

30 October – 5 November 2011

## Preface

As part of its monitoring roles for the National Gas Market Bulletin Board (Bulletin Board) and the Declared Wholesale Gas Market (Victorian Gas Market), the AER publishes a weekly gas market report. Part A of the report looks at gas usage and flows of registered facilities in southern and eastern Australia (as reported on the Bulletin Board). Part B provides a summary of operational and market data in the Victorian Gas Market.

The AER is responsible for monitoring and enforcing compliance with Part 20 of the National Gas Rules (Gas Rules) that authorise and govern conduct in the Short Term Trading Market (STTM). The STTM is a market for the wholesale trading of natural gas at defined hubs between pipelines and distribution systems, and began operation on 1 September 2010. With initial hubs of Sydney and Adelaide, additional hubs are intended for the future. Each hub is scheduled and settled separately, but all hubs operate under the same rules. Part C provides a summary of operational and market data in the STTM.

The Victorian Gas Market lies between the two STTM hubs and shares common production sources with the Adelaide and Sydney hubs. Participation in the Victorian Gas Market and the STTM hubs occurs on the basis of a different set of market rules and requires contractual arrangements with different pipeline owners. Participants operate in only those markets where they have production, gas and pipeline contracts. Some key differences between the STTM and the Victorian Gas Market are set out at the start of Part C.

This report will evolve over time and the nature of information presented may change. The AER welcomes feedback on the report from interested parties. Feedback can be sent to [aer inquiry@ aer.gov.au](mailto:aer inquiry@ aer.gov.au), with the subject title 'Comments on weekly gas report'.

## Summary

Average daily prices in the Victorian market and the Sydney and Adelaide hubs are shown in figure 1.

**Figure 1: Average daily price (\$/GJ) – All gas markets**

30 October – 5 November	Victorian market*	STTM Sydney hub**	STTM Adelaide hub**
<b>Average Price</b>	2.13	2.56	3.77

\*weighted average daily imbalance price

\*\*ex ante market price

## STTM Gas Markets (Adelaide and Sydney)

For Sydney figure S3 shows this week's average ex ante and ex post prices were lower than those for the previous week and year-to-date periods. Figure S4 shows that in Adelaide both the average ex ante and ex post prices were higher than for the previous week and close to year-to-date levels.

Figure S2 shows that no withdrawal bids were scheduled in Adelaide this week. Epic Energy has notified the AER that it has temporarily stopped accepting backhaul nominations from shippers

due to an error in its systems. According to Epic, whenever backhaul is scheduled the error causes it to under-allocate the forward haul quantity of gas delivered to the hub, which affects MOS allocations. Epic Energy advised it will resume backhaul services once it has resolved the problem.

### **Victorian Gas Market**

Higher demand, consistent with cooler weather, saw higher injections than the previous week (from 473 TJ/day to 524 TJ/day). Consistent with this, the average weekly price was higher than the previous week.

A planned outage at the Otway gas plant began on 1 November, leading to a significant reduction in flows on the South West Pipeline. As a result of this outage, from Tuesday the (large demand) Victorian market was supplied by facilities in Eastern Victoria, while gas sourced from the Otway basin was delivered into the Western Transmission System (west of Geelong) and exported to Adelaide via the SEAGas Pipeline.

The Otway plant is scheduled to return to service on 1 December.

### **National Gas Market Bulletin Board**

Figure N4 shows overall gas demand and gas production volumes increased by 64 TJ/day and 44 TJ/day respectively compared to the previous week. Overall gas-powered generation volumes were also slightly higher this week.

There were no instances of late or missing Bulletin Board data this week.

# Part A: National Gas Market Bulletin Board

## Overview of pipeline and production flows

Figure N1 sets out the average daily pipeline flows into each key demand region across the National Gas Market. A list of pipeline facilities for each demand region is provided in Figure A1 of the Appendix.

