

Spot prices greater than \$5000/MWh



AUSTRALIAN ENERGY
REGULATOR

South Australia: 19 January 2009

Introduction

The AER is required to publish a report covering the circumstances in which the spot price exceeds \$5000/MWh, pursuant to clause 3.13.7 (d) of the Rules. That report should:

- describe significant factors contributing to the spot price exceeding \$5000/MWh, including withdrawal of generation capacity and network availability;
- assess whether rebidding pursuant to clause 3.8.22 contributed to the spot price exceeding \$5000/MWh;
- identify the marginal scheduled generating units; and
- identify all units with offers for the trading interval equal to or greater than \$5000/MWh and compare these dispatch offers to relevant dispatch offers in previous trading intervals.

Summary/assessment

On Monday 19 January the spot price in South Australia exceeded \$5000/MWh for the 12.30 pm trading interval and was close to the price cap for five trading intervals between 2 pm and 4 pm inclusive.

The spot price reached \$5050/MWh for the 12.30 pm trading interval due to an incorrect input into the dispatch process. NEMMCO has declared that this constituted a scheduling error.

In relation to the later trading intervals, high demand caused by extreme temperatures led to high-priced capacity being dispatched. Rebidding at around 11.30 am by AGL shifted 340 MW of available capacity from prices below \$101/MWh to the price cap. Dispatch of this AGL capacity set the price for the majority of the time between 1.35 pm and 4 pm.

Scheduling error - 12.30 pm spot price

The prices for the dispatch intervals ending 12.15 pm to 12.25 pm were affected by an incorrect input to the dispatch process (a manifestly incorrect input¹) related to the Davenport to Brinkworth 275 kV transmission line metering. This affected constraint equations controlling the dispatch of the Murraylink interconnector and generation north of Adelaide and caused a step change in the dispatch of flows on both the Heywood and Murraylink interconnectors. The flows across Murray link changed from 129 MW into South Australia to 128 MW out of South Australia and imports into South Australia across Heywood increased from 364 MW to 490 MW, (exceeding the import limit by around 140 MW). This resulted in a net reduction in imports of around 130 MW and caused the five minute price to increase from \$100/MWh to the price cap for the 12.15 pm to 12.25 pm dispatch intervals.

¹ NER clause 3.9.2B - Pricing where NEMMCO determines a manifestly incorrect input.

The energy prices for these dispatch intervals were automatically triggered as “subject to review”. Under the NER, NEMMCO has 30 minutes within which to adjust the price relevant to affected dispatch intervals. Problems with NEMMCO’s IT systems prevented the adjustment and the prices of \$9999.98/MWh or greater remained for these dispatch intervals, rather than being replaced with the 12.10 pm dispatch interval price of \$100.77/MWh. As a result the spot price reached \$5050/MWh for the 12.30 pm trading interval. NEMMCO has concluded that this was a scheduling error and is investigating the incident further to prevent a recurrence.

The remainder of this report deals with the five trading intervals between 2 pm and 4 pm inclusive when the spot price exceeded \$5000/MWh.

Actual and forecast demand

The temperature in Adelaide on the day reached a maximum of 37 degrees, driving high demand. Demand was above 2500 MW between 2 pm and 4 pm, reaching a maximum of 2631 MW at 4 pm. At the time of high prices demand was greater than forecast four and 12 hours ahead.

Figure 1: South Australia spot price, demand and available capacity

2:00 pm	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	9999.68	63.90	65.10
Demand (MW)	2558	2450	2389
Available capacity (MW)	2530	2651	2657
2:30 pm	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	8499.68	1000.00	81.02
Demand (MW)	2580	2471	2407
Available capacity (MW)	2604	2664	2657
3:00 pm	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	8750.12	100.77	93.17
Demand (MW)	2587	2484	2411
Available capacity (MW)	2610	2684	2658
3:30 pm	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	9999.77	96.29	93.84
Demand (MW)	2610	2532	2416
Available capacity (MW)	2606	2683	2658
4:00 pm	Actual	4 hr forecast	12 hr forecast
Price (\$/MWh)	9999.77	3705.55	89.87
Demand (MW)	2631	2537	2431
Available capacity (MW)	2593	2663	2650

Generator offers and rebidding

During the time of high prices all generation in South Australia was available apart from four units at Torrens Island and a partial reduction at Playford power station.

