Electricity Report

AUSTRALIAN ENERGY REGULATOR

15 – 21 January 2017

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 – 21 January 2017.

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

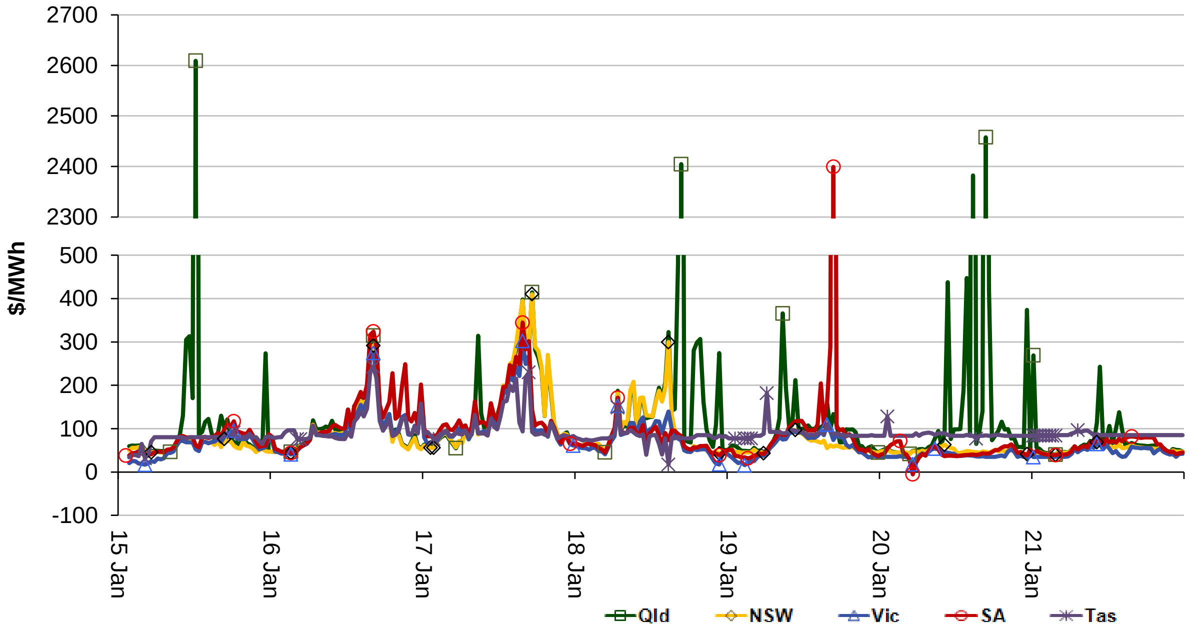


Figure 2 shows the volume weighted average (VWA) prices for the current week (with prices shown in Table 1) and the preceding 12 weeks, as well as the VWA price over the previous 3 financial years.

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

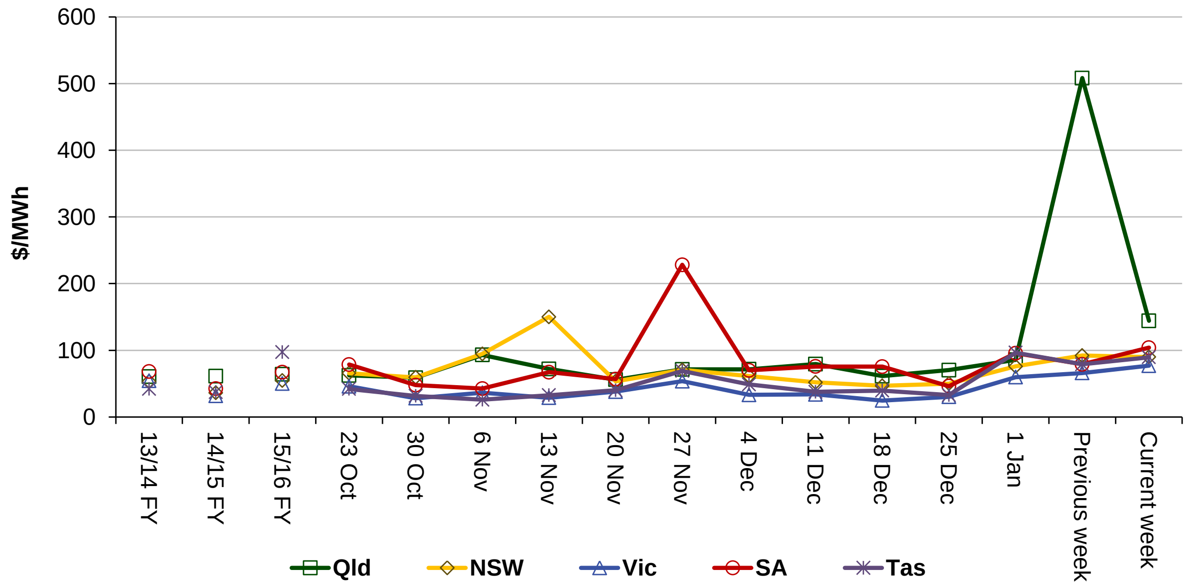


Table 1: Volume weighted average spot prices by region ($/MWh)

Region	Qld	NSW	Vic	SA	Tas
Current week	144	90	77	104	90
15-16 financial YTD	45	47	44	64	62
16-17 financial YTD	82	64	46	105	51

