	14 157.82	180.46	13 579.24	8468	8023	8111	8270	8292	8281
9 pm	11 464.46	410.56	330.74	8058	7641	7669	8290	8279	8357

Analysis of the 4 pm to 9 pm trading intervals is discussed in Electricity spot prices above $5000/MWh, Victoria and South Australia – 24 January 2019 report, released 26 March 2019. In summary, the high prices were a result of forced generator outages, high demand driven by high temperatures and low wind output.

Friday, 25 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
11 am	7432.69	457.44	450.10	9076	8382	8366	8166	8218	8181
11.30 am	14 500	14 500	11 499	9075	8872	8619	8018	8232	8186

Analysis of the 11 am and 11.30 am trading intervals is discussed in the Electricity spot prices above $5000/MWh, Victoria and South Australia – 25 January 2019 report, released 26 March 2019. There was involuntary customer load shedding from 11.10 am so the price

went to the price cap until the Cumulative Price Threshold was breached at 11.30 am in Victoria and South Australia. This resulted in priced being capped at $300/MWh for around a week.

South Australia

There were thirteen occasions where the spot price in South Australia was greater than three times the South Australia weekly average price of $1005/MWh and above $250/MWh.

Thursday, 24 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
4 pm	12 843.69	13 869.00	14 122.40	2838	2833	2841	3097	3188	3159
4.30 pm	13 711.22	14 500	14 312.79	2938	2911	2911	3071	3125	3152
5 pm	13 024.59	14 500	14 500	2954	2959	2990	3041	3120	3130
5.30 pm	14 500	14 500	14 500	2967	3047	3020	3057	3104	3113
6 pm	14 500	14 500	14 500	2922	3092	3042	3052	3083	3099
6.30 pm	14 500	14 500	14 500	2973	3131	3062	3020	3057	3082
7 pm	14 500	14 500	14 500	2994	3160	3089	2951	2991	3062
7.30 pm	14 500	14 500	14 500	2992	3136	3073	2883	2951	3014
8 pm	14 500	10 618.48	14 500	2968	3086	3006	2761	2955	2980
8.30 pm	14 500	196.89	13 998.99	2896	3022	2934	2725	2941	2995
9 pm	11 999.83	439.10	377.91	2846	2958	2821	2721	2968	3037

Prices aligned with Victoria, see Victorian analysis.

Friday, 25 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
11 am	3816.84	407.94	404.16	1932	1983	1948	3130	3270	3211
11.30 am	11 340.39	10 248.30	9155.39	1995	1987	1947	3146	3298	3251

Analysis of the 11 am and 11.30 am trading intervals is discussed in the Electricity spot prices above $5000/MWh, Victoria and South Australia – 25 January 2019 report, released 26 March 2019.

Tasmania

There were three occasions where the spot price in Tasmania was greater than three times the Tasmania weekly average price of $189/MWh and above $250/MWh and there were two occasions where the spot price was below -$100/MWh.

Tuesday, 22 January

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	2197.36	231.30	1198.41	1246	1161	1178	2058	2081	2098

Conditions at the time saw demand 85 MW higher than forecast four hours ahead and availability close to forecast. At 4.45 pm, energy was co-optimised with raise regulation ancillary services and the dispatch price reached the market price cap of $14 500/MWh across Tasmania, Victoria and South Australia. In response to the high price, Hydro Tasmania rebid around 720 MW of capacity to the price floor and the price fell to -$70/MWh at 4.50 pm and remained negative for the rest of the trading interval.

Wednesday, 23 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
12.30 pm	2616.41	150.70	152.58	1028	1013	1062	2166	2049	2040
1.30 pm	2590.66	151.62	139.69	1034	1012	1058	2145	2045	2043

For 12.30 pm trading interval, availability was 117 MW higher than forecast and demand was close to forecast, four hours prior. At 12.25 pm, the constraint that manages avoiding overloading the Hadspen to George Town 220 kV line violated. This affects most of the generation in Tasmania. As a result, lower priced generation was ramp-up constrained and the price went to the cap for one dispatch interval.

For 1.30 pm trading interval, demand was 22 MW higher than forecast and availability was 100 MW higher than forecast, four hours prior. At 1.25 pm, the constraint that manages avoiding overloading the Hadspen to George Town 220 kV line violated again. As a result, lower priced generation was ramp-up constrained and the price went to the cap for one dispatch interval.

Thursday, 24 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
3.30 pm	-145.31	13.30	545.67	1048	988	1005	2225	2202	2190
7.30 pm	-119.57	-0.72	877.52	1096	1071	1056	2237	2202	2210

For 3.30 pm trading interval, demand and availability were both close to that forecast four hours prior. Effective from 3.15 pm Hydro Tasmania rebid capacity across the region to in response to lower than forecast wind generation (shown in Table 10). As a result, the price dropped to the floor for one dispatch interval due to more expensive plant being either ramp constrained or trapped in FCAS and unable to set price.