At 3.02 pm on 18 January, the day before the high prices, AGL rebid to commit Torrens Island A unit four online for a total of 120 MW, 100 MW of which was bid below \$105/MWh. At the same time AGL rebid Torrens Island B unit one to not come into service (a total of 200 MW of capacity, 180 MW of which had been previously bid at below \$105/MWh). Combined, the two changes had the effect of reducing available capacity by 80 MW. The reason given was "Plant limitations:Adj to unit commitment".

At 11.22 am on 19 January, AGL rebid 420 MW of capacity at Torrens Island to \$9999.77/MWh effective from 2pm. Of this 420 MW of capacity, 340 MW had previously been bid at \$100.77/MWh. The reason given for the rebid was "PD demand change::demand inc/avail decrease SA".

Infratil, which is operated by AGL, had all of its capacity (50 MW at the Angaston power station) priced close to the price cap at times during the high priced period. This was its initial offer.

International Power (Synergen) had 217 MW of capacity priced above \$5000/MWh through its initial offers. Following several rebids from late morning that shifted capacity into lower prices (in order to commit plant) less than 30 MW of capacity remained priced above \$5000/MWh.

Over two rebids at 12.17 pm and 12.31 pm, TRUenergy shifted 30 MW of capacity at Hallett from prices below \$1000/MWh to above \$9000/MWh. The reasons given were "Band adj due to market cond" and "Bnd price higher than fcast".

In total, for the whole of South Australia, up to 507 MW of available capacity was priced above \$5000/MWh during the times of high prices. The closing bids for all participants in South Australia with capacity priced at or above \$5000/MWh during the high priced periods are presented in **Appendix A**.

The generators involved in setting the spot price exceeding \$5000/MWh on the six high priced trading intervals are detailed in **Appendix B**.

Changes to network availability

Apart from the 12.30 pm trading interval, flows across the Heywood interconnector into South Australia were as forecast at its limit of 360 MW. Imports into South Australia across Murraylink were around 80 MW lower than that forecast and limited to around 100 MW.

Australian Energy Regulator

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Appendix A – Closing bids

Figures A1 – A4 highlight the half hour closing bids for participants in South Australia with significant capacity priced at or above \$5000/MWh during the trading intervals in which the spot price exceeded \$5000/MWh. It also shows the generation output of that participant and the spot price.

