

Report into market ancillary service prices above \$5000/MW

Queensland, 25 August 2018

June 2019



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1 Obligation

The Australian Energy Regulator regulates energy markets and networks under national legislation and rules in eastern and southern Australia, as well as networks in the Northern Territory. Its functions include:

- monitoring wholesale electricity and gas markets to ensure energy businesses comply with the legislation and rules, and taking enforcement action where necessary;
- setting the amount of revenue that network businesses can recover from customers for using networks (electricity poles and wires and gas pipelines) that transport energy;
- regulating retail energy markets in Queensland, New South Wales, South Australia, Tasmania (electricity only), and the ACT;
- operating the Energy Made Easy website, which provides a retail price comparator and other information for energy consumers;
- publishing information on energy markets, including the annual State of the energy market report.

The AER is required to monitor significant variations between forecast and actual prices and publish a report where:

- prices for a market ancillary service over a period significantly exceed the relevant spot price for energy; and
- prices for a market ancillary service exceed \$5000/MW for a number of trading intervals within that period.

In accordance with the clause 3.13.7(e) of the National Electricity Rules, the report must:

- describe the significant factors that contributed to the ancillary service prices exceeding \$5000/MW;
- identify any linkages between spot prices in the energy market and ancillary service prices contributing to the occurrence; and
- assess whether rebidding pursuant to clause 3.8.22 contributed to prices exceeding \$5000/MW.

These reports examine the reasons for the high price outcomes—they are not compliance reports. We deal separately with compliance issues that come to our attention during the preparation of these reports.

2 Summary

On Saturday 25 August 2018, the price for all eight frequency control ancillary services (FCAS) exceeded \$5000/MW in Queensland for most of the dispatch intervals between 1.25 pm and 2.45 pm.

A single lightning strike on a transmission tower structure supporting the two circuits of the Queensland to New South Wales interconnector (QNI) caused QNI to "trip" at just after 1 pm, islanding the Queensland region from the rest of the NEM. As a result, frequency in the Queensland region increased, and fell in the rest of the NEM.

Consistent with standard practice, the market operator (AEMO) required Queensland to source all FCAS from within the region. To manage the security of the system in Queensland, AEMO invoked constraints to limit the output of generators in Queensland to 350 MW. All available local ancillary services in Queensland were used in an effort to maintain frequency in the region, some of which were priced very high. This contributed to the high prices. In addition, at times the level of available local FCAS was not sufficient to meet the required amount set by AEMO. The trade-off between the competing demands for energy and FCAS led to FCAS prices exceeding \$14 000/MW.

Strategic rebidding by participants did not contributed to the price exceeding \$5000/MW.

The event in Queensland had a cascading effect in other regions. The reduction in frequency across the NEM caused an increase in flows of electricity from Tasmania to Victoria across the Basslink interconnector, causing 81 MW of load to be shed in Tasmania (under the automatic under-frequency load shedding scheme). The reduction in frequency also activated the emergency control scheme on the Vic-SA (Heywood) interconnector, causing it to trip. In South Australia all services, with the exception of raise 60 second, experienced one dispatch interval above \$5000/MW between 1.25 pm and 1.45 pm.¹

The reduction in frequency in the "islanded" New South Wales/Victoria region triggered under-frequency load shedding – a total of 997 MW of supply was interrupted: 904 MW of smelter load across the two regions (622 MW at Tomago in New South Wales, and 282 MW at Alcoa in Victoria) and 93 MW of consumer load in New South Wales.²

¹ See AER Electricity Weekly Report 19-25 August 2018 (<u>https://www.aer.gov.au/wholesale-markets/market-performance/electricity-report-19-25-august-2018</u>)

² See Final Report – Queensland and South Australia system separation on 25 August 2018 (<u>http://www.aemo.com.au/-</u> /media/Files/Electricity/NEM/Market_Notices_and_Events/Power_System_Incident_Reports/2018/Qld---SA-Separation-25-August-2018-Incident-Report.pdf)

3 Analysis

FCAS is used to maintain the frequency of the power system within set frequency operating standards³. In general, when (alternating current, or AC) interconnectors connecting NEM regions are operating satisfactorily, FCAS can be freely transferred between regions.

When QNI tripped unexpectedly at just after 1 pm on 25 August, Queensland was unable to source FCAS from the rest of the NEM. This meant that rather than being able to rely on other regions of the NEM to help maintain frequency, AEMO required Queensland generators to provide the necessary services.

Table 1 shows the prices for 'local' FCAS (i.e. FCAS provided by Queensland generators), during the period of the outage. Prices for some services reached the price cap of \$14 500/MW on numerous occasions. The energy spot price was significantly lower than the FCAS price for the entire time, reaching a maximum of only \$318/MWh at 2 pm.

The main reasons for the high prices are as follows:

- Co-optimisation (trade off) between ancillary services; and between individual ancillary services and energy (see Box 2 for an explanation of how this trade off works). High prices resulting from co-optimisation are highlighted in bold in Figure 1.
- High priced capacity was needed to meet the requirement.
- Insufficient capacity was available.

Rebidding from low to high prices may have been a factor in several dispatch intervals. These reasons are explained in the following sections.

FCAS price (\$/MW)									
Time	L5	L60	L6	LREG	R5	R60	R6	RREG	
1.25 pm	14 500	14 200	14 200	14 500	14 500	14 370	14 200	14 500	
1.30 pm	14 200	14 200	14 200	14 500	14 200	14 200	14 325	14 500	
1.35 pm	14 500	14 200	14 200	14 500	14 500	14 200	14 500	14 500	
1.40 pm	14 200	14 200	14 200	14 290	14 500	14 200	14 500	14 500	
1.45 pm	0	14 200	83	2020	2 304	14 200	37	5 005	
1.50 pm	0	14 000	75	14 042	14 500	34	181	14 500	
1.55 pm	0	14 000	75	14 164	8 659	34	14 059	14 500	
2.00 pm	0	14 000	75	14 500	14 500	34	1 086	14 500	

Table 1: Prices for Queensland local FCAS during the high-price period

 3 Appendix A provides more background on the operation of the FCAS markets

FCAS price (\$/MW)									
Time	L5	L60	L6	LREG	R5	R60	R6	RREG	
2.05 pm	14 500	14 200	14 200	14 500	14 500	1 200	14 500	14 500	
2.10 pm	14 500	14 200	14 200	14 500	14 200	1 200	14 500	14 500	
2.15 pm	14 200	14 200	14 200	14 233	14 200	14 200	14 500	14 500	
2.20 pm	1 200	14 000	75	14 082	14 200	14 200	14 500	14 500	
2.25 pm	14 500	14 500	2 000	14 500	14 200	14 200	14 200	14 500	
2.30 pm	14 500	14 293	12 652	14 500	14 500	14 200	14 200	14 500	
2.35 pm	14 200	14 200	14 200	14 500	14 500	14 200	14 262	14 500	
2.40 pm	14 200	14 200	14 500	14 500	14 200	14 200	14 200	14 500	
2.45 pm	14 200	14 500	14 200	14 200	14 263	14 200	14 200	14 263	

The sustained high FCAS prices led to FCAS costs in Queensland of \$11 million for the day and a total of \$14 million across the NEM, the highest cost for a single region on a day - the next highest was \$8.2 million in South Australia on 1 November 2015.

3.1 Effects of the unplanned outage of QNI

On Saturday 25 August, lightning struck the QNI interconnector causing it to trip, making it unable to transfer electricity and FCAS between Queensland and the rest of the NEM. Queensland generators were therefore required to provide FCAS to maintain system frequency within the region. The market notices relating to events on the day are at Appendix E. As explained in Box 1, Queensland and New South Wales are also electrically connected via the Terranora interconnector, which is unable to transfer FCAS.⁴

⁴ Unlike Basslink, Terranora does not have a frequency controller and therefore cannot transfer FCAS. See AEMO NEM Constraint Report 2016, published June 2017, p26 (<u>https://www.aemo.com.au/-/media/Files/Electricity/NEM/Security_and_Reliability/Congestion-Information/2017/The-NEM-Constraint-Report-2016.pdf</u>)

Box 1. QNI and outage management

Queensland is electrically connected to New South Wales by the QNI and Terranora interconnectors. The QNI interconnector is an alternating current high voltage transmission link which can transfer FCAS from the rest of the NEM. Terranora does not have a frequency controller and therefore cannot transfer FCAS. The figure below is a simplified representation of the network around the QNI and Terranora interconnectors.



On 25 August, there was an unplanned outage of both of the Dumaresq to Bulli Creek lines. AEMO invoked constraints to manage the outage which meant that Queensland had to source its FCAS locally. This ensures adequate regulation services are immediately available to manage the frequency (around 50Hz) within Queensland in case of a contingency.

AEMO also invoked constraints to limit the largest contingency (in other words, the maximum any single generator in Queensland could generate) to 350 MW. By doing so, AEMO limited the possibility of large frequency deviations if that generator tripped.

The local requirement for FCAS for the region is based on the size of the largest contingency. The size of the contingency also dictates the extent to which generators are able to trade-off between energy and FCAS (in other words, where they are located in their FCAS trapezium – see box 2).

Box 2 explains how the trade-off between FCAS and energy offers determines a generator's effective availability for FCAS and can lead to high FCAS prices.

Box 1: Relationship between generator FCAS and energy offers

Generators must register with AEMO to provide FCAS and offer FCAS capacity in a similar manner to energy into the market. Participants offer the maximum amount of FCAS (f in the diagram below) and energy, in mega-watts (MW), they are willing to supply across ten price bands, ranging between -1000 and 14200/MWh for a trading day. Participants also offer the limits at which they can be dispatched in FCAS (a, b, c, d in the diagram below). The trade-off between the provision of FCAS and energy determines the effective availability of FCAS. For example in the diagram below, if a generator's energy output is at E_1 then its effective FCAS availability is F_1 . If its output in energy increases to E_2 then its effective FCAS availability drops to F_2 .

For every dispatch interval the National Electricity Market Dispatch Engine (NEMDE) co-optimises market participants' FCAS and energy offers to arrive at the least cost outcome while maintaining system security.



3.2 FCAS availability on the day

Table 2 shows capacity offered below and above \$5000/MW, by service. The table shows that capacity priced below \$5000/MW was offered in all services, and capacity priced above \$5000/MW was offered in all services apart from lower regulation services.

It is important to remember that the outage was unplanned, so participants would not have been able to adjust their positions in anticipation of the outage.

Table 2: FCAS capacity offered above and below \$5000/MW inQueensland, by service, during the high price period

Service	Capacity priced below \$5000/MW	Capacity priced above \$5000/MW
Lower 5 min	\checkmark	✓
Lower 60 sec	\checkmark	\checkmark
Lower 6 sec	\checkmark	\checkmark
Lower reg	\checkmark	×
Raise 5 min	\checkmark	✓
Raise 60 sec	\checkmark	\checkmark
Raise 6 sec	✓	✓
Raise reg	\checkmark	\checkmark

Figures 1 and 2 show the local requirements for each service (indicated by the blue lines), participants' maximum offers (indicated by the grey lines), effective offers (indicated by the orange lines) and the maximum capacity of each service participants were prepared to offer for 25 August on 24 August (i.e. original offers), indicated by the green lines).