**Figure N1: Average daily pipeline flows (TJ) into each demand region**

Average daily flows	QLD							
	NSW	ACT	VIC	SA	TAS	Brisbane	Mt Isa	Gladstone
<b>30 October – 5 November</b>	269	11	505	241	53	166	107	130
Financial Year-to-date 2011-12*	349	33	723	284	50	172	102	123
Financial Year-to-date 2010-11**	425	35	785	305	47	180	93	108

\*Average daily estimated gas consumption measured from 1 July 2011 to the current week (inclusive)

\*\*Average daily estimated gas consumption measured from 1 July 2010 to the equivalent week in 2010-11 (inclusive)

Source: National Gas Market Bulletin Board <http://www.gasbb.com.au>

Figure N2 provides the average daily amount of gas used for GPG (gas-powered generators) in each state.

**Figure N2: Average daily gas (TJ) used by gas-powered generators in each state**

Average daily gas for GPG usage^	NSW	VIC	SA	TAS	QLD
<b>30 October – 5 November</b>	34	4	128	37	142
Financial Year-to-date 2011-12*	55	15	159	34	133
Financial Year-to-date 2010-11**	86	17	174	31	154

^Estimated values based on application of implied heat rates for generators within the demand region sourced from ACIL Tasman's 2009 Final Report 'Fuel resource, new entry and generation costs in the NEM'

\*Average daily estimated gas consumption measured from 1 July 2011 to the current week (inclusive)

\*\*Average daily estimated gas consumption measured from 1 July 2010 to the equivalent week in 2010-11 (inclusive)

Source: <http://www.aemo.com.au>

Notes: Data for each state collected on the following basis:

1. NSW - Smithfield Energy, Uranquinty, Hunter Valley GT, Colongra and Tallawarra power stations.
2. VIC - Laverton North, Valley Power, Jeeralang A, Jeeralang B, Somerton, Bairnsdale, and Newport power stations.
3. SA - Dry Creek GT, Hallet, Pelican Point, Torrens Island, Mintaro, Osborne, Ladbroke Grove, and Quarantine power stations.
4. TAS - Tamar Valley power stations.
5. QLD - Braemar 1, Braemar 2, Roma, Oakey, Barcaldine, and Swanbank power stations.

Figure N3 sets out the daily average flows from production and storage facilities from each production zone across the National Gas Market. A list of production/storage facilities for each zone is provided in Figure A2.