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 290 trading intervals throughout the week where actual prices varied significantly from forecasts. This compares to the weekly average in 2016 of 273 counts and the average in 2015 of 133. 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	3	42	0	1
% of total below forecast	36	15	0	2

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

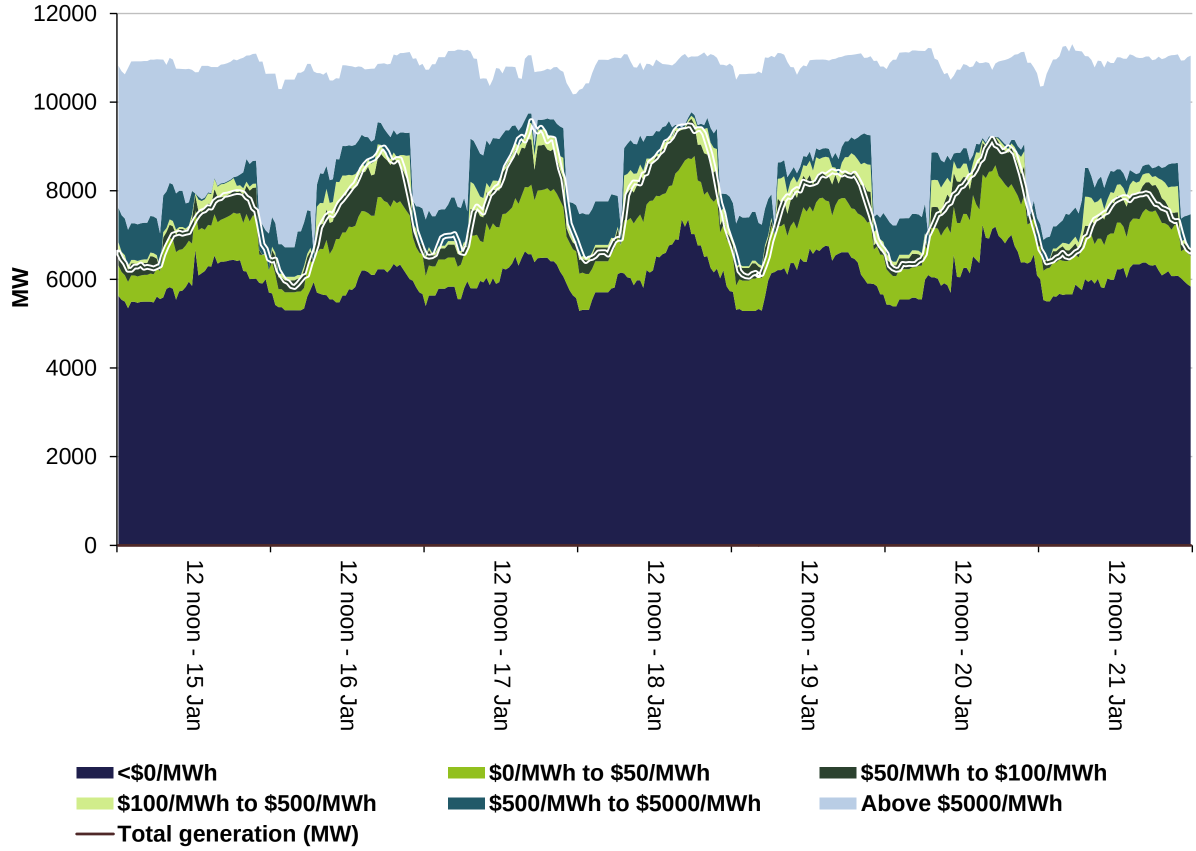


Figure 4: New South Wales generation and bidding patterns

