

Spot prices greater than \$5000/MWh



AUSTRALIAN ENERGY
REGULATOR

South Australia: 13 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 13 January 2009, spot market prices in South Australia exceeded \$7500/MWh on eight occasions from 2 pm to 5.30 pm. The temperature on the day reached 41 degrees, driving high demand. In addition, around 30 per cent of generation in South Australia was priced at close to the price cap during the 2 pm to 5.30 pm trading intervals, all of which was set up in initial offers. The majority of this high priced capacity was offered by AGL for its Torrens Island power station.

The major contributing factor to high prices on the day was AGL's bidding behaviour and high demand which resulted in initial high price forecasts. Rebidding into lower price bands by International Power and Origin reduced initially high forecast prices. Lower than forecast import capability into South Australia resulted in some prices being significantly higher than forecast.

Rebidding did not contribute to spot prices exceeding \$5000/MWh.

Actual and forecast demand

Temperatures in excess of 41 degrees saw demand exceed 2600 MW from 2 pm to 6.30 pm, with a maximum demand of 2733 MW (compared with record demand of 3077 MW) reached at 4.30 pm. Actual demand was up to 160 MW greater than that forecast 12 hours ahead but close to that forecast four hours ahead.

Network Availability

Combined import limits into South Australia were up to 130 MW less than forecast. Imports across Heywood were being limited to around 280 MW by a system normal constraint. Imports across Murraylink were 100 MW lower than forecast, at around 90 MW.

Figure 1 compares the actual demand in South Australia with that forecast by NEMMCO four and twelve hours ahead of dispatch. A comparison of actual and forecast combined import capability and spot price is also included.

Figure 1: South Australia spot price and demand data

Tuesday 2:00 PM	Actual	4 hr forecast	12 hr forecast
Demand (MW)	2625	2577	2467
Import capability into SA	366	476	492
Spot Price (\$/MW/h)	7784	302	1000
Tuesday 2:30 PM	Actual	4 hr forecast	12 hr forecast
Demand (MW)	2653	2620	2512
Import capability into SA	377	467	488
Spot Price	9799	938	9999
Tuesday 3:00 PM	Actual	4 hr forecast	12 hr forecast
Demand (MW)	2663	2706	2554
Import capability into SA	376	467	490
Spot Price	9400	3706	9999
Tuesday 3:30 PM	Actual	4 hr forecast	12 hr forecast
Demand (MW)	2675	2738	2609
Import capability into SA	369	491	493
Spot Price	9999	3706	10000
Tuesday 4:00 PM	Actual	4 hr forecast	12 hr forecast
Demand (MW)	2697	2754	2634
Import capability into SA	356	481	485
Spot Price	8551	8801	10000
Tuesday 4:30 PM	Actual	4 hr forecast	12 hr forecast
Demand (MW)	2733	2784	2664
Import capability into SA	375	482	487
Spot Price	9999	9999	10000
Tuesday 5:00 PM	Actual	4 hr forecast	12 hr forecast
Demand (MW)	2726	2788	2687
Import capability into SA	381	500	485
Spot Price	9799	9999	10000
Tuesday 5:30 PM	Actual	4 hr forecast	12 hr forecast
Demand (MW)	2707	2791	2692
Import capability into SA	381	512	496
Spot Price	9000	9999	10000

Generator offers and rebidding

During the time of high prices a significant amount of capacity was priced above \$5000/MWh at AGL's Torrens Island power station (TIPS). Approximately 80 per cent of available capacity at the station (820 MW) was priced at close to the price cap of \$10 000/MWh. The remaining capacity (up to the nominal minimum operating levels) was priced at the price floor of -\$1000/MWh. Infratil, which is also operated by AGL, had all of its capacity (50 MW at the Angaston Power Station) priced close to the price cap during the high priced period. The majority of high prices were set by these high priced offers.

Through its day ahead offer, International Power (Synergen) had 30 MW of available capacity at its Port Lincoln peaking plant priced above \$5000/MWh.

As a result of initial high price forecasts, Origin Energy and International Power rebid 300 MW of capacity in total across their peaking plants into lower prices for the high priced period. Origin's rebid was the day before and International Power's rebid was at 5.30 am. These rebids served to significantly reduce forecast prices.