There is a relationship between the lines in the figures. The grey line represents participants' collective maximum offers throughout the day as they adjusted their original offers through rebidding. The orange line represents effective offers; that is, maximum offers adjusted according to participants' trapeziums. This relationship is explained in Box 2 – *Trade-off between generator FCAS and energy offers*. Effective offers represent the capacity generators are physically capable of providing.

Figure 1 relates to lower services and Figure 2 relates to raise services. The graphs are designed to show how offers compared to requirements.

The figures show that, according to original offers, there would have been sufficient FCAS to meet requirements in half of the cases (green lines above blue lines – Lower Regulation, Raise 6 second, Raise 60 second and Raise Regulation services).

The appearance of the orange line below the blue line indicates insufficient effective offers in Queensland to meet local requirements. This may be because generators were limited in their ability to provide FCAS to ensure they wouldn't become the largest contingency in Queensland. This trade-off between FCAS and energy caused many of the high price outcomes (in bold in Table 1). However, this condition improved for several services from around 2 pm onwards, as effective availability exceeded the requirement (orange lines exceeded the blue lines).

Strategic rebidding by participants did not contributed to the price exceeding \$5000/MW. The reasons for any rebids were technical in nature (boiler control issues) and related to the trip of QNI.



Figure 1: Lower service requirements, maximum, effective and forecast offers





Australian Energy Regulator

June 2019

Appendix A: Explanation of FCAS

Frequency control ancillary services (FCAS) are required to maintain the frequency of the power system within the frequency operating standards. The two general categories of FCAS are:

- Regulation services, which continuously adjust to small changes in demand or supply (changes that cause the frequency to move by only a small amount away from 50 Hz). There are regulation services to increase the frequency (raise regulation or RREG) and services to decrease the frequency (lower regulation or LREG).
- Contingency services, which manage large changes in demand or supply that occur relatively rarely and move the frequency by a large amount. There are three contingency services to increase the frequency and three contingency services to decrease the frequency. Raise contingency FCAS are required to be available to correct frequency excursions that have arisen from a credible contingency event that leads to a decrease in frequency. As these contingency events usually involve step reductions in supply side, the Electricity Rules stipulate that generators pay for these services. Lower contingency FCAS are the services required to be available to correct the frequency excursions that arise from a credible contingency event that leads to an increase in frequency. As these contingency events usually involve step reductions in customer demand, the Electricity Rules stipulate that customers pay for these services.

Participants providing regulation services receive adjusted dispatch targets every 5 minutes via their automatic generation control (AGC) signals from AEMO. Participants are paid through the FCAS markets in accordance with their offered volumes. Their energy production, which may be higher or lower depending on the AGC signals they receive, are settled in accordance with energy market prices.

There are three lower and three raise contingency services:

- fast services, which arrest a frequency deviation within the first six seconds of a contingent event (L6 and R6);
- slow services, which stabilise frequency deviations within sixty seconds of the event (L60/R60); and
- delayed services, which stabilise frequency deviations within five minutes of the event (L5/R5).

Participants offering to provide contingency services are enabled in accordance with the "trapezium" supplied in their offers. While participants will not necessarily be supplying these services until a contingency occurs they are paid in accordance with their enablement.

Frequency Control Ancillary Service Settlement

AEMO settles the FCAS markets on a weekly basis, as follows⁵.

- Regulation FCAS: Cost recovery on a "causer pays" basis using the Causer Pays Procedure⁶ developed by AEMO in accordance with the appropriate NER procedures.
- Contingency FCAS: Generators pay for Raise Services and customers pay for Lower Services.

The 'Causer Pays' Procedure allocates regulation FCAS costs to those market generators, customers and small generation aggregators with facilities that have the metering capable of determining their contribution to frequency deviations at any time.

Every four weeks based on historical data AEMO calculates a causer pays contribution factor for each generator. Broadly, the contribution factor is determined from historical 4 second generator output and frequency information and is a measure of how each generator contributed to managing changes in the system frequency. If a generators' output changes such that it supports maintaining the system frequency its contribution factor is positive. Conversely, if a generators' output changes such that it exacerbates a frequency deviation, its contribution factor will be negative. The causer pays contribution factors for a portfolio of generators effectively represent the aggregation of the individual performance of the generators in that portfolio.

Settlement is determined by allocating the FCAS costs incurred in the current period in accordance with the causer pays contribution factor for that portfolio from the preceding period. Thus cost allocation to a participant is not dependent on the amount of energy purchased or consumed in that period but by the performance of that participant in managing system frequency in the previous period.

Consequently a portfolio of generators with a negative factor in a particular period will still pay a share of FCAS costs irrespective of how much it generates in the current period.

Since not all of the costs will be recovered from generators, the residual costs are recovered from market customers (including retailers) in the relevant region, based on the amount of energy each market customer is purchasing.

⁵ For a full description go to <u>https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Data/Ancillary-Services/Payments-and-Recovery</u>

⁶ For a full description go to <u>https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Security-and-</u> reliability/Ancillary-services/Ancillary-services-causer-pays-contribution-factors

Appendix B: Local Frequency Control Ancillary Services

AEMO sets the requirement for FCAS to ensure that the frequency standard (as set by the Reliability Panel) is maintained in the event of step changes in supply or demand that results from credible contingencies. Where a credible contingency results in the loss of an interconnector it is termed a "separation event".

The standard states that in the event of a "separation event" the frequency must be contained within 49 to 51 Hz or a wider band notified to AEMO by a relevant JSSC⁷.

When there is a potential separation event caused by the loss of an interconnector "local frequency control ancillary services" are usually required.

If the region was exporting at the time the interconnector fails, then as a consequence of the immediate over supply situation local contingency "lower" services are required in the islanded region to lower the frequency (typically generators offer to quickly reduce output to lower frequency). In other words, the loss of the QNI when power is flowing from Queensland, results in an oversupply of generation, increasing the frequency in Queensland. Contingency lower services are sourced from registered suppliers in Queensland (typically generators) in proportion to the flow across the interconnector from Queensland to New South Wales to quickly reduce that over frequency.

A similar situation exists for contingency "raise" services for all other regions except South Australia where, in accordance with the advice from the JSSC, the raise requirement is covered by under frequency load shedding. In other words, the loss of the QNI when power is flowing into New South Wales, results in an undersupply of generation decreasing the frequency in Queensland. Under frequency load shedding reduces demand in blocks to arrest the falling frequency until supply matches demand and the frequency is restored.

In either event, in the past, in the period immediately following the separation event AEMO would invoke local regulation services and establish a local regulation reference source to manage frequency until the region can be reconnected to the rest of the NEM.

⁷ JSSC refers to the Jurisdictional System Security Coordinator

Appendix C: Stations with capacity priced above \$5000/MW

Figure C1 shows the stations in Queensland enabled for FCAS during the separation event and highlights if the station had offers priced above \$5000/MW for any time during the separation event.

Participant	Station	Service	Capacity priced above
			\$5000/MW
Stanwell Corp	Tarong	Lower5min	×
		Lower60sec	✓
		Lower6sec	✓
		Lowerreg	×
		Raise5min	×
		Raise60sec	✓
		Raise6sec	✓
		Raisereg	×
	Stanwell	Lower5min	×
		Lower60sec	✓
		Lower6sec	✓
		Lowerreg	×
		Raise60sec	✓
		Raise6sec	×
		Raisereg	✓
CS Energy	Callide B	Lower5min	✓
		Lower60sec	✓
		Lower6sec	✓
		Lowerreg	×
		Raise5min	✓
		Raise60sec	✓
		Raise6sec	✓
		Raisereg	✓
	Gladstone	Lower5min	×
		Lower60sec	✓
		Lower6sec	×
		Lowerreg	×
		Raise5min	×
		Raise60sec	×
		Raise6sec	×
		Raisereg	×

Figure C1: Stations with capacity priced above \$5000/MW (by service)

Appendix D: Impacts on other regions of the NEM

Loss of SA Heywood interconnector

The sudden loss of QNI caused a power frequency drop in the other NEM regions. This frequency drop activated the Heywood Emergency Control Scheme⁸ and flows on the Heywood interconnector reduced from 430 MW (from SA to Victoria) to zero at 1.25 pm.

Similar to Terranora in Queensland, the remaining South Australia interconnector (Murraylink) is a direct current interconnector and is unable to transfer FCAS (as it does not have a frequency controller), hence South Australia was considered an islanded region for frequency management purposes and required to source ancillary services locally.

The interconnector returned to service at 1.50 pm and local ancillary services were no longer required. In South Australia all services, with the exception of raise 60 second, experienced one dispatch interval above \$5000/MW between 1.25 pm and 1.45 pm.

Loss of load in NSW, VIC and TAS

Under Frequency Load Shedding (UFLS) arrangements are coordinated across the NEM to help maintain the frequency within operational frequency tolerance band. On the day, UFLS scheme was activated in three regions shedding over 1078 MW of load. In New South Wales, 93 MW of customer load and two Tomago potlines were shed (622 MW), affecting around 100 000 customers. In Victoria, 282 MW of load at Alcoa Portland Aluminium potline was shut down and lastly 81 MW of contracted industrial load in Tasmania was shed.

Restoration of customer load commenced from 1.44 pm onwards, with all load restored by 3.28 pm.

⁸ They Heywood Emergency Control Scheme is designed to pre-emptively isolate South Australia from the rest of the NEM, to reduce the risk of the islanded frequency in SA collapsing. The scheme is triggered by a number of system conditions on the interconnector, including frequency, voltage stability issues and power system oscillations.

Appendix E: Market notices

AEMO issued the following market notices relating to events on the day.

Market Notice	Туре	Date of issue	Last Changed			
63985	POWER SYSTEM EVENTS	25/08/2018 1:46:15 PM	25/08/2018 1:46:15 PM			
Reason						
AEMO ELECTRICITY MARKET NOTICE. POWER SYSTEM EVENT AEMO has become aware of the following circumstance(s) with respect to AEMO ELECTRICITY MARKET NOTICE.						
At 1312 hrs 25/08/2018 Queensland separated from NSW region and South Australia separated from Victoria region. South Australia operating in an Island. Queensland region operating in an island. NSW and Victoria remain connected Indication of volume of load shed and in which region. NSW shed 800 MW. Victoria 280 MW Approximate total amount of generation tripped in each region. Nil At 1337 hrs South Australia Synchronised with Victoria. AEMO has issued this Market Notice in accordance with the NER CI 4.8.3.						

Market Notice	Туре	Date of issue	Last Changed
64001	POWER SYSTEM EVENTS	25/08/2018 2:51:47 PM	25/08/2018 2:51:47 PM

Reason

AEMO ELECTRICITY MARKET NOTICE.

Update - POWER SYSTEM EVENT 25/08/2018 Refer to AEMO Electricity Market Notice 63985

AEMO has become aware of the following circumstance(s) with respect to the power system.

At 1312 hrs 25/08/2018 Queensland separated from NSW region and South Australia separated from Victoria region. South Australia operating in an Island. Queensland region operating in an island. NSW and Victoria remain connected.