Figure A1: AGL (Torrens Island) closing bid prices, dispatch and spot price

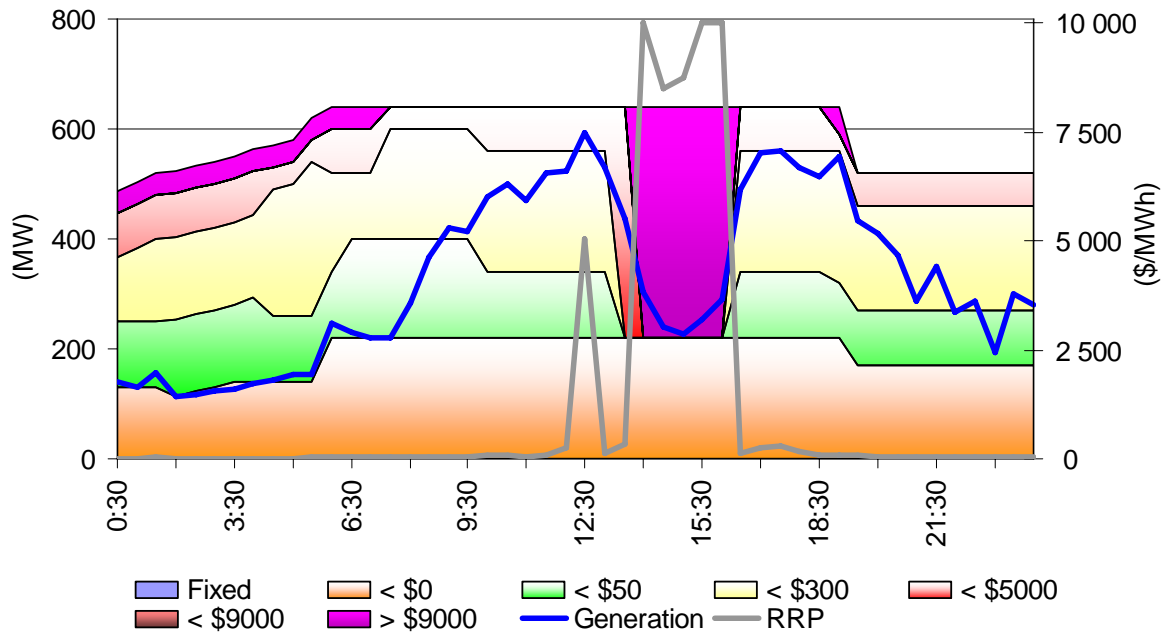


Figure A2: AGL (Angaston) closing bid prices, dispatch and spot price