Table 10: Rebids effective 3.15 pm

Participant	Plant	Capacity (MW)	Price from ($/MWh)	Price to ($/MWh)	Rebid reason
Hydro Tasmania	Gordon	102	-1000	>-1	1503A wind gen in Tas < forecast+env cnst
Hydro Tasmania	Reece	102	395	-1000	1503A wind gen in Tas < forecast

For 7.30 pm trading interval, demand and availability were both close to that forecast four hours prior. Effective from 7.30 pm, Hydro Tasmania rebid capacity across the region to manage bushfire risk in the area (shown in Table 11). While there was still higher priced generation dispatched at Gordon and Poatina, this was either ramp down-constrained or trapped in FCAS and unable to set price. As a result, the price decreased to the floor.

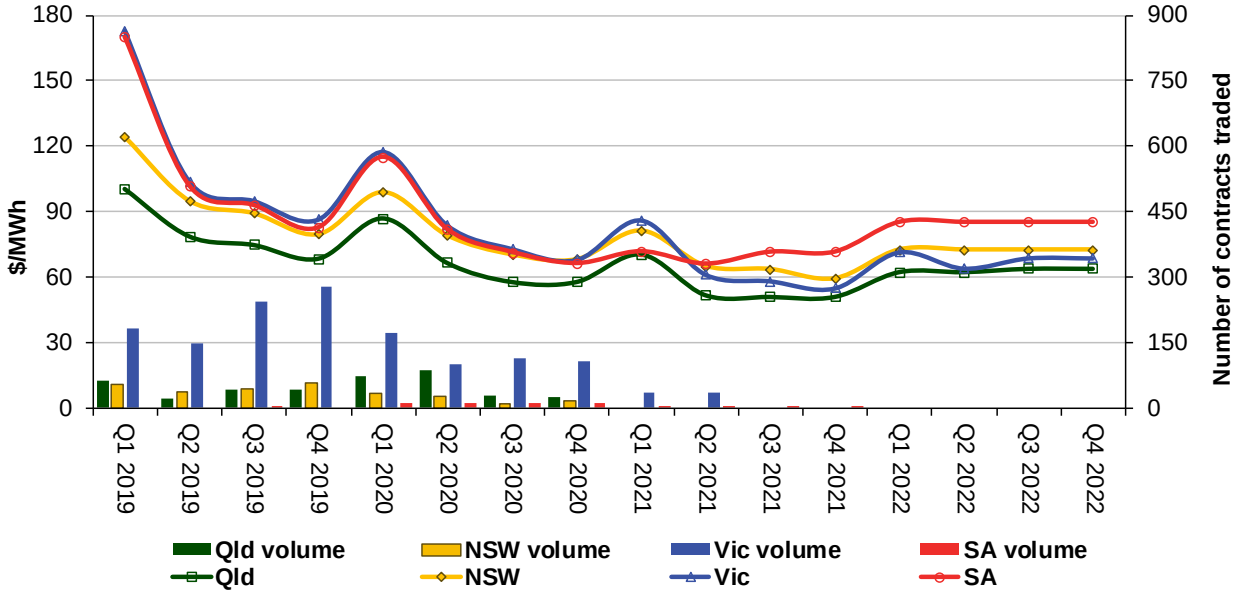
Table 11: Rebids effective 7.30 pm

Participant	Plant	Capacity (MW)	Price from ($/MWh)	Price to ($/MWh)	Rebid reason
Hydro Tasmania	Tamar Valley GT	2	N/A	-1000	1921P managing bushfire risk f-t-fare_n-2
Hydro Tasmania	Cethana	73	395	-1000	1921P managing bushfire risk f-t-fare_n-2
Hydro Tasmania	Gordon	76	-1000	>-1	1921P managing bushfire risk f-t-fare_n-2+env cnst

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.