**Figure N3: Daily average production flows (TJ) for each production zone**

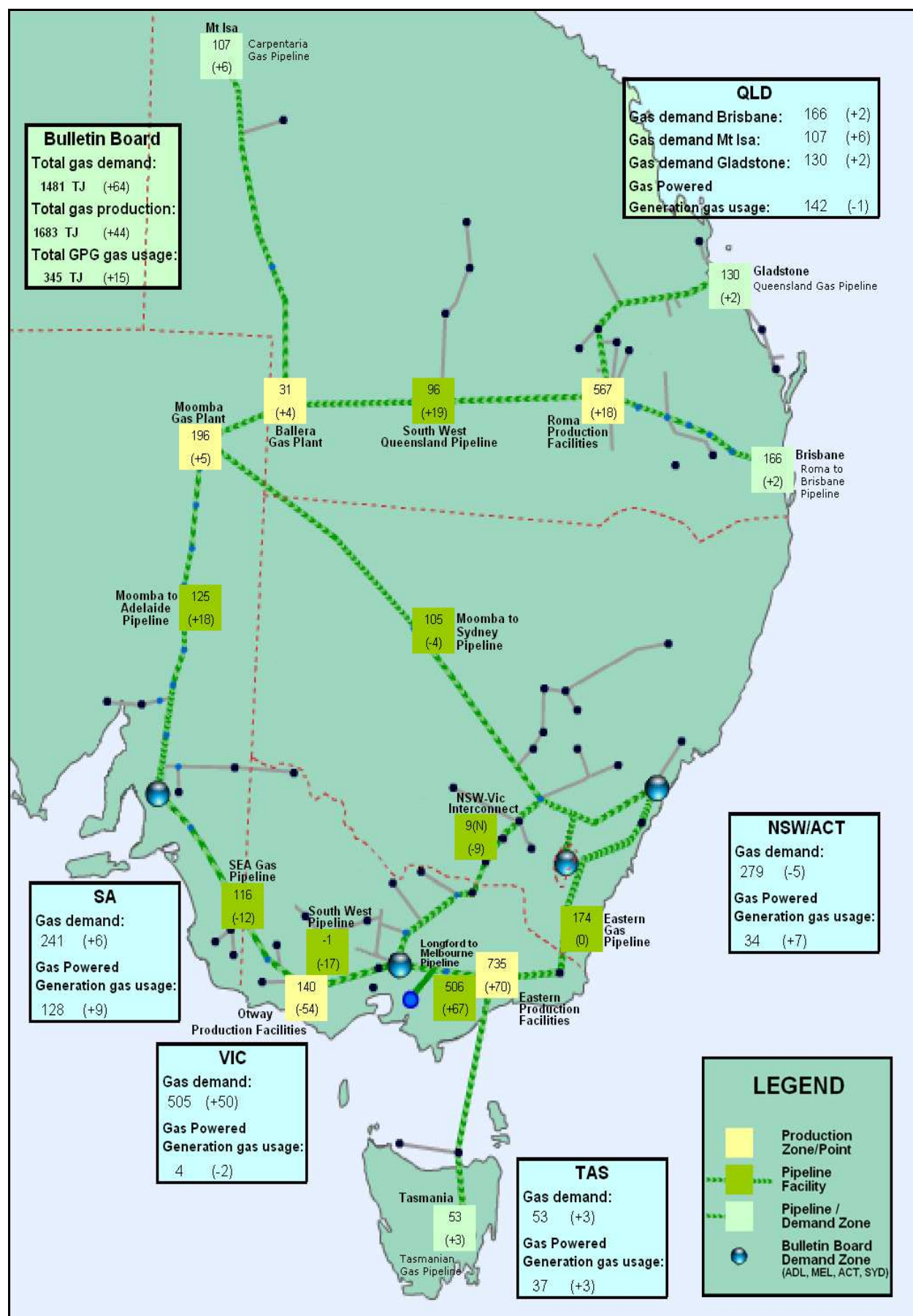
Average daily flows	Roma (QLD)	Eastern Victoria	Otway Basin (VIC)	Moomba (SA/QLD)
<b>30 October – 5 November</b>	567	735	140	227
Financial Year-to-date 2011-12*	555	840	311	269
Financial Year-to-date 2010-11**	549	924	317	334

\*Average daily estimated gas consumption measured from 1 July 2011 to the current week (inclusive)

\*\*Average daily estimated gas consumption measured from 1 July 2010 to the equivalent week in 2010-11 (inclusive)