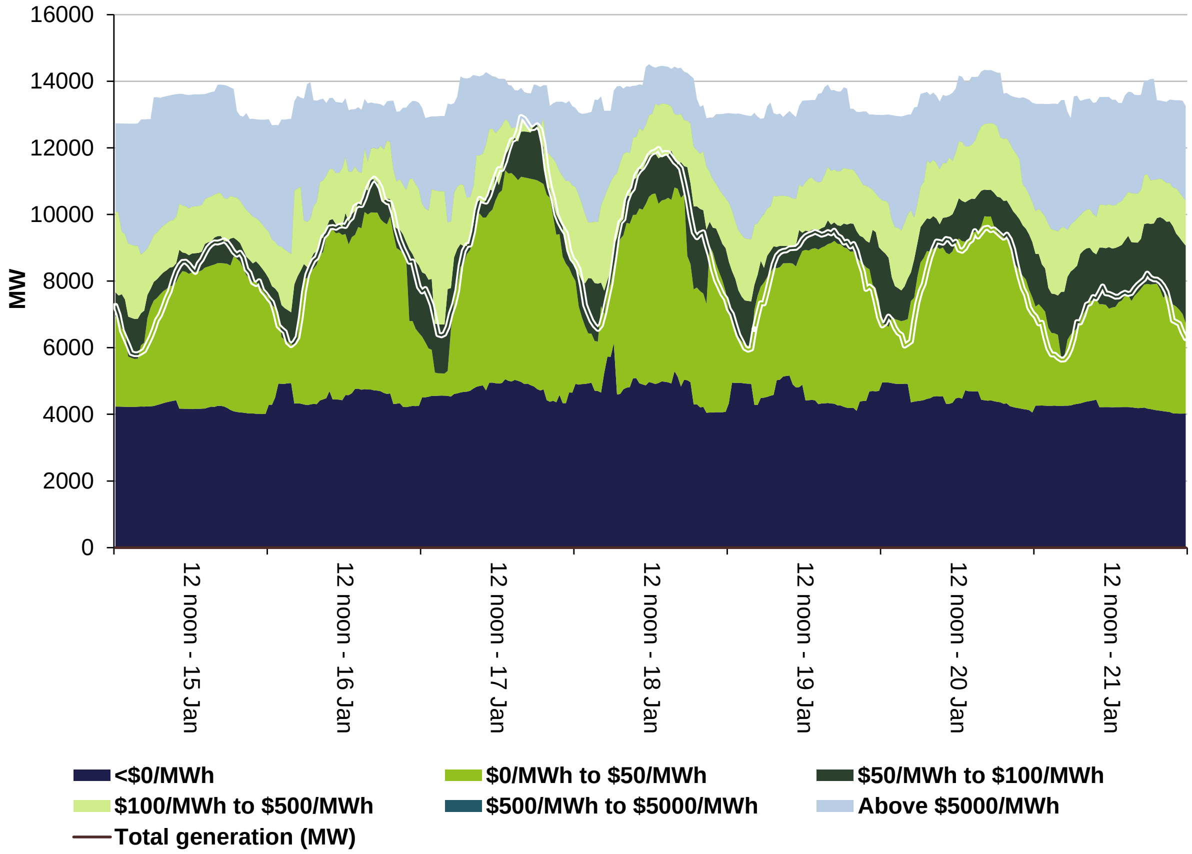


Figure 5: Victoria generation and bidding patterns

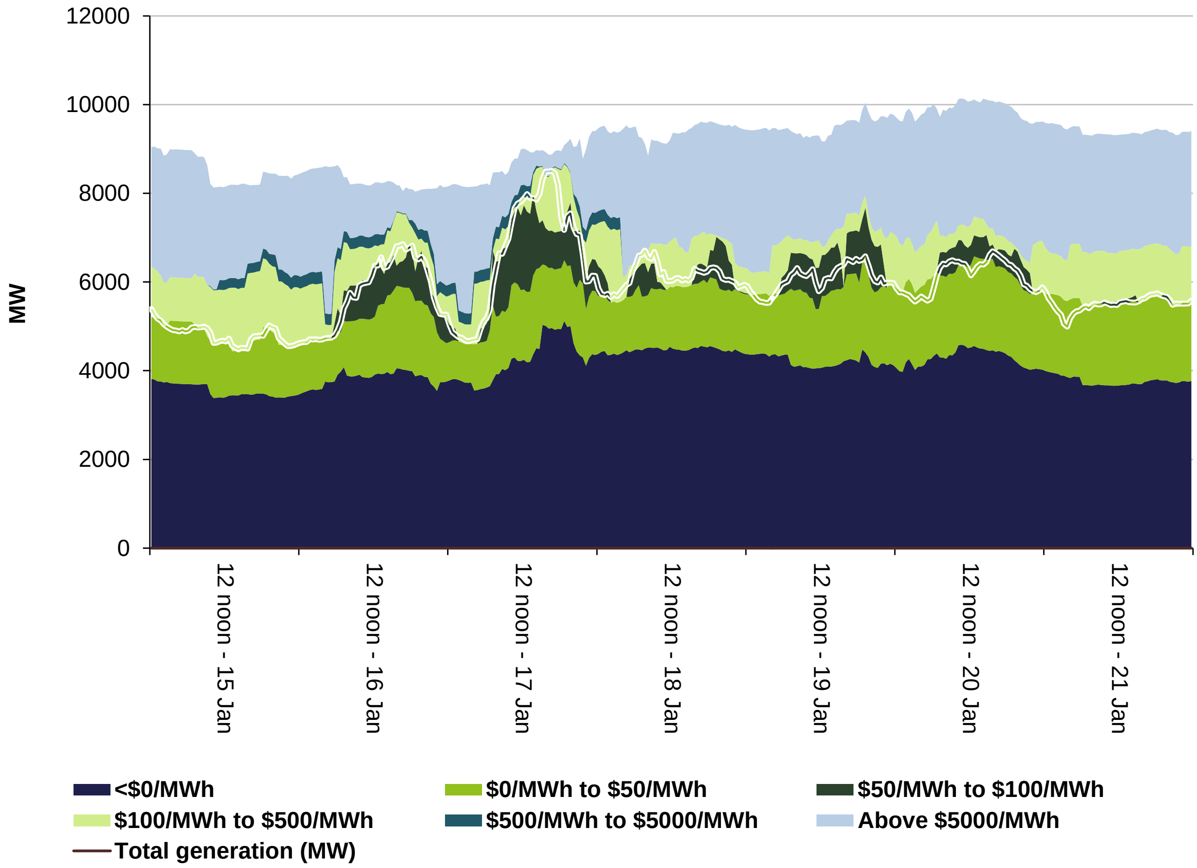


Figure 6: South Australia generation and bidding patterns

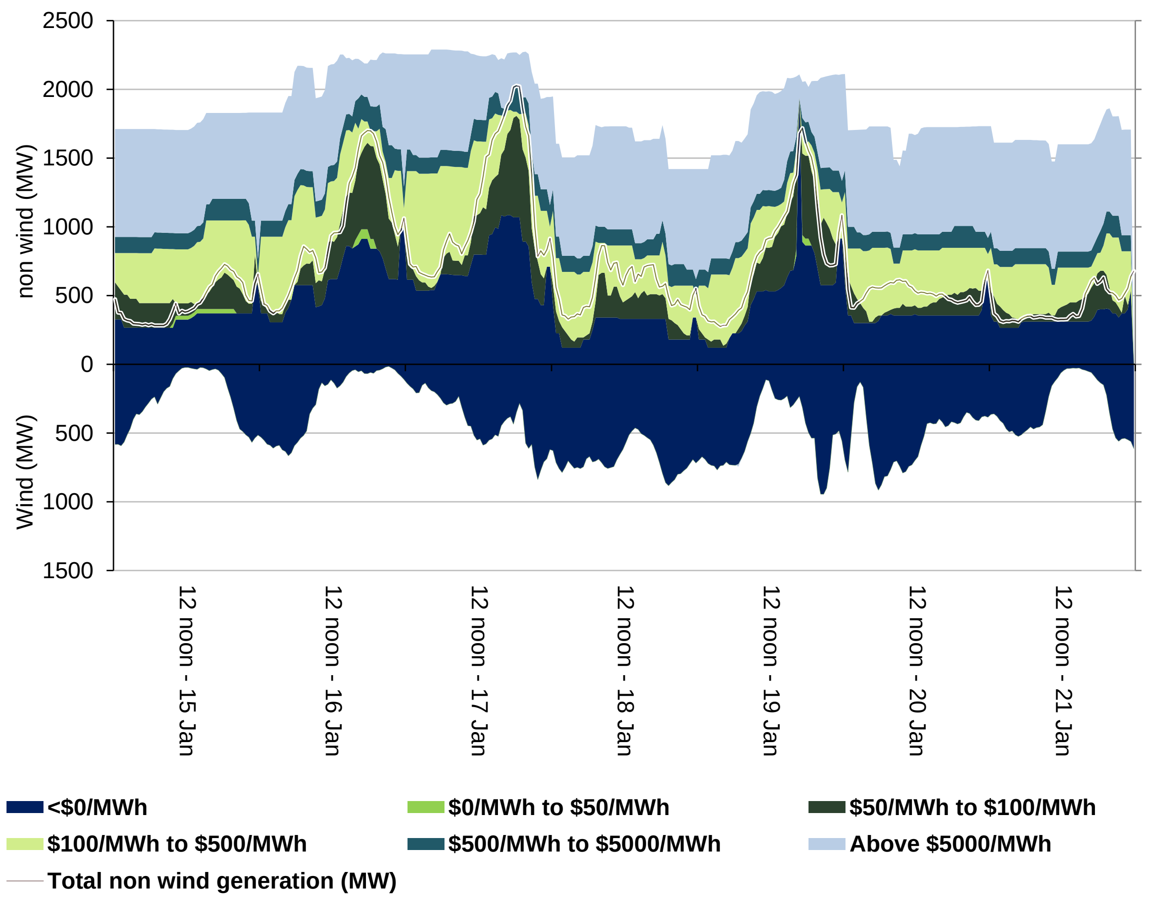
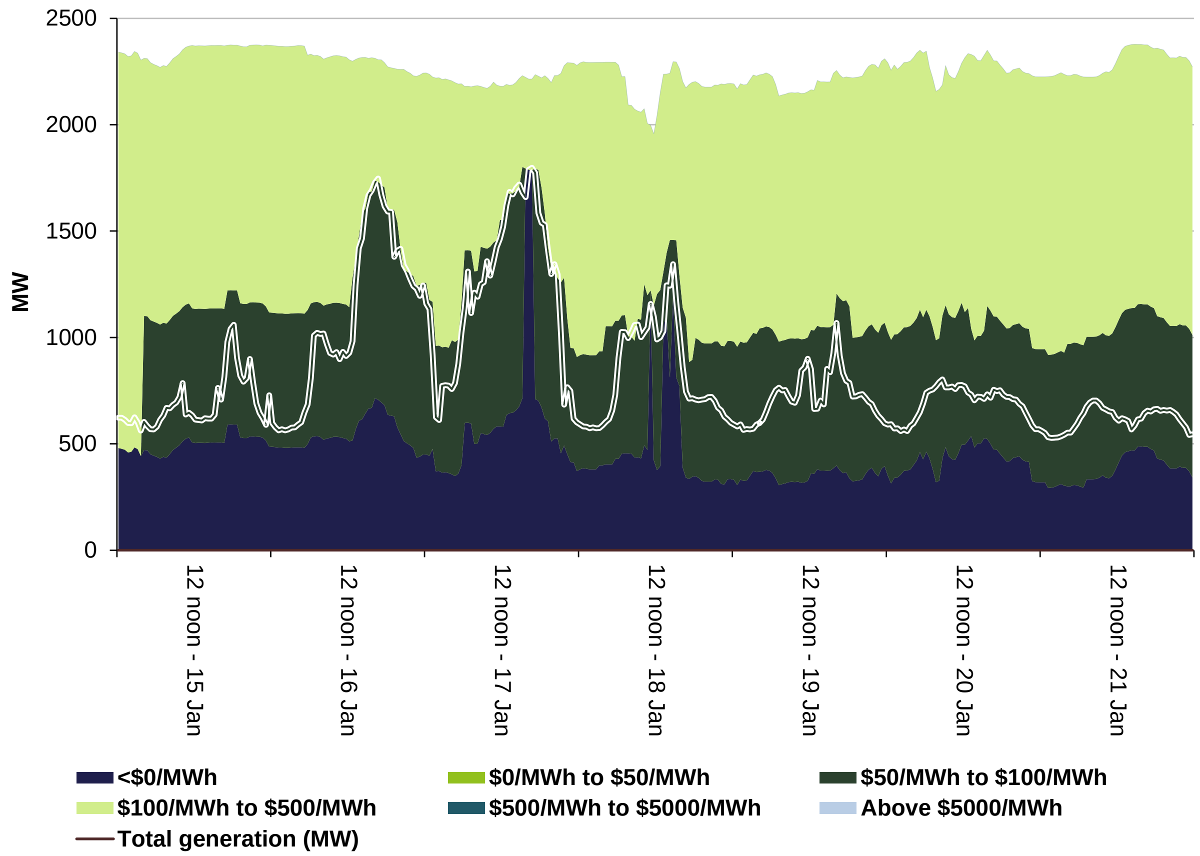