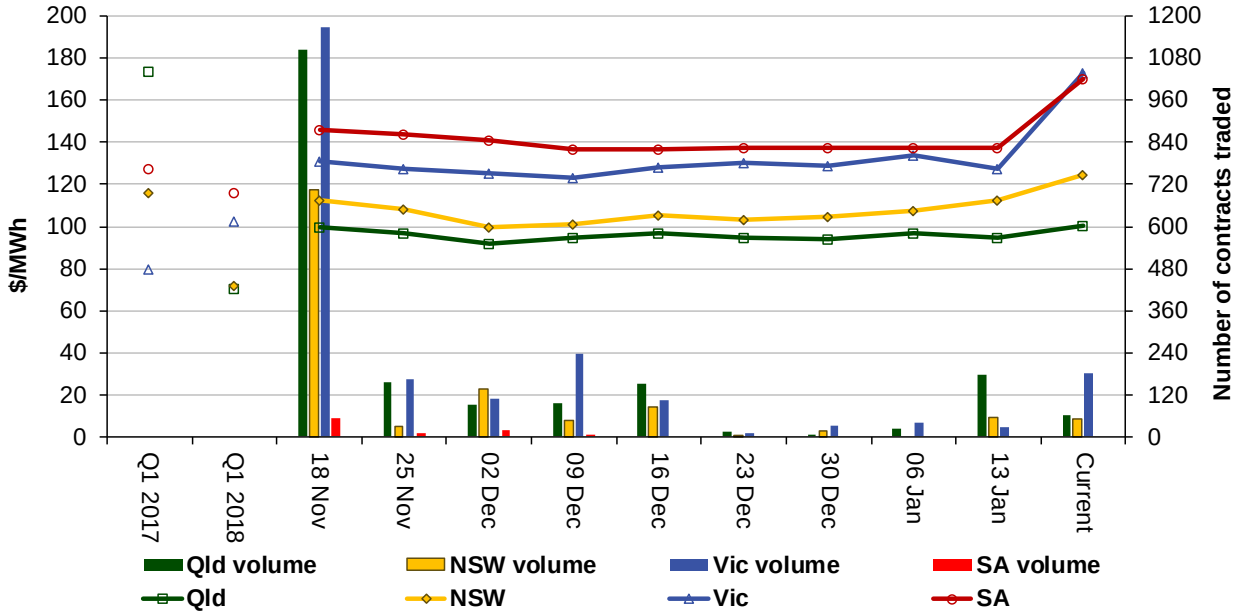
Figure 9: Quarterly base future prices Q1 2019 – Q4 2022



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 2017 and quarter 1 2018 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 2019 base contracts over the past 10 weeks (and the past 2 years)



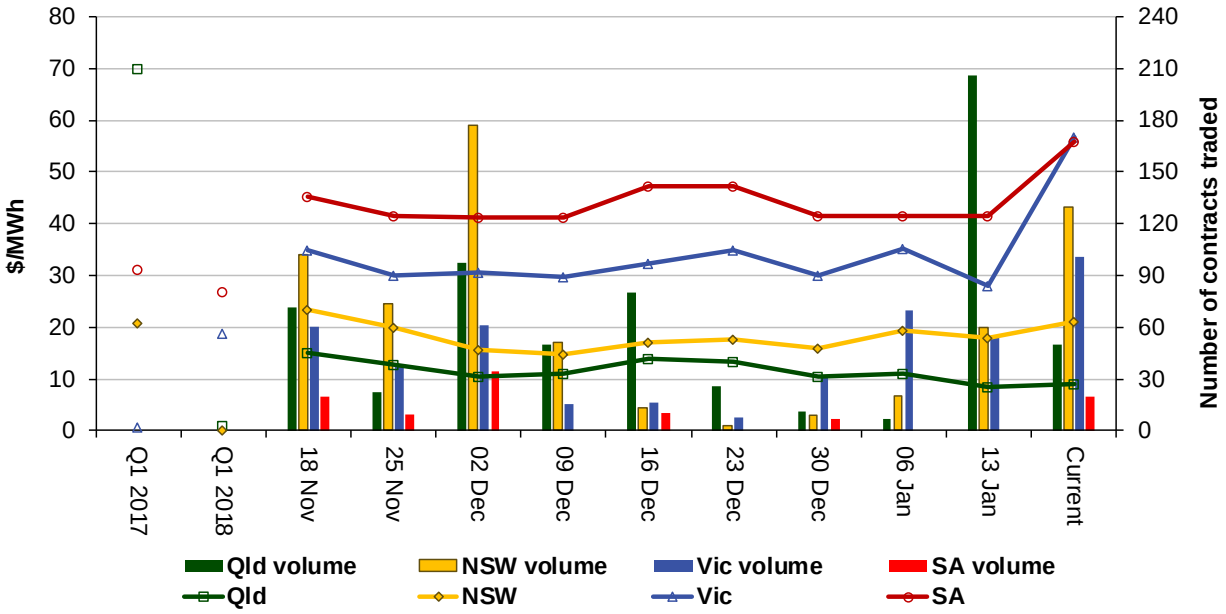
Note. Base contract prices are shown for each of the current week and the previous 9 weeks, with average prices shown for periods 1 and 2 years prior to the current year.

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 2019 cap contract has changed over the last 10 weeks (as well as the total number of trades each week). The closing quarter 1 2017 and quarter 1 2018 prices are also shown.

Figure 11: Price of Q1 2019 cap contracts over the past 10 weeks (and the past 2 years)



Source. ASXEnergy.com.au

Australian Energy Regulator
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