



Electricity spot prices above \$5000/MWh

**South Australia,
7 July 2016**

13 September 2016

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1 Introduction

The AER is required to publish a report whenever the electricity spot price exceeds \$5000/MWh.¹ The report:

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

On 7 July 2016 at 7.30 pm, the spot price for electricity reached \$8879/MWh in South Australia exceeding the \$5000/MWh threshold. This report presents our analysis of the events in accordance with this obligation.

¹ This requirement is set out in clause 3.13.7 (d) of the National Electricity Rules.

2 Summary

Twelve hour ahead forecasts for 7 July 2016 predicted the spot price would exceed \$5000/MWh for 33 trading intervals. On the day, dispatch prices were volatile, exceeding \$10 000/MWh on multiple occasions between 8.40 am and 9.40 pm. However, the spot price exceeded \$5000/MWh only once, reaching \$8898/MWh for the 7.30 pm trading interval. Other high spot prices on the day ranged from between \$400/MWh and \$3625/MWh (see Table 1).

The high prices were the culmination of a number of factors:

- Network outages to complete augmentation works on the Heywood Interconnector between Victoria and South Australia materially reduced its capacity. These were first announced to the market in late 2015. The impact of these outages was to reduce the capability of the interconnector to deliver power into South Australia. While this major upgrade was flagged to the market, its impact on Heywood's operating capability was, at times, not clear.
- The change in the generation mix following the closure of Northern Power station (coal fuelled) in May 2016 means that South Australia is dependent on two primary fuel sources: gas and wind.
 - While there is in the order of 1200 MW of Semi-scheduled wind installed in South Australia, on the day it was generating below 20 MW, as forecast.
 - Gas fired generators were faced with limited gas and transport capacity making scheduling of the limited fuel problematic. Given the uncertainty, energy constrained generators were cautious not to commit plant too far in advance, instead adjusting output as market outcomes became more certain. While two gas generators; Pelican Point Power Station and Torrens Island B3, were unavailable on planned outages the remaining available generating capacity was dispatched.

Rebidding of capacity from low to high prices did not contribute to the price exceeding \$5000/MWh. Demand was at similar levels to previous days and to average demand levels of last winter.

3 Analysis

Table 1 shows the actual and forecast spot price, demand and generator availability for the 7.30 pm trading interval and other high priced consecutive trading intervals.

Table 1: Actual and forecast spot price and demand

Trading interval	Price (\$/MWh)				Demand (MW)			
	Actual	0.5 hr forecast	4 hr forecast	12 hr forecast	Actual	0.5 hr forecast	4 hr forecast	12 hr forecast
1.30 pm	2090	411	10 586	10 586	1565	1535	1594	1567
2 pm	1964	499	10 586	10 586	1605	1570	1594	1587
2.30 pm	2450	10 580	411	10 586	1632	1585	1561	1585
3 pm	1941	10 580	300	10 586	1634	1595	1532	1589
3.30 pm	407	13 330	300	10 586	1577	1634	1532	1610
4 pm	2146	13 330	495	10 586	1586	1675	1579	1632
4.30 pm	1901	10 580	13 330	10 586	1699	1720	1642	1684
5 pm	2036	456	13 330	13 482	1768	1682	1715	1747
5.30 pm	1961	300	13 330	10 586	1871	1813	1835	1853
6 pm	2087	10 580	13 482	14 000	2008	2013	1987	1995
6.30 pm	2375	14 000	14 000	14 000	2151	2165	2151	2144
7 pm	2482	14 000	14 000	14 000	2159	2222	2226	2206
7.30 pm	8898	13 482	14 000	14 000	2140	2207	2233	2206
8 pm	3605	10 580	14 000	14 000	2110	2149	2204	2177
8.30 pm	1985	10 580	13 330	14 000	2089	2075	2127	2151
9 pm	3624	10 580	13 330	14 000	2042	2022	2087	2106
9.30 pm	3580	10 580	13 330	14 000	1998	1975	2057	2064
10 pm	1915	10 580	13 330	14 000	1909	1915	1974	1985

Table 1 shows selected price and demand forecasts for the period 1.30 pm to 10 pm. The line of bold text at 7.30 pm corresponds to the spot price exceeding \$5000/MWh. The table shows that the high prices were forecast in advance giving time for participants to respond. AEMO’s initial forecasts, at around 12.30 pm the day before, showed high prices. These high forecast prices remained 12 hours ahead, while 14 of 18 high prices were forecast four hours ahead, and most were still forecast 30 minutes prior to dispatch.

Table 1 also shows that demand was generally close to that forecast and, at the time the price exceeded \$5000/MWh demand, was marginally lower than that forecast.

Demand forecasts, provided by AEMO in the Short Term Projected Assessment System Adequacy (STPASA) 7 days ahead, were also close to actual demand.

3.1 Network Availability

This section examines the change in network capability approaching the event and its contribution to price outcomes.

Table 2 shows actual and forecast net import limit into South Australia (MurrayLink and Heywood) for the trading intervals from 1.30 pm to 10 pm on 7 July 2016.

The MurrayLink interconnector was limited to between 180 MW and 220 MW (its nominal limit).²

Table 2: Actual and forecast net network capability

Trading interval	Flows into South Australia (MW)			Net Import limit (MW)		
	Actual	4 hr forecast	12 hr forecast	Actual	4 hr forecast	12 hr forecast
1.30 pm	205	248	254	270	248	254
2 pm	141	244	261	238	244	261
2.30 pm	97	247	269	257	247	269
3 pm	64	246	268	264	246	268
3.30 pm	156	245	268	255	245	268
4 pm	241	266	267	257	266	267
4.30 pm	1	269	270	262	269	270
5 pm	133	260	260	269	260	260
5.30 pm	198	253	256	262	253	256
6 pm	188	245	238	248	245	238
6.30 pm	116	246	237	224	246	237
7 pm	88	235	237	222	235	237
7.30 pm	236	232	247	236	232	247
8 pm	135	240	251	251	240	251
8.30 pm	153	245	251	249	245	251
9 pm	123	264	256	257	264	256
9.30 pm	84	266	258	257	266	258
10 pm	52	274	261	245	274	261