Figure 7: Tasmania generation and bidding patterns



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.

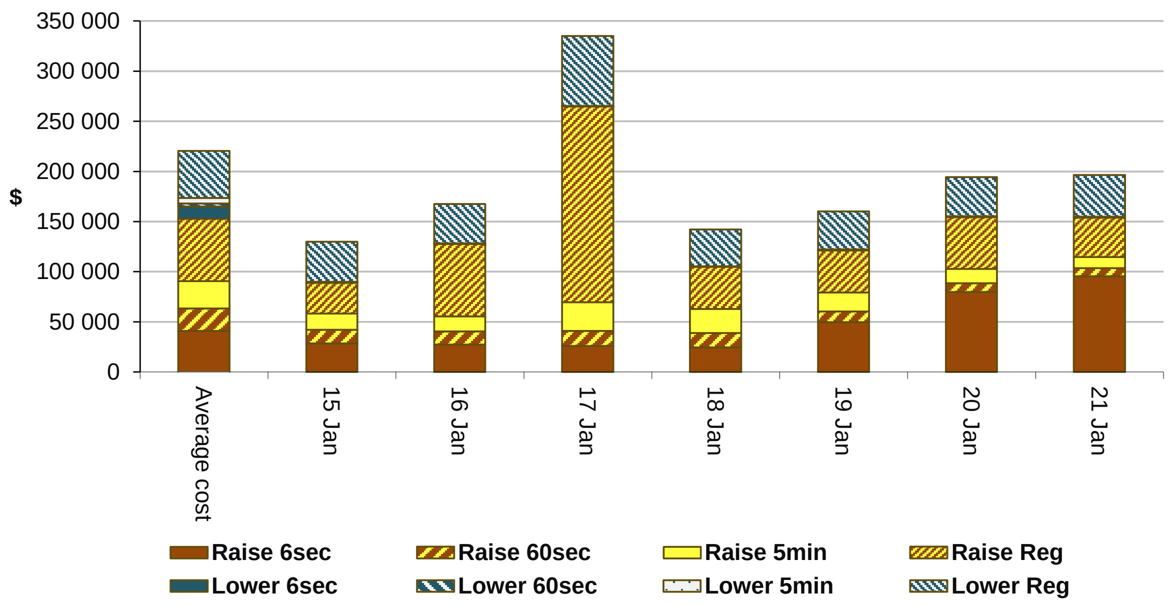
The Electricity Rules stipulate that generators pay for raise contingency services and customers pay for lower contingency services. Regulation services are paid for on a “causer pays” basis determined every four weeks by AEMO.

The total cost of FCAS on the mainland for the week was $900 000 or less than one per cent of energy turnover on the mainland.

The total cost of FCAS in Tasmania for the week was $425 000 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

Queensland

There were seven occasions where the spot price in Queensland was greater than three times the Queensland weekly average price of $144/MWh and above $250/MWh.

Sunday, 15 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
12.30 pm	2609.08	103.05	1405.69	7419	7317	7330	10 693	10 822	10 945

Conditions at the time saw demand around 100 MW above that forecast four hours ahead and available capacity around 130 MW lower than that forecast four hours ahead.

At 12.03 pm, Millmerran energy Trader rebid 100 MW of capacity at Millmerran from the price floor to the price cap. The reason given was “A Qld rrp P5 run 11:45 di 12:30 value 1406 vs P5 run 11:40 di sl”. With capacity priced between $100/MWh and $13 800/MWh ramp rate limited or needing more than five minutes to start, the dispatch price increased from $294/MWh at 12.05 pm to $1406/MWh at 12.10 pm. At 12.15 pm there was a 50 MW increase in demand and an 18 MW rebid of capacity from low to high prices which saw the price increase to $13 800/MWh. Prices fell to around $50/MWh for the rest of the trading interval following reductions in demand and rebidding by participants from high to low prices.

Wednesday, 18 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
4.30 pm	479.19	142.31	168.98	9314	9026	9010	11 012	11 112	11 169
5 pm	2404.56	2150.30	160.06	9332	9134	9087	11 086	11 120	11 102

Conditions at the time saw demand up to 288 MW higher than forecast four hours ahead and reaching a new record of 9357 MW at 7 pm. Available capacity was slightly lower than forecast.

Over two rebids from 4.02 pm AGL withdrew 76 MW of capacity at Yabulu, all of which was priced below $90/MWh due to an issue returning to service.