The following transmission lines tripped out of service.

All regions reconnected at 1420 hrs 8L and 8M Dumaresq to Bulli 330 kV Transmission line tripped out of service. Both lines in-service by 1433 hrs.

86 Armidale -Tamworth 330 kV transmission line tripped out of service. 86 Line remains out of service.

Indication of volume of load shed and in regions. NSW shed 800 MW. Victoria shed 280 MW. Tasmania shed 80 MW.

Load in Victoria restored 1400 hrs

Industrial Load in the NSW region restored 1410 hrs. 1340 hrs other customer load permission to restore. Load in Tasmania restored 1342 hrs.

Approximate total amount of generation tripped in each region. Nil generation observed to trip.

At 1337 hrs South Australia region synchronised with Victoria region.

At 1420 hrs Queensland region synchronised and NSW.

AEMO has issued this Market Notice in accordance with the NER CI 4.8.3.

Market Notice	Туре	Date of issue	Last Changed
64002	POWER SYSTEM EVENTS	25/08/2018 3:44:25 PM	25/08/2018 3:44:25 PM

Reason

AEMO ELECTRICITY MARKET NOTICE

Reclassification for simultaneous trip of 8L and 8M Dumaresq - Bulli 330 kV Transmission lines as a credible contingency.

Refer AEMO Electricity Market Notices 63985 and 64001

At 1312 hrs 25/08/2018 8L and 8M Dumaresq to Bulli 330 kV Transmission lines tripped simultaneously.

The cause of this non credible contingency event is not known at this stage.

AEMO is not satisfied that this non credible event is unlikely to re-occur. AEMO therefore reclassifies this event as being a credible contingency from 1515 hrs Constraint set F-I_BCDM _N-2 invoked 1515 hrs until further notice.

Constraint has the following interconnector on the LHS. NSW1-QLD1 T-V-MNSP1

Market Notice	Туре	Date of issue	Last Changed
64003	POWER SYSTEM EVENTS	25/08/2018 6:22:00 PM	25/08/2018 6:22:00 PM

Reason

AEMO ELECTRICITY MARKET NOTICE. Update - POWER SYSTEM EVENT 25/08/2018

Refer to AEMO Electricity Market Notice 63985 and 64001

AEMO advises this update on the following circumstance(s) with respect to the power system.

At 1312 hrs 25/08/2018 Queensland separated from NSW region and South Australia separated from Victoria region. South Australia operating in an Island. Queensland region operating in an island. NSW and Victoria remain connected.

The following transmission lines tripped out of service. 8L and 8M Dumaresq to Bulli 330 kV Transmission line tripped out of service. Both lines in-service by 1433 hrs. 86 Armidale -Tamworth 330 kV transmission line tripped. 86 Line returned to service 1516 hrs.

At 1337 hrs South Australia region synchronised with Victoria region.

At 1420 hrs Queensland region synchronised and NSW.

Indication of volume of load shed and in the regions. NSW shed 724 MW. Victoria shed 280 MW. Tasmania shed 80 MW.

Load in Victoria restored 1400 hrs 600 MW Industrial Load in the NSW region restored 1410 hrs. Customer load 124 MW all restored by 1528 hrs. Load in Tasmania restored 1342 hrs.

Approximate total amount of generation tripped in each region - Nil generation observed to trip.AEMO has issued this Market Notice in accordance with the NER CI 4.8.3.

Appendix F: Price setter

The following tables identify the price and the generating units involved in setting the price for each of the lower and raise regulation and contingency services in Queensland over the period between 1.25 pm and 2.45 pm. This information is published by AEMO.⁹ Also shown are the offer prices involved in determining the dispatch price, together with the quantity of that service and the contribution to the total price. AEMO reports an increase as a negative marginal change in FCAS price setter. Generator offers which contributed zero to the price have been removed for clarity.

DI	Dispatch Price (\$/MW)	Participant	Unit	Service	Offer price (\$/MW)	Marginal change	Contribution
13:05	\$20.70	EnergyAustralia	YWPS3	Raise 6 sec	\$20.70	-1.00	-\$20.70
13:10	\$16.88	AGL (SA)	TORRB1	Energy	\$115.00	0.18	\$20.70
		AGL (SA)	TORRB2	Energy	\$115.00	0.18	\$20.70
		AGL (SA)	TORRB3	Energy	\$115.00	0.18	\$20.70
		AGL (SA)	TORRB4	Energy	\$115.00	0.18	\$20.70
		Delta Electricity	VP6	Energy	\$86.00	-1.50	-\$129.00
		CS Energy	GSTONE1	Energy	\$64.73	1.00	\$64.73
		Snowy Hydro	TUMUT3	Raise 5 min	\$30.00	-0.73	-\$21.90
		AGL (SA)	TORRB1	Raise 5 min	\$0.50	0.18	\$0.09
		AGL (SA)	TORRB2	Raise 5 min	\$0.50	0.18	\$0.09
		AGL (SA)	TORRB3	Raise 5 min	\$0.50	0.18	\$0.09
		AGL (SA)	TORRB4	Raise 5 min	\$0.50	0.18	\$0.09
		CS Energy	GSTONE1	Raise 60 sec	\$9.99	-1.00	-\$9.99
		AGL (SA)	TORRB1	Raise 60 sec	\$5.00	0.25	\$1.25
		AGL (SA)	TORRB2	Raise 60 sec	\$5.00	0.25	\$1.25
		AGL (SA)	TORRB3	Raise 60 sec	\$5.00	0.25	\$1.25
		AGL (SA)	TORRB4	Raise 60 sec	\$5.00	0.25	\$1.25
		CS Energy	GSTONE1	Raise 6 sec	\$9.99	-1.00	-\$9.99
13:15	\$16.33	Snowy Hydro	UPPTUMUT	Energy	\$80.00	-0.86	-\$68.80
		CS Energy	GSTONE1	Energy	\$59.73	1.00	\$59.73
		Origin Energy	ER02	Raise 60 sec	\$12.50	1.00	\$12.50
		CS Energy	GSTONE1	Raise 60 sec	\$9.99	-1.00	-\$9.99
		CS Energy	GSTONE1	Raise 6 sec	\$9.99	-1.00	-\$9.99
13:20	\$33.33	EnergyAustralia	YWPS4	Raise 6 sec	\$33.33	-1.00	-\$33.33
13:25	\$14 200.00	CS Energy	CALL_B_2	Raise 6 sec	\$14 200.00	-1.00	-\$14 200.00
13:30	\$14 325.06	CS Energy	GSTONE2	Energy	\$64.73	-1.30	-\$84.15

Raise 6 regulation 25 August 2018

⁹ Details on how the price is determined can be found at <u>www.aemo.com.au</u>

DI	Dispatch Price (\$/MW)	Participant	Unit	Service	Offer price (\$/MW)	Marginal change	Contribution
		CS Energy	GSTONE5	Energy	\$64.73	-1.30	-\$84.15
		CS Energy	CALL_B_2	Energy	\$16.79	2.61	\$43.82
		CS Energy	CALL_B_2	Raise 6 sec	\$14 200.00	-1.00	-\$14 200.00
13:35	\$14 500*	Stanwell	TARONG#3	Energy	\$300.90	-2.61	-\$785.35
		CS Energy	CALL_B_2	Energy	\$16.79	2.61	\$43.82
		CS Energy	CALL_B_2	Raise 6 sec	\$14 200.00	-1.00	-\$14 200.00
13:40	\$14 500*	ERM Power	OAKEY2	Energy	\$1411.69	-2.61	-\$3684.51
		CS Energy	CALL_B_2	Energy	\$16.79	2.61	\$43.82
		CS Energy	CALL_B_2	Raise 6 sec	\$14 200.00	-1.00	-\$14 200.00
13:45	\$37.03	CS Energy	GSTONE5	Energy	\$64.73	-1.00	-\$64.73
		CS Energy	GSTONE4	Energy	\$53.73	1.00	\$53.73
		CS Energy	GSTONE5	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE4	Lower 60 sec	\$1.49	1.00	\$1.49
		CS Energy	GSTONE5	Lower 6 sec	\$17.99	-1.00	-\$17.99
		CS Energy	GSTONE4	Lower 6 sec	\$0.45	1.00	\$0.45
		CS Energy	PUMP1	Raise 60 sec	\$14 200.00	1.00	\$14 200.00
		CS Energy	GSTONE4	Raise 60 sec	\$4.99	-1.00	-\$4.99
		CS Energy	GSTONE4	Raise 6 sec	\$4.99	-1.00	-\$4.99
13:50	\$180.58	CS Energy	GSTONE1	Energy	\$53.73	-1.33	-\$71.46
		CS Energy	GSTONE3	Energy	\$53.73	-1.33	-\$71.46
		CS Energy	GSTONE4	Energy	\$53.73	-1.33	-\$71.46
		Millmerran	MPP_1	Energy	\$9.41	1.00	\$9.41
		Stanwell	TNPS1	Energy	\$6.93	1.00	\$6.93
		Callide Power	CPP_3	Energy	-\$1000.00	1.00	-\$1000.00
		Callide Power	CPP_4	Energy	-\$1000.00	1.00	-\$1000.00
		CS Energy	KPP_1	Energy	-\$1000.00	1.00	-\$1000.00
		Stanwell	STAN-3	Energy	-\$1000.00	-1.00	\$1000.00
		Stanwell	STAN-3	Lower reg	\$34.00	-1.00	-\$34.00
		Millmerran	MPP_1	Lower reg	\$18.00	1.00	\$18.00
		Stanwell	STAN-3	Raise reg	\$2000.00	1.00	\$2000.00
		Stanwell	TARONG#1	Raise 60 sec	\$34.00	1.00	\$34.00
13:55	\$14 059.03	CS Energy	GSTONE3	Energy	\$53.73	1.00	\$53.73
		CS Energy	GSTONE4	Energy	\$53.73	-1.00	-\$53.73
		Stanwell	STAN-2	Lower 60 sec	\$14 000.00	-1.00	-\$14 000.00
		CS Energy	GSTONE3	Lower 60 sec	\$1.49	1.00	\$1.49
		Stanwell	STAN-2	Lower 6 sec	\$74.99	-1.00	-\$74.99
		CS Energy	GSTONE3	Lower 6 sec	\$0.45	1.00	\$0.45
		Stanwell	TARONG#1	Raise 60 sec	\$34.00	1.00	\$34.00

