

Market Event Report: Record Demand in South Australia and Victoria 28 to 31 January 2009

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Final

1. Introduction

This report discusses the market outcomes when the South Australian and Victorian regions experienced a significant increase in demand due to high temperatures between 28 January 2009 and 31 January 2009. Four separate brief pricing reports covering the event for each calendar day were published on NEMMCO's website in association with specific events within this period (http://www.nemmco.com.au/opreports/pricing_jan.html).

NEM regions experienced extreme price fluctuations from 28 to 31 January 2009. The energy prices in Victoria increased to the market cap price of \$10,000/MWh while South Australia saw a peak energy price of \$9,999.92/MWh. The peak energy prices in other NEM regions during that period were \$6,880.22/MWh in Tasmania, \$2,657.59/MWh in New South Wales and \$1,134.99/MWh in Queensland. The Tasmanian region saw negative energy prices of less than -\$999/MWh for 11 trading intervals (TIs). The Frequency Control Ancillary Services (FCAS) prices in Tasmania reached \$10,000/MWh on Friday, 30 January 2009. FCAS prices in other regions were not materially affected.

Melbourne and Adelaide temperatures in excess of 43°C drove the 30-minute Victorian and South Australian market demand to reach record maximums of 10,494MW and 3,383MW respectively on 29 January 2009. The following market outcomes were observed between 28 and 31 January 2009:

- A Lack Of Reserve (LOR) 3 condition was declared on 29 and 30 January 2009 and instructions for load shedding were issued in South Australia and Victoria;
- South Morang to Keilor 500kV transmission line went out of service due to equipment damage at 14:12hrs on 30 January 2009 and the South Morang to Sydenham No.2 500kV line failed at 17:01hrs;
- Directions were issued to generators on 30 and 31 January 2009 for managing energy reserve levels and network security;
- Intervention pricing was invoked on 30 January 2009 when a direction was issued to a South Australian generator to manage the energy reserve level;
- Basslink interconnector shutdown for several TIs on 29 and 30 January 2009;
- Administered Price Period was declared in South Australia and Victoria from TI 15:30hrs and TI 17:30hrs respectively on 29 January 2009 and ceased on trading day commencing 04:00hrs, 6 February 2009 in Victoria and ceased on trading day commencing 04:00hrs, 7 February 2009 in South Australia; and
- More than \$910,000 of negative residues were accrued on 29 and 30 January 2009.

This report examines the market outcomes during this period.

A system incident report covering the operational aspects of this event will be published in due course.

2. Energy pricing outcomes

Figure 1 shows the 30-minute trading interval energy prices in the NEM and Table 1 summarises the events when the energy prices were either above \$300/MWh or below \$0/MWh. Appendix B lists the 30-minute trading energy prices between 28 and 31 January 2009.

Figure 1 – Trading Interval Energy Prices in the NEM (\$/MWh)

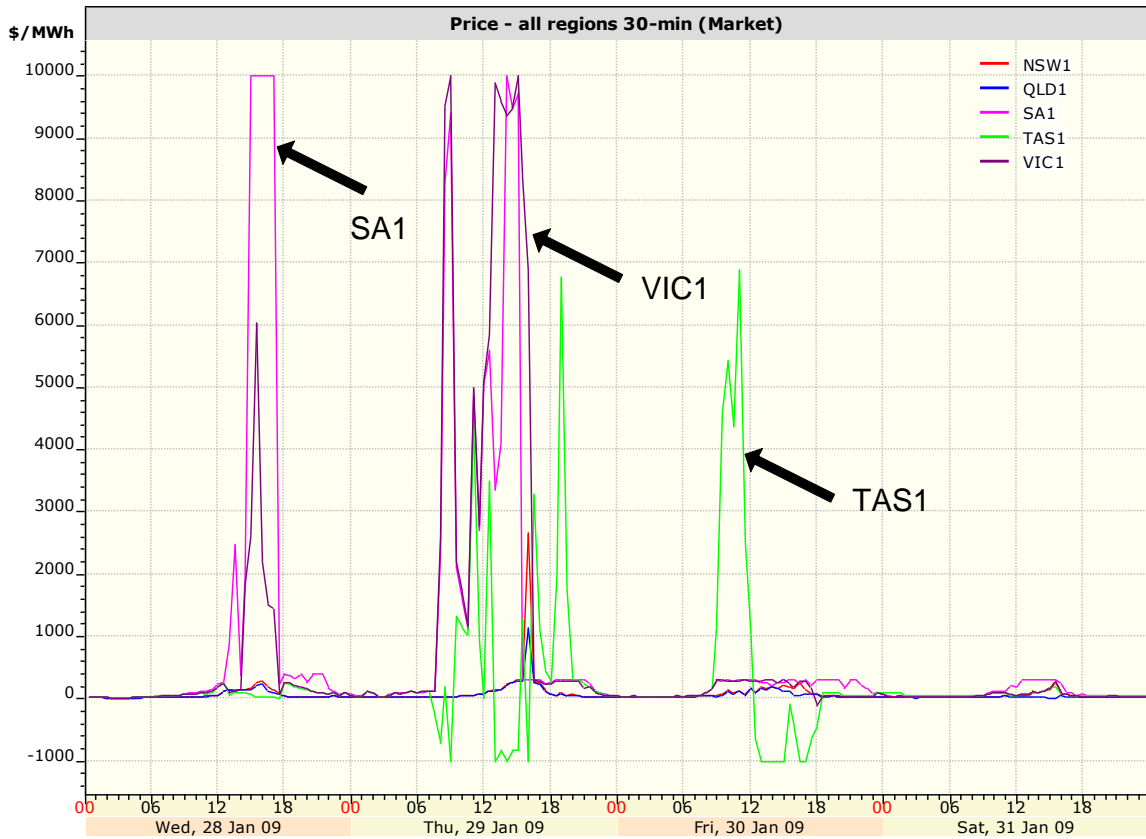


Table 1 - Trading Interval Energy Prices Above \$300/MWh and Below \$0/MWh

Date	Max Spot Price (Above \$300/MWh)	Duration when Spot Prices > \$300/MWh	Min Spot Price (Below \$0/MWh)	Duration when Spot Prices < \$0/MWh	Regions
28 January 2009	9999.77	8hrs			SA
	6035.89	3hrs			VIC
29 January 2009	10,000	9hrs			VIC
	9999.92	7.5hrs			SA
	6778.32	7.5hrs	-999.72	4.5hrs	TAS
	2657.59	1hr			NSW
30 January 2009	1134.99	0.5hrs			QLD
	6880.22	3.5hrs	-999.76	6hrs	TAS
			-106.15	0.5hrs	VIC

2.1 Energy Price Fluctuations

NEM regions, in particular South Australia, Victoria and Tasmania, saw significant energy spot price fluctuations from TI 13:00hrs on 28 January 2009 to TI 18:00hrs on 30 January 2009.

The main contributor to the high energy prices in South Australia and Victoria was high temperatures in excess of 40°C in Adelaide and Melbourne between 28 and 31 January 2009. This drove the demand to a record maximum of 10,494MW in Victoria and 3,383MW in South Australia on 29 January 2009 when temperatures peaked above 43°C.

The energy price in Victoria was manually set to \$10,000/MWh¹ from 12:40hrs to 15:20hrs on 29 January 2009 when an LOR 3 condition was declared and instructions for load shedding were issued. The energy price in South Australia was manually set to \$10,000/MWh from 13:55hrs to 15:20hrs on 29 January 2009 when an LOR 3 condition was declared in the region. The sequence of the power system events and load shedding instructions was published in NEM Communications No. 3233.

Both South Australia and Victoria regions experienced a scarcity of supply during the early afternoon on the 29 January 2009. NEMMCO managed the necessary load shedding by combining the current priority lists of the load blocks of both regions. The load blocks (such as smelter potlines and distribution feeders) are usually discreet in nature which means that they cannot be partly or incrementally shed. The first load block from the combined list was shed at 12:40hrs and energy price in Victoria was set to VoLL (as per procedure). This initial shedding of load in Victoria was large enough to relieve the shortage of supply in both Victoria and South Australia. Since South Australia was also experiencing a shortage of supply, and this condition was relieved through the load shedding action by freeing up interconnector supply, the South Australian prices could have been set to VoLL at the same time, without waiting until load was actually shed in that region. NEMMCO is considering clarification of procedures for application of the VoLL override when load shedding is activated in one region of a group that is sharing reserve on interconnectors.

On 30 January 2009, an LOR 3 condition was again declared in both South Australia and Victoria. The sequence of the power system events and load shedding instructions were published in NEM Communications No. 3243 and 3244. The energy prices in both regions were capped at \$300/MWh during the Administered Price Period (APP) on the day, as discussed in section 2.2.

Between DI 17:45hrs and DI 17:55hrs on 30 January 2009, the Victorian energy price collapsed to the administered price floor of -\$300/MWh when NEMMCO issued instructions to shed up to 1200MW of load from the western side of Melbourne. This was to restore power system security following the –short notice outage of the South Morang to Sydenham 500kV No.2 transmission line while the South Morang to Keilor 500kV line was already out of service earlier on the day due to equipment damage.

Intervention pricing² was triggered twice when similar directions were issued to Northern Power Station unit 2 on two separate days. The first period of intervention pricing was between DI 12:35hrs through to DI 16:35hrs on 30 January 2009 and the second period was between DI 12:20hrs and 5:30hrs on 31 January 2009. An outline of the direction is available from section 2.5.

¹ NER clause 3.9.2(e)(1) requires NEMMCO to set the regional reference price to VoLL when all load in a region cannot be supplied. There are exceptions, such as when an administered price period is current.

² Refer to the following link for more information regarding intervention pricing:

(<http://www.nemmco.com.au/powersystemops/140-0071.html>)

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Intervention pricing sets the energy and FCAS prices for all regions based on dispatch that would have occurred in the absence of the direction. The intervention pricing run uses initial values for all regions derived from the target values of the intervention run for the previous DI, while the outturn run (which determines generator & MNSP dispatch targets) uses the latest SCADA values as initial MW.

Figure 2 and Figure 3 show the 5-minute energy prices for both intervention ('what if') and out turn runs in South Australia and Victoria respectively for 30 and 31 January 2009. In addition to the intervention constraint equations that impacted the dispatch outcome in South Australia, the out-turn run uses the latest SCADA values as initial MW and applies the intervention constraint equations. The intervention run ignores any intervention constraint equations and applies the target values from the previous DI as the initial MW values (other than the first interval of the intervention pricing period). Therefore, it is expected that the prices for the two runs would be different. The prices in the two runs in South Australia were the same on 31 January as they were both capped to \$300/MWh under the APP.

Figure 2 - Comparison of Energy Prices from Intervention 'What if' and Target 'Out turn' runs (SA)

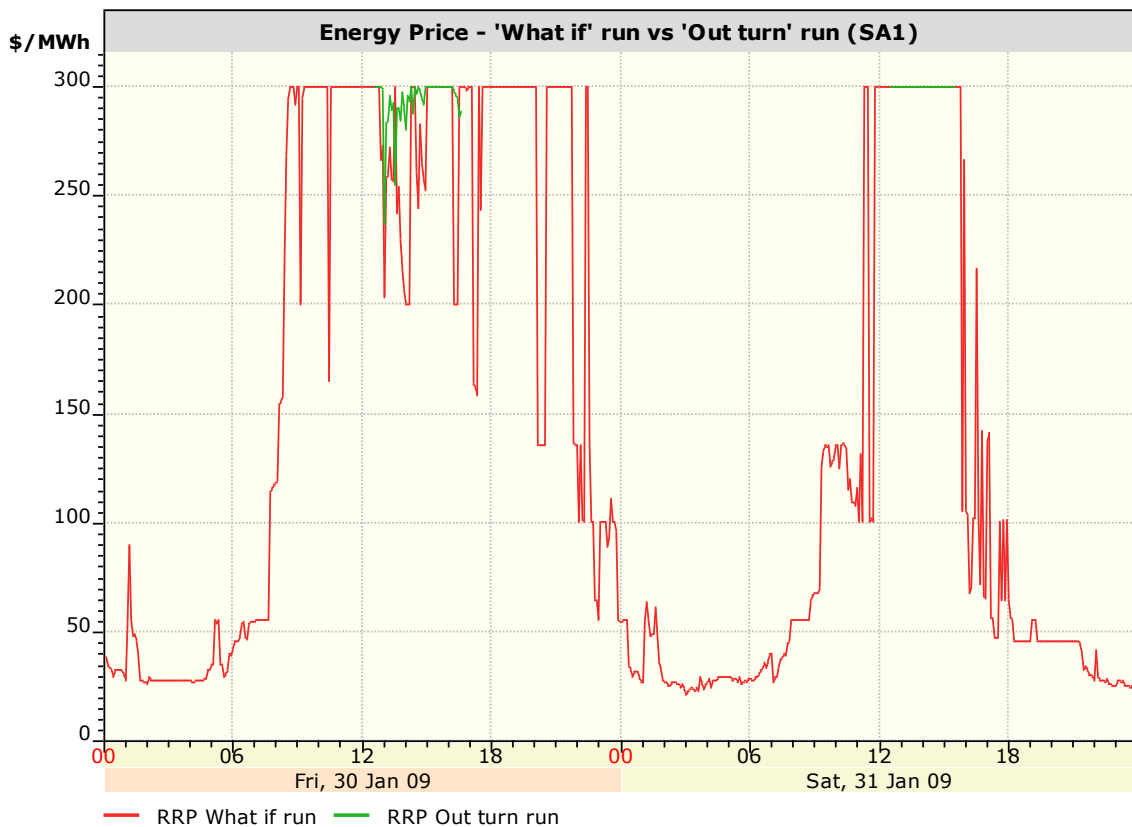
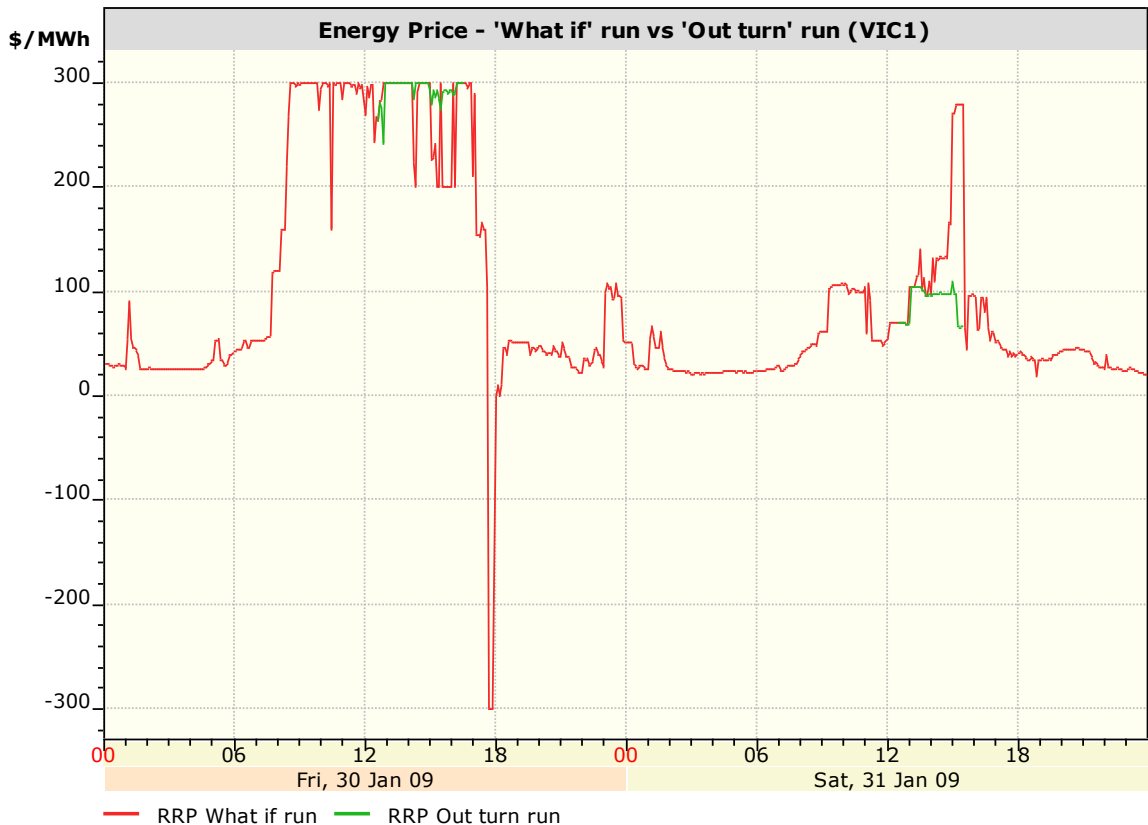


Figure 3 - Comparison of Energy Prices from Intervention 'What if" and Target 'Out turn' runs (VIC)



The transfer capability into Victoria from New South Wales through the VIC-NSW interconnector was predominantly limited by system normal constraint equations. Import into Victoria from Tasmania through the Basslink interconnector was at its upper operational limit of 594MW on 28 January 2009. The flows on the Basslink on other days were either limited to a lower value or tripped due to thermal protection. Further details on interconnector flows are available in section 3.

During the period in review, the Tasmanian region experienced energy prices that fluctuated between a peak of \$6880.22/MWh and a negative value of -\$999.76/MWh. During this period, local Tasmanian generators offered a significant amount of their generation capacity (between 60% and 100%) in the bands priced at less than \$0/MWh.

The energy prices in New South Wales and Queensland regions increased above \$300/MWh for 6 DIs and 4 DIs respectively on 29 January 2009. This coincides with the peak demand period of the day.

2.2 Administered Price Period (APP)

The 7-day cumulative price in South Australia reached \$153,794 at 15:00hrs on 29 January 2009 therefore an APP was declared from TI 15:30hrs in accordance to NER 3.14.2 (d1). At 17:00hrs on the same day, the cumulative price in Victoria reached \$151,446 and an APP was declared from TI 17:30hrs. During the APP, both energy and FCAS prices are capped at \$300/MWh and the minimum energy prices are -\$300/MWh (the minimum is \$0/MWh for FCAS prices).

If the price is capped in a region, then dispatch prices in adjacent regions are automatically scaled³ so that large negative residues are avoided on the regulated interconnectors when adjacent regions provide support over regulated interconnectors to the capped region. During the APP, in accordance to NEMMCO's procedure, the prices of the Victorian region were scaled when the net interconnector flow is towards the price capped region. The scaled price can be higher than the cap value as the marginal loss value can be greater than or less than unity, depending on the level of the dispatched interconnector flow.

In some dispatch intervals (eg. DI 15:25hrs 29 January 2009), Murraylink and Heywood interconnectors were dispatched to flow in opposite directions. Murraylink was dispatched to support the Victorian outer 220kV grid due to intra-regional transmission outages in Victoria. Enquiries were made by market participants regarding the application of price scaling as to whether the test is upon the net interconnector flow or if any one interconnector flow is towards the price capped region. In accordance with NEMMCO's procedure the net energy flow over the multiple parallel regulated interconnectors was used when assessing whether price scaling is to be applied to the adjacent region. This is consistent with the business requirement of avoiding negative settlement residues, which are calculated on the net flow. It also resolves the logical conflict that is likely to arise if the flow on an individual interconnector were used and both regions are subject to capping, whereby the prices in each region would have to be scaled from the other simultaneously and by different factors.

A number of enquiries arose from market participants during the event in regards to the time when APP was declared in the Victorian region. The calculation of the 7-day cumulative prices in all regions is based on the pre-cap⁴ prices, including the removing of price scaling during APP as described in the previous paragraph. The energy prices in Victoria were subjected to price scaling for 13 DIs prior to TI 17:30hrs when APP was declared in the region. Therefore, the cumulative price for the Victorian region could not be determined from NEMMCO's information published in the dispatch timeframe. Since the event, the pre-cap prices and the running cumulative price for all regions have been published on NEMMCO's website⁵ as an interim measure. The publication of pre-cap prices through the external market interface has been identified as an important project for the end of year 2009 MMS release.