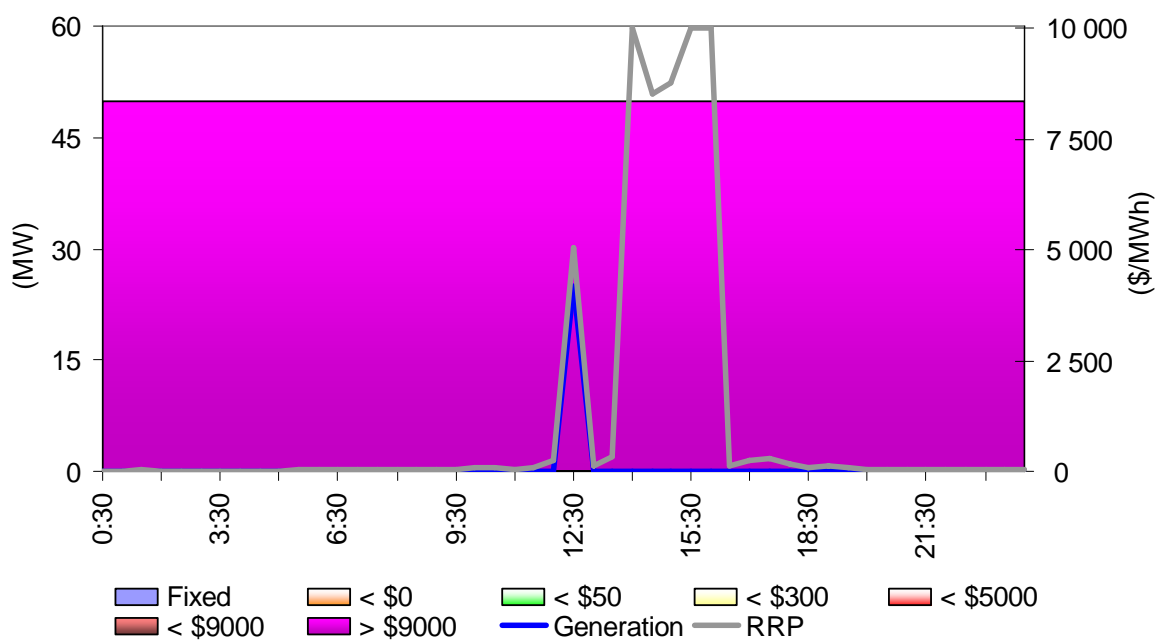


Figure A3: Synergen closing bid prices, dispatch and spot price

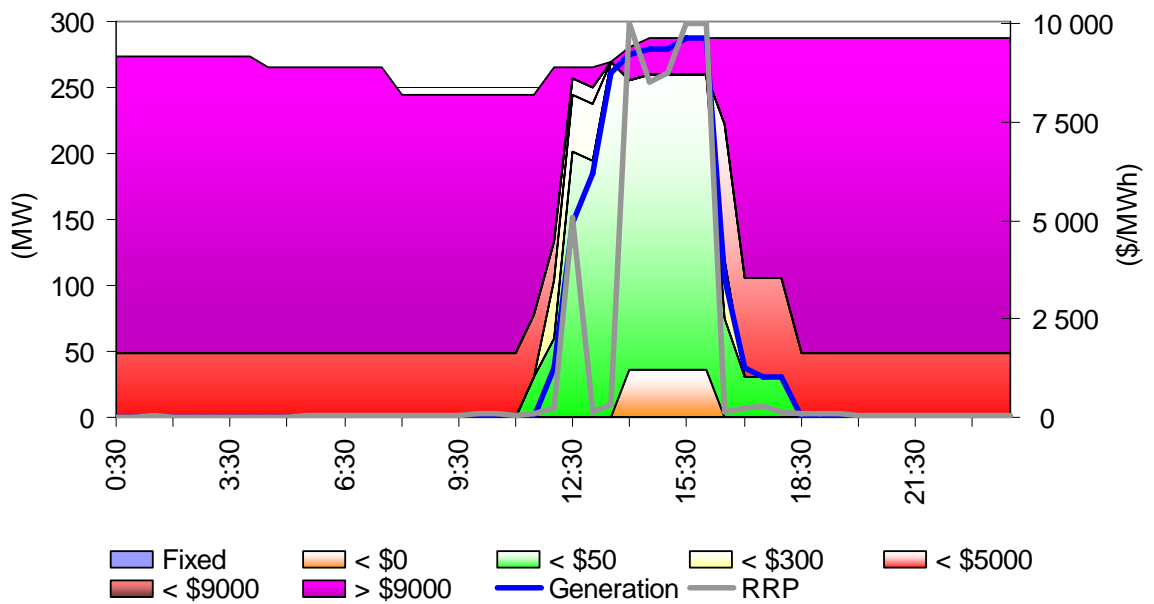
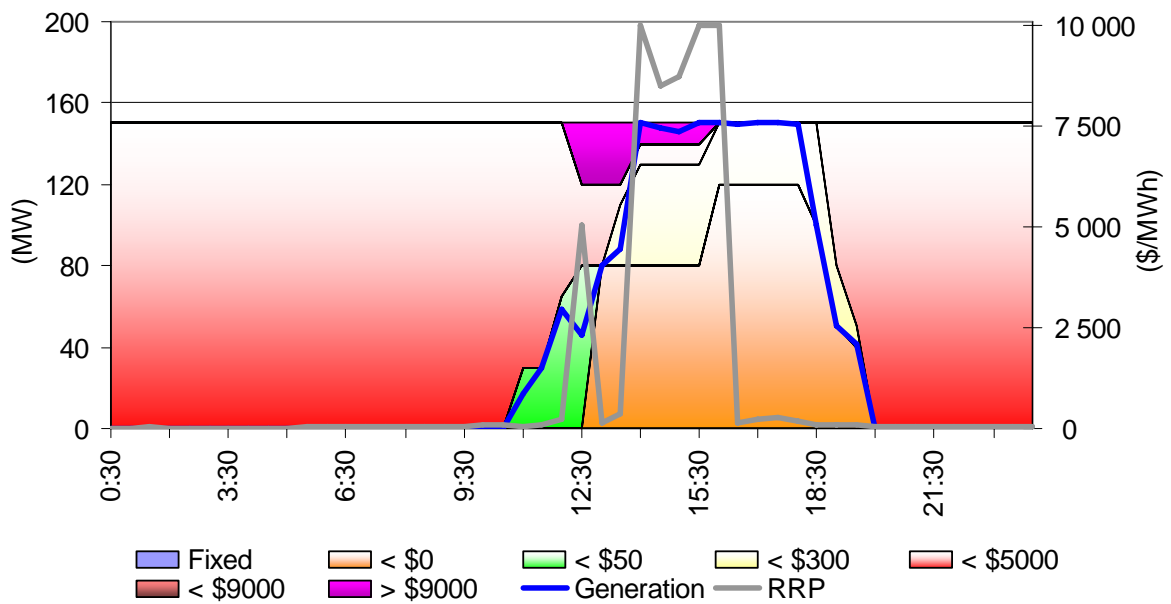