Source: National Gas Market Bulletin Board <http://www.gasbb.com.au>

**Figure N4: Gas production/consumption and pipeline flows (TJ) (changes from the previous week are shown in brackets)**



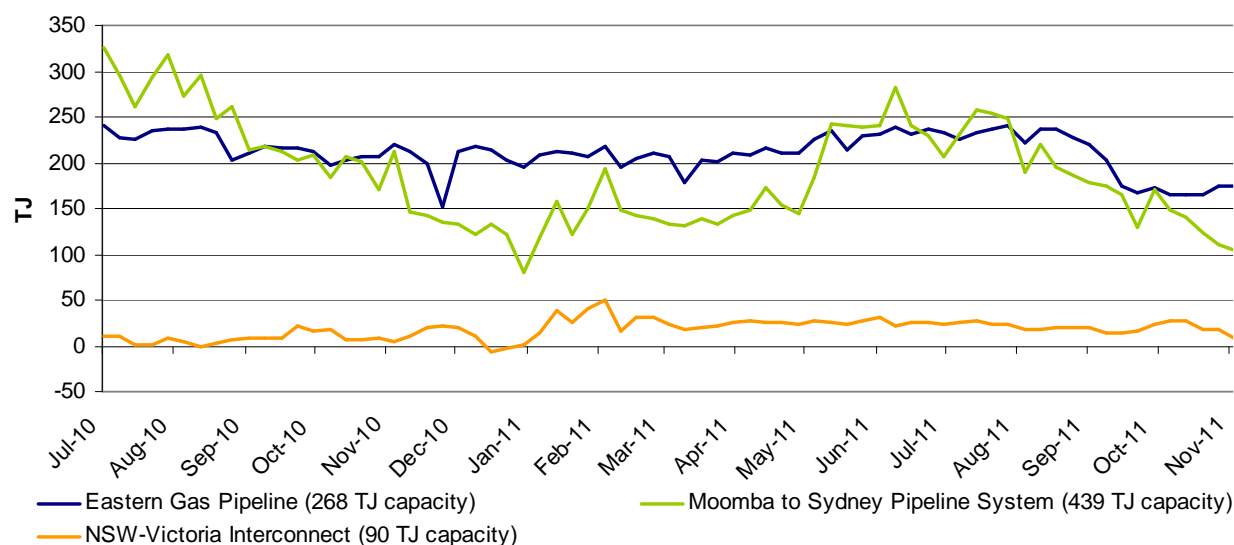
Source: Natural Gas Market Bulletin Board <http://www.gasbb.com.au>

Notes: Direction of aggregate daily flows along the NSW-Vic Interconnect indicated on map by S (South) or N (North). Numbers in brackets indicate a change in average daily flow from the previous week.

## Gas flows into demand regions

The figures below provide the average daily flows into each of the demand regions served by multiple pipelines and supply sources.

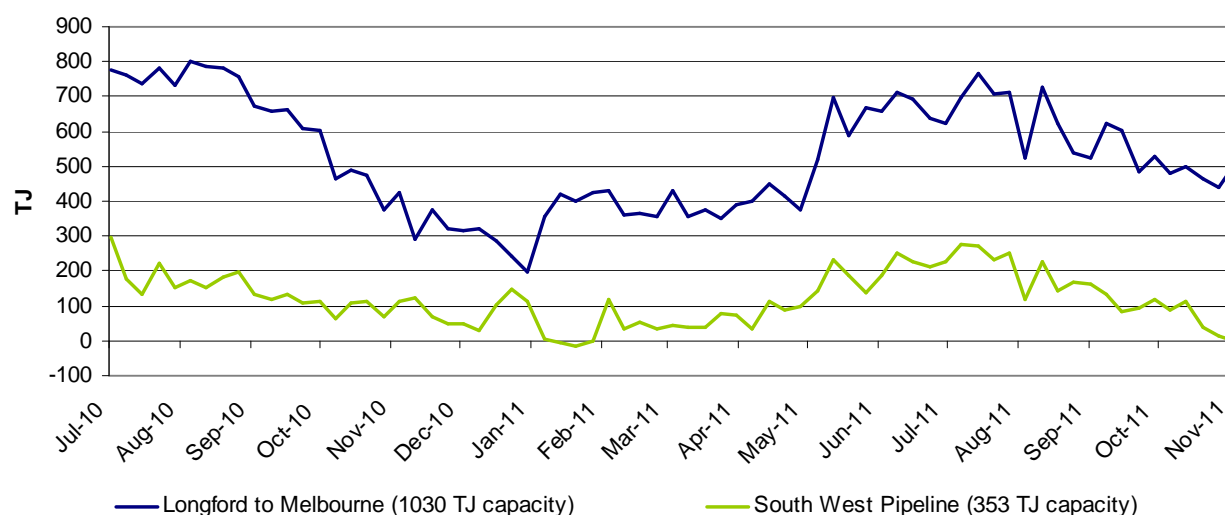
**Figure N5: Average daily flows (TJ) into NSW/ACT demand region**



Source: Natural Gas Market Bulletin Board <http://www.gasbb.com.au>

Notes: Negative flows on the NSW-Victoria Interconnect represent flows out of NSW into VIC.