At 4.11 pm, effective from 4.20 pm, CS Energy rebid 60 MW of capacity at Callide B from $17/MWh to the price cap. The reason given was “1611A dispatch price lower than 5min forecast-sl”. These rebids coupled with the higher than forecast demand saw the dispatch price increase from $156/MWh at 4.15 pm to $2150/MWh at 4.20 pm.

At 4.17 pm AGL rebid back the 76 MW of capacity at Yabulu to under $90/MWh and the dispatch price fell to $89/MWh.

The spot price for 5 pm was slightly higher than forecast due to higher than forecast demand.

Friday, 20 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
11 am	437.73	156.03	310.03	7997	8199	8265	10 849	10 873	10 933
2 pm	447.30	60.94	156.03	8475	8127	8839	10 776	11 122	11 160
3 pm	2382.27	85.99	13 800.00	8810	8318	9042	10 921	11 050	11 034
5 pm	2457.65	98.93	14 000.00	9170	8897	9471	10 858	11 001	11 040

Conditions at the time saw demand higher than forecast except for the 11 am trading interval. Available capacity was close to forecast except for the 2 pm trading interval which was around 350 MW lower than forecast.

Throughout the majority of the day there was little capacity priced between $300/MWh and $2000/MWh and that capacity was ramp rate limited, needed more than five minutes to start or trapped or stranded in FCAS. This meant that small changes in demand or rebidding could lead to large changes in price.

There were four dispatch price spikes, two at $2150/MWh at 10.45 am and 1.35 pm and two at $13 800/MWh at 3 pm and 4.55 pm. All these prices coincided with a sharp five minute increase in demand (up to 286 MW). The 3 pm and 5 pm prices saw Queensland participants rebid capacity from low to high prices, shown in the tables below. The price spikes were preceded by a large decrease in demand (up to 571 MW), most likely a demand side response and prices fell.

Table 6: Significant rebids for 3 pm

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from ($/MWh)	Price to ($/MWh)	Rebid reason
2.26 pm	2.35 pm	Millmerran Energy Trader	Millmerran	20	10	14 000	14:25 F portfolio readjustment due to unit 1 issues sl
2.37 pm	2.45 pm	Alinta Energy	Braemar A	6	97	14 000	1436~P~revise unit output based on ambient conditions~
2.39 pm	2.50 pm	CS Energy	Gladstone	-10	99	N/A	1439P technical issues-id fan-sl
2.47 pm	2.55 pm	Callide Power Trading	Callide C	86	-1000	14 000	1445A A Qld dem ds di 14:45 VS pd run 14:30 ti 15:00 sl
2.47 pm	2.55 pm	Millmerran Energy Trader	Millmerran	30	-1000	14 000	14:47 A Qld dem ds di 14:45 vs pd run 14:30 ti 15:00 sl
2.49 pm	3.00 pm	CS Energy	Gladstone	-20	<295	N/A	1449P technical issues-id fan-sl

Table 7: Significant rebids for 5 pm

Submitted time	Time effective	Participant	Station	Capacity rebid (MW)	Price from ($/MWh)	Price to ($/MWh)	Rebid reason
4.38 pm	4.45 pm	Millmerran Energy Trader	Millmerran	30	-1000	14 000	A Qld +200 sens pd run 16:30 ti 17:00 value 13641 vs pd run sl
4.39 pm	4.50 pm	Callide Power Trading	Callide C	40	-1000	14 000	1638A Qld +200 sens pd run 16:30 ti 17:00 value 13641 vs pd run
4.41 pm	4.50 pm	CS Energy	Gladstone	100	>13 800	<99	1638P fuel management-sl
4.41 pm	4.50 pm	CS Energy	Wivenhoe	160	0	14 000	1638P fuel management-sl
4.52 pm	5.00 pm	Callide Power Trading	Callide C	126	14 000	-1000	1651A price above pd - sl

New South Wales

There were thirteen occasions where the spot price in New South Wales was greater than three times the New South Wales weekly average price of $90/MWh and above $250/MWh.

Monday, 16 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
4 pm	270.88	139.40	251.14	11 128	10 656	10 791	13 384	13 901	14 228
4.30 pm	291.58	148.07	253.56	11 194	10 809	10 823	13 357	13 705	14 213
5 pm	275.81	258.99	261.46	11 197	10 874	10 827	13 337	13 634	14 192

Conditions at the time saw demand up to 472 MW higher than forecast four hours ahead. Available capacity was up to 517 MW lower than forecast four hours ahead, with most of the capacity removed priced below $300/MWh. The reasons for the reduction in capacity given by New South Wales participants related to unexpected plant issues or ambient temperatures.

As a result of the higher than forecast demand and reduced low priced capacity the dispatch prices increased to around $300/MWh at 3.40 pm and stayed there until 5.05 pm.

Tuesday, 17 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	294.35	299.60	277.97	13 204	12 599	12 325	13 804	14 261	14 417
3.30 pm	348.22	299.60	299.80	13 442	12 792	12 413	13 693	14 471	14 682

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	394.76	299.80	299.80	13 526	13 031	12 525	13 817	14 412	14 658
4.30 pm	299.33	299.80	299.80	13 605	13 126	12 478	13 666	14 402	14 630
5 pm	302.03	299.60	299.60	13 677	13 081	12 430	13 646	14 298	14 588
5.30 pm	410.39	125.56	299.60	13 505	12 766	12 171	13 621	14 236	14 527
6 pm	289.38	96.99	290.83	13 483	12 536	12 018	13 716	14 163	14 480
6.30 pm	279.06	97.41	116.55	13 261	12 223	11 658	13 868	14 009	14 441
8 pm	269.77	93.52	87.69	12 757	11 456	11 264	13 889	13 297	13 597

Conditions at the time saw prices close to forecast for the 3 pm to 5 pm trading intervals even though demand was up to 650 MW higher and available capacity was up to 778 MW lower than forecast four hours ahead, the majority of which was low priced. There was around 500 MW of capacity rebid by New South Wales participants from high to low prices.