Figure A4: TRUenergy closing bid prices, dispatch and spot price



Appendix B – Price setters for 19 January 2009

The following tables identify the trading intervals in which the spot price exceeded \$5000/MWh. Each five minute dispatch interval price and the generating units involved in setting the energy price, as published in the market systems are shown. This information is published by NEMMCO². Also shown is the energy or ancillary service offer price involved in determining the dispatch price together with the quantity of that service and the contribution to the total energy price. The 30-minute spot price is the time weighted average of the six dispatch interval prices.

Monday 19 January – South Australia – 12.30 pm

Time	Dispatch price	Participant	Unit	Service	Offer price	Marginal change	Contribution
12:05	\$100.77	AGL SA	TORRA1	Energy	\$100.77	0.17	\$16.80
		AGL SA	TORRA4	Energy	\$100.77	0.17	\$16.80
		AGL SA	TORRB3	Energy	\$100.77	0.33	\$33.59
		AGL SA	TORRB4	Energy	\$100.77	0.33	\$33.59
12:10	\$100.77	AGL SA	TORRA1	Energy	\$100.77	0.17	\$16.80
		AGL SA	TORRA4	Energy	\$100.77	0.17	\$16.80
		AGL SA	TORRB3	Energy	\$100.77	0.33	\$33.59
		AGL SA	TORRB4	Energy	\$100.77	0.33	\$33.59
12:15	\$9 999.98	Infratil	ANGAS1	Energy	\$9 999.98	0.60	\$5 999.99
		Infratil	ANGAS2	Energy	\$9 999.98	0.40	\$3 999.99
12:20	\$10 000.00	Ecogen	NPS	Energy	\$36.70	-1.11	-\$40.55
		Synergen	SNUG1	Energy	\$9 997.50	1.94	\$19 389.75
12:25	\$9 999.98	Infratil	ANGAS1	Energy	\$9 999.98	0.60	\$5 999.99
		Infratil	ANGAS2	Energy	\$9 999.98	0.40	\$3 999.99
12:30	\$100.77	AGL SA	TORRA1	Energy	\$100.77	0.50	\$50.39
		AGL SA	TORRA4	Energy	\$100.77	0.50	\$50.39
Spot price		\$ 5050/MWh					

Monday 19 January – South Australia – 2 pm

Time	Dispatch price	Participant	Unit	Service	Offer price	Marginal change	Contribution
13:35	\$9 999.22	AGL SA	TORRB3	Energy	\$9 999.77	0.50	\$4 999.89
		AGL SA	TORRB4	Energy	\$9 999.77	0.50	\$4 999.89
		AGL SA	TORRB3	Lower reg	\$0.25	0.50	\$0.13
		AGL SA	TORRB4	Lower reg	\$0.25	0.50	\$0.13
		MacGen	BW02	Lower reg	\$0.80	-1.00	-\$0.80
13:40	\$9 999.77	AGL SA	TORRA1	Energy	\$9 999.77	0.50	\$4 999.89
		AGL SA	TORRA4	Energy	\$9 999.77	0.50	\$4 999.89
13:45	\$9 999.77	AGL SA	TORRA1	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRA4	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRB3	Energy	\$9 999.77	0.33	\$3 260.82
		AGL SA	TORRB4	Energy	\$9 999.77	0.33	\$3 260.82
13:50	\$9 999.77	AGL SA	TORRA1	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRA4	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRB3	Energy	\$9 999.77	0.33	\$3 260.82
		AGL SA	TORRB4	Energy	\$9 999.77	0.33	\$3 260.82
13:55	\$9 999.77	AGL SA	TORRA1	Energy	\$9 999.77	0.50	\$4 999.89
		AGL SA	TORRA4	Energy	\$9 999.77	0.50	\$4 999.89
14:00	\$9 999.77	AGL SA	TORRA1	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRA4	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRB3	Energy	\$9 999.77	0.33	\$3 260.82
		AGL SA	TORRB4	Energy	\$9 999.77	0.33	\$3 260.82
Spot price		\$ 9999.68/MWh					