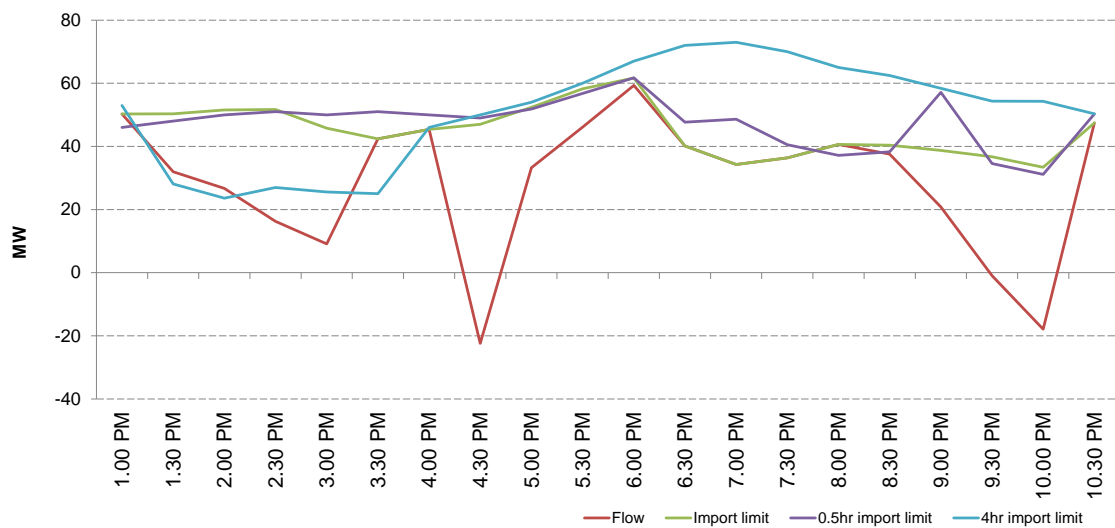
² Limits were reduced by a constraint managing the outage of the New South Wales MurrayLink runback scheme.

The notable difference between the actual net import limits and actual flows for all periods other than 7.30 pm, when the price reached \$8898/MWh, was as a result of participants in South Australia rebidding capacity into low prices after the initial high dispatch price early in the trading interval, reducing flows into South Australia. See Figure 6 which shows the variation in price and offers.

Network constraints were invoked to manage a planned network outage on equipment at Taillem Bend in South Australia as part of the Heywood interconnector upgrade.³ On 7 July, these constraints reduced the import limit into South Australia and limited generation in the south east of the State. Appendix A provides a description of the constraint and network configuration. While this major upgrade was flagged to the market as early as November 2015, its impact on Heywood’s operating capability was, at times, not clear. The timing and notification of the network outages can be found in Appendix F.

Figure 1 shows the import limit, and target flows of the Heywood interconnector. As is evident, flows on Heywood into South Australia, were forecast to be low. STPASA showed that the Heywood interconnector would be zero while Murraylink would be around 200 MW.

Figure 1: Heywood interconnector import limits and target flows



3.2 Generator availability and offers

This section discusses changes to the price and capacity offered by generators, and demand conditions relevant to the pricing event.

3.2.1 Generator Availability

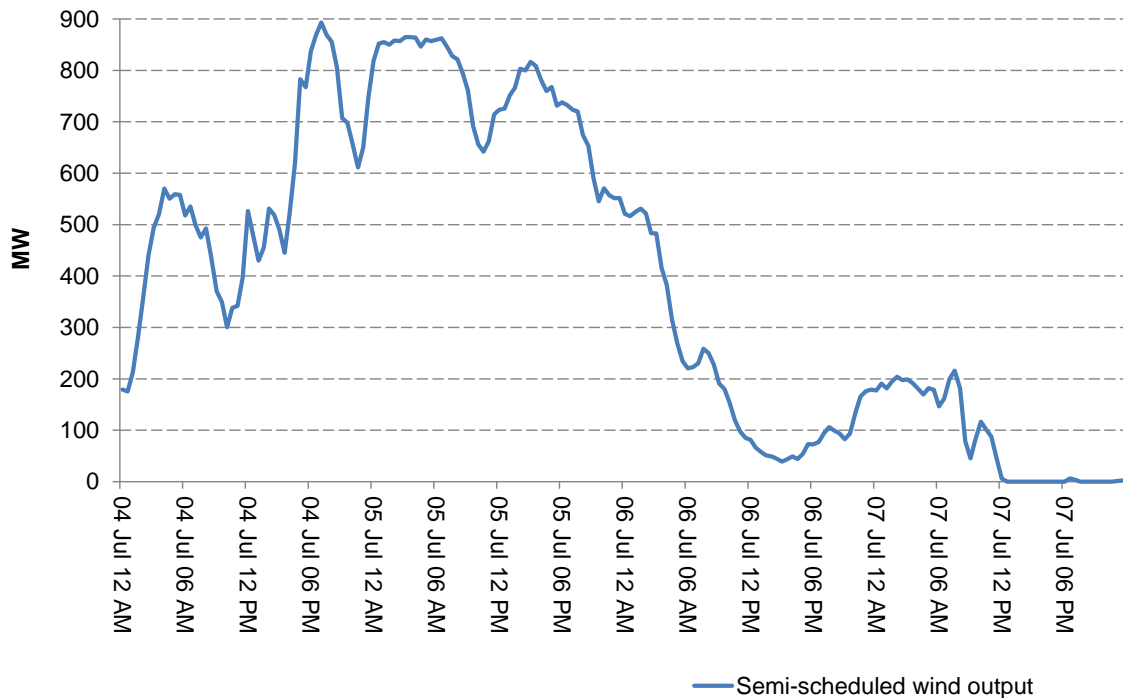
Generator availability and low wind generation affected outcomes on the day.

The available capacity from thermal generators during the first weeks of July remained relatively consistent. While high prices were also forecast on these days the

³ At 7 am on 4 July, a planned network outage commenced on equipment at Taillem Bend in South Australia as part of the Heywood interconnector upgrade. This outage continued until the evening of 14 July.

contribution from wind was more than that during 7 July 2016. Figure 2 shows the output from semi-scheduled wind farms in South Australia for 7 July and the previous three days.

Figure 2: Semi-scheduled wind output



There were some long term outages of generators, Engie’s Pelican Point Power station was placed on 48 hour recall in 2015 and AGL’s Torrens Island B3 unit had been unavailable since 28 June 2016 to complete mandatory safety and compliance work and could not be returned to service quickly.

Figure 3 shows the installed generation capacity in South Australia versus that which was available on the day. The solid red line at around 4100 MW shows the total scheduled and semi-scheduled generation capacity installed in South Australia after the retirement of Northern Power station in May 2016. Deducting the wind capacity, this figure drops 1200 MW (on the day only around 40 MW was operating compared to an average of around 600 MW in the weeks prior), to around 2900 MW. The purple line shows that slightly less than 2500 MW was available after the deduction of Pelican Point and this drops another 200 MW after Torrens Island B3 is removed. Torrens Island A1 was also not offered into the market until 4 pm.

Figure 3: Installed versus actual availability

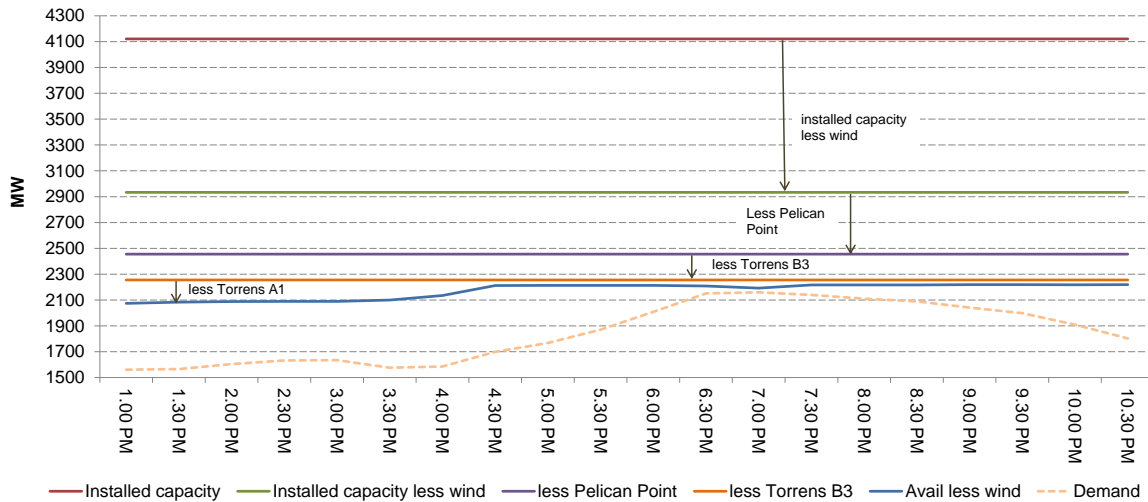
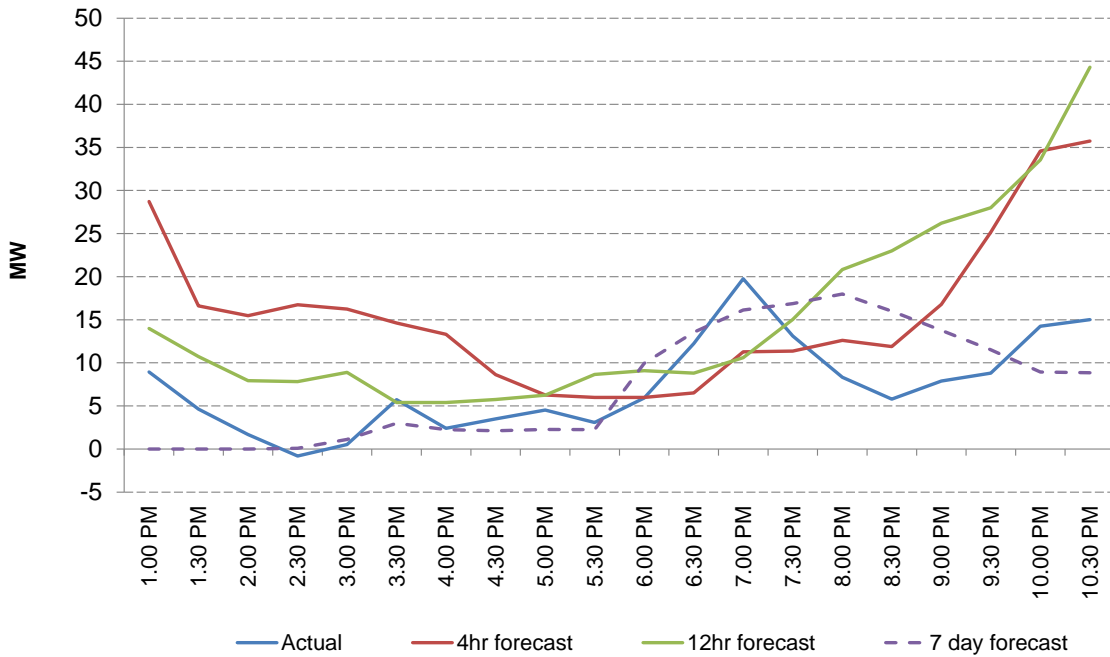


Figure 3 shows that South Australia’s generation mix is heavily dependent on two fuels: Gas and wind, one of which is intermittent. On this day, with low wind and without the full capacity of the interconnector all conventional generators were dispatched, resulting in high prices, as was forecast.

The first STPASA run published by AEMO on 1 July flagged Lack of Reserve 1 (LOR1) conditions for 7 pm and 7.30 pm. The Lack of Reserve flag is the first in a series of escalating notices and indicates that AEMO considers that there is insufficient short term capacity available to maintain the necessary reserves in an operational timeframe in the event of a credible contingency occurring. The LOR is a trigger for the market to respond. There was very limited response and an actual LOR1 was declared at 6.15 pm on 7 July. Given a demand forecast peaking at around 2220 MW and around 2400 MW of thermal generation available in South Australia, high prices under such conditions were not unexpected.

While, at the time of high prices wind generation in South Australia was less than 20 MW, it had been forecast to be low. Figure 4 shows the actual and forecast wind generation, four and 12 hours ahead and as shown in STPASA 7 days ahead.

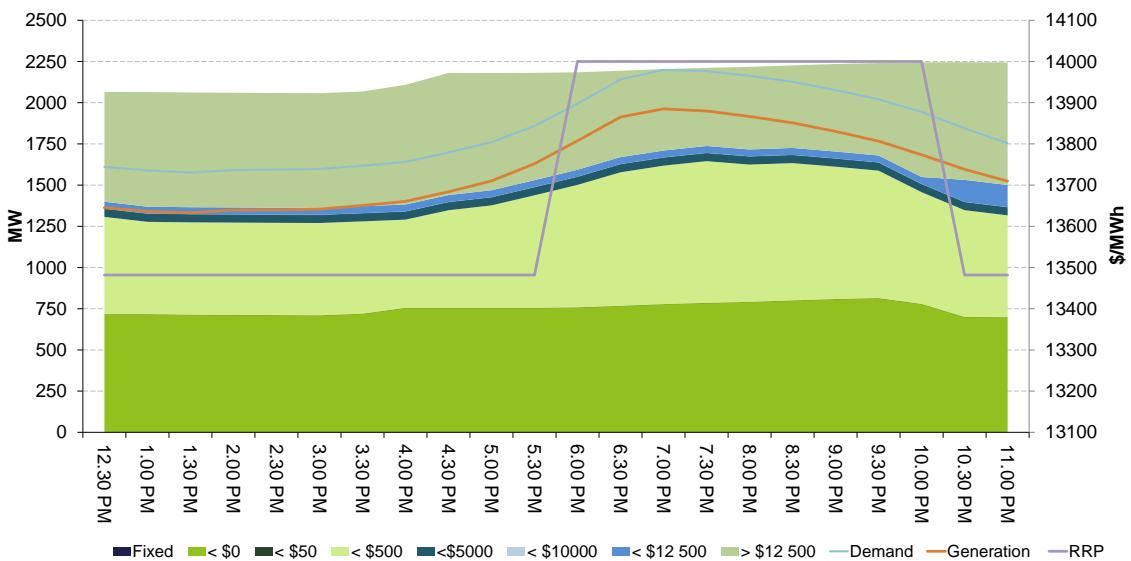
Figure 4: Actual and forecast wind generation



3.2.2 Offers and rebidding.

Figure 5 shows the initial offers of South Australian generators as well as initial forecast demand, generation and spot price. Initial offers created a situation where there was no capacity priced between \$580/MWh and \$12 000/MWh and the forecast price was expected to be greater than \$5000/MWh for the majority of the peak of the day. At the beginning of the 7.30 pm trading interval there was around 1880 MW of capacity priced below \$5000/MWh.

Figure 5: Initial bids of South Australia generators and forecast price



There was no significant rebidding of capacity from low to high prices that contributed to the high priced outcomes. High prices resulted from initial offers lodged prior to the first pre-dispatch run, at 12.30 pm the preceding day.

High forecast prices persisted until dispatch when, in response to actual high prices, participants were prompted to rebid capacity from high to low prices.

The protracted period of high forecast prices and limited gas and transport capacity made scheduling of the limited fuel available problematic, with generators not being prepared to commit plant before outcomes became more certain. Consequently the generators waited until prices actually went high then rebid capacity to low prices to increase their dispatch. The effect this has on the closing bids for the generators in South Australia is shown below in Figure 6.

This is supported by public statements made by AGL to the ASX regarding the lack of adequate gas supplies that could be transported to South Australia and a significant increase in the level of gas generation.⁴

Figure 6: Closing bids of South Australia generators, output and dispatch price

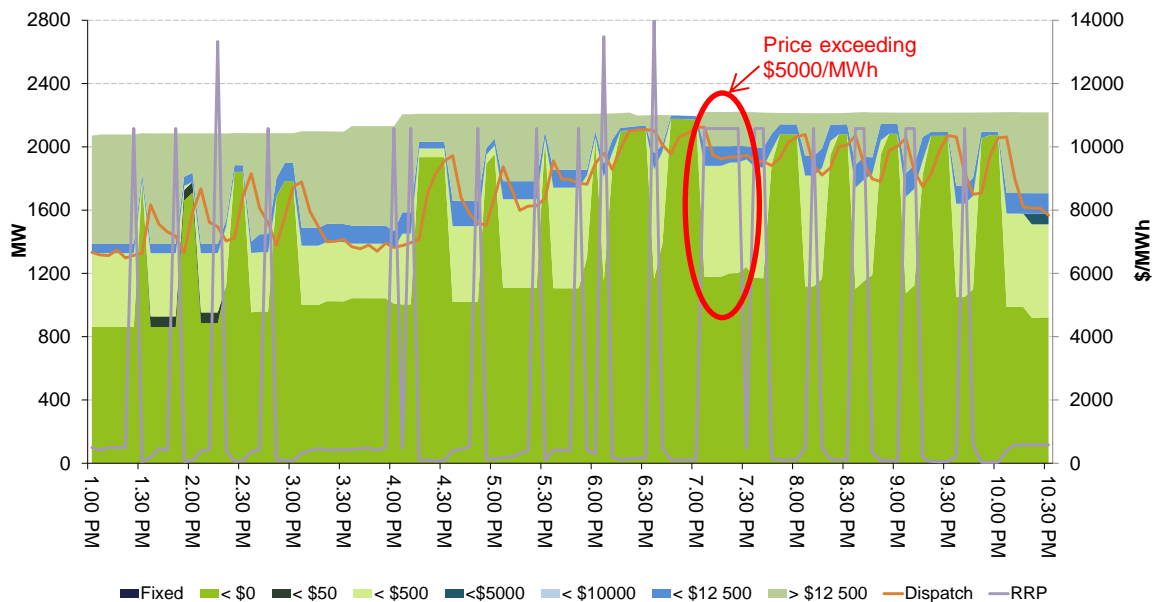


Figure 6 shows that after high 5-minute dispatch prices occurred, participants in South Australia rebid capacity from high to low prices on most occasions, resulting in lower dispatch prices for the remainder of the 30 minute trading interval. A notable exception is for the 7.30 pm trading interval where there was no rebidding into lower prices and the resultant spot price exceeded \$5000/MWh.

Appendix B details the generators involved in setting the price during the high-price periods, and how that price was determined by the market systems.

The closing bids for all participants in South Australia with capacity priced at or above \$5000/MWh for the high-price periods are set out in Appendix C.

A summary of the rebids in response to the high prices are in Appendix E.

⁴ AGL media statement : <https://www.agl.com.au/about-agl/media-centre/article-list/2016/august/agl-comments-on-recent-market-events-in-south-australia>

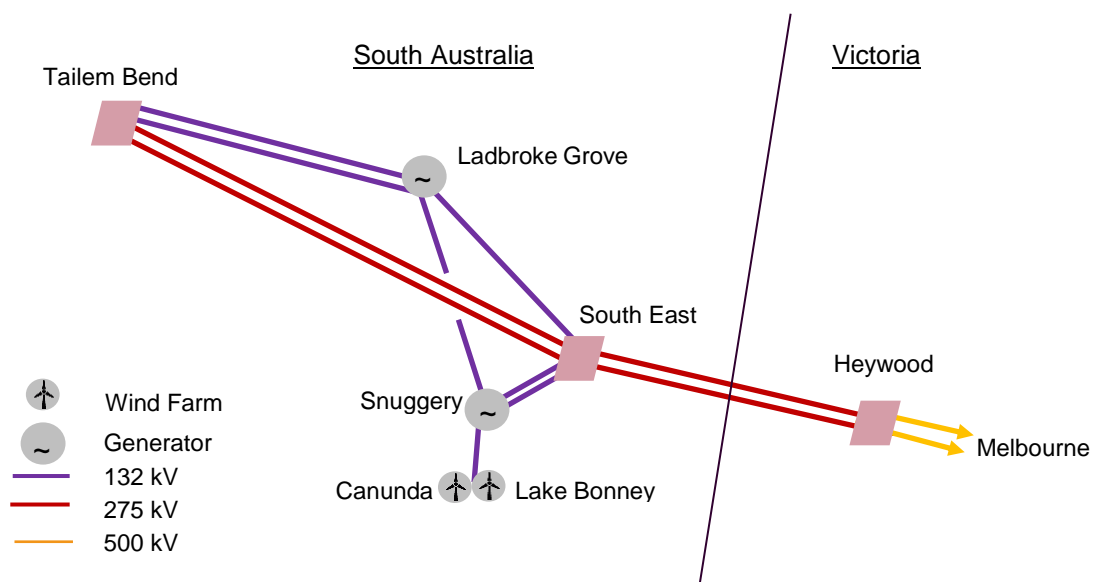
Appendix A: Network Diagram

In March 2014 the Heywood augmentation project to increase the capacity of the transmission system between South Australia and Victoria to 650 MW in both directions satisfied the Regulatory Investment Test (transmission). Until the completion of the augmentation, the Heywood interconnector has a nominal capacity of 460 MW. While the Heywood interconnector is notionally only the lines between South East Substation and the Heywood Terminal Station it effectively comprised:

- four parallel circuits (two circuits operating at 275 kV and two circuits operating at 132 kV) between Taillem Bend (near Adelaide) and South East Substation (close to the border). These lines also deliver power to the load centres at Keith, Kincaig; Penola, Blanche and Mount Gambier; and
- two parallel 275 kV circuits between South East Substation to Heywood Terminal Station in south-west Victoria and two parallel 500 kV circuits from the Heywood Terminal Station to Moorabool Terminal Stations and on to the Sydenham Terminal Station 29 kms north west of Melbourne.

The upgrade works:

- reduce the number of parallel circuits in South Australia between Taillem Bend and South East Substation to three; and
- install an additional transformer and associated switchgear at Heywood terminal station and compensation equipment along the transmission path.



The V::S_TB_275kV_W_B1 constraint was invoked to manage the outage of the Taillem Bend West bus. The constraint contains six variables, all of which have a factor of one:

- generation from Ladbroke units 1 and 2
- generation from Lake Bonney units 2 and 3
- generation from Snuggery unit 1 and
- flow from Vic to SA on the Heywood interconnector.

This means that an increase in generation from these units or an increase in flow into South Australia across Heywood will reduce the headroom of the constraint, until it binds. Conversely reduced generation from the units or flows into Victoria increases the headroom. If the constraint is binding, flows on Heywood are optimised with local generation in the South East. For example a MW increase in generation in the South East must be balanced against either a MW reduction in flow into South Australia or a MW increase in flow into Victoria across Heywood.

Appendix B: Price setter

The following table identifies for the trading interval in which the spot price exceeded \$5000/MWh, each five minute dispatch interval price and the generating units involved in setting the energy price. This information is published by AEMO.⁵ The 30-minute spot price is the average of the six dispatch interval prices.

Table 3: price setter for the 7.30 pm trading interval

DI	Dispatch Price	Participant	Unit	Service	Offer price	Marginal change	Contribution
19:05	\$10 580.30	Engie	DRYCGT2	Energy	\$10 580.3	1.00	\$10 580.30
19:10	\$10 580.40	Engie	DRYCGT1	Energy	\$10 580.4	1.00	\$10 580.40
19:15	\$10 580.30	Engie	DRYCGT2	Energy	\$10 580.3	1.00	\$10 580.30
19:20	\$10 580.30	Engie	DRYCGT2	Energy	\$10 580.3	1.00	\$10 580.30
19:25	\$10 580.20	Engie	DRYCGT3	Energy	\$10 580.2	1.00	\$10 580.20
19:30	\$485.29	AGL (SA)	TORRB1	Energy	\$484.99	0.50	\$242.50
		AGL (SA)	TORRB2	Energy	\$484.99	0.50	\$242.50
		Hydro Tasmania	GORDON	Raise 5 min	\$2.10	1.00	\$2.10
		AGL (SA)	TORRB1	Raise 5 min	\$1.80	-0.50	-\$0.90
		AGL (SA)	TORRB2	Raise 5 min	\$1.80	-0.50	-\$0.90
			ENOF,TORR		\$0.00	-5.00	\$0.00
			ENOF,TORR		\$0.00	-5.00	\$0.00

Spot Price **\$8898/MWh**

⁵ Details on how the price is determined can be found at www.aemo.com.au

Appendix C: Closing bids

Figures C1 to C4 highlight the half hour closing bids for participants in South Australia with significant capacity priced at or above \$5000/MWh during the periods in which the spot price exceeded \$5000/MWh. They also show generation output and the spot price. While Origin Energy offered around 500 MW of capacity, only 1 MW was priced above \$5000/MWh when the price exceeded \$5000/MWh.

Figure C1 - AGL (Torrens Island, The Bluff, Hallett Wind Farm, North Brown Hill) closing bid prices, dispatch and spot price

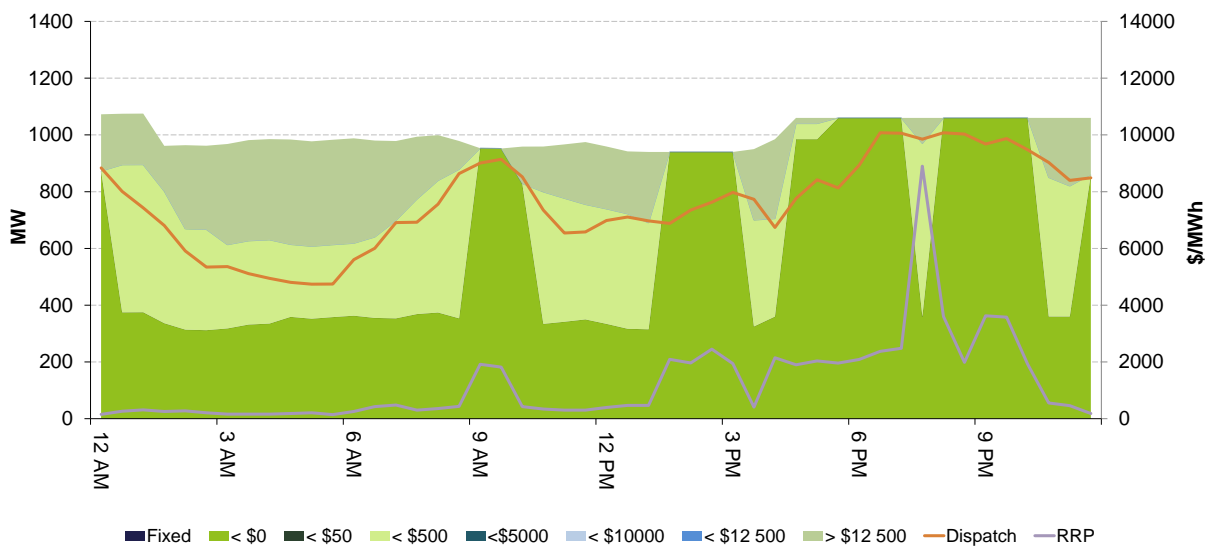


Figure C2 - EnergyAustralia (Hallett, Waterloo) closing bid prices, dispatch and spot price

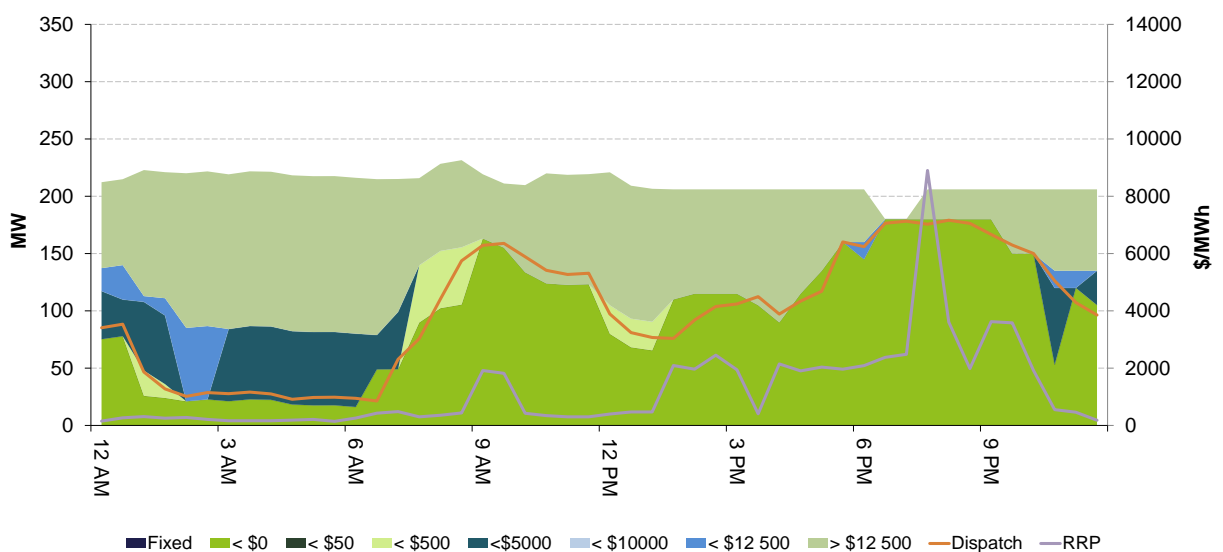


Figure C3 - Engie (Dry Creek, Mintaro, Port Lincoln, Snuggery) closing bid prices, dispatch and spot price

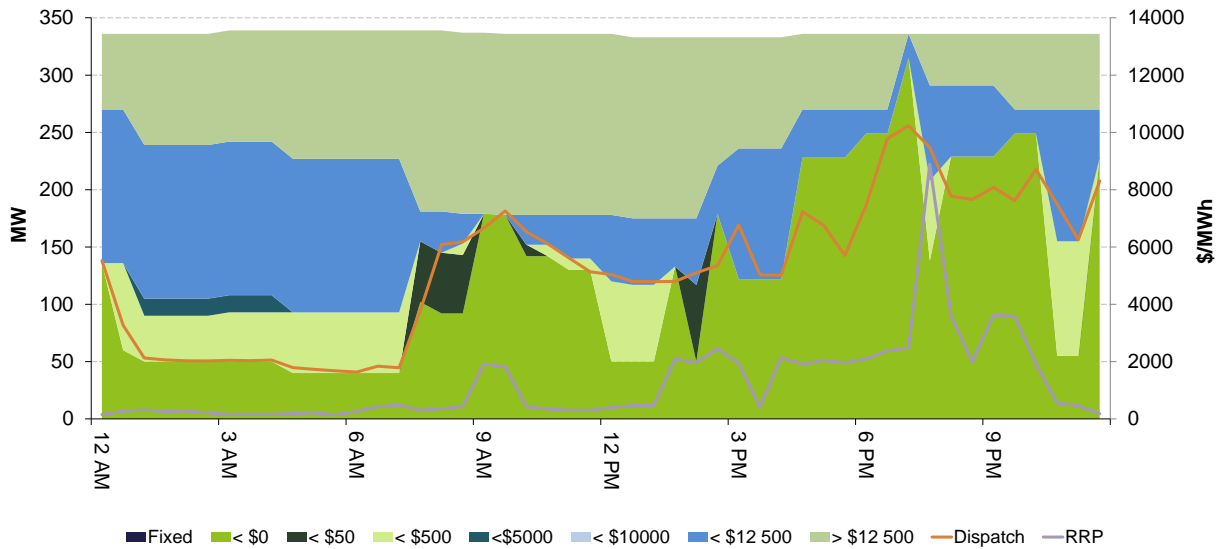
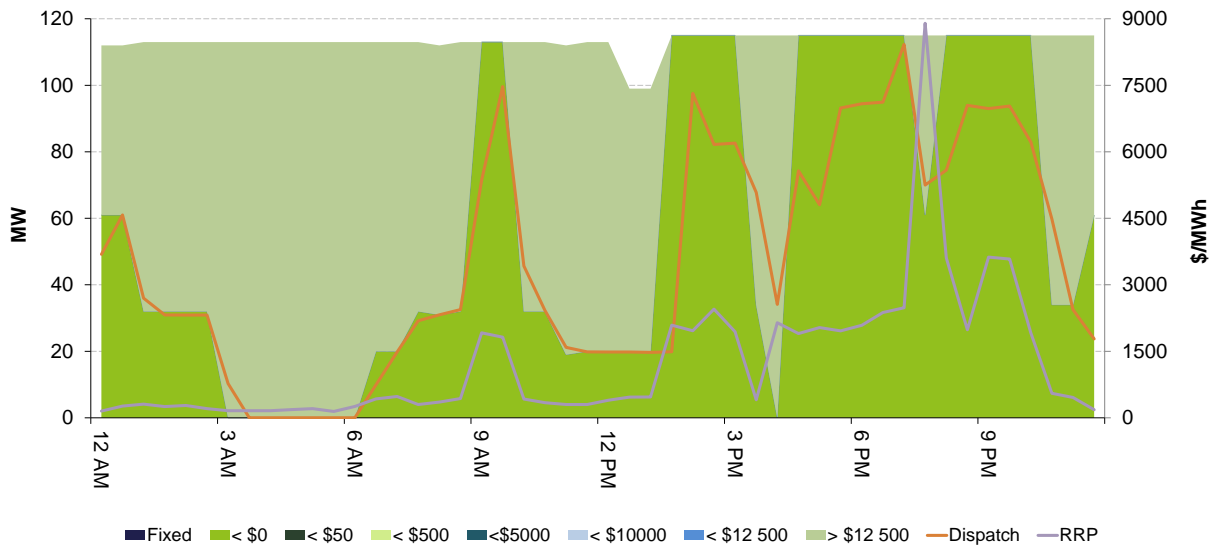


Figure C4 – Snowy Hydro (Lonsdale, Pt Stanvac and Angaston) closing bid prices, dispatch and spot price



Appendix D: Relevant Market Notices

The following market notices either were notifying the market of the network issues in South Australia.

Market Notice	Type	Date of issue	Last Changed
54171	GENERAL NOTICE	29/06/2016 14:55:03	29/06/2016 14:55:03

External Reference

Planned outage of Tailern Bend 275kV - South East 275kV No.1 line from 04/07/2016 0745 hrs to 12/07/2016 1730hrs

Reason

AEMO ELECTRICITY MARKET NOTICE.

Planned outage of Tailern Bend 275kV - South East 275kV No.1 line from 04/07/2016 0745 hrs to 12/07/2016 1730hrs

During these outage, South Australia region will remain connected to the NEM. However, there is a risk of South Australia region separating from the rest of the NEM following the next credible contingency (trip Tailern Bend 275kV - South East 275kV No.2 line).

AEMO will take all necessary steps as outlined in Section 6.1 of SO-OP-3715 Power System Security Guideline to manage the orderly separation of SA from the NEM following the next credible contingency.

Prior to the orderly separation of SA, the following FCAS regulation constraints will be invoked to manage security of South Australia power system.

F-S_LREG_0035

F-S_RREG_0035

Refer to AEMO Network Outage Schedule (NOS) for further details

Operations Planning

Market Notice	Type	Date of issue	Last Changed
54188	RESERVE NOTICE	01/07/2016 14:51:08	01/07/2016 14:51:08

External Reference

Update: Forecast Lack Of Reserve Level 1(LOR1) in the South Australia region - STPASA - 4, 6 and 7 July 2016

Reason

AEMO ELECTRICITY MARKET NOTICE RE: AEMO Electricity Market Notice(s) No. 54183. NOTICE OF UPDATE AEMO declares a Forecast LOR1 condition for the South Australia region for the following period(s): 1. From 04/07/2016 1800 hrs to 1900 hrs The minimum reserve available is 365 MW. 2. From 06/07/2016 1800 hrs to 2100 hrs The minimum reserve available is 273 MW. 3. From 07/07/2016 1800 hrs to 2100 hrs The minimum reserve available is 217 MW. The contingency capacity reserve required over the above periods of forecast LOR1 conditions is 400 MW. Harmohan Singh Operations Planning

Market Notice	Type	Date of issue	Last Changed
54306	Reserve Notice	07/07/2016 18:12:30	07/07/2016 18:12:30

External Reference

Actual Lack Of Reserve Level 1 (LOR1) in the SA Region - 07 July 2016

Reason

AEMO ELECTRICITY MARKET NOTICE

Actual Lack Of Reserve Level 1 (LOR1) in the SA Region - 07 July 2016
 An Actual LOR1 condition has been declared for the SA Region from 1815 hrs.
 The Actual LOR1 condition is forecast to exist until 2130 hrs
 The contingency capacity reserve required is 400 MW
 The reserve available is 277 MW
 Manager NEM Real Time Operations

Market Notice	Type	Date of issue	Last Changed
54352	Reserve Notice	07/07/2016 21:53:00	07/07/2016 21:53:00

External Reference

Cancellation of the Actual (LOR1) condition in the SA region - 7/07/2016

Reason

AEMO ELECTRICITY MARKET NOTICE

Cancellation of Actual (LOR1) condition in the SA region - 7/07/2016
 The Actual LOR1 Condition in the SA Region advised in AEMO Electricity Market Notice No.54306 is cancelled at 2130 hrs 7/07/2016.
 Manager NEM Real Time Operations

Appendix E: Rebid summary

Table 4 below shows the net effect of rebids by South Australian participants where capacity was moved from above to below the actual price. A negative number refers to the MW capacity being withdrawn and a positive means additional capacity.

Table 4: Net Effective rebids for South Australia from 1.30 pm to 10 pm

	Origin		EA		Snowy Hydro		Engie		AGL		Total	
	Above	Below	Above	Below	Above	Below	Above	Below	Above	Below	Above	Below
1.30 pm	-83	79	-20	20	-95	94	-5	5	-250	250	-453	448
2 pm	-82	78	-25	25	-95	94	11	-11	-250	250	-441	436
2.30 pm	-82	80	-25	25	-95	94	-51	51	-250	250	-503	500
3 pm	-82	84	-25	25	-95	94	16	-16	-250	250	-436	437
3.30 pm	No high price											
4 pm	-27	29			20	-21	-25	25			-32	33
4.30 pm	-82	84	-25	25	-61	61	-138	141	-310	310	-616	621
5 pm	-47	49	-45	45	-61	61	-138	141	-280	280	-571	576
5.30 pm	-47	49			-61	61	-128	131	-240	240	-476	481
6 pm	0	2	15	-15	-61	61	-149	152	-180	180	-375	380
6.30 pm	1	2	-20	20	-54	54	-134	134	-120	120	-327	330
7 pm	1	2	-20	20	-54	54	-195	195	-90	90	-358	361
7.30 pm	0	1	-20	20			-88	88	20	-20	-88	89
8 pm	0	1	-20	20	-61	61	-58	58	-90	90	-229	230
8.30 pm	-48	49	-20	20	-61	61	-58	58	-90	90	-277	278
9 pm	-48	49	-50	50	-61	61	-58	58	-120	120	-337	338
9.30 pm	-49	50	-20	20	-61	61	-83	83	-180	180	-393	394
10 pm	-49	50	-20	20	-81	81	-84	84	-210	210	-444	445

Appendix F Network Outage Timing

The following table contains a summary of information provided by ElectraNet and AEMO on the outages and their impact on the market. While various capacity limits were listed in MTPASA over the months preceding the Heywood outage, the first indication that the transfer limit from VIC to SA would be 0 MW occurred in STPASA 7 days prior to the commencement of the outage.

Mechanism	Date	By Whom	Comment
13 Month Outage Plan	20 Nov 2015	ElectraNet	Initial request Job EN34907 30/5/16 to 2/6/16 SE – Taillem Bend 1 Job EN34908 6/6/16 to 9/6/16 SE – Taillem Bend 2
MTPASA	22 Nov 2015	AEMO	MTPASA run 720 run types RELIABILITY_LIMITS, RELIABILTY_LOR, OUTAGE_LIMITS OUTAGE_LOR VIC to SA = 570 MW : V>S_570_MT SA to VIC = 550 MW : S>V_550_MT, V>>V_NIL_2A_R
Network Outage Scheduler	23 Mar 2016	ElectraNet	Initial entry Job EN34907 4/7/16 to 13/7/16 SE – Taillem Bend 1 Job EN34908 15/7/16 to 23/7/16 SE – Taillem Bend 2
MTPASA	24 Mar 2016	AEMO	MTPASA run 748 run types RELIABILITY_LIMITS, RELIABILTY_LOR, OUTAGE_LIMITS OUTAGE_LOR VIC to SA = 570 MW : V>S_570_MT SA to VIC = 550 MW : S>V_550_MT, V>>V_NIL_2A_R
Constraint Invoke tables	6 Apr 2016	AEMO	Constraint set V_S_SETB entered into the Constraint invoke tables. ⁶
MTPASA	19 Apr 2016	AEMO	MTPASA run 757 run types RELIABILITY_LIMITS, RELIABILTY_LOR VIC to SA = 570 MW : V>S_570_MT SA to VIC = 550 MW : S>V_550_MT, V>>V_NIL_2A_R OUTAGE_LIMITS VIC to SA = 377 MW : V^MS_PAVC_SETB ⁷ SA to VIC = 550 MW : S>V_550_MT OUTAGE_LOR VIC to SA = 505 MW : V^MS_PAVC_SETB SA to VIC = 550 MW : V>>V_NIL_2A_R
Network Outage Scheduler	26 Apr 2016	ElectraNet	Timing adjustment Job EN34907 4/7/16 to 13/7/16 SE – Taillem Bend 1 Job EN34908 15/7/16 to 23/7/16 SE – Taillem Bend 2

⁶ The GENCONSETINVOKE as defined in the MMS Data Model v4.25 Oracle published by AEMO at <https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/IT-systems-and-change> states:

“GENCONSETINVOKE provides details of invoked and revoked generic constraints. GENCONSETINVOKE is the key table for determining what constraints are active in dispatch, pre-dispatch and PASA.” This does not however indicate what the effect of the constraint will be on network transfer capabilities.

⁷ AEMO has indicated that this constraint was operating erroneously and had no relevance to the outage on the interconnector. The constraint was withdrawn on 8/8/16.

Mechanism	Date	By Whom	Comment
MTPASA	17 May 2016	AEMO	MTPASA run 766 run types RELIABILITY_LIMITS, RELIABILTY_LOR VIC to SA = 570 MW : V>S_570_MT SA to VIC = 550 MW : S>V_550_MT, V>>V_NIL_2A_R OUTAGE_LIMITS VIC to SA = 377 MW : V^S_PAVC_SETB SA to VIC = 216 MW : S^V_SETB_SETB ⁸ OUTAGE_LOR VIC to SA = 505 MW : V^S_PAVC_SETB SA to VIC = 270 MW : V>>V_NIL_2A_R
MTPASA	24 May 2016	AEMO	MTPASA run 768 run types RELIABILITY_LIMITS, RELIABILTY_LOR VIC to SA = 570 MW : V>S_570_MT SA to VIC = 500 MW : S>V_550_MT, V>>V_NIL_2A_R OUTAGE_LIMITS VIC to SA = 377 MW : V^S_PAVC_SETB SA to VIC = 550 MW : S>V_550_MT OUTAGE_LOR VIC to SA = 505 MW : V^S_PAVC_SETB SA to VIC = 550 MW : V>>V_NIL_2A_R
MTPASA	14 Jun 2016	AEMO	MTPASA run 777 run types RELIABILITY_LIMITS, RELIABILTY_LOR VIC to SA = 570 MW : V>S_570_MT SA to VIC = 550 MW : S>V_550_MT, V>>V_NIL_2A_R OUTAGE_LIMITS VIC to SA = 377 MW : V^S_PAVC_SETB SA to VIC = 530 MW : S:V_530 OUTAGE_LOR VIC to SA = 505 MW : V^S_PAVC_SETB SA to VIC = 550 MW : V>>V_NIL_2A_R
Settlement surplus residue auction	15 Jun 2016	AEMO	Settlement Residue Auction
MTPASA	21 Jun 2016	AEMO	MTPASA run 779 run types RELIABILITY_LIMITS, RELIABILTY_LOR VIC to SA = 570 MW : V>S_570_MT SA to VIC = 500 MW : S>V_500_MT, V>>V_NIL_2A_R OUTAGE_LIMITS VIC to SA = 377 MW : V^S_PAVC_SETB SA to VIC = 500 MW : S>V_500_MT OUTAGE_LOR VIC to SA = 505 MW : V^S_PAVC_SETB SA to VIC = 500 MW : S>V_500_MT

⁸ AEMO has indicated that this constraint was operating erroneously and had no relevance to the outage on the interconnector. The constraint was withdrawn on 8/8/16.

Mechanism	Date	By Whom	Comment
7 day out assessments and STPASA	1 Jul 2016	AEMO	STPASA 1 July 2016 4.00am for 7 July 2016 Region Solution OUTAGE_LOR flagged LOR1 for 19:00 and 19:30 Demand and wind forecast close to actual Interconnector Solution VIC to SA = 0 MW : ST_SA_0 SA to VIC = 110 MW : S::V_TBSE_TBSE RELIABILITY_LRC VIC to SA = 0 MW : ST_SA_0 SA to VIC = 500 MW : S:V_500_HY_TEST
Pre-dispatch	6 Jul 2016	AEMO	Heywood Interconnector export limit from VIC to SA shown as around 70 MW.