The 5.30 pm to 8 pm spot prices were higher than forecast but still around the $300/MWh driven by higher than forecast demand. Demand was up to 1301 MW higher than forecast four hours ahead and, with the exception of 8 pm, available capacity was up to 615 MW lower than forecast four hours ahead, the majority of which was low priced.

The dispatch price remained around $300/MWh for a majority of the time between 3 pm and 8 pm.

Wednesday, 18 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
3 pm	299.60	299.80	113.59	12 579	13 748	12 717	14 434	14 468	14 342

The spot price was close to that forecast four hours ahead.

Victoria

There were four occasions where the spot price in Victoria was greater than three times the Victoria weekly average price of $77/MWh and above $250/MWh.

Monday, 16 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
4 pm	261.34	133.04	262.95	6302	6008	6012	8218	8421	8339

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
4.30 pm	274.52	138.00	262.95	6489	6072	6091	8173	8585	8337

Conditions at the time saw demand up to 417 MW higher than forecast four hours ahead. Available capacity up to 412 MW lower than forecast four hours ahead with most of the capacity removed priced below $110/MWh. The reasons given related to ambient temperature and unexpected plant limitations, the temperature in the Melbourne, Victoria was around 33 degrees.

The combination of higher than forecast demand and reduced low priced capacity saw dispatch prices remain at around $280/MWh for a majority of the time between 3.40 pm and 4.25 pm.

Tuesday, 17 January

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	302.01	290.00	279.77	8084	7824	7285	8925	9135	9294
5 pm	267.57	268.73	262.95	7996	7531	7192	8877	9465	9555

Spot prices were close to those forecast.

South Australia

There were four occasions where the spot price in South Australia was greater than three times the South Australia weekly average price of $104/MWh and above $250/MWh.

Monday, 16 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
4 pm	316.64	193.87	350.69	2011	1784	1923	2260	2308	2312
4.30 pm	323.86	299.99	351.48	2083	1861	2002	2276	2309	2311

Conditions at the time saw demand up to 227 MW higher than forecast four hours ahead. Prices were aligned with those in Victoria.

Tuesday, 17 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	344.37	350.01	358.28	2509	2421	2386	2664	2652	2667

The spot price was close to that forecast.

Thursday, 19 January

Table 15: 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	2399.21	126.29	124.99	2421	2151	2137	2336	2357	2429

Conditions at the time saw demand 270 MW higher than forecast four hours ahead while available capacity was close to forecast.

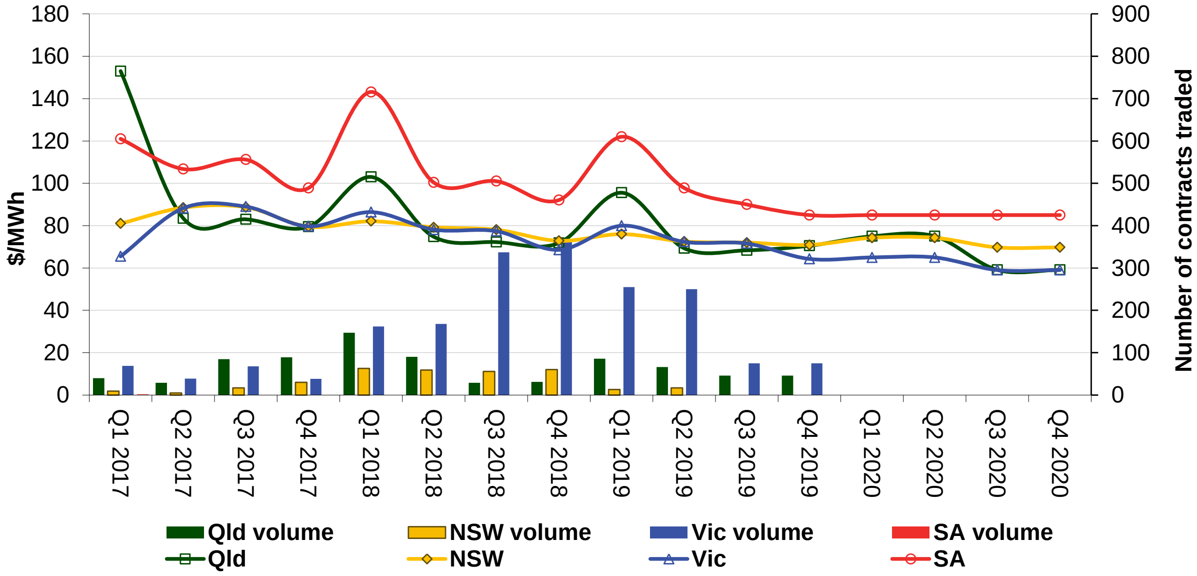
There was little capacity priced between $127/MWh and $13 000/MWh and the capacity that was needed required more than five minutes to start. This meant that small changes in demand, rebidding or interconnector flows could have a significant effect on price.