² NEMMCO first published details on how the price is determined, for every dispatch interval, in June 2004. Documentation of this process can be found at <http://www.nemmco.com.au/dispatchandpricing/140-0036.htm>

Monday 19 January – South Australia – 2.30 pm

Time	Dispatch price	Participant	Unit	Service	Offer price	Marginal change	Contribution
14:05	\$9 999.22	AGL SA	TORRB3	Energy	\$9 999.77	0.50	\$4 999.89
		AGL SA	TORRB4	Energy	\$9 999.77	0.50	\$4 999.89
		AGL SA	TORRB3	Lower reg	\$0.25	0.50	\$0.13
		AGL SA	TORRB4	Lower reg	\$0.25	0.50	\$0.13
		MacGen	BW02	Lower reg	\$0.80	-1.00	-\$0.80
14:10	\$9 999.77	AGL SA	TORRA1	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRA4	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRB3	Energy	\$9 999.77	0.33	\$3 260.82
		AGL SA	TORRB4	Energy	\$9 999.77	0.33	\$3 260.82
		AGL SA	TORRB3	Lower reg	\$0.25	-0.33	-\$0.08
14:15	\$9 999.77	AGL SA	TORRA1	Energy	\$9 999.77	0.50	\$4 999.89
		AGL SA	TORRA4	Energy	\$9 999.77	0.50	\$4 999.89
14:20	\$9 999.53	AGL SA	TORRB3	Energy	\$9 999.77	0.50	\$4 999.89
		AGL SA	TORRB4	Energy	\$9 999.77	0.50	\$4 999.89
		AGL SA	TORRB3	Lower reg	\$0.25	0.50	\$0.13
		AGL SA	TORRB4	Lower reg	\$0.25	0.50	\$0.13
		Eraring Energy	ER01	Lower reg	\$0.49	-1.00	-\$0.49
14:25	\$9 999.77	AGL SA	TORRA1	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRA4	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRB3	Energy	\$9 999.77	0.33	\$3 260.82
		AGL SA	TORRB4	Energy	\$9 999.77	0.33	\$3 260.82
14:30	\$1 000.00	TRUenergy (SA)	AGLHAL	Energy	\$1 000.00	1.00	\$1 000.00
Spot price		\$ 8499.68/MWh					

Monday 19 January – South Australia –3 pm

Time	Dispatch price	Participant	Unit	Service	Offer price	Marginal change	Contribution
14:35	\$9 999.62	AGL SA	TORRB3	Energy	\$9 999.77	0.50	\$4 999.89
		AGL SA	TORRB4	Energy	\$9 999.77	0.50	\$4 999.89
		AGL SA	TORRB3	Lower reg	\$0.25	0.50	\$0.13
		AGL SA	TORRB4	Lower reg	\$0.25	0.50	\$0.13
		MacGen	BW01	Lower reg	\$0.40	-1.00	-\$0.40
14:40	\$9 598.60	Synergen	POR01	Energy	\$9 598.60	1.00	\$9 598.60
14:45	\$3 705.55	Origin Energy	OSB-AG	Energy	\$3 705.55	1.00	\$3 705.55
14:50	\$9 598.60	Synergen	POR01	Energy	\$9 598.60	1.00	\$9 598.60
14:55	\$9 598.60	Synergen	POR01	Energy	\$9 598.60	1.00	\$9 598.60
15:00	\$9 999.77	AGL SA	TORRA1	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRA4	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRB3	Energy	\$9 999.77	0.33	\$3 260.82
		AGL SA	TORRB4	Energy	\$9 999.77	0.33	\$3 260.82
		AGL SA	TORRB3	Lower reg	\$0.25	-0.33	-\$0.08
		AGL SA	TORRB4	Lower reg	\$0.25	0.33	\$0.08
Spot price		\$ 8750.12/MWh					