At 12.09 pm, for the 6 pm to 7.30 pm trading intervals, AGL rebid 820 MW of available capacity at TIPS from prices below \$5000/MWh to prices close to the price cap. The reason given was "Predispatch demand change incr SA DD". This rebid extended the high priced capacity offer in its initial bid. This led to forecast spot prices at the price cap. As a result of this rebid the price was at or above \$1000/MWh for eight dispatch intervals and the spot price reached \$3335/MWh at 6 pm.

During the high priced period there was only 50 MW of generation capacity in South Australia priced between \$500/MWh and \$8000/MWh. This meant that a small increase in demand or reduction in supply (including imports) led to a large increase in the dispatch price.

The closing bids for all participants in South Australia with capacity priced at or above \$5000/MWh during the high priced period are presented in **Appendix A**. The generators involved in setting the spot price during the time prices were above \$5000/MWh, and how that price was determined by the market systems, are detailed in **Appendix B**.

**Australian Energy Regulator
February 2009**

Appendix A – Closing bids

Figures A1 – A3 highlight the half hour closing bids for power stations 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 and the spot price (RRP).

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

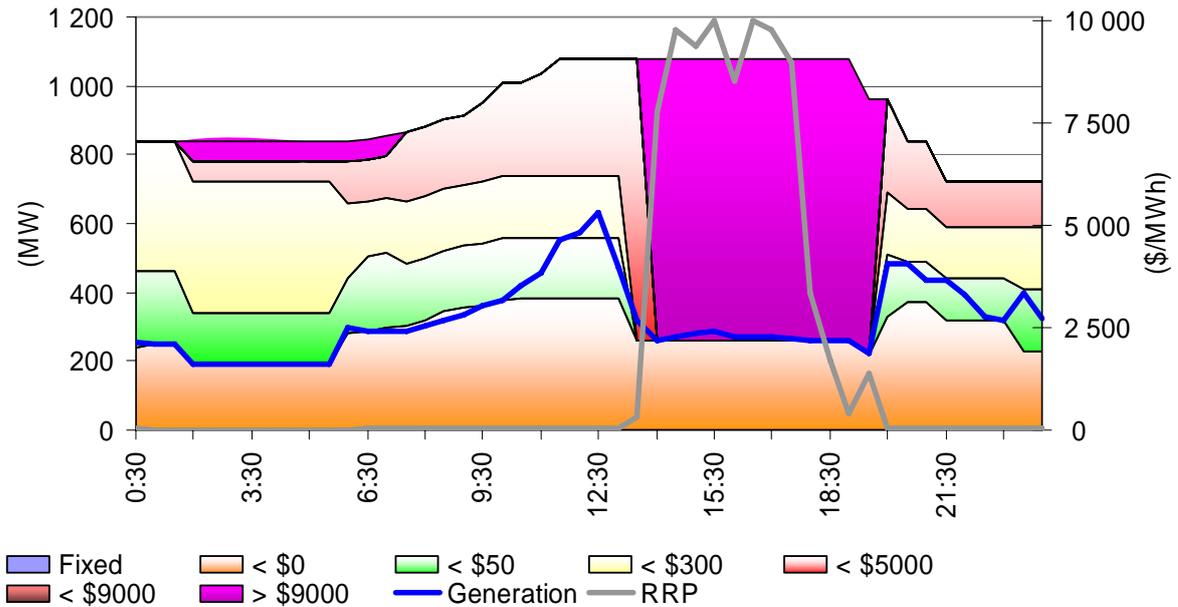


Figure A2: Angaston closing bid prices, dispatch and spot price

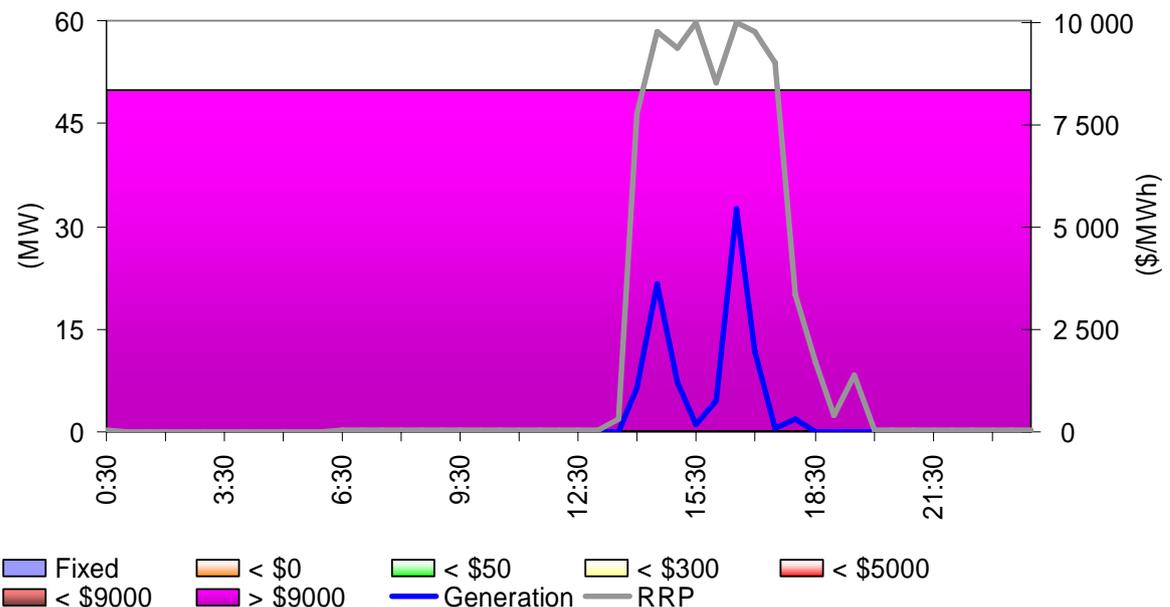
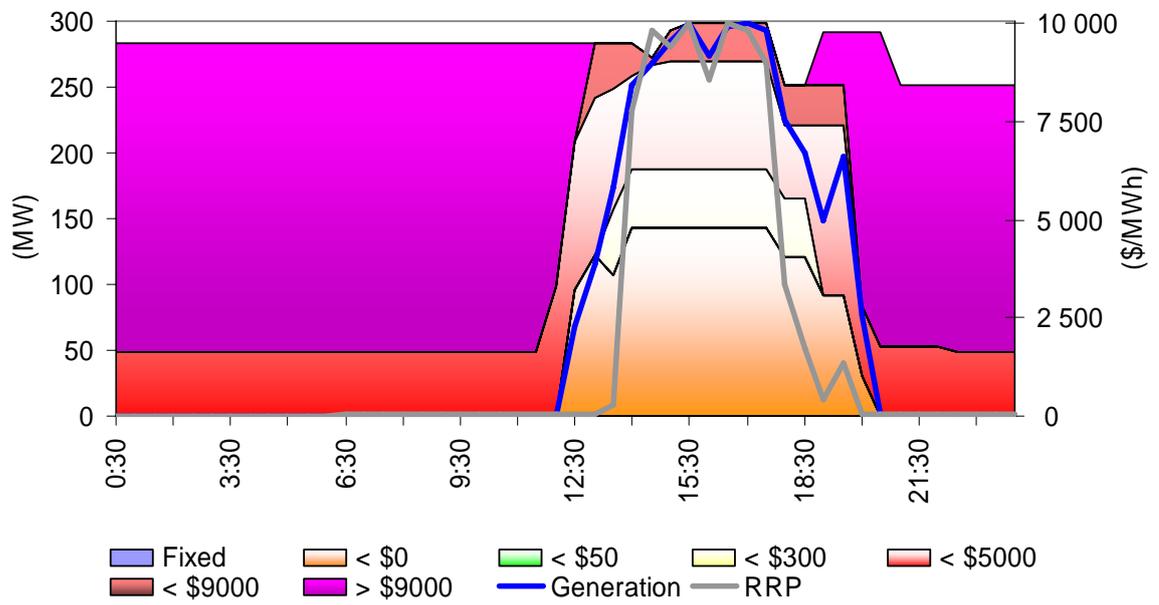


Figure A3: International Power (Synergen) closing bid prices, dispatch and spot price



Appendix B – Price setters for 13 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 NEMMCO¹. 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.

Tuesday 13 January – South Australia – 2 pm

Time	Dispatch price	Participant	Unit	Service	Offer price	Marginal change	Contribution
13:35	\$301.98	Synergen	DRYCGT2	Energy	\$301.98	1.00	\$301.98
13:40	\$9,999.09	Infratil	ANGAS1	Energy	\$9,999.09	0.60	\$5,999.45
		Infratil	ANGAS2	Energy	\$9,999.09	0.40	\$3,999.64
13:45	\$9,999.09	Infratil	ANGAS1	Energy	\$9,999.09	0.60	\$5,999.45
		Infratil	ANGAS2	Energy	\$9,999.09	0.40	\$3,999.64
13:50	\$8,800.74	Synergen	POR01	Energy	\$8,800.74	1.00	\$8,800.74
13:55	\$8,800.74	Synergen	POR01	Energy	\$8,800.74	1.00	\$8,800.74
14:00	\$8,800.74	Synergen	POR01	Energy	\$8,800.74	1.00	\$8,800.74
Spot price	\$ 9000/MWh						

Tuesday 13 January – South Australia – 2.30 pm

Time	Dispatch price	Participant	Unit	Service	Offer price	Marginal change	Contribution
14:05	\$8,800.74	Synergen	POR01	Energy	\$8,800.74	1.00	\$8,800.74
14:10	\$9,999.09	Infratil	ANGAS1	Energy	\$9,999.09	0.60	\$5,999.45
		Infratil	ANGAS2	Energy	\$9,999.09	0.40	\$3,999.64
14:15	\$9,999.09	Infratil	ANGAS1	Energy	\$9,999.09	0.60	\$5,999.45
		Infratil	ANGAS2	Energy	\$9,999.09	0.40	\$3,999.64
14:20	\$9,999.71	AGL SA	TORRB1	Energy	\$9,999.77	1.00	\$9,999.77
		Stanwell	STAN-2	Lower 5 min	\$0.01	-1.00	-\$0.01
		Hydro Tasmania	CETHANA	Lower 5 min	\$0.60	1.00	\$0.60
		AGL SA	TORRB1	Lower reg	\$0.25	1.00	\$0.25
		Hydro Tasmania	CETHANA	Lower reg	\$0.90	-1.00	-\$0.90
14:25	\$9,999.09	Infratil	ANGAS1	Energy	\$9,999.09	0.60	\$5,999.45
		Infratil	ANGAS2	Energy	\$9,999.09	0.40	\$3,999.64
14:30	\$9,999.09	Infratil	ANGAS1	Energy	\$9,999.09	0.60	\$5,999.45
		Infratil	ANGAS2	Energy	\$9,999.09	0.40	\$3,999.64
Spot price	\$ 7784/MWh						

Tuesday 13 January – South Australia – 3 pm

Time	Dispatch price	Participant	Unit	Service	Offer price	Marginal change	Contribution
14:35	\$8,800.74	Synergen	POR01	Energy	\$8,800.74	1.00	\$8,800.74
14:40	\$8,800.74	Synergen	POR01	Energy	\$8,800.74	1.00	\$8,800.74
14:45	\$8,800.74	Synergen	POR01	Energy	\$8,800.74	1.00	\$8,800.74
14:50	\$9,999.09	Infratil	ANGAS1	Energy	\$9,999.09	0.60	\$5,999.45
		Infratil	ANGAS2	Energy	\$9,999.09	0.40	\$3,999.64
14:55	\$9,999.09	Infratil	ANGAS1	Energy	\$9,999.09	0.60	\$5,999.45
		Infratil	ANGAS2	Energy	\$9,999.09	0.40	\$3,999.64
15:00	\$9,999.09	Infratil	ANGAS1	Energy	\$9,999.09	0.60	\$5,999.45
		Infratil	ANGAS2	Energy	\$9,999.09	0.40	\$3,999.64
Spot price	\$ 9799/MWh						

¹ 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/powersystemops/140-0073.pdf>

Tuesday 13 January – South Australia – 3.30 pm

Time	Dispatch price	Participant	Unit	Service	Offer price	Marginal change	Contribution
15:05	\$9,999.09	Infratil	ANGAS1	Energy	\$9,999.09	0.60	\$5,999.45
		Infratil	ANGAS2	Energy	\$9,999.09	0.40	\$3,999.64
15:10	\$9,998.86	AGL SA	TORRB4	Energy	\$9,999.77	1.00	\$9,999.77
		AGL SA	TORRB4	Raise reg	\$0.25	1.00	\$0.25
		Hydro Tasmania	CETHANA	Raise reg	\$1.10	-1.00	-\$1.10
		AGL SA	TORRB4	Raise 60 sec	\$0.04	1.41	\$0.06
		TRUenergy (Vic)	YWPS1	Raise 60 sec	\$0.05	-1.41	-\$0.07
		AGL SA	TORRB4	Raise 6 sec	\$0.04	0.83	\$0.03
		Delta Electricity	MP2	Raise 6 sec	\$0.10	-0.83	-\$0.08
15:15	\$9,998.96	AGL SA	TORRB4	Energy	\$9,999.77	1.00	\$9,999.77
		AGL SA	TORRB4	Raise reg	\$0.25	1.00	\$0.25
		Delta Electricity	WW7	Raise reg	\$1.00	-1.00	-\$1.00
		AGL SA	TORRB4	Raise 60 sec	\$0.04	1.41	\$0.06
		TRUenergy (Vic)	YWPS1	Raise 60 sec	\$0.05	-1.41	-\$0.07
		AGL SA	TORRB4	Raise 6 sec	\$0.04	0.83	\$0.03
		Delta Electricity	MP1	Raise 6 sec	\$0.10	-0.83	-\$0.08
15:20	\$9,998.89	AGL SA	TORRB4	Energy	\$9,999.77	1.00	\$9,999.77
		AGL SA	TORRB4	Raise reg	\$0.25	1.00	\$0.25
		Eraring Energy	ER01	Raise reg	\$1.07	-1.00	-\$1.07
		AGL SA	TORRB4	Raise 60 sec	\$0.04	1.41	\$0.06
		TRUenergy (Vic)	YWPS3	Raise 60 sec	\$0.05	-1.41	-\$0.07
		AGL SA	TORRB4	Raise 6 sec	\$0.04	0.83	\$0.03
		Delta Electricity	MP2	Raise 6 sec	\$0.10	-0.83	-\$0.08
15:25	\$9,998.77	AGL SA	TORRB3	Energy	\$9,999.77	1.00	\$9,999.77
		AGL SA	TORRB3	Raise reg	\$0.25	1.00	\$0.25
		Hydro Tasmania	BASTYAN	Raise reg	\$1.10	-1.00	-\$1.10
		AGL SA	TORRB3	Raise 60 sec	\$0.04	1.72	\$0.07
		Delta Electricity	MP1	Raise 60 sec	\$0.10	-1.72	-\$0.17
		AGL SA	TORRB3	Raise 6 sec	\$0.04	0.83	\$0.03
		Delta Electricity	MP2	Raise 6 sec	\$0.10	-0.83	-\$0.08
15:30	\$9,999.02	AGL SA	TORRB3	Energy	\$9,999.77	1.00	\$9,999.77
		Stanwell	STAN-1	Lower 5 min	\$0.01	-1.00	-\$0.01
		Hydro Tasmania	CETHANA	Lower 5 min	\$0.60	1.00	\$0.60
		AGL SA	TORRB3	Lower reg	\$0.25	1.00	\$0.25
		Hydro Tasmania	CETHANA	Lower reg	\$0.90	-1.00	-\$0.90
		AGL SA	TORRB3	Raise reg	\$0.25	1.00	\$0.25
		Stanwell	STAN-4	Raise reg	\$0.94	-1.00	-\$0.94
Spot price		\$ 9400/MWh					

Tuesday 13 January – South Australia – 4 pm

Time	Dispatch price	Participant	Unit	Service	Offer price	Marginal change	Contribution
15:35	\$3,705.55	Origin Energy	OSB-AG	Energy	\$3,705.55	1.00	\$3,705.55
15:40	\$8,800.74	Synergen	POR01	Energy	\$8,800.74	1.00	\$8,800.74
15:45	\$8,800.74	Synergen	POR01	Energy	\$8,800.74	1.00	\$8,800.74
15:50	\$9,999.09	Infratil	ANGAS1	Energy	\$9,999.09	0.60	\$5,999.45
		Infratil	ANGAS2	Energy	\$9,999.09	0.40	\$3,999.64
15:55	\$9,999.09	Infratil	ANGAS1	Energy	\$9,999.09	0.60	\$5,999.45
		Infratil	ANGAS2	Energy	\$9,999.09	0.40	\$3,999.64
16:00	\$9,999.09	Infratil	ANGAS1	Energy	\$9,999.09	0.60	\$5,999.45
		Infratil	ANGAS2	Energy	\$9,999.09	0.40	\$3,999.64
Spot price		\$ 9999/MWh					

Tuesday 13 January – South Australia – 4.30 pm

Time	Dispatch price	Participant	Unit	Service	Offer price	Marginal change	Contribution
16:05	\$9,999.09	Infratil	ANGAS1	Energy	\$9,999.09	0.60	\$5,999.45
		Infratil	ANGAS2	Energy	\$9,999.09	0.40	\$3,999.64
16:10	\$9,999.09	Infratil	ANGAS1	Energy	\$9,999.09	0.60	\$5,999.45
		Infratil	ANGAS2	Energy	\$9,999.09	0.40	\$3,999.64
16:15	\$9,999.09	Infratil	ANGAS1	Energy	\$9,999.09	0.60	\$5,999.45
		Infratil	ANGAS2	Energy	\$9,999.09	0.40	\$3,999.64
16:20	\$9,999.09	Infratil	ANGAS1	Energy	\$9,999.09	0.60	\$5,999.45
		Infratil	ANGAS2	Energy	\$9,999.09	0.40	\$3,999.64
16:25	\$9,999.09	Infratil	ANGAS1	Energy	\$9,999.09	0.60	\$5,999.45
		Infratil	ANGAS2	Energy	\$9,999.09	0.40	\$3,999.64
16:30	\$9,999.09	Infratil	ANGAS1	Energy	\$9,999.09	0.60	\$5,999.45
		Infratil	ANGAS2	Energy	\$9,999.09	0.40	\$3,999.64
Spot price		\$ 8551/MWh					

Tuesday 13 January – South Australia – 5 pm

Time	Dispatch price	Participant	Unit	Service	Offer price	Marginal change	Contribution
16:35	\$9,999.09	Infratil	ANGAS1	Energy	\$9,999.09	0.60	\$5,999.45
		Infratil	ANGAS2	Energy	\$9,999.09	0.40	\$3,999.64
16:40	\$9,998.97	AGL SA	TORRB1	Energy	\$9,999.77	0.50	\$4,999.89
		AGL SA	TORRB3	Energy	\$9,999.77	0.50	\$4,999.89
		AGL SA	TORRB1	Raise reg	\$0.25	0.50	\$0.13
		AGL SA	TORRB3	Raise reg	\$0.25	0.50	\$0.13
		Mac Gen	BW02	Raise reg	\$0.80	-1.00	-\$0.80
		Mac Gen	BW02	Raise 60 sec	\$0.02	0.61	\$0.01
		AGL SA	TORRB1	Raise 60 sec	\$0.04	0.86	\$0.03
		AGL SA	TORRB3	Raise 60 sec	\$0.04	0.86	\$0.03
		Delta Electricity	MP2	Raise 60 sec	\$0.10	-2.33	-\$0.23
		Mac Gen	BW02	Raise 6 sec	\$0.02	0.61	\$0.01
		AGL SA	TORRB1	Raise 6 sec	\$0.04	0.42	\$0.02
		AGL SA	TORRB3	Raise 6 sec	\$0.04	0.42	\$0.02
Delta Electricity	MP1	Raise 6 sec	\$0.10	-1.44	-\$0.14		
16:45	\$8,800.74	Synergen	POR01	Energy	\$8,800.74	1.00	\$8,800.74
16:50	\$9,999.09	Infratil	ANGAS1	Energy	\$9,999.09	0.60	\$5,999.45
		Infratil	ANGAS2	Energy	\$9,999.09	0.40	\$3,999.64
16:55	\$9,999.09	Infratil	ANGAS1	Energy	\$9,999.09	0.60	\$5,999.45
		Infratil	ANGAS2	Energy	\$9,999.09	0.40	\$3,999.64
17:00	\$9,999.09	Infratil	ANGAS1	Energy	\$9,999.09	0.60	\$5,999.45
		Infratil	ANGAS2	Energy	\$9,999.09	0.40	\$3,999.64
Spot price		\$ 9999/MWh					

Tuesday 13 January – South Australia – 5.30 pm

Time	Dispatch price	Participant	Unit	Service	Offer price	Marginal change	Contribution
17:05	\$9,999.09	Infratil	ANGAS1	Energy	\$9,999.09	0.60	\$5,999.45
		Infratil	ANGAS2	Energy	\$9,999.09	0.40	\$3,999.64
17:10	\$8,800.74	Synergen	POR01	Energy	\$8,800.74	1.00	\$8,800.74
17:15	\$8,800.74	Synergen	POR01	Energy	\$8,800.74	1.00	\$8,800.74
17:20	\$8,800.74	Synergen	POR01	Energy	\$8,800.74	1.00	\$8,800.74
17:25	\$8,800.74	Synergen	POR01	Energy	\$8,800.74	1.00	\$8,800.74
17:30	\$8,800.74	Synergen	POR01	Energy	\$8,800.74	1.00	\$8,800.74
Spot price		\$ 9799/MWh					