DI	Dispatch Price (\$/MW)	Participant	Unit	Service	Offer price (\$/MW)	Marginal change	Contribution
		CS Energy	GSTONE3	Raise 60 sec	\$9.99	-1.00	-\$9.99
		CS Energy	GSTONE3	Raise 6 sec	\$9.99	-1.00	-\$9.99
14:00	\$1085.76	Snowy Hydro	MURRAY	Energy	\$93.00	-0.92	-\$85.56
		Callide Power	CPP_4	Energy	-\$1000.00	1.00	-\$1000.00
14:05	\$14 500*	CS Energy	CALL_B_2	Raise 5 min	\$14 200.00	-2.61	-\$37 062.00
		CS Energy	CALL_B_2	Raise reg	\$260.00	2.61	\$678.60
		CS Energy	CALL_B_2	Raise 6 sec	\$14 200.00	-1.00	-\$14 200.00
14:10	\$14 500*	Stanwell	TARONG#3	Energy	\$300.90	-2.61	-\$785.35
		CS Energy	CALL_B_2	Energy	-\$0.06	2.61	-\$0.16
		Stanwell	STAN-3	Lower reg	\$2000.00	-2.61	-\$5220.00
		CS Energy	CALL_B_2	Lower reg	\$42.27	2.61	\$110.32
		CS Energy	CALL_B_2	Lower 60 sec	\$14 200.00	-2.61	-\$37 062.00
		Stanwell	STAN-3	Lower 60 sec	\$2000.00	2.61	\$5220.00
		CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-1.39	-\$19 738.00
		Stanwell	STAN-3	Lower 6 sec	\$74.99	1.39	\$104.24
		CS Energy	CALL_B_2	Raise 6 sec	\$14 200.00	-1.00	-\$14 200.00
14:15	\$14 500*	Braemar Power	BRAEMAR3	Energy	\$318.08	-2.61	-\$830.19
		CS Energy	CALL_B_2	Energy	-\$0.06	2.61	-\$0.16
		CS Energy	CALL_B_2	Lower 5 min	\$14 200.00	-2.61	-\$37 062.00
		Hydro Tasmania	JBUTTERS	Lower 5 min	\$0.06	2.61	\$0.16
		CS Energy	CALL_B_2	Lower reg	\$42.27	2.61	\$110.32
		EnergyAustralia	MP2	Lower reg	\$32.81	-2.61	-\$85.63
		CS Energy	CALL_B_2	Raise 6 sec	\$14 200.00	-1.00	-\$14 200.00
14:20	\$14 500*	ERMPower and	BRAEMAR6	Energy	\$112.00	-1.47	-\$164.64
		ERMPower and	BRAEMAR7	Energy	\$112.00	-1.14	-\$127.68
		CS Energy	CALL_B_2	Energy	-\$0.06	2.61	-\$0.16
		Stanwell	TARONG#1	Lower reg	\$64.70	-2.61	-\$168.87
		CS Energy	CALL_B_2	Lower reg	\$42.27	2.61	\$110.32
		Stanwell	STAN-2	Lower 60 sec	\$14 000.00	-2.61	-\$36 540.00
		Stanwell	TARONG#1	Lower 60 sec	\$14.95	2.61	\$39.02
		Stanwell	STAN-2	Lower 6 sec	\$74.99	-1.39	-\$104.24
		Stanwell	TARONG#1	Lower 6 sec	\$14.95	1.39	\$20.78
		CS Energy	CALL_B_2	Raise 6 sec	\$14 200.00	-1.00	-\$14 200.00
14:25	\$14 200.00	Stanwell	TARONG#1	Raise 6 sec	\$14 200.00	-1.00	-\$14 200.00
14:30	\$14 200.00	CS Energy	CALL_B_2	Raise 6 sec	\$14 200.00	-1.00	-\$14 200.00
14:35	\$14 262.43	Snowy Hydro	MURRAY	Energy	\$107.00	-1.08	-\$115.56
		CS Energy	GSTONE3	Energy	\$53.73	0.50	\$26.87
		CS Energy	GSTONE4	Energy	\$53.73	0.50	\$26.87

DI	Dispatch Price (\$/MW)	Participant	Unit	Service	Offer price (\$/MW)	Marginal change	Contribution
		CS Energy	GSTONE2	Lower reg	\$4.99	-1.00	-\$4.99
		CS Energy	GSTONE3	Lower reg	\$4.99	0.50	\$2.50
		CS Energy	GSTONE4	Lower reg	\$4.99	0.50	\$2.50
		CS Energy	CALL_B_2	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE2	Lower 60 sec	\$0.45	1.00	\$0.45
		CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE2	Lower 6 sec	\$0.45	1.00	\$0.45
		Stanwell	TARONG#1	Raise 60 sec	\$14 200.00	1.00	\$14 200.00
		CS Energy	GSTONE3	Raise 60 sec	\$0.99	-0.50	-\$0.50
		CS Energy	GSTONE4	Raise 60 sec	\$0.99	-0.50	-\$0.50
		CS Energy	GSTONE3	Raise 6 sec	\$0.74	-0.50	-\$0.37
		CS Energy	GSTONE4	Raise 6 sec	\$0.74	-0.50	-\$0.37
14:40	\$14 200.00	Stanwell	TARONG#1	Raise 6 sec	\$14 200.00	-1.00	-\$14 200.00
14:45	\$14 200.00	Stanwell	TARONG#1	Raise 6 sec	\$14 200.00	-1.00	-\$14 200.00

*Prices are capped at the price cap of \$14 500/MWh

Raise 60 seconds 25 August

DI	Dispatch Price (\$/MW)	Participant	Unit	Service	Offer price (\$/MW)	Marginal change	Contribution
13:20	\$28.99		APD01	Raise 60 sec	\$28.99	-1.00	-\$28.99
13:25	\$14 370.44	Stanwell	STAN-1	Energy	\$64.78	-2.63	-\$170.37
		CS Energy	CALL_B_2	Energy	-\$0.06	2.63	-\$0.16
		CS Energy	CALL_B_2	Raise 60 sec	\$14 200.00	-1.00	-\$14 200.00
			ENOF,CALL_		\$0.00	-368.00	\$0.00
			ENOF,STAN-		\$0.00	-78.86	\$0.00
			ENOF,STAN-		\$0.00	-78.86	\$0.00
13:30	\$14 200.00	CS Energy	CALL_B_2	Raise 60 sec	\$14 200.00	-1.00	-\$14 200.00
13:35	\$14 200.00	CS Energy	CALL_B_2	Raise 60 sec	\$14 200.00	-1.00	-\$14 200.00
13:40	\$14 200.00	CS Energy	CALL_B_2	Raise 60 sec	\$14 200.00	-1.00	-\$14 200.00
13:45	\$14 200.00	CS Energy	PUMP1	Raise 60 sec	\$14 200.00	-1.00	-\$14 200.00
13:50	\$34.00	Stanwell	TARONG#1	Raise 60 sec	\$34.00	-1.00	-\$34.00
13:55	\$34.00	Stanwell	TARONG#1	Raise 60 sec	\$34.00	-1.00	-\$34.00
14:00	\$34.00	Stanwell	TARONG#1	Raise 60 sec	\$34.00	-1.00	-\$34.00
14:05	\$1200.00	CS Energy	CALL_B_2	Raise 60 sec	\$1200.00	-1.00	-\$1200.00
14:10	\$1200.00	CS Energy	CALL_B_2	Raise 60 sec	\$1200.00	-1.00	-\$1200.00
14:15	\$14 200.00	CS Energy	CALL_B_2	Raise 60 sec	\$14 200.00	-1.00	-\$14 200.00
14:20	\$14 200.00	CS Energy	CALL_B_2	Raise 60 sec	\$14 200.00	-1.00	-\$14 200.00
14:25	\$14 200.00	Stanwell	TARONG#1	Raise 60 sec	\$14 200.00	-1.00	-\$14 200.00

14:30	\$14 200.00	CS Energy	CALL_B_2	Raise 60 sec	\$14 200.00	-1.00	-\$14 200.00
14:35	\$14 200.00	Stanwell	TARONG#1	Raise 60 sec	\$14 200.00	-1.00	-\$14 200.00
14:40	\$14 200.00	CS Energy	CALL_B_2	Raise 60 sec	\$14 200.00	-1.00	-\$14 200.00
14:45	\$14 200.00	Stanwell	TARONG#1	Raise 60 sec	\$14 200.00	-1.00	-\$14 200.00

Raise 5 minutes 25 August

DI	Dispatch Price (\$/MW)	Participant	Unit	Service	Offer price (\$/MW)	Marginal change	Contribution
13:25	\$14 500*	Stanwell	TARONG#1	Energy	\$84.60	1.00	\$84.60
		Stanwell	STAN-1	Energy	\$64.78	-1.00	-\$64.78
		CS Energy	GSTONE5	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
		Stanwell	TARONG#1	Lower 60 sec	\$14.95	1.00	\$14.95
		CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-0.53	-\$7526.00
		Stanwell	TARONG#1	Lower 6 sec	\$14.95	0.53	\$7.92
		Stanwell	TARONG#1	Raise reg	\$2000.00	-1.00	-\$2000.00
13:30	\$14 200	CS Energy	CALL_B_2	Raise 5 min	\$14 200.00	-1.00	-\$14 200.00
13:35	\$14 500*	Stanwell	TARONG#3	Energy	\$300.90	-1.00	-\$300.90
		Snowy Hydro	UPPTUMUT	Energy	\$90.00	1.00	\$90.00
		AGL Energy	BW04	Energy	\$52.52	-1.00	-\$52.52
		Stanwell	TARONG#2	Energy	-\$1000.00	1.00	-\$1000.00
		Stanwell	TARONG#2	Lower reg	\$55.00	1.00	\$55.00
		Stanwell	TARONG#1	Lower reg	\$34.00	-1.00	-\$34.00
		CS Energy	CALL_B_2	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
		Stanwell	TARONG#1	Lower 60 sec	\$14.95	1.00	\$14.95
		CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-0.53	-\$7526.00
		Stanwell	TARONG#1	Lower 6 sec	\$14.95	0.53	\$7.92
		Engie	LOYYB1	Raise 5 min	\$28.40	-1.00	-\$28.40
		Stanwell	TARONG#2	Raise reg	\$2000.00	-1.00	-\$2000.00
		AGL Energy	BW04	Raise reg	\$4.00	1.00	\$4.00
13:40	\$14 500*	ERM Power	OAKEY2	Energy	\$1411.69	-1.00	-\$1411.69
		Snowy Hydro	UPPTUMUT	Energy	\$90.00	1.00	\$90.00
		AGL Energy	BW04	Energy	\$52.52	-1.00	-\$52.52
		Stanwell	TARONG#2	Energy	-\$1000.00	1.00	-\$1000.00
		CS Energy	CALL_B_2	Lower 5 min	\$14 200.00	-1.00	-\$14 200.00
		AGL Energy	BW04	Lower reg	\$48.80	-1.00	-\$48.80
		Stanwell	TARONG#2	Lower reg	\$14.95	1.00	\$14.95
		Engie	LOYYB1	Raise 5 min	\$28.40	-1.00	-\$28.40
		Stanwell	TARONG#2	Raise reg	\$2000.00	-1.00	-\$2000.00
		AGL Energy	BW04	Raise reg	\$4.00	1.00	\$4.00
13:45	\$14 500*	CS Energy	GSTONE5	Energy	\$64.73	0.53	\$34.31

DI	Dispatch Price (\$/MW)	Participant	Unit	Service	Offer price (\$/MW)	Marginal change	Contribution
		CS Energy	GSTONE4	Energy	\$53.73	-0.53	-\$28.48
		Stanwell	STAN-2	Energy	\$20.40	-1.00	-\$20.40
		ERMPower and	BRAEMAR6	Energy	\$0.00	1.00	\$0.00
		Stanwell	STAN-2	Lower reg	\$2000.00	-1.00	-\$2000.00
		Stanwell	TARONG#2	Lower reg	\$14.95	1.00	\$14.95
		CS Energy	GSTONE5	Lower 60 sec	\$14 200.00	0.53	\$7526.00
		CS Energy	GSTONE4	Lower 60 sec	\$1.49	-0.53	-\$0.79
		CS Energy	GSTONE5	Lower 6 sec	\$17.99	0.53	\$9.53
		CS Energy	GSTONE4	Lower 6 sec	\$0.45	-0.53	-\$0.24
		Stanwell	TARONG#2	Raise 5 min	\$300.00	-1.00	-\$300.00
		CS Energy	PUMP1	Raise 60 sec	\$14 200.00	-0.53	-\$7526.00
		CS Energy	GSTONE4	Raise 60 sec	\$4.99	0.53	\$2.64
		Stanwell	TARONG#2	Raise 6 sec	\$34.00	-0.53	-\$18.02
		CS Energy	GSTONE4	Raise 6 sec	\$4.99	0.53	\$2.64
13:50	\$14 500*	CS Energy	GSTONE1	Energy	\$53.73	-0.33	-\$17.73
		CS Energy	GSTONE3	Energy	\$53.73	-0.33	-\$17.73
		CS Energy	GSTONE4	Energy	\$53.73	-0.33	-\$17.73
		Stanwell	STAN-3	Energy	-\$1000.00	1.00	-\$1000.00
		Stanwell	STAN-3	Lower reg	\$34.00	1.00	\$34.00
		Stanwell	TARONG#1	Lower reg	\$25.00	-1.00	-\$25.00
		Stanwell	STAN-2	Lower 60 sec	\$14 000.00	-1.00	-\$14 000.00
		Stanwell	TARONG#1	Lower 60 sec	\$14.95	1.00	\$14.95
		Stanwell	STAN-2	Lower 6 sec	\$74.99	-0.53	-\$39.74
		Stanwell	TARONG#1	Lower 6 sec	\$14.95	0.53	\$7.92
		Stanwell	STAN-3	Raise reg	\$2000.00	-1.00	-\$2000.00
13:55	\$8658.67	CS Energy	GSTONE3	Energy	\$53.73	-0.53	-\$28.48
		CS Energy	GSTONE4	Energy	\$53.73	0.53	\$28.48
		Stanwell	STAN-3	Energy	-\$1000.00	1.00	-\$1000.00
		Stanwell	TARONG#2	Energy	-\$1000.00	-1.00	\$1000.00
		Stanwell	STAN-2	Lower 60 sec	\$14 000.00	-0.47	-\$6580.00
		Stanwell	STAN-3	Lower 60 sec	\$147.00	1.00	\$147.00
		CS Energy	GSTONE3	Lower 60 sec	\$1.49	-0.53	-\$0.79
		Stanwell	STAN-3	Lower 6 sec	\$55.00	0.53	\$29.15
		CS Energy	GSTONE3	Lower 6 sec	\$0.45	-0.53	-\$0.24
		Stanwell	TARONG#2	Raise 5 min	\$300.00	-1.00	-\$300.00
		Stanwell	STAN-3	Raise reg	\$2000.00	-1.00	-\$2000.00
		Stanwell	TARONG#2	Raise reg	\$24.97	1.00	\$24.97
		Stanwell	TARONG#1	Raise 60 sec	\$34.00	-0.53	-\$18.02

DI	Dispatch Price (\$/MW)	Participant	Unit	Service	Offer price (\$/MW)	Marginal change	Contribution
		CS Energy	GSTONE3	Raise 60 sec	\$9.99	0.53	\$5.29
		Stanwell	TARONG#2	Raise 6 sec	\$34.00	-0.53	-\$18.02
		CS Energy	GSTONE3	Raise 6 sec	\$9.99	0.53	\$5.29
14:00	\$14 500*	Snowy Hydro	MURRAY	Energy	\$93.00	-3.69	-\$343.17
		Millmerran	MPP_1	Energy	\$9.41	1.00	\$9.41
		Stanwell	TNPS1	Energy	\$6.93	1.00	\$6.93
		Callide Power	CPP_3	Energy	-\$1000.00	1.00	-\$1000.00
		CS Energy	KPP_1	Energy	-\$1000.00	1.00	-\$1000.00
		Stanwell	STAN-3	Lower reg	\$2000.00	-1.00	-\$2000.00
		Millmerran	MPP_1	Lower reg	\$18.00	1.00	\$18.00
		Stanwell	STAN-2	Lower 60 sec	\$14 000.00	-1.00	-\$14 000.00
		Stanwell	STAN-3	Lower 60 sec	\$55.00	1.00	\$55.00
		Stanwell	TARONG#2	Lower 6 sec	\$74.99	-0.53	-\$39.74
		Stanwell	STAN-3	Lower 6 sec	\$34.00	0.53	\$18.02
		Stanwell	TARONG#1	Raise 60 sec	\$34.00	1.00	\$34.00
14:05	\$14 500*	Origin Energy	ER04	Energy	\$48.02	-0.82	-\$39.38
		Stanwell	TARONG#2	Energy	-\$1000.00	1.00	-\$1000.00
		Stanwell	TARONG#1	Lower reg	\$2000.00	-1.00	-\$2000.00
		Stanwell	TARONG#2	Lower reg	\$14.95	1.00	\$14.95
		CS Energy	GSTONE5	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
		Stanwell	TARONG#1	Lower 60 sec	\$34.00	1.00	\$34.00
		CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-0.53	-\$7526.00
		Stanwell	TARONG#1	Lower 6 sec	\$14.95	0.53	\$7.92
		EnergyAustralia	MP1	Raise 5 min	\$28.50	-0.82	-\$23.37
		Origin Energy	ER04	Raise 5 min	\$14.49	0.82	\$11.88
		Stanwell	TARONG#2	Raise reg	\$2000.00	-1.00	-\$2000.00
		AGL Energy	BW02	Raise 60 sec	\$48.00	-0.82	-\$39.36
		Origin Energy	ER04	Raise 60 sec	\$14.75	0.82	\$12.10
14:10	\$14 200	CS Energy	GSTONE5	Raise 5 min	\$14 200.00	-1.00	-\$14 200.00
14:15	\$14 200	CS Energy	CALL_B_2	Raise 5 min	\$14 200.00	-1.00	-\$14 200.00
14:20	\$14 200	CS Energy	CALL_B_2	Raise 5 min	\$14 200.00	-1.00	-\$14 200.00
14:25	\$14 200	CS Energy	CALL_B_2	Raise 5 min	\$14 200.00	-1.00	-\$14 200.00
14:30	\$14 500*	CS Energy	GSTONE4	Raise reg	\$7.20	-1.00	-\$7.20
		CS Energy	CALL_B_2	Raise 60 sec	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE4	Raise 60 sec	\$0.99	1.00	\$0.99
		CS Energy	CALL_B_2	Raise 6 sec	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE4	Raise 6 sec	\$0.74	1.00	\$0.74
14:35	\$14 500*	CS Energy	GSTONE2	Energy	\$59.73	1.00	\$59.73

DI	Dispatch Price (\$/MW)	Participant	Unit	Service	Offer price (\$/MW)	Marginal change	Contribution
		Stanwell	TARONG#2	Energy	-\$1000.00	-1.00	\$1000.00
		Stanwell	TARONG#2	Lower 60 sec	\$14 000.00	-1.00	-\$14 000.00
		CS Energy	GSTONE2	Lower 60 sec	\$0.45	1.00	\$0.45
		CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-0.47	-\$6674.00
		Stanwell	TARONG#2	Lower 6 sec	\$74.99	-0.53	-\$39.74
		CS Energy	GSTONE2	Lower 6 sec	\$0.45	1.00	\$0.45
		Stanwell	TARONG#2	Raise 5 min	\$300.00	-1.00	-\$300.00
		Stanwell	TARONG#2	Raise reg	\$2000.00	1.00	\$2000.00
		CS Energy	GSTONE2	Raise reg	\$7.20	-1.00	-\$7.20
14:40	\$14 200.00	CS Energy	CALL_B_2	Raise 5 min	\$14 200.00	-1.00	-\$14 200.00
14:45	\$14 262.76	Snowy Hydro	MURRAY	Energy	\$107.00	-1.07	-\$114.49
		CS Energy	GSTONE3	Energy	\$53.73	0.50	\$26.87
		CS Energy	GSTONE4	Energy	\$53.73	0.50	\$26.87
		CS Energy	CALL_B_2	Lower 5 min	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE3	Lower reg	\$4.99	0.50	\$2.50
		CS Energy	GSTONE4	Lower reg	\$4.99	0.50	\$2.50
		CS Energy	GSTONE3	Raise reg	\$7.20	-0.50	-\$3.60
		CS Energy	GSTONE4	Raise reg	\$7.20	-0.50	-\$3.60

*Prices are capped at the price cap of \$14 500/MWh

Raise Regulations 25 August

DI	Dispatch Price (\$/MW)	Participant	Unit	Service	Offer price (\$/MW)	Marginal change	Contribution
13:25	\$14 500*	Stanwell	TARONG#1	Energy	\$84.60	1.00	\$84.60
		Stanwell	STAN-1	Energy	\$64.78	-1.00	-\$64.78
		CS Energy	GSTONE5	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
		Stanwell	TARONG#1	Lower 60 sec	\$14.95	1.00	\$14.95
		CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-0.53	-\$7526.00
		Stanwell	TARONG#1	Lower 6 sec	\$14.95	0.53	\$7.92
		Stanwell	TARONG#1	Raise reg	\$2000.00	-1.00	-\$2000.00
13:30	\$14 500*	Stanwell	TARONG#1	Energy	\$84.60	1.00	\$84.60
		CS Energy	GSTONE2	Energy	\$64.73	-0.50	-\$32.37
		CS Energy	GSTONE5	Energy	\$64.73	-0.50	-\$32.37
		CS Energy	GSTONE5	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
		Stanwell	TARONG#1	Lower 60 sec	\$14.95	1.00	\$14.95
		CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-0.53	-\$7526.00
		Stanwell	TARONG#1	Lower 6 sec	\$14.95	0.53	\$7.92
		Stanwell	TARONG#1	Raise reg	\$2000.00	-1.00	-\$2000.00