Monday 19 January – South Australia – 3.30 pm

Time	Dispatch price	Participant	Unit	Service	Offer price	Marginal change	Contribution
15:05	\$9 999.77	AGL SA	TORRA1	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRA4	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRB3	Energy	\$9 999.77	0.33	\$3 260.82
		AGL SA	TORRB4	Energy	\$9 999.77	0.33	\$3 260.82
		AGL SA	TORRB3	Lower reg	\$0.25	-0.33	-\$0.08
		AGL SA	TORRB4	Lower reg	\$0.25	0.33	\$0.08
15:10	\$9 999.77	AGL SA	TORRA1	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRA4	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRB3	Energy	\$9 999.77	0.33	\$3 260.82
		AGL SA	TORRB4	Energy	\$9 999.77	0.33	\$3 260.82
15:15	\$9 999.77	AGL SA	TORRA1	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRA4	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRB3	Energy	\$9 999.77	0.33	\$3 260.82
		AGL SA	TORRB4	Energy	\$9 999.77	0.33	\$3 260.82
15:20	\$9 999.77	AGL SA	TORRA1	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRA4	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRB3	Energy	\$9 999.77	0.33	\$3 260.82
		AGL SA	TORRB4	Energy	\$9 999.77	0.33	\$3 260.82
15:25	\$9 999.77	AGL SA	TORRA1	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRA4	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRB3	Energy	\$9 999.77	0.33	\$3 260.82
		AGL SA	TORRB4	Energy	\$9 999.77	0.33	\$3 260.82
15:30	\$9 999.77	AGL SA	TORRA1	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRA4	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRB3	Energy	\$9 999.77	0.33	\$3 260.82
		AGL SA	TORRB4	Energy	\$9 999.77	0.33	\$3 260.82
Spot price		\$ 9999.77/MWh					

Monday 19 January – South Australia – 4 pm

Time	Dispatch price	Participant	Unit	Service	Offer price	Marginal change	Contribution
15:35	\$9 999.77	AGL SA	TORRA1	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRA4	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRB3	Energy	\$9 999.77	0.33	\$3 260.82
		AGL SA	TORRB4	Energy	\$9 999.77	0.33	\$3 260.82
15:40	\$9 999.77	AGL SA	TORRA1	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRA4	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRB3	Energy	\$9 999.77	0.33	\$3 260.82
		AGL SA	TORRB4	Energy	\$9 999.77	0.33	\$3 260.82
15:45	\$9 999.77	AGL SA	TORRA1	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRA4	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRB3	Energy	\$9 999.77	0.33	\$3 260.82
		AGL SA	TORRB4	Energy	\$9 999.77	0.33	\$3 260.82
15:50	\$9 999.77	AGL SA	TORRA1	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRA4	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRB3	Energy	\$9 999.77	0.33	\$3 260.82
		AGL SA	TORRB4	Energy	\$9 999.77	0.33	\$3 260.82
15:55	\$9 999.77	AGL SA	TORRA1	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRA4	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRB3	Energy	\$9 999.77	0.33	\$3 260.82
		AGL SA	TORRB4	Energy	\$9 999.77	0.33	\$3 260.82
16:00	\$9 999.77	AGL SA	TORRA1	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRA4	Energy	\$9 999.77	0.17	\$1 739.06
		AGL SA	TORRB3	Energy	\$9 999.77	0.33	\$3 260.82
		AGL SA	TORRB4	Energy	\$9 999.77	0.33	\$3 260.82
Spot price		\$ 9999.77/MWh					