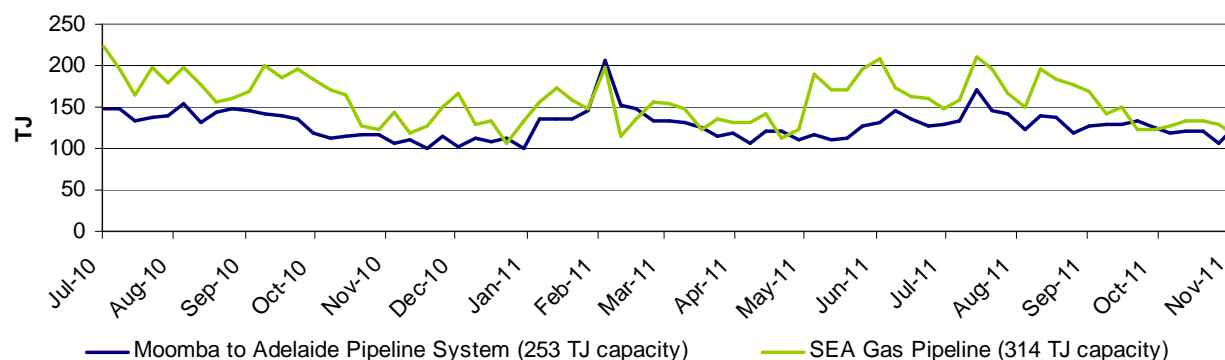
**Figure N6: Average daily flows (TJ) into VIC demand region**



Source: Natural Gas Market Bulletin Board <http://www.gasbb.com.au>

Notes: Negative flows on the South West Pipeline represent flows out of the VPTS and back into storage at Iona.

**Figure N7: Average daily flows (TJ) into SA demand region**



Source: Natural Gas Market Bulletin Board <http://www.gasbb.com.au>

## Part B: Victorian Gas Market

### Participation in the market

Figure V1 shows participant bids submitted at the start of the gas day (6 am) at injection and withdrawal points on the Victorian Declared Transmission System (DTS). The orange shaded boxes indicate that the participant submitted bids at that location on at least one occasion during the week. An “S” indicates that some of this nominated gas was scheduled into the gas market, while “NS” indicates that none of the gas was scheduled. Green shading indicates where a change has occurred from the previous week.

Bids are scheduled in price merit order — this means injection bids which are less than the market clearing price will be scheduled, while withdrawal bids which are greater than the market clearing price will be scheduled into the market.

**Figure V1: Injection and withdrawal point bids in the VIC Gas Market<sup>^</sup>**

Market Participant	Participant type	No. of injection / withdrawal bid points	Injection bids in the VPTS									Withdrawal bids in the VPTS			
			BassGas	Culcairn	IONA	LNG	Longford	SEA Gas	VicHub	Otway	Mortlake	Culcairn	IONA	SEA Gas	VicHub
AETV Power	Trader	1							S						S
AGL (Qld)	Retailer	1				NS									
AGL	Retailer	3			NS	NS	S								
Aurora Energy	Retailer	1					S								
Aust. Power & Gas	Retailer	3			NS	NS	S						S		
Aust. Power & Gas	Trader	1					S								
Coogee Energy	Transmission Customer	1					S								
Lumo Energy	Retailer	4		NS		NS		S	S			NS			
Lumo Energy	Trader	2			NS				NS				S		S
Origin (Vic)	Retailer	6	S	NS	S	NS	S	S				S	S		
Origin (Uranquinty)	Trader	2					S					S			
Red Energy	Retailer	1					S								
Santos	Retailer	3			S			S	S						S
Simply Energy	Retailer	4			S	NS	S	S					S	S	
TRU Energy	Retailer	4			S	NS	S		NS				NS		NS
TRU Energy 2	Retailer	2					S		NS						NS
Visy Paper	Distribution Customer	2					S					S			

<sup>^</sup>Bids taken from 6 am data for each gas day during the current week.