DI	Dispatch Price (\$/MW)	Participant	Unit	Service	Offer price (\$/MW)	Marginal change	Contribution
13:35	\$14 500*	Stanwell	TARONG#3	Energy	\$300.90	-1.00	-\$300.90
		Stanwell	TARONG#2	Energy	-\$1000.00	1.00	-\$1000.00
		Stanwell	TARONG#2	Lower reg	\$55.00	1.00	\$55.00
		Stanwell	TARONG#1	Lower reg	\$34.00	-1.00	-\$34.00
		CS Energy	CALL_B_2	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
		Stanwell	TARONG#1	Lower 60 sec	\$14.95	1.00	\$14.95
		CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-0.53	-\$7526.00
		Stanwell	TARONG#1	Lower 6 sec	\$14.95	0.53	\$7.92
		Stanwell	TARONG#2	Raise reg	\$2000.00	-1.00	-\$2000.00
13:40	\$14 500*	ERM Power	OAKEY2	Energy	\$1411.69	-1.00	-\$1411.69
		Stanwell	TARONG#2	Energy	-\$1000.00	1.00	-\$1000.00
		CS Energy	CALL_B_2	Lower 5 min	\$14 200.00	-1.00	-\$14 200.00
		Engie	LOYYB2	Lower reg	\$89.99	-1.00	-\$89.99
		Stanwell	TARONG#2	Lower reg	\$14.95	1.00	\$14.95
		Stanwell	TARONG#2	Raise reg	\$2000.00	-1.00	-\$2000.00
13:45	\$5005.45	Stanwell	STAN-2	Energy	\$20.40	-1.00	-\$20.40
		Stanwell	TARONG#2	Energy	-\$1000.00	1.00	-\$1000.00
		Stanwell	STAN-2	Lower reg	\$2000.00	-1.00	-\$2000.00
		Stanwell	TARONG#2	Lower reg	\$14.95	1.00	\$14.95
		Stanwell	TARONG#2	Raise reg	\$2000.00	-1.00	-\$2000.00
13:50	\$14 500*	CS Energy	GSTONE1	Energy	\$53.73	-0.33	-\$17.73
		CS Energy	GSTONE3	Energy	\$53.73	-0.33	-\$17.73
		CS Energy	GSTONE4	Energy	\$53.73	-0.33	-\$17.73
		Stanwell	STAN-3	Energy	-\$1000.00	1.00	-\$1000.00
		Stanwell	STAN-3	Lower reg	\$34.00	1.00	\$34.00
		Stanwell	TARONG#1	Lower reg	\$25.00	-1.00	-\$25.00
		Stanwell	STAN-2	Lower 60 sec	\$14 000.00	-1.00	-\$14 000.00
		Stanwell	TARONG#1	Lower 60 sec	\$14.95	1.00	\$14.95
		Stanwell	STAN-2	Lower 6 sec	\$74.99	-0.53	-\$39.74
		Stanwell	TARONG#1	Lower 6 sec	\$14.95	0.53	\$7.92
		Stanwell	STAN-3	Raise reg	\$2000.00	-1.00	-\$2000.00
13:55	\$14 500*	CS Energy	GSTONE4	Energy	\$53.73	-1.00	-\$53.73
		Stanwell	STAN-3	Energy	-\$1000.00	1.00	-\$1000.00
		Stanwell	STAN-2	Lower 60 sec	\$14 000.00	-1.00	-\$14 000.00
		Stanwell	STAN-3	Lower 60 sec	\$147.00	1.00	\$147.00
		Stanwell	STAN-2	Lower 6 sec	\$74.99	-0.53	-\$39.74
		Stanwell	STAN-3	Lower 6 sec	\$55.00	0.53	\$29.15
		Stanwell	STAN-3	Raise reg	\$2000.00	-1.00	-\$2000.00

DI	Dispatch Price (\$/MW)	Participant	Unit	Service	Offer price (\$/MW)	Marginal change	Contribution
14:00	\$14 500*	Snowy Hydro	MURRAY	Energy	\$93.00	-0.92	-\$85.56
		Stanwell	TARONG#2	Energy	-\$1000.00	1.00	-\$1000.00
		Stanwell	STAN-3	Lower reg	\$2000.00	-1.00	-\$2000.00
		Stanwell	TARONG#2	Lower reg	\$34.00	1.00	\$34.00
		Stanwell	STAN-2	Lower 60 sec	\$14 000.00	-1.00	-\$14 000.00
		Stanwell	STAN-3	Lower 60 sec	\$55.00	1.00	\$55.00
		Stanwell	TARONG#2	Lower 6 sec	\$74.99	-0.53	-\$39.74
		Stanwell	STAN-3	Lower 6 sec	\$34.00	0.53	\$18.02
		Stanwell	TARONG#2	Raise reg	\$2000.00	-1.00	-\$2000.00
14:05	\$14 500*	Origin Energy	ER04	Energy	\$48.02	-0.82	-\$39.38
		Stanwell	TARONG#2	Energy	-\$1000.00	1.00	-\$1000.00
		Stanwell	TARONG#1	Lower reg	\$2000.00	-1.00	-\$2000.00
		Stanwell	TARONG#2	Lower reg	\$14.95	1.00	\$14.95
		CS Energy	GSTONE5	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
		Stanwell	TARONG#1	Lower 60 sec	\$34.00	1.00	\$34.00
		CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-0.53	-\$7526.00
		Stanwell	TARONG#1	Lower 6 sec	\$14.95	0.53	\$7.92
		EnergyAustralia	MP1	Raise 5 min	\$28.50	-0.82	-\$23.37
		Origin Energy	ER04	Raise 5 min	\$14.49	0.82	\$11.88
		Stanwell	TARONG#2	Raise reg	\$2000.00	-1.00	-\$2000.00
		AGL Energy	BW02	Raise 60 sec	\$48.00	-0.82	-\$39.36
		Origin Energy	ER04	Raise 60 sec	\$14.75	0.82	\$12.10
14:10	\$14 500*	Stanwell	TARONG#3	Energy	\$300.90	-1.00	-\$300.90
		CS Energy	CALL_B_2	Energy	-\$0.06	1.00	-\$0.06
		Stanwell	STAN-3	Lower reg	\$2000.00	-1.00	-\$2000.00
		CS Energy	CALL_B_2	Lower reg	\$42.27	1.00	\$42.27
		CS Energy	CALL_B_2	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
		Stanwell	STAN-3	Lower 60 sec	\$2000.00	1.00	\$2000.00
		CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-0.53	-\$7526.00
		Stanwell	STAN-3	Lower 6 sec	\$74.99	0.53	\$39.74
		CS Energy	CALL_B_2	Raise reg	\$14 200.00	-1.00	-\$14 200.00
14:15	\$14 500*	Braemar Power	BRAEMAR3	Energy	\$318.08	-1.00	-\$318.08
		CS Energy	CALL_B_2	Energy	-\$0.06	1.00	-\$0.06
		CS Energy	CALL_B_2	Lower 5 min	\$14 200.00	-1.00	-\$14 200.00
		Hydro Tasmania	JBUTTERS	Lower 5 min	\$0.06	1.00	\$0.06
		CS Energy	CALL_B_2	Lower reg	\$42.27	1.00	\$42.27
		EnergyAustralia	MP2	Lower reg	\$32.81	-1.00	-\$32.81
		CS Energy	CALL_B_2	Raise reg	\$14 200.00	-1.00	-\$14 200.00

DI	Dispatch Price (\$/MW)	Participant	Unit	Service	Offer price (\$/MW)	Marginal change	Contribution
14:20	\$14 500*	ERMPower and	BRAEMAR6	Energy	\$112.00	-0.56	-\$62.72
		ERMPower and	BRAEMAR7	Energy	\$112.00	-0.44	-\$49.28
		CS Energy	CALL_B_2	Energy	-\$0.06	1.00	-\$0.06
		Stanwell	TARONG#1	Lower reg	\$64.70	-1.00	-\$64.70
		CS Energy	CALL_B_2	Lower reg	\$42.27	1.00	\$42.27
		Stanwell	STAN-2	Lower 60 sec	\$14 000.00	-1.00	-\$14 000.00
		Stanwell	TARONG#1	Lower 60 sec	\$14.95	1.00	\$14.95
		Stanwell	STAN-2	Lower 6 sec	\$74.99	-0.53	-\$39.74
		Stanwell	TARONG#1	Lower 6 sec	\$14.95	0.53	\$7.92
		CS Energy	CALL_B_2	Raise reg	\$14 200.00	-1.00	-\$14 200.00
14:25	\$14 500*	CS Energy	GSTONE2	Energy	\$59.73	-1.00	-\$59.73
		CS Energy	CALL_B_2	Energy	-\$1000.00	1.00	-\$1000.00
		CS Energy	CALL_B_2	Lower 5 min	\$14 200.00	-1.00	-\$14 200.00
		Engie	LOYYB2	Lower 5 min	\$0.07	1.00	\$0.07
		Stanwell	TARONG#1	Lower reg	\$2000.00	-1.00	-\$2000.00
		CS Energy	CALL_B_2	Lower reg	\$42.27	2.00	\$84.54
		EnergyAustralia	MP1	Lower reg	\$31.81	-1.00	-\$31.81
		Stanwell	TARONG#1	Lower 60 sec	\$2000.00	1.00	\$2000.00
		CS Energy	CALL_B_2	Lower 60 sec	\$1200.00	-1.00	-\$1200.00
		Stanwell	TARONG#1	Lower 6 sec	\$2000.00	1.00	\$2000.00
		CS Energy	CALL_B_2	Lower 6 sec	\$1200.00	-1.00	-\$1200.00
		CS Energy	CALL_B_2	Raise reg	\$14 200.00	-1.00	-\$14 200.00
14:30	\$14 500*	CS Energy	GSTONE4	Raise reg	\$7.20	-1.00	-\$7.20
		CS Energy	CALL_B_2	Raise 60 sec	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE4	Raise 60 sec	\$0.99	1.00	\$0.99
		CS Energy	CALL_B_2	Raise 6 sec	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE4	Raise 6 sec	\$0.74	1.00	\$0.74
14:35	\$14 500*	Snowy Hydro	MURRAY	Energy	\$107.00	-1.08	-\$115.56
		CS Energy	GSTONE2	Energy	\$59.73	1.00	\$59.73
		CS Energy	CALL_B_2	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE2	Lower 60 sec	\$0.45	1.00	\$0.45
		CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE2	Lower 6 sec	\$0.45	1.00	\$0.45
		CS Energy	GSTONE2	Raise reg	\$7.20	-1.00	-\$7.20
14:40	\$14 500*	CS Energy	GSTONE2	Energy	\$59.73	1.00	\$59.73
		CS Energy	GSTONE1	Energy	\$53.73	-1.00	-\$53.73
		CS Energy	GSTONE1	Lower reg	\$4.99	-1.00	-\$4.99
		CS Energy	GSTONE2	Lower reg	\$4.99	1.00	\$4.99

DI	Dispatch Price (\$/MW)	Participant	Unit	Service	Offer price (\$/MW)	Marginal change	Contribution
		CS Energy	GSTONE2	Raise reg	\$7.20	-1.00	-\$7.20
		CS Energy	CALL_B_2	Raise 60 sec	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE1	Raise 60 sec	\$0.99	1.00	\$0.99
		Stanwell	TARONG#1	Raise 6 sec	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE1	Raise 6 sec	\$0.74	1.00	\$0.74
14:45	\$14 262.76	Snowy Hydro	MURRAY	Energy	\$107.00	-1.07	-\$114.49
		CS Energy	GSTONE3	Energy	\$53.73	0.50	\$26.87
		CS Energy	GSTONE4	Energy	\$53.73	0.50	\$26.87
		CS Energy	CALL_B_2	Lower 5 min	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE3	Lower reg	\$4.99	0.50	\$2.50
		CS Energy	GSTONE4	Lower reg	\$4.99	0.50	\$2.50
		CS Energy	GSTONE3	Raise reg	\$7.20	-0.50	-\$3.60
		CS Energy	GSTONE4	Raise reg	\$7.20	-0.50	-\$3.60