At 4.35 pm local generation increase by 32 MW due to a reduction in imports and a small increase in demand. Low priced capacity was unable to start in five minutes so high priced capacity was dispatch which saw the price increase from $579/MWh at 4.30 pm to $13 999/MWh at 4.35 pm. The price then decreased to less than $110/MWh for the remainder of the trading interval due to rebidding by participants of capacity from high to low prices.

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.

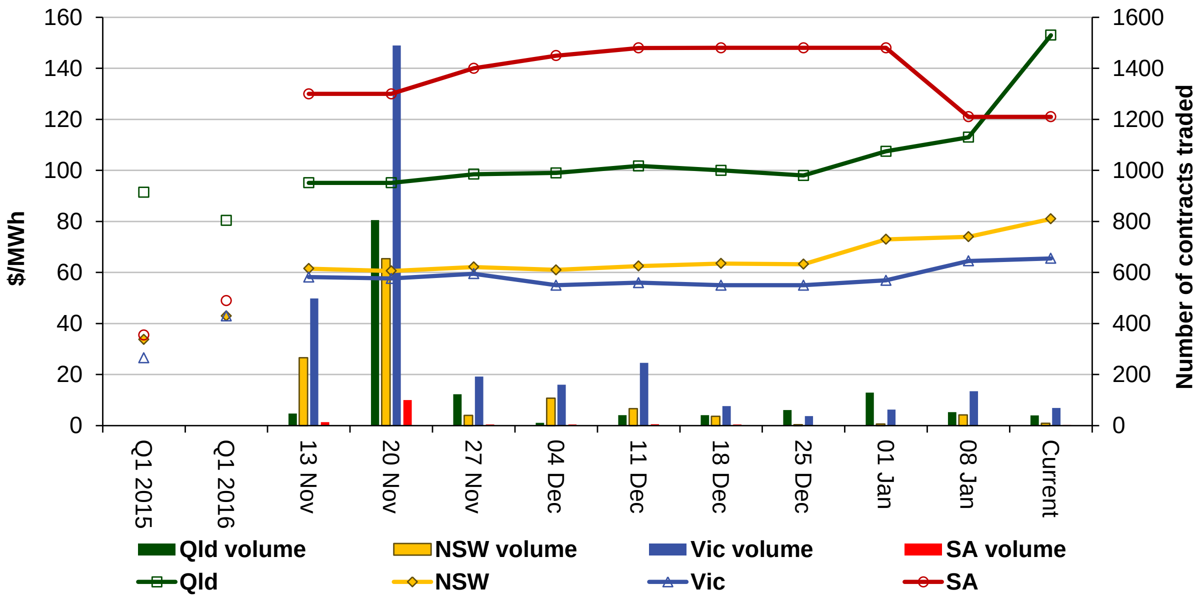
Figure 9: Quarterly base future prices Q1 2017 – Q4 2020



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)



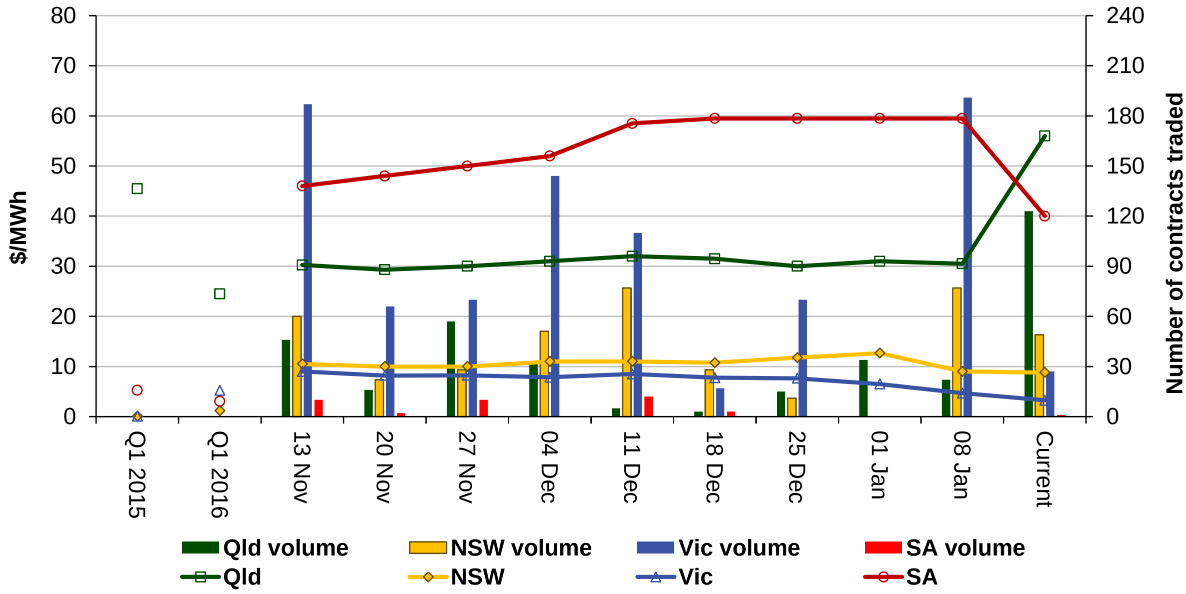
Note. Base contract prices are shown for each of the current week and the previous 9 weeks, with average prices shown for periods 1 and 2 years prior to the current year.

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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