Source: <http://www.aemo.com.au> (INT131)



## Market Prices

Figure V2 displays volume-weighted average daily imbalance prices, compared to the 2010-11 financial year-to-date average and the 2009-10 financial year-to-date equivalent as well as daily imbalance prices for each day during the current week.

The daily average market price is a volume weighted imbalance price taking account of trading amounts at five times through the gas day — 6 am, 10 am, 2 pm, 6 pm and 10 pm.

**Figure V2: Imbalance Weighted Prices (\$/GJ)**

	30 October – 5 November	23 October – 29 October	2011-12 Financial YTD*	2010-11 Financial YTD**
<b>Average daily price</b>	2.13	1.65	3.03	2.02

30 October – 5 November	Sun	Mon	Tue	Wed	Thu	Fri	Sat
<b>Daily price</b>	2.19	2.49	0.82	2.47	2.95	1.26	2.77

\*Average daily imbalance weighted average price from 1 July 2011 to the current week (inclusive)

\*\*Average daily imbalance weighted average price from 1 July 2010 to the equivalent week in 2010-11 (inclusive)

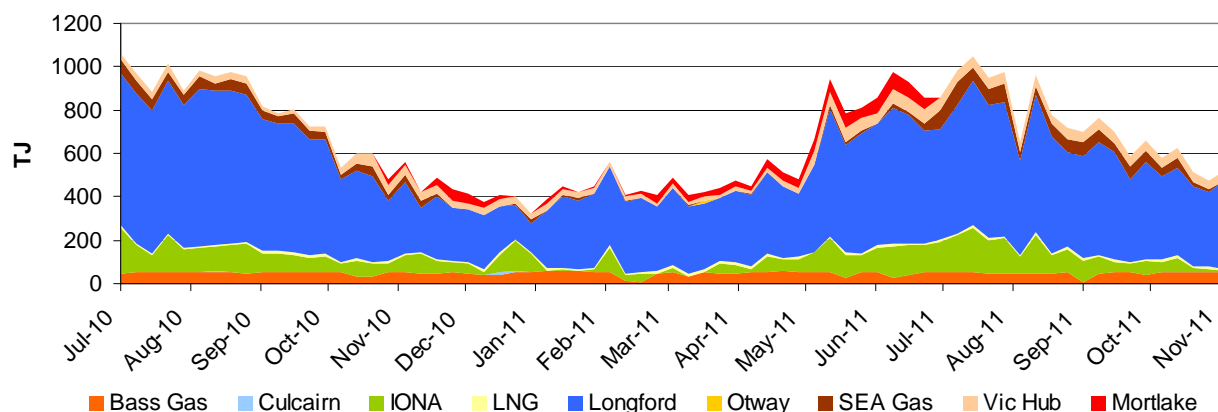
Source: <http://www.aemo.com.au> (INT 041)

## System Injections

Figure V3 shows the average daily injections into the DTS for the current and previous week, compared with the 2010-11 and 2009-10 equivalent financial year-to-date daily averages.

**Figure V3: Average daily flows (TJ) from Injection Points on the DTS**

Injection Point:	30 October – 5 November	23 October – 29 October	2011-12 Financial YTD*	2010-11 Financial YTD**
<b>Culcairn</b>	0	0	0	1
<b>Longford</b>	404	348	487	570
<b>LNG</b>	9	7	9	8
<b>IONA</b>	6	16	90	95
<b>VicHub</b>	50	39	48	32
<b>SEAGas</b>	2	10	52	43
<b>Bass Gas</b>	52	53	48	48
<b>Otway</b>	0	0	0	0
<b>Mortlake</b>	0	0	0	8
<b>TOTAL</b>	<b>524</b>	<b>473</b>	<b>734</b>	<b>807</b>



\*Average daily estimated gas consumption measured from 1 July 2011 to the current week (inclusive)