Lower 6 seconds 25 August

DI	Dispatch Price (\$/MW)	Participant	Unit	Service	Offer price (\$/MW)	Marginal change	Contribution
13:25	\$14 200.00	CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-1.00	-\$14 200.00
13:30	\$14 200.00	CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-1.00	-\$14 200.00
13:35	\$14 200.00	CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-1.00	-\$14 200.00
13:40	\$14 200.00	CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-1.00	-\$14 200.00
13:45	\$82.72	CS Energy	GSTONE5	Energy	\$64.73	-1.00	-\$64.73
		ERMPower and	BRAEMAR6	Energy	\$0.00	1.00	\$0.00
		CS Energy	GSTONE5	Lower 6 sec	\$17.99	-1.00	-\$17.99
13:50	\$74.99	Stanwell	STAN-2	Lower 6 sec	\$74.99	-1.00	-\$74.99
13:55	\$74.99	Stanwell	STAN-2	Lower 6 sec	\$74.99	-1.00	-\$74.99
14:00	\$74.99	Stanwell	TARONG#2	Lower 6 sec	\$74.99	-1.00	-\$74.99
14:05	\$14 200	CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-1.00	-\$14 200.00
14:10	\$14 200	CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-1.00	-\$14 200.00
14:15	\$14 200	CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-1.00	-\$14 200.00
14:20	\$74.99	Stanwell	STAN-2	Lower 6 sec	\$74.99	-1.00	-\$74.99
14:25	\$14 500*	Stanwell	TARONG#1	Lower 6 sec	\$2000.00	-1.00	-\$2000.00
14:30	\$12 651.52	CS Energy	GSTONE3	Energy	\$53.73	-0.50	-\$26.87
		CS Energy	GSTONE4	Energy	\$53.73	-0.50	-\$26.87
		CS Energy	CALL_B_2	Energy	-\$1000.00	1.00	-\$1000.00
		Stanwell	TARONG#1	Lower reg	\$2000.00	1.00	\$2000.00
		CS Energy	GSTONE3	Lower reg	\$4.99	-0.50	-\$2.50

DI	Dispatch Price _(\$/MW)	Participant	Unit	Service	Offer price _(\$/MW)	Marginal change	Contribution
		CS Energy	GSTONE4	Lower reg	\$4.99	-0.50	-\$2.50
		CS Energy	CALL_B_2	Lower 60 sec	\$1200.00	1.00	\$1200.00
		Stanwell	TARONG#1	Lower 60 sec	\$300.00	-1.00	-\$300.00
		Stanwell	TARONG#1	Lower 6 sec	\$300.00	-1.00	-\$300.00
		CS Energy	CALL_B_2	Raise reg	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE4	Raise reg	\$7.20	1.00	\$7.20
		CS Energy	GSTONE3	Raise 60 sec	\$0.99	0.50	\$0.50
		CS Energy	GSTONE4	Raise 60 sec	\$0.99	-0.50	-\$0.50
		CS Energy	GSTONE3	Raise 6 sec	\$0.74	0.50	\$0.37
		CS Energy	GSTONE4	Raise 6 sec	\$0.74	-0.50	-\$0.37
14:35	\$14 200	CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-1.00	-\$14 200.00
14:40	\$14 500*	ERMPower and	BRAEMAR6	Energy	\$150.01	0.56	\$84.01
		ERMPower and	BRAEMAR7	Energy	\$150.01	0.44	\$66.00
		CS Energy	GSTONE3	Energy	\$53.73	-0.50	-\$26.87
		CS Energy	GSTONE4	Energy	\$53.73	-0.50	-\$26.87
		CS Energy	CALL_B_2	Lower 60 sec	\$14 200.00	1.00	\$14 200.00
		CS Energy	GSTONE3	Lower 60 sec	\$1200.00	-0.50	-\$600.00
		CS Energy	GSTONE4	Lower 60 sec	\$1200.00	-0.50	-\$600.00
		CS Energy	GSTONE3	Lower 6 sec	\$17.99	-0.50	-\$9.00
		CS Energy	GSTONE4	Lower 6 sec	\$17.99	-0.50	-\$9.00
		CS Energy	CALL_B_2	Raise 60 sec	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE3	Raise 60 sec	\$0.99	0.50	\$0.50
		CS Energy	GSTONE4	Raise 60 sec	\$0.99	0.50	\$0.50
		Stanwell	TARONG#1	Raise 6 sec	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE3	Raise 6 sec	\$0.74	0.50	\$0.37
		CS Energy	GSTONE4	Raise 6 sec	\$0.74	0.50	\$0.37
14:45	\$14 200	Stanwell	TARONG#1	Lower 6 sec	\$14 200.00	-1.00	-\$14 200.00

Lower 60 seconds 25 August

DI	Dispatch Price (\$/MW)	Participant	Unit	Service	Offer price (\$/MW)	Marginal change	Contribution
13:25	\$14 200	CS Energy	GSTONE5	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
13:30	\$14 200	CS Energy	GSTONE5	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
13:35	\$14 200	CS Energy	CALL_B_2	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
13:40	\$14 200	CS Energy	CALL_B_2	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
13:45	\$14 200	CS Energy	GSTONE5	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
13:50	\$14 000	Stanwell	STAN-2	Lower 60 sec	\$14 000.00	-1.00	-\$14 000.00

DI	Dispatch Price (\$/MW)	Participant	Unit	Service	Offer price (\$/MW)	Marginal change	Contribution
13:55	\$14 000	Stanwell	STAN-2	Lower 60 sec	\$14 000.00	-1.00	-\$14 000.00
14:00	\$14 000	Stanwell	STAN-2	Lower 60 sec	\$14 000.00	-1.00	-\$14 000.00
14:05	\$14 200	CS Energy	GSTONE5	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
14:10	\$14 200	CS Energy	CALL_B_2	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
14:15	\$14 200	CS Energy	CALL_B_2	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
14:20	\$14 000	Stanwell	STAN-2	Lower 60 sec	\$14 000.00	-1.00	-\$14 000.00
14:25	\$14 500*	CS Energy	CALL_B_2	Lower 5 min	\$14 200.00	-1.00	-\$14 200.00
		Engie	LOYYB2	Lower 5 min	\$0.07	1.00	\$0.07
		CS Energy	CALL_B_2	Lower reg	\$42.27	1.00	\$42.27
		EnergyAustralia	MP1	Lower reg	\$31.81	-1.00	-\$31.81
		CS Energy	CALL_B_2	Lower 60 sec	\$1200.00	-1.00	-\$1200.00
		Stanwell	TARONG#1	Lower 6 sec	\$2000.00	1.00	\$2000.00
		CS Energy	CALL_B_2	Lower 6 sec	\$1200.00	-1.00	-\$1200.00
14:30	\$14 293	ERMPower and	BRAEMAR6	Energy	\$112.00	0.56	\$62.72
		ERMPower and	BRAEMAR7	Energy	\$112.00	0.44	\$49.28
		CS Energy	CALL_B_2	Energy	-\$1000.00	-1.00	\$1000.00
		CS Energy	CALL_B_2	Lower 60 sec	\$1200.00	-1.00	-\$1200.00
		CS Energy	CALL_B_2	Raise reg	\$14 200.00	1.00	\$14 200.00
		CS Energy	GSTONE4	Raise reg	\$7.20	-1.00	-\$7.20
		CS Energy	CALL_B_2	Raise 60 sec	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE4	Raise 60 sec	\$0.99	1.00	\$0.99
		CS Energy	CALL_B_2	Raise 6 sec	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE4	Raise 6 sec	\$0.74	1.00	\$0.74
14:35	\$14 200	CS Energy	CALL_B_2	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
14:40	\$14 200	CS Energy	CALL_B_2	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
14:45	\$14 500*	CS Energy	CALL_B_2	Lower 5 min	\$14 200.00	-1.00	-\$14 200.00
		Stanwell	TARONG#1	Lower reg	\$2000.00	1.00	\$2000.00
		Stanwell	TARONG#1	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00

Lower 5 minutes 25 August

DI	Dispatch Price (\$/MW)	Participant	Unit	Service	Offer price (\$/MW)	Marginal change	Contribution
13:25	\$14 500*	EnergyAustralia	MP1	Lower reg	\$298.81	1.00	\$298.81
		Stanwell	TARONG#1	Lower reg	\$55.00	-1.00	-\$55.00
		CS Energy	GSTONE5	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
		Stanwell	TARONG#1	Lower 60 sec	\$14.95	1.00	\$14.95
		CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-0.53	-\$7526.00
		Stanwell	TARONG#1	Lower 6 sec	\$14.95	0.53	\$7.92

DI	Dispatch Price (\$/MW)	Participant	Unit	Service	Offer price (\$/MW)	Marginal change	Contribution
13:30	\$14 200	CS Energy	CALL_B_2	Lower 5 min	\$14 200.00	-1.00	-\$14 200.00
13:35	\$14 500*	EnergyAustralia	MP2	Lower reg	\$68.81	1.00	\$68.81
		Stanwell	TARONG#1	Lower reg	\$34.00	-1.00	-\$34.00
		CS Energy	CALL_B_2	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
		Stanwell	TARONG#1	Lower 60 sec	\$14.95	1.00	\$14.95
		CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-0.53	-\$7526.00
		Stanwell	TARONG#1	Lower 6 sec	\$14.95	0.53	\$7.92
13:40	\$14 200	CS Energy	CALL_B_2	Lower 5 min	\$14 200.00	-1.00	-\$14 200.00
13:45	\$0.00	Snowy Hydro	UPPTUMUT	Lower 5 min	\$0.00	-1.00	\$0.00
14:05	\$14 500*	Stanwell	TARONG#1	Lower reg	\$2000.00	-1.00	-\$2000.00
		EnergyAustralia	MP2	Lower reg	\$68.81	1.00	\$68.81
		CS Energy	GSTONE5	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
		Stanwell	TARONG#1	Lower 60 sec	\$34.00	1.00	\$34.00
		CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-0.53	-\$7526.00
		Stanwell	TARONG#1	Lower 6 sec	\$14.95	0.53	\$7.92
14:10	\$14 500*	Stanwell	STAN-3	Lower reg	\$2000.00	-1.00	-\$2000.00
		AGL Energy	BW03	Lower reg	\$48.80	1.00	\$48.80
		Hydro Tasmania	JBUTTERS	Lower reg	\$0.01	-1.00	-\$0.01
		CS Energy	CALL_B_2	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
		Stanwell	STAN-3	Lower 60 sec	\$2000.00	1.00	\$2000.00
		CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-0.53	-\$7526.00
		Stanwell	STAN-3	Lower 6 sec	\$74.99	0.53	\$39.74
14:15	\$14 200	CS Energy	CALL_B_2	Lower 5 min	\$14 200.00	-1.00	-\$14 200.00
14:20	\$1200	CS Energy	CALL_B_2	Lower 5 min	\$1200.00	-1.00	-\$1200.00
14:25	\$14 500*	CS Energy	CALL_B_2	Lower 5 min	\$14 200.00	-1.00	-\$14 200.00
		Stanwell	TARONG#1	Lower reg	\$2000.00	-1.00	-\$2000.00
		CS Energy	CALL_B_2	Lower reg	\$42.27	1.00	\$42.27
		Stanwell	TARONG#1	Lower 60 sec	\$2000.00	1.00	\$2000.00
		CS Energy	CALL_B_2	Lower 60 sec	\$1200.00	-1.00	-\$1200.00
		Stanwell	TARONG#1	Lower 6 sec	\$2000.00	1.00	\$2000.00
		CS Energy	CALL_B_2	Lower 6 sec	\$1200.00	-1.00	-\$1200.00
14:30	\$14 500*	AGL (SA)	TORRB3	Energy	\$115.00	1.00	\$115.00
		ERMPower and	BRAEMAR6	Energy	\$112.00	0.56	\$62.72
		ERMPower and	BRAEMAR7	Energy	\$112.00	0.44	\$49.28
		Snowy Hydro	MURRAY	Energy	\$107.00	-0.86	-\$92.02
		CS Energy	GSTONE3	Energy	\$53.73	-0.50	-\$26.87
		CS Energy	GSTONE4	Energy	\$53.73	-0.50	-\$26.87
		Engie	LOYYB1	Lower 5 min	\$0.07	-1.00	-\$0.07

DI	Dispatch Price (\$/MW)	Participant	Unit	Service	Offer price (\$/MW)	Marginal change	Contribution
		AGL (SA)	TORRB3	Lower reg	\$45.99	1.00	\$45.99
		CS Energy	GSTONE3	Lower reg	\$4.99	-0.50	-\$2.50
		CS Energy	GSTONE4	Lower reg	\$4.99	-0.50	-\$2.50
		CS Energy	CALL_B_2	Raise 60 sec	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE3	Raise 60 sec	\$0.99	0.50	\$0.50
		CS Energy	GSTONE4	Raise 60 sec	\$0.99	0.50	\$0.50
		CS Energy	CALL_B_2	Raise 6 sec	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE3	Raise 6 sec	\$0.74	0.50	\$0.37
		CS Energy	GSTONE4	Raise 6 sec	\$0.74	0.50	\$0.37
14:35	\$14 200	CS Energy	CALL_B_2	Lower 5 min	\$14 200.00	-1.00	-\$14 200.00
14:40	\$14 200	CS Energy	CALL_B_2	Lower 5 min	\$14 200.00	-1.00	-\$14 200.00
14:45	\$14 200	CS Energy	CALL_B_2	Lower 5 min	\$14 200.00	-1.00	-\$14 200.00

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DI	Dispatch Price (\$/MW)	Participant	Unit	Service	Offer price (\$/MW)	Marginal change	Contribution
13:25	\$14 500*	Stanwell	TARONG#1	Lower reg	\$55.00	-1.00	-\$55.00
		CS Energy	GSTONE5	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
		Stanwell	TARONG#1	Lower 60 sec	\$14.95	1.00	\$14.95
		CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-0.53	-\$7526.00
		Stanwell	TARONG#1	Lower 6 sec	\$14.95	0.53	\$7.92
13:30	\$14 500*	Stanwell	TARONG#1	Lower reg	\$25.00	-1.00	-\$25.00
		CS Energy	GSTONE5	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
		Stanwell	TARONG#1	Lower 60 sec	\$14.95	1.00	\$14.95
		CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-0.53	-\$7526.00
		Stanwell	TARONG#1	Lower 6 sec	\$14.95	0.53	\$7.92
13:35	\$14 500*	Stanwell	TARONG#1	Lower reg	\$34.00	-1.00	-\$34.00
		CS Energy	CALL_B_2	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
		Stanwell	TARONG#1	Lower 60 sec	\$14.95	1.00	\$14.95
		CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-0.53	-\$7526.00
		Stanwell	TARONG#1	Lower 6 sec	\$14.95	0.53	\$7.92
13:40	\$14 290	CS Energy	CALL_B_2	Lower 5 min	\$14 200.00	-1.00	-\$14 200.00
		Engie	LOYYB2	Lower reg	\$89.99	-1.00	-\$89.99
13:45	\$14 500*	Stanwell	STAN-2	Energy	\$20.40	-1.00	-\$20.40
		ERMPower and	BRAEMAR6	Energy	\$0.00	1.00	\$0.00
		Stanwell	STAN-2	Lower reg	\$2000.00	-1.00	-\$2000.00
13:50	\$14 042.07	Stanwell	TARONG#1	Lower reg	\$25.00	-1.00	-\$25.00

DI	Dispatch Price (\$/MW)	Participant	Unit	Service	Offer price (\$/MW)	Marginal change	Contribution
		Stanwell	STAN-2	Lower 60 sec	\$14 000.00	-1.00	-\$14 000.00
		Stanwell	TARONG#1	Lower 60 sec	\$14.95	1.00	\$14.95
		Stanwell	STAN-2	Lower 6 sec	\$74.99	-0.53	-\$39.74
		Stanwell	TARONG#1	Lower 6 sec	\$14.95	0.53	\$7.92
13:55	\$14 163.66	Stanwell	STAN-3	Lower reg	\$300.00	-1.00	-\$300.00
		Stanwell	STAN-2	Lower 60 sec	\$14 000.00	-1.00	-\$14 000.00
		Stanwell	STAN-3	Lower 60 sec	\$147.00	1.00	\$147.00
		Stanwell	STAN-2	Lower 6 sec	\$74.99	-0.53	-\$39.74
		Stanwell	STAN-3	Lower 6 sec	\$55.00	0.53	\$29.15
14:00	\$14 500*	Stanwell	STAN-3	Lower reg	\$2000.00	-1.00	-\$2000.00
		Stanwell	STAN-2	Lower 60 sec	\$14 000.00	-1.00	-\$14 000.00
		Stanwell	STAN-3	Lower 60 sec	\$55.00	1.00	\$55.00
		Stanwell	TARONG#2	Lower 6 sec	\$74.99	-0.53	-\$39.74
		Stanwell	STAN-3	Lower 6 sec	\$34.00	0.53	\$18.02
14:05	\$14 500*	Stanwell	TARONG#1	Lower reg	\$2000.00	-1.00	-\$2000.00
		CS Energy	GSTONE5	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
		Stanwell	TARONG#1	Lower 60 sec	\$34.00	1.00	\$34.00
		CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-0.53	-\$7526.00
		Stanwell	TARONG#1	Lower 6 sec	\$14.95	0.53	\$7.92
14:10	\$14 500*	Stanwell	STAN-3	Lower reg	\$2000.00	-1.00	-\$2000.00
		CS Energy	CALL_B_2	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
		Stanwell	STAN-3	Lower 60 sec	\$2000.00	1.00	\$2000.00
		CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-0.53	-\$7526.00
		Stanwell	STAN-3	Lower 6 sec	\$74.99	0.53	\$39.74
		CS Energy	CALL_B_2	Lower 5 min	\$14 200.00	-1.00	-\$14 200.00
		Hydro Tasmania	JBUTTERS	Lower 5 min	\$0.06	1.00	\$0.06
14:15	\$14 232.75	EnergyAustralia	MP2	Lower reg	\$32.81	-1.00	-\$32.81
14:20	\$14 081.77	Stanwell	TARONG#1	Lower reg	\$64.70	-1.00	-\$64.70
		Stanwell	STAN-2	Lower 60 sec	\$14 000.00	-1.00	-\$14 000.00
		Stanwell	TARONG#1	Lower 60 sec	\$14.95	1.00	\$14.95
		Stanwell	STAN-2	Lower 6 sec	\$74.99	-0.53	-\$39.74
		Stanwell	TARONG#1	Lower 6 sec	\$14.95	0.53	\$7.92
14:25	\$14 500*	CS Energy	CALL_B_2	Lower 5 min	\$14 200.00	-1.00	-\$14 200.00
		Engie	LOYYB2	Lower 5 min	\$0.07	1.00	\$0.07
		Stanwell	TARONG#1	Lower reg	\$2000.00	-1.00	-\$2000.00
		CS Energy	CALL_B_2	Lower reg	\$42.27	1.00	\$42.27
		EnergyAustralia	MP1	Lower reg	\$31.81	-1.00	-\$31.81
		Stanwell	TARONG#1	Lower 60 sec	\$2000.00	1.00	\$2000.00

DI	Dispatch Price (\$/MW)	Participant	Unit	Service	Offer price (\$/MW)	Marginal change	Contribution
		CS Energy	CALL_B_2	Lower 60 sec	\$1200.00	-1.00	-\$1200.00
		Stanwell	TARONG#1	Lower 6 sec	\$2000.00	1.00	\$2000.00
		CS Energy	CALL_B_2	Lower 6 sec	\$1200.00	-1.00	-\$1200.00
14:30	\$14 500*	ERMPower and	BRAEMAR6	Energy	\$112.00	0.56	\$62.72
		ERMPower and	BRAEMAR7	Energy	\$112.00	0.44	\$49.28
		CS Energy	GSTONE3	Energy	\$53.73	-0.50	-\$26.87
		CS Energy	GSTONE4	Energy	\$53.73	-0.50	-\$26.87
		CS Energy	GSTONE3	Lower reg	\$4.99	-0.50	-\$2.50
		CS Energy	GSTONE4	Lower reg	\$4.99	-0.50	-\$2.50
		CS Energy	CALL_B_2	Raise 60 sec	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE3	Raise 60 sec	\$0.99	0.50	\$0.50
		CS Energy	GSTONE4	Raise 60 sec	\$0.99	0.50	\$0.50
		CS Energy	CALL_B_2	Raise 6 sec	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE3	Raise 6 sec	\$0.74	0.50	\$0.37
		CS Energy	GSTONE4	Raise 6 sec	\$0.74	0.50	\$0.37
14:35	\$14 500*	CS Energy	GSTONE2	Lower reg	\$4.99	-1.00	-\$4.99
		CS Energy	CALL_B_2	Lower 60 sec	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE2	Lower 60 sec	\$0.45	1.00	\$0.45
		CS Energy	CALL_B_2	Lower 6 sec	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE2	Lower 6 sec	\$0.45	1.00	\$0.45
14:40	\$14 500*	ERMPower and	BRAEMAR6	Energy	\$150.01	0.56	\$84.01
		ERMPower and	BRAEMAR7	Energy	\$150.01	0.44	\$66.00
		CS Energy	GSTONE1	Energy	\$53.73	-1.00	-\$53.73
		CS Energy	GSTONE1	Lower reg	\$4.99	-1.00	-\$4.99
		CS Energy	CALL_B_2	Raise 60 sec	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE1	Raise 60 sec	\$0.99	1.00	\$0.99
		Stanwell	TARONG#1	Raise 6 sec	\$14 200.00	-1.00	-\$14 200.00
		CS Energy	GSTONE1	Raise 6 sec	\$0.74	1.00	\$0.74
14:45	\$14 200	CS Energy	CALL_B_2	Lower 5 min	\$14 200.00	-1.00	-\$14 200.00

*Prices are capped at the price cap of \$14 500/MWh