The pre-cap energy prices in South Australia and Victoria during the APP period remained fairly high (above \$9,000/MWh) from 29 to 31 January 2009. Figure 4 shows the 5-minute dispatch energy price difference between the pre-cap value and the regional reference price (RRP) for the period in review. The seven-day rolling price sum for (pre-cap) energy prices is shown in Figure 5.

The APPs continued well into the following week and their termination is discussed in a separate Market Event Report covering that period. There was no material affect on market outcomes on the intervening days from 1 February to 5 February as prices did not require capping at any time during that period.

³ NER Clause 3.14.2(e) states in part that "...the dispatch prices at all other regional reference nodes connected by a regional interconnector or regulated interconnectors that have an energy flow towards that regional reference node must not exceed the product of the administered price cap multiplied by the average loss factor for that dispatch interval.."

⁴ Pre-cap price refers to the energy prices that would have been published if not for the application of the administered price cap Rule 3.14. Pre-cap prices are important for determining the end of APPs and the start of an APP in a region adjacent one that is already subject to APP capping.

⁵ Refer to the bottom of the web page <http://www.nemmco.com.au/data/csv.htm>
5 May, 2009

Figure 4 - Energy Price difference between Pre-Cap and RRP (\$/MWh)

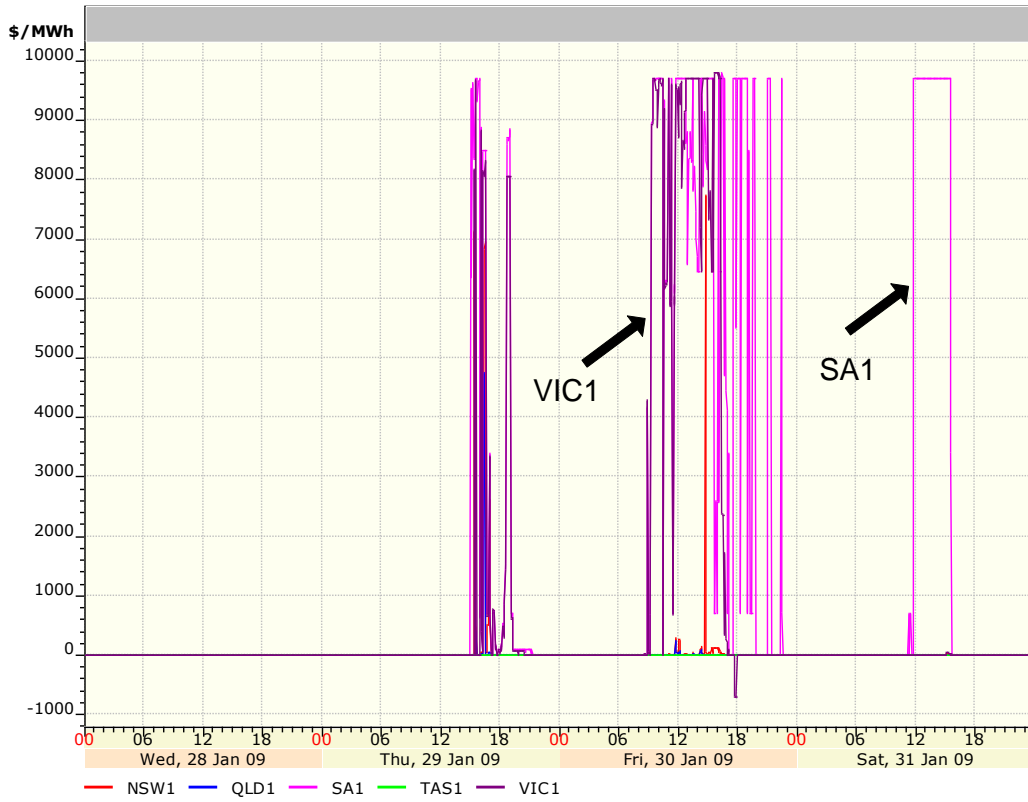
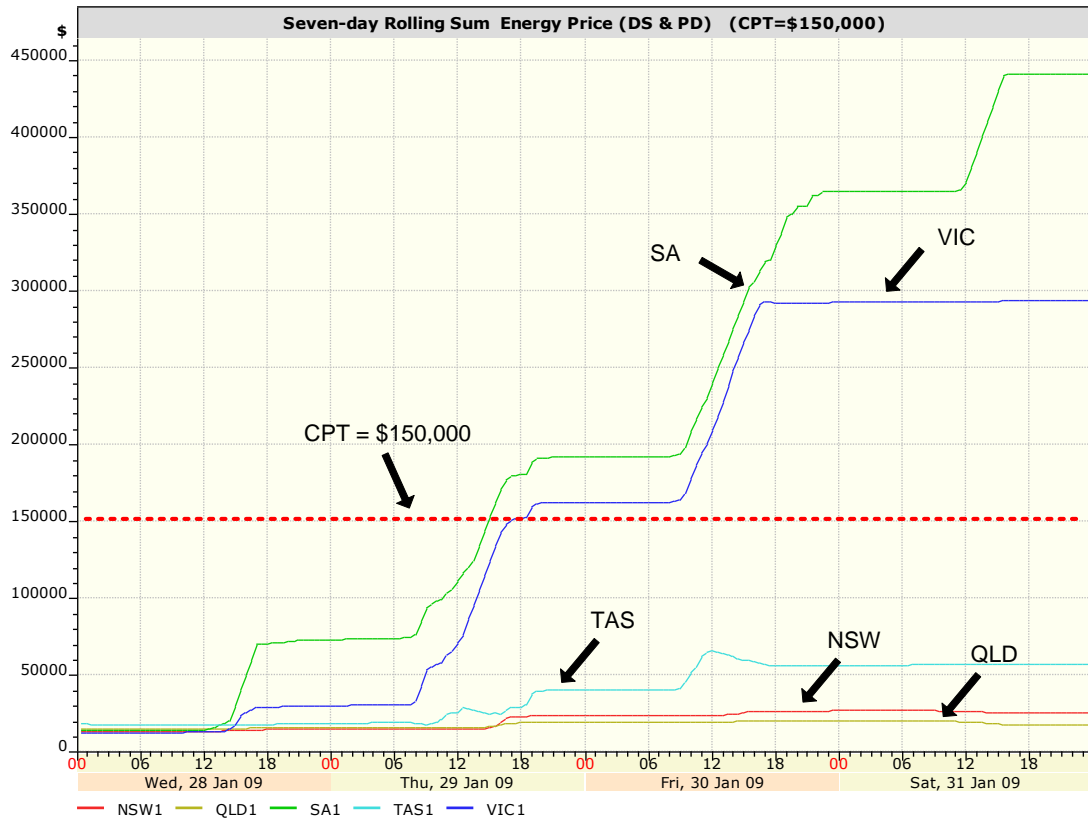


Figure 5 - Seven-day Rolling Sum Energy Price



2.3 Over-constrained dispatch (OCD)

A total of 87 DIs were triggered for automatic Over-Constrained Dispatch (OCD) re-runs between 28 and 31 January 2009. The OCD re-runs are triggered when constraint equations were violated and the raw dispatch price was either above the market cap price or below the market floor price. The automatic OCD process relaxes the constraint equation by the violation amount and solves again. A manual OCD process is required when the automatic OCD run does not resolve all violations and the dispatch price is still either above the market cap price or below the market floor price. The manual process is carried out by the end of the next business day. The price solution from the last OCD process is used for the settlement calculation.

During the period in review, a total of 15 of the 87 dispatch intervals were flagged for manual OCD re-runs. Four of these intervals required price adjustments, as listed in

Table 2.

Table 2 – Manually priced OCD intervals

Dispatch Interval	Region ID	Market	Original Published Price	Final OCD Price
29/01/2009 08:55	TAS1	Energy	-\$ 999.72	-\$ 999.70
29/01/2009 09:00	NSW1	Energy	\$ 40.10	\$ 40.89
	NSW1	L5MI	\$ 0	\$ 0.01
	NSW1	R60S	\$ 0.10	\$ 0.05
	QLD1	Energy	\$ 39.21	\$ 39.99
	QLD1	L5MI	\$ 0	\$ 0.01
	QLD1	R60S	\$ 0.10	\$ 0.05
	SA1	L5MI	\$ 0	\$ 0.01
	SA1	R60S	\$ 0.10	\$ 0.05
	TAS1	L5RE	\$ 1.60	\$ 1.59
	TAS1	R6SE	\$ 0.10	\$ 176.74
	VIC1	L5MI	\$ 0	\$ 0.01
	VIC1	R60S	\$ 0.10	\$ 0.05
30/01/2009 12:50	NSW1	Energy	\$ 116.72	\$ 117.50
	QLD1	Energy	\$ 110.85	\$ 110.87
30/01/2009 12:55	NSW1	Energy	\$ 119.18	\$ 149.95
	QLD1	Energy	\$ 110.85	\$ 138.57

Details of the price adjustments were published⁶ on 2 February, however monthly price summary information⁷ was not updated until 13 February 2009, which is later than the target completion time. NEMMCO is investigating procedures that will improve the publication of these manually adjusted prices so that the latest values are readily and automatically available.

2.4 Frequency Control Ancillary Service (FCAS) prices

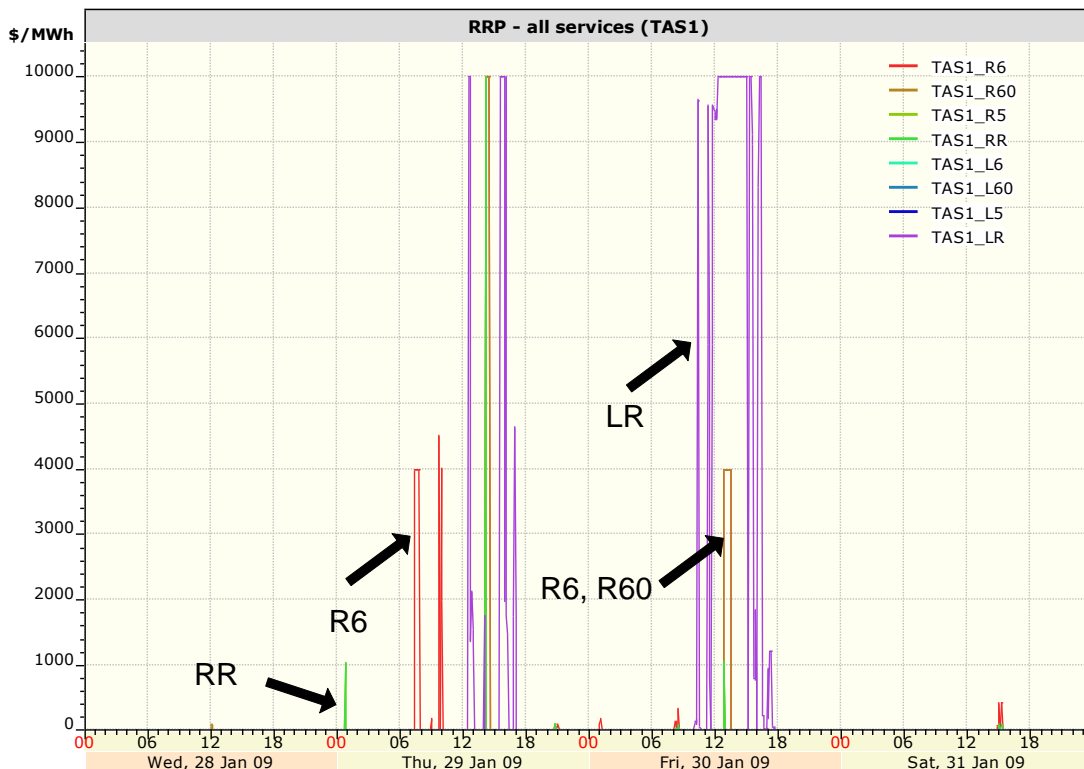
The FCAS prices in Tasmania increased significantly to a peak of \$10,000/MWh on 29 and 30 January 2009, as shown in Figure 6. The factors that contributed to the high FCAS prices include the Basslink interconnector going out of service; FCAS offers shifted to the higher priced bands; and some generators being FCAS trapezium limited. This means that there was a trade-off between the dispatch of energy and FCAS from some generators which cannot provide maximum FCAS and maximum energy at the same time.

The FCAS prices in the mainland regions of the NEM were not materially affected.

⁶ Refer to http://www.nemweb.com.au/REPORTS/CURRENT/Adjusted_Prices_Reports/

⁷ See aggregated price and demand data at http://www.nemmco.com.au/data/market_data.htm
5 May, 2009

Figure 6 - 5-minute FCAS Prices for All FCAS Services (\$/MWh)



2.5 Other Market Impacts

Directions were issued on 30 and 31 January 2009 to several generators in Victoria and South Australia to manage energy reserve levels or to maintain network security. A direction was issued to Northern Power Station unit 2 to increase its generation capacity from 240MW to 270MW between DI 12:25hrs to 16:35hrs on 30 January. A similar direction on the same generating unit was in place from 12:20hrs to 15:30 hrs on 31 January. Details of the directions have been published in separate direction reports. Intervention pricing was triggered for both of these directions as outlined in section 2.1.

Between 28 and 31 January 2009, the approximate amount of negative residues accrued on the Victoria to South Australia directional interconnector was \$584,422, accrued from 12:00 hrs to 14:30 hrs. The critical period was one hour when load shedding was initiated in Victoria but not in South Australia. The load shedding was accompanied by initiation of the VoLL override to set the Victorian price to \$10,000/MWh starting at DI 12:40hrs. The original prices based on dispatched offers for both regions fell away at this time when the demand was reduced through the load shedding action. Price scaling of the South Australian RRP did not apply because scaling acts as an upper limit and the flow on the interconnector was from Victoria to South Australia. Thus counter-price conditions were established with a flow of around 100MW from Victoria priced near VoLL to South Australia with trading interval prices around \$3,500/MWh. When load shedding was initiated in South Australia at 13:49 hrs and the VoLL override applied in that region as well, negative residues ceased. The Rules require that the VoLL override applies only to the region or regions in which load shedding has taken place, however the supply scarcity was across the combined regions. The load shedding in Victoria provided relief to South Australia as well, and this was reflected in the reduced initial price outcomes for both regions. On the day, the first load shed block, which happened to be in Victoria, was sufficiently large that there was no need to invoke a proportional reduction in South Australia, as would normally be required to share

load shedding in proportion to regional loads, until the demand increased later in the afternoon. Therefore it may have been appropriate from a market perspective, for the Rules to have required application of the VoLL override to both regions from DI12:40 hrs, rather than just Victoria.

The approximate amount of negative residues accrued on the South Australia to Victoria directional interconnector was \$335,322. This was accrued mainly during a period of 5 hours from 17:30 hrs on 30 January when power was constrained towards Victoria to maintain security of the weakened network in that region.

The value of energy traded on 29 January 2009 was approximately \$660M and on 30 January 2009 was approximately \$86.5M. For comparison, the average value of energy traded daily is around \$27M.

3. Interconnectors

The following figures show the target flows and limits for VIC-NSW, Heywood, Murraylink and Basslink interconnectors between 28 and 31 January 2009. The interconnector limits are calculated for each interconnector in turn by assuming that all other variables remained unchanged. Therefore, the same constraint violation can be repeatedly shown in the limits of multiple interconnectors.

The target flows on both the VIC-NSW and the Basslink interconnectors were predominantly towards Victoria.

The Basslink interconnector shut down between DI 14:10hrs to DI 14:40hrs on 29 January 2009 and between DI 12:50hrs and DI 15:05hrs on 30 January 2009, due to temperatures exceeding design limits at the converter stations. The Tasmanian FCAS prices increased significantly during both periods, as outlined in section 2.4. Energy prices in other regions were not materially affected. During the Basslink interconnector shut down period on 29 January 2009, the South Australian and Victorian regional prices were manually set to the market cap price of \$10,000/MWh. The second shut down period on 30 January 2009 coincided with the intervention pricing period and both South Australian and Victorian regional prices were under APP.

A constraint equation that sets the import limit of the Heywood interconnector and the export limit of the Basslink interconnector violated during the entire invocation period (DI 08:15hrs to DI 09:05hrs on 29 January 2009). This is shown by the spike in the relevant graphs below. The constraint equation manages the overloading of one Rowville to Yallourn 220kV line on trip of the other line. This constraint equation was created using the constraint automation tool to reflect the power system conditions during that period. Those conditions included the Hazelwood 500/220kV transformer No.1 being out of service from 01:42hrs to 09:05hrs and the Yallourn – Hazelwood 220kV lines closed at 08:07 hrs. With most Victorian generators being constrained off when the demand was increasing (9168MW in Victoria and temperature of 37.3°C at TI 09:00hrs), the energy prices in Victoria were driven to \$10,000/MWh from DI 08:05 to DI 09:05 hrs.

NEMMCO's Power System Incident Report will review the security implications of this constraint equation violation and will be published in due course.

In the following graphs, violation of constraint equations is indicated when the export limit (red) occasionally falls below the import limit (blue) or the import limit may rise above the export limit.

Figure 7 - VIC1-NSW1 Target Flows and Limits (MW)

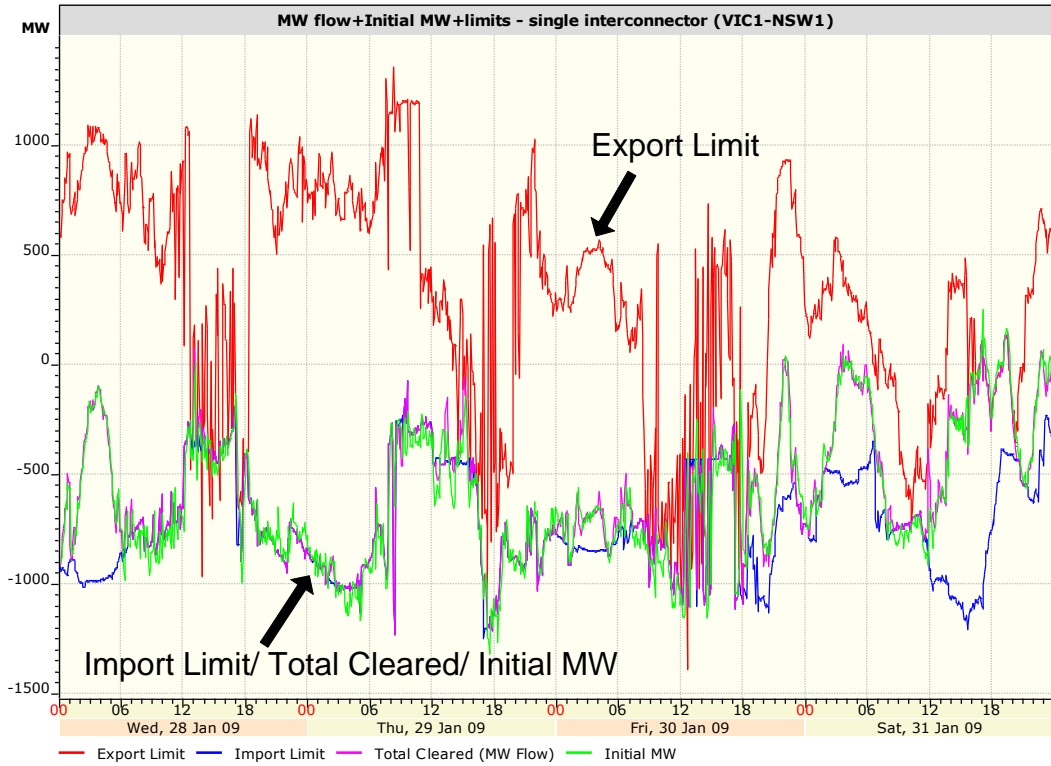


Figure 8 - V-SA Target Flows and Limits (MW)

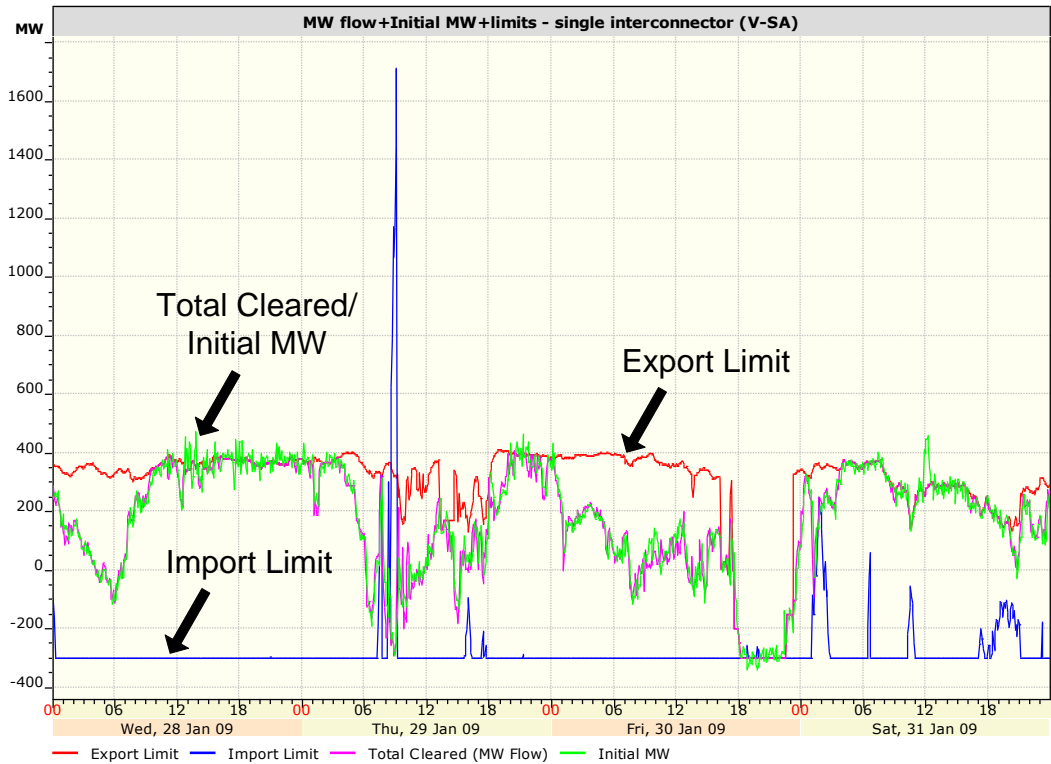


Figure 9 - V-S-MNSP1 Target Flows and Limits (MW)

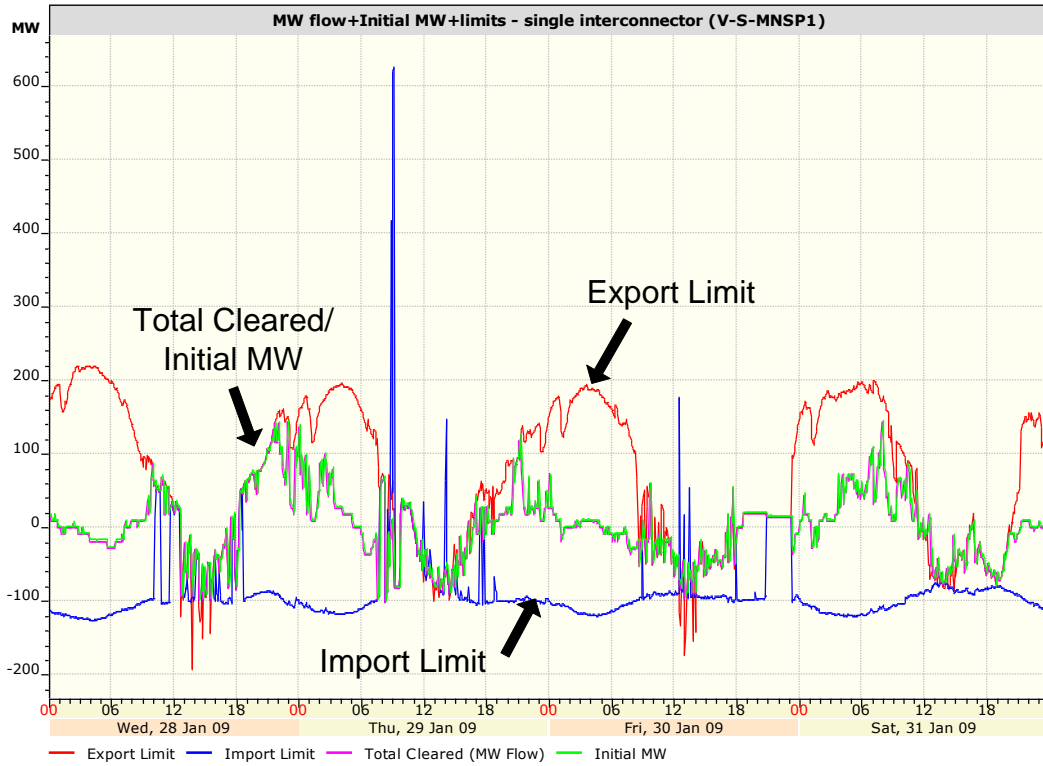
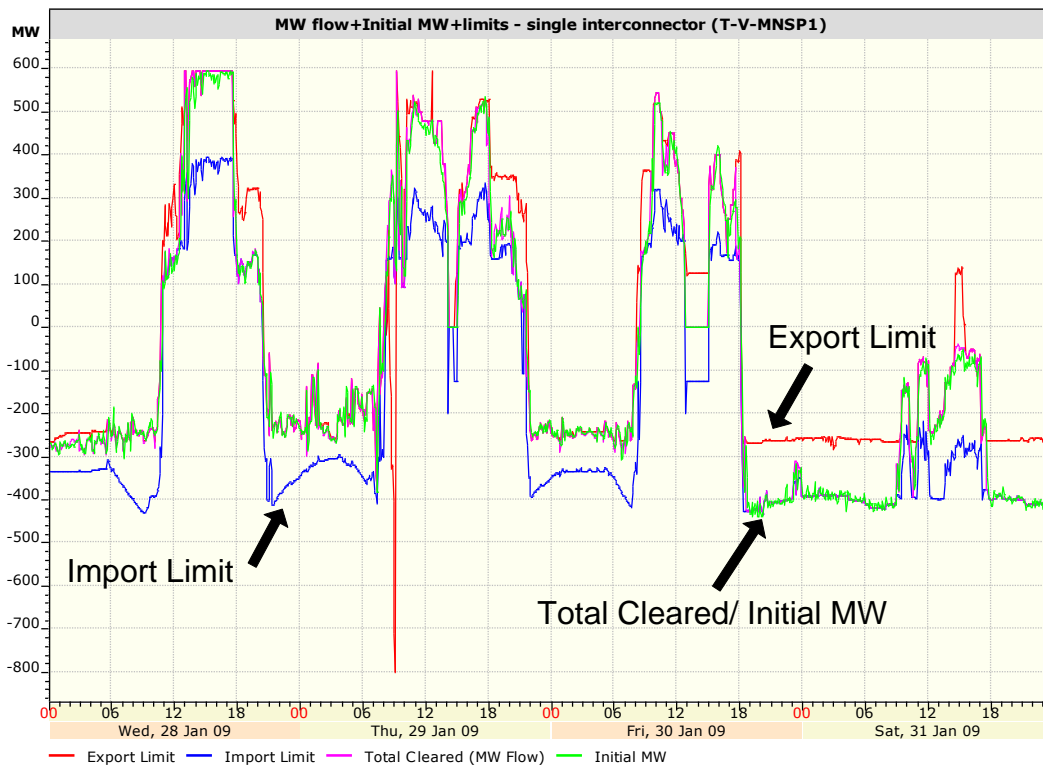


Figure 10 - T-V-MNSP1 Target Flows and Limits (MW)



4. Demand and Temperature

The following figures show the demand versus temperature in South Australia and Victoria for the week ending 1 February 2009. Both regions saw peak temperatures in excess of 43°C on 29 January 2009 resulting in record demand of 3,383MW in South Australia and 10,494MW in Victoria.

Figure 11 - South Australian Region Demand and Temperature

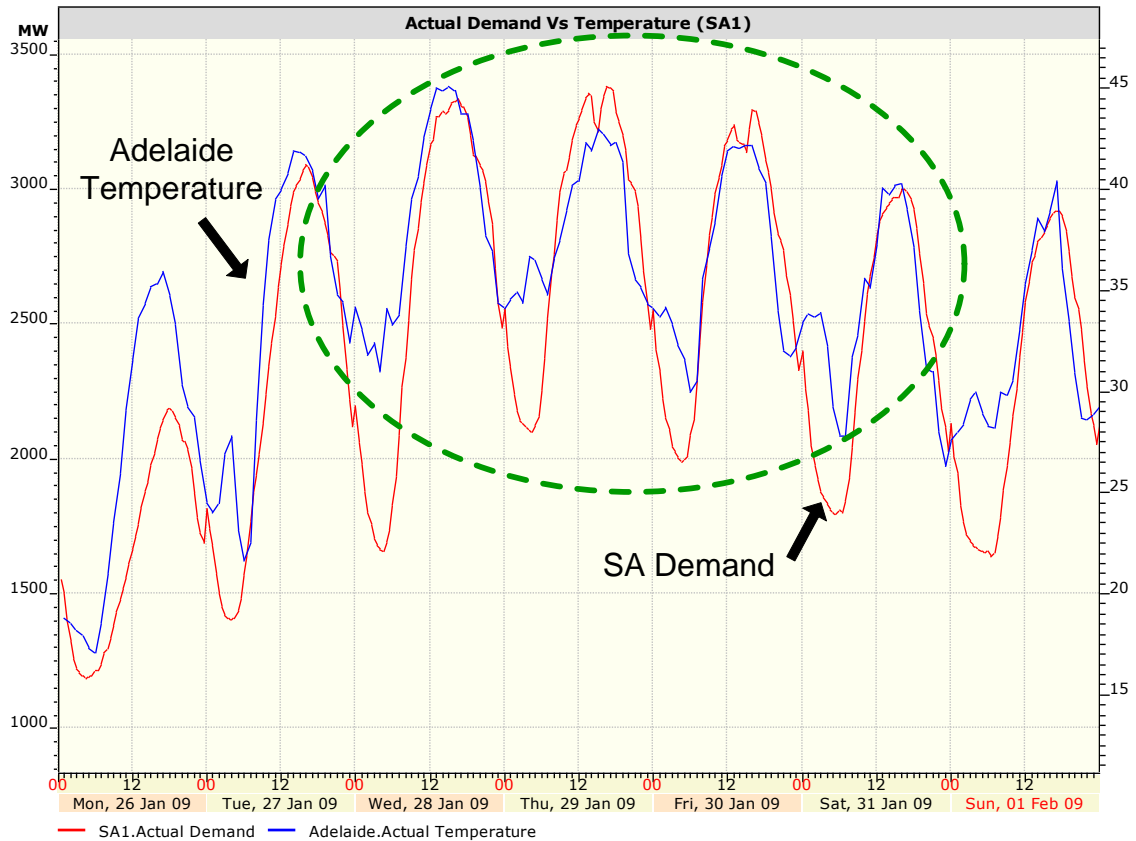
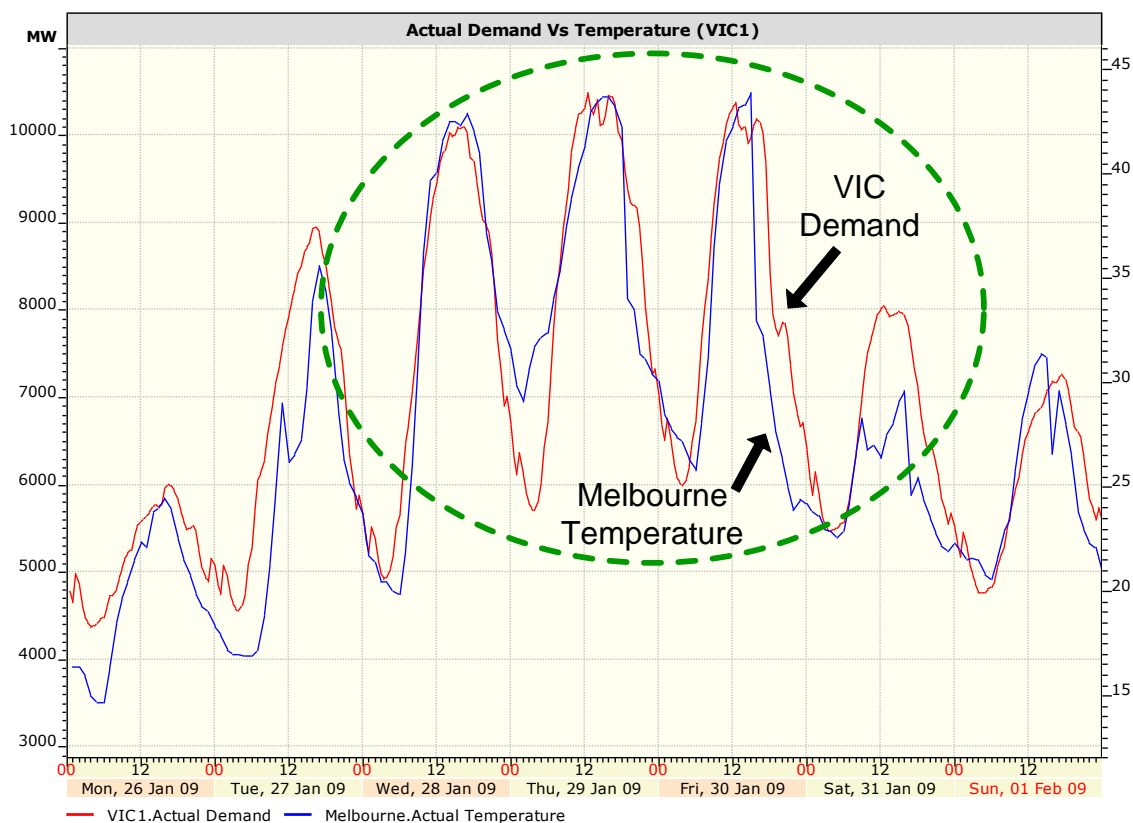


Figure 12 - Victorian Region Demand and Temperature



5. Generating Plant Operations

Figure 13, Figure 14 and Figure 15 show the 5-minute bid stack of the South Australian, Victorian and Tasmanian generators between 28 and 31 January 2009.

On 28 January 2009, a South Australian generator offered approximately 807MW into bands priced at more than \$9,990/MWh over the period 14:30hrs to 17:00hrs.

On 29 January 2009, some Victorian generators reduced their offered capability down by approximately 300MW due to the effects of high ambient temperatures on the plant. This aspect is discussed in the relevant power system incident report.

During the peak demand period, Tasmanian generators offered a significant amount of their generation capacity (between 60% and 100%) in the bands priced at less than \$0/MWh.

Figure 13 - 5-minute Bid Stack of South Australian Generators

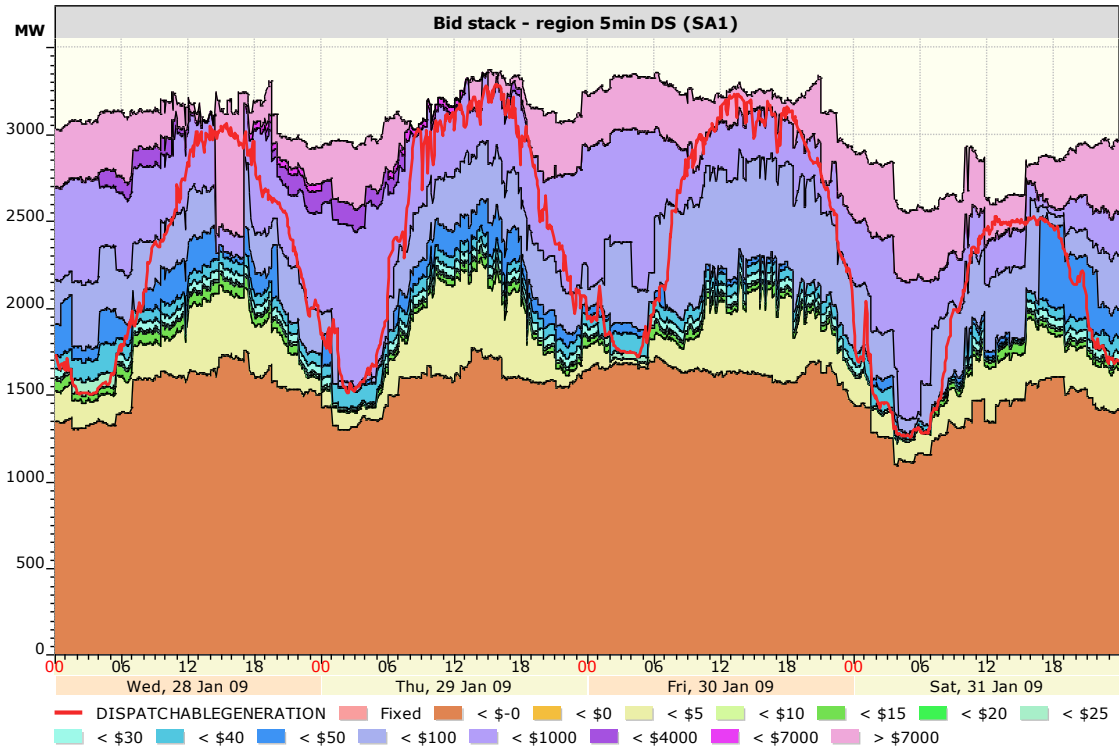


Figure 14 - 5-minute Bid Stack of Victorian Generators

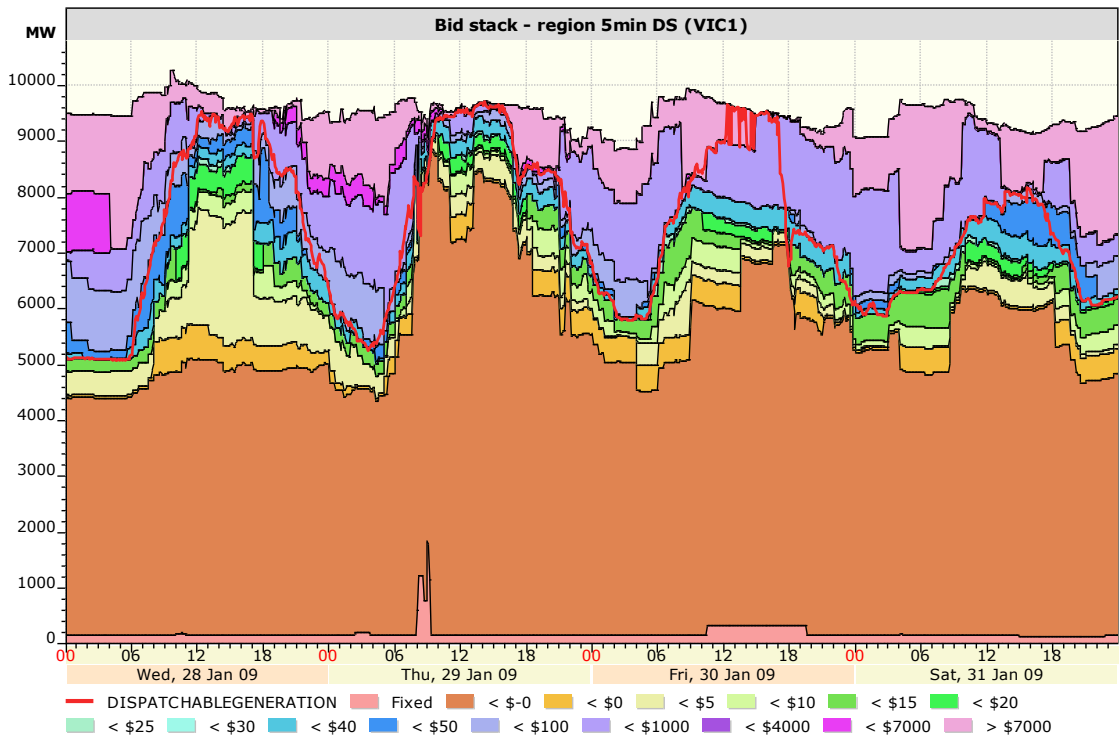
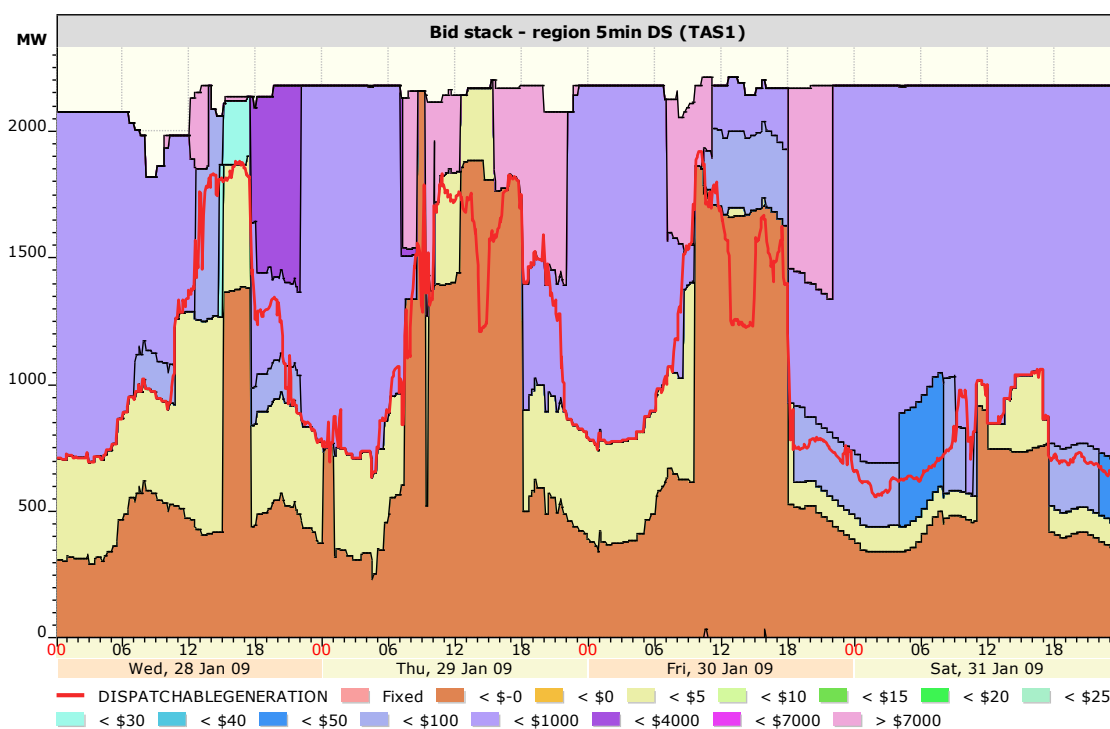


Figure 15 - 5-minute Bid Stack of Tasmanian Generators



6. Conclusion

All NEM regions saw significant price fluctuations between 29 and 31 January 2009. The principal features of the event were:

- Very high demand in South Australia and Victoria, driven by temperatures in excess of 40°C;
- A Lack Of Reserve (LOR) 3 condition was declared on 29 and 30 January 2009 and instructions for load shedding were issued in South Australia and Victoria;
- Forced outages on South Morang to Keilor 500kV transmission line and South Morang to Sydenham No.2 500kV line;
- Directions were issued on 30 and 31 January 2009 for managing energy reserve level and network security;
- Intervention pricing was invoked on 30 January 2009 when a direction was issued to a South Australian generator to manage the energy reserve level;
- Basslink interconnector shut down for several TIs on 29 and 30 January 2009;
- Administered Price Period was declared in South Australia and Victoria; and
- More than \$910,000 of negative settlement residues were accrued on 29 and 30 January 2009.

The prices for a number of intervals during the event were subject to OCD runs. The price solution from the last OCD process (either automatic or manual) is used for the settlement calculation. NEMMCO is investigating methods that will improve the presentation of these manually adjusted prices so that the latest values are readily and automatically available to stakeholders.

Other issues that arose from the event were:

- Energy prices prior to application if the administered price cap were not available to participants: NEMMCO made arrangements for publishing these prices on the website during the following week. The end of year 2009 MMS release is planned to include the publication of pre-cap prices through the external market interface.
- Application of VoLL override to a group of regions when load shedding occurs in one of them: NEMMCO to review procedures and Rules relating to the declaration of LOR3 and setting of VoLL when there is a supply scarcity in a group of adjacent regions.

Outcomes appear to be consistent with the dispatch offers and power system conditions during this event.

Appendix A – Glossary of Abbreviations

Abbreviation	Meaning
APC	Administered Price Cap
APP	Administered Price Period
DI	Dispatch Interval
DS	Dispatch
FCAS	Frequency Control Ancillary Services
L6	Lower 6 second FCAS service
L60	Lower 60 second FCAS service
L5	Lower 5 minute FCAS service
LHS	Left Hand Side
LReg	Lower regulation FCAS service
MNSP	Market Network Service Provider
NEM	National Electricity Market
NEMDE	National Electricity Market Dispatch Engine
NEMMCO	National Electricity Market Management Company
OCD	Over Constrained Dispatch
PD	Pre-dispatch
R6	Raise 6 second FCAS service
R60	Raise 60 second FCAS service
R5	Raise 5 minute FCAS service
RHS	Right Hand Side
RReg	Raise regulation FCAS service
RRP	Regional Reference Price
TI	Trading Interval
VoLL	Value of Lost Load, currently \$10,000/MWh

Appendix B – Trading Interval Energy Prices from 28 to 31 January 2009

The table below lists the 30-minute trading interval energy prices (in \$/MWh) from 28 to 31 January 2009. The trading intervals where the energy prices are below \$0/MWh or above \$300/MWh are highlighted in the table.

Settlement Date	NSW	QLD	SA	TAS	VIC
28/01/2009 00:30	27.95	26.64	36.92	34.75	33.56
28/01/2009 01:00	22.42	21.94	27.61	26.64	25.69
28/01/2009 01:30	21.66	20.72	29.88	29.51	28.52
28/01/2009 02:00	17.73	16.9	22.22	21.64	20.9
28/01/2009 02:30	11.82	11.28	14.19	13.76	13.31
28/01/2009 03:00	13.46	12.81	15.29	15.12	14.65
28/01/2009 03:30	15.08	14.13	16.92	16.89	16.29
28/01/2009 04:00	16.12	15	17.54	17.75	17.18
28/01/2009 04:30	19.47	18.02	21.18	21.86	21.11
28/01/2009 05:00	21.74	20.19	24.44	24.98	24.21
28/01/2009 05:30	23.36	21.72	27.25	28.28	27.32
28/01/2009 06:00	25.92	23.65	29.77	31.06	30.5
28/01/2009 06:30	35.36	32.34	42.69	44.2	42.96
28/01/2009 07:00	37.15	34.12	45.93	46.22	45.29
28/01/2009 07:30	34.76	32.96	50.42	48.76	47.45
28/01/2009 08:00	32.01	31.1	54.31	51.43	50.37
28/01/2009 08:30	35.22	33.81	53.6	50.14	49.2
28/01/2009 09:00	36.83	35.38	78.6	73.77	72.2
28/01/2009 09:30	40.89	38.8	93.72	85.54	83.21
28/01/2009 10:00	39.82	38.44	102.99	81.13	79.41
28/01/2009 10:30	42.91	40.59	127.28	98.03	96.2
28/01/2009 11:00	43.67	41.65	132.65	77.76	96.82
28/01/2009 11:30	55.64	52.78	142.53	112.26	117.73
28/01/2009 12:00	55.8	52.17	242.57	194.37	204.71
28/01/2009 12:30	121.12	115.32	268.46	260.23	246.4
28/01/2009 13:00	148.46	139.38	918.97	65.3	106.77
28/01/2009 13:30	136.53	126.78	2483.86	91.9	120.86
28/01/2009 14:00	149.1	138.23	367.15	90.06	143.33
28/01/2009 14:30	149.95	140.67	2000.64	95.19	1830.9
28/01/2009 15:00	160.11	148.5	9999.77	67.57	2648.28
28/01/2009 15:30	251.88	222.63	9999.77	28.27	6035.89
28/01/2009 16:00	275.76	237.6	9999.77	29.32	2196.99
28/01/2009 16:30	185.71	122.04	9999.77	24.43	1516.79
28/01/2009 17:00	144.86	94.76	9999.77	27.39	1435.39
28/01/2009 17:30	80.92	67.51	244.05	1.33	75.65
28/01/2009 18:00	56.77	47.79	401	260.26	274.29
28/01/2009 18:30	33.14	31.86	383.97	245.07	256.78
28/01/2009 19:00	28.13	28.3	333.59	200.41	207.2
28/01/2009 19:30	32.69	32.65	400.77	181.07	190.4
28/01/2009 20:00	35.54	34.87	261.39	153.96	162.35
28/01/2009 20:30	34.01	33.35	401.23	127.77	122.08
28/01/2009 21:00	31.69	30.72	401.53	100.57	100.2
28/01/2009 21:30	40.09	39.01	400.77	100.98	101.91
28/01/2009 22:00	30.46	30.13	170.74	86.96	85.25
28/01/2009 22:30	44.07	43.69	125.14	92.36	90.31
28/01/2009 23:00	35.29	35.22	75.62	57.07	56.13
28/01/2009 23:30	32.46	32.01	105.09	93.21	91.51
29/01/2009 00:00	27.53	27.16	89	64.23	63.14
29/01/2009 00:30	30.94	29.42	52.29	40.72	39.62
29/01/2009 01:00	26.57	25.35	48.25	40.26	39.54
29/01/2009 01:30	23.5	22.81	128.61	118.73	118.61
29/01/2009 02:00	22	21.77	112.26	96.45	96.12
29/01/2009 02:30	22	21.75	36.01	27.81	27.03
29/01/2009 03:00	22	21.76	41.16	33.6	32.62
29/01/2009 03:30	22	21.62	73.06	61.36	59.49
29/01/2009 04:00	22.09	21.66	107.04	96.09	94.01

Settlement Date	NSW	QLD	SA	TAS	VIC
29/01/2009 04:30	23.52	22.65	91.93	83.7	82.05
29/01/2009 05:00	24.99	23.52	100.77	91.34	90.31
29/01/2009 05:30	24.51	23.46	124.42	116.62	116.25
29/01/2009 06:00	31	28.89	110.17	106.37	105.19
29/01/2009 06:30	37.52	34.47	110.39	114.63	113.62
29/01/2009 07:00	39.78	36.98	116.04	119.31	120.65
29/01/2009 07:30	40.02	38.3	118.99	-259.48	127.62
29/01/2009 08:00	30.91	31.2	2392.62	-696.48	2641.34
29/01/2009 08:30	28.26	29.58	8266.44	191.77	9511.49
29/01/2009 09:00	36.67	36.72	9398.05	-999.72	10000
29/01/2009 09:30	38.14	37.83	2115.6	1315.95	2194.45
29/01/2009 10:00	44.59	43.78	1602.56	1136.79	1714.37
29/01/2009 10:30	53.99	52.5	1116.88	1033.53	1152.44
29/01/2009 11:00	58.17	57.15	4884.72	4416.15	4988.69
29/01/2009 11:30	82.71	80.26	2716.93	953.14	2773.48
29/01/2009 12:00	89.69	86.2	5042.02	1.28	5098.65
29/01/2009 12:30	124.49	121.81	5594.24	3491.16	5885.4
29/01/2009 13:00	139.77	134.67	3353.56	-999.65	9897.98
29/01/2009 13:30	149	143.44	4126.81	-832.86	9584.8
29/01/2009 14:00	233.04	221.75	9999.92	-999.66	9357.65
29/01/2009 14:30	273.11	253.99	9470.63	-832.96	9500.84
29/01/2009 15:00	299.89	274.85	9733.23	-832.94	10000
29/01/2009 15:30	305.05	279.92	300	1286.22	8383.34
29/01/2009 16:00	2657.59	1134.99	300	-999.7	6872.23
29/01/2009 16:30	276.2	267.46	300	3292.9	308.77
29/01/2009 17:00	258.94	248.2	300	1125.84	297.45
29/01/2009 17:30	125.98	116.39	244.63	452.58	236.37
29/01/2009 18:00	76.98	71.6	251.46	271.54	244.29
29/01/2009 18:30	59.41	54.78	300	2015.35	288.89
29/01/2009 19:00	90.94	82.83	300	6778.32	288.82
29/01/2009 19:30	60.39	56.46	300	1754.49	284.76
29/01/2009 20:00	70.08	63.85	300	319.07	281.58
29/01/2009 20:30	46.98	45.27	300	320.29	279.96
29/01/2009 21:00	33.96	33.49	300	237.66	166.41
29/01/2009 21:30	39.39	37.74	242.24	195.92	200.15
29/01/2009 22:00	25.78	25.57	118.13	108.81	102.84
29/01/2009 22:30	41.73	40.93	101.69	92.25	89.72
29/01/2009 23:00	33.5	33.57	67.97	60.24	58.8
29/01/2009 23:30	28.47	28.68	63.47	58.87	57.63
30/01/2009 00:00	25.01	24.81	53.02	45.63	44.77
30/01/2009 00:30	24.85	23.98	33.99	30.29	29.49
30/01/2009 01:00	24.39	24.05	31.83	30.02	29.13
30/01/2009 01:30	24.27	24.31	57.6	57.38	55.88
30/01/2009 02:00	21.82	22.02	29.61	28.65	27.81
30/01/2009 02:30	22.31	22.35	28.53	27.4	26.64
30/01/2009 03:00	21.95	22.06	27.95	26.69	26.01
30/01/2009 03:30	21.92	22.08	28.16	26.69	25.94
30/01/2009 04:00	21.94	21.99	28.18	26.6	25.92
30/01/2009 04:30	21.98	22.03	27.94	26.64	25.92
30/01/2009 05:00	23.42	23.42	31.16	30.03	29.13
30/01/2009 05:30	25.67	24.89	45.42	44.51	43.55
30/01/2009 06:00	29.45	27.05	36.24	36.07	35.06
30/01/2009 06:30	40.72	38.12	49.24	49.43	48.27
30/01/2009 07:00	43.31	40.83	52.45	52.51	50.76
30/01/2009 07:30	45.06	43.58	55.77	55.64	54.33
30/01/2009 08:00	51.44	50.31	96.59	99.87	99.15
30/01/2009 08:30	56.83	55.64	179.79	178.52	181.74
30/01/2009 09:00	44.09	43.5	297.66	1153.61	299.35
30/01/2009 09:30	67.27	64.9	282.52	4587.38	300
30/01/2009 10:00	139.13	132.07	300	5442.84	294.99
30/01/2009 10:30	96.64	77.85	277.5	4362.56	275.97
30/01/2009 11:00	127.41	121.82	300	6880.22	297.24
30/01/2009 11:30	67.36	64.34	300	2537.19	299.28
30/01/2009 12:00	167.58	162.42	300	1026.43	291.74
30/01/2009 12:30	111.71	108.34	300	-634.01	281.73

Settlement Date	NSW	QLD	SA	TAS	VIC
30/01/2009 13:00	187.81	179.65	273.73	-999.68	288.45
30/01/2009 13:30	168.11	157.63	267.38	-999.72	300
30/01/2009 14:00	203.78	186.7	224.99	-999.72	300
30/01/2009 14:30	178.47	169.47	260.13	-999.76	269.08
30/01/2009 15:00	225.4	125.92	267.07	-999.74	300
30/01/2009 15:30	203.21	113.95	300	-85.49	232.99
30/01/2009 16:00	181.37	50.75	300	-451.15	200
30/01/2009 16:30	256.83	48.71	250	-999.73	283.33
30/01/2009 17:00	144.07	88.84	299.75	-999.7	284.22
30/01/2009 17:30	81.4	73.51	221.33	-633.98	179.49
30/01/2009 18:00	85.07	76.36	300	-438.55	-106.15
30/01/2009 18:30	45.33	42.05	300	106.38	25.43
30/01/2009 19:00	44.94	43.48	300	97.4	51.99
30/01/2009 19:30	44.96	45.16	300	97.44	51.51
30/01/2009 20:00	37.17	37.88	300	97.6	44.62
30/01/2009 20:30	35.31	35.58	163.14	65.32	43.1
30/01/2009 21:00	34.62	34.76	300	65.32	41.4
30/01/2009 21:30	34.58	34.85	300	65.32	39.31
30/01/2009 22:00	23.5	24.25	217.99	65.32	24.93
30/01/2009 22:30	31.8	32.77	173.14	65.32	33.75
30/01/2009 23:00	33.72	34.46	87.18	65.32	38.18
30/01/2009 23:30	28.84	29.64	97.76	104.96	100.14
31/01/2009 00:00	26.28	26.35	86.6	101.3	82.95
31/01/2009 00:30	25.42	24.63	44.07	97.62	39.56
31/01/2009 01:00	23.66	22.8	30.28	97.62	27.42
31/01/2009 01:30	22.68	21.71	53.84	97.62	52.88
31/01/2009 02:00	22.15	21.69	39.04	65.32	37.43
31/01/2009 02:30	21.67	21.24	26.82	65.32	24.35
31/01/2009 03:00	20.93	20.3	25.13	65.32	22.98
31/01/2009 03:30	20.8	20.61	24.03	65.32	21.87
31/01/2009 04:00	21.03	21.07	26.42	65.32	21.99
31/01/2009 04:30	21.81	21.6	28.03	45.29	22.8
31/01/2009 05:00	22	21.85	30.01	45.3	23.4
31/01/2009 05:30	21.63	20.83	28.89	45.3	23.04
31/01/2009 06:00	21.64	20.67	27.77	45.3	22.88
31/01/2009 06:30	22.64	21.24	30.15	45.3	24.52
31/01/2009 07:00	24.12	22.57	36.88	45.3	27.12
31/01/2009 07:30	23.5	23.02	33.04	45.3	26.64
31/01/2009 08:00	27.45	27.14	47.08	45.3	32.3
31/01/2009 08:30	38.15	37.1	55.77	65.3	45.46
31/01/2009 09:00	36.95	35.15	61.37	65.3	55.5
31/01/2009 09:30	41.17	37.95	100.33	85.81	83.33
31/01/2009 10:00	42.89	38.97	131.92	106.3	106.14
31/01/2009 10:30	41.18	36.11	133.78	106.29	102.65
31/01/2009 11:00	51.41	44.37	113.42	104.85	100.98
31/01/2009 11:30	47.4	39.35	205.58	65.08	70.27
31/01/2009 12:00	45.24	34.59	200.62	50.2	52.72
31/01/2009 12:30	59.99	38.63	300	72.44	70.75
31/01/2009 13:00	64.99	35.81	300	77.06	75.58
31/01/2009 13:30	98.58	31.96	300	114.85	114.72
31/01/2009 14:00	93.32	25.43	300	101.59	102.81
31/01/2009 14:30	116.64	23.49	300	125.11	128.05
31/01/2009 15:00	151.77	18.92	300	162.9	166.5
31/01/2009 15:30	269.11	7.5	300	202.71	277.6
31/01/2009 16:00	77.26	46.65	229.68	70.67	82.62
31/01/2009 16:30	80.22	34.4	110.74	70.3	82.38
31/01/2009 17:00	65.33	31.83	97.95	54.31	64.48
31/01/2009 17:30	47.3	31.25	66.27	56.84	47.24
31/01/2009 18:00	42.15	35.07	83.28	65.22	39.85
31/01/2009 18:30	37.49	31.47	49.35	65.28	37.82
31/01/2009 19:00	34.59	30.5	45.77	65.28	32.01
31/01/2009 19:30	36.57	32.97	50.77	65.3	34.98
31/01/2009 20:00	39.2	34.72	45.77	65.3	40.89
31/01/2009 20:30	39.77	35.25	45.77	65.3	44.23
31/01/2009 21:00	35.43	31.77	45.77	65.3	44.84

Settlement Date	NSW	QLD	SA	TAS	VIC
31/01/2009 21:30	33.38	30.41	42.57	65.3	39.22
31/01/2009 22:00	25.5	23.26	31.01	65.3	28.41
31/01/2009 22:30	27.22	25.12	30.63	45.3	28.99
31/01/2009 23:00	24.29	23.06	26.62	45.3	25.07
31/01/2009 23:30	24.41	23.26	27.18	45.3	25.77
01/02/2009 00:00	21.17	20.54	23.98	45.3	21.83