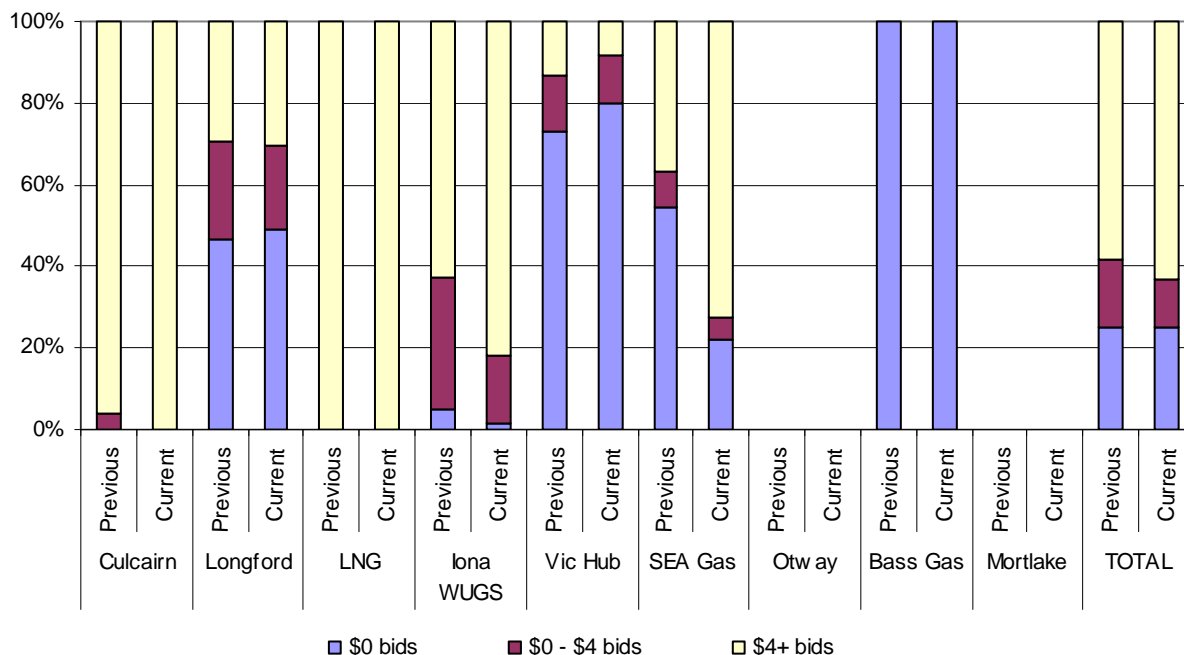
\*\*Average daily estimated gas consumption measured from 1 July 2010 to the equivalent week in 2010-11 (inclusive)

Source: <http://www.aemo.com.au> (INT 150)

## Bidding Activity

Figure V4 compares the price structure of gas bid at each of the injection points on the DTS, within three price bands of \$0/GJ, \$0/GJ to \$4/GJ, and \$4/GJ and above, for the current week and for the previous week.

**Figure V4: Price structure of bids by injection points**



Source: <http://www.aemo.com.au> (INT 131) - bids submitted for the 6am schedule on each day of the week.

Notes: Figures in the table are rounded off the nearest round number (TJ); the maximum allowable bid is \$800/GJ.

Figure V5 provides a table of injection points on the DTS where market participants submitted intra-day renominations, for each day of the week.

**Figure V5: Intra-day rebidding of gas injections**

Injection Point:	Sun	Mon	Tue	Wed	Thu	Fri	Sat
<b>Culcairn</b>	Lumo			Lumo	Lumo		
<b>Longford</b>	AGL Origin TRU	AGL Origin TRU	AGL Origin TRU	AGL Origin TRU	AGL TRU Simply	AGL Origin TRU	AGL TRU
<b>LNG</b>							
<b>Iona</b>						Origin TRU Simply	
	TRU APG	TRU Simply APG	TRU Simply APG	TRU Simply Lumo APG	TRU Simply Lumo APG	Lumo APG	TRU Simply
<b>VicHub</b>	Lumo	AETV	AETV Lumo	AETV Lumo	AETV Lumo	AETV Lumo	AETV Lumo
<b>SEAGas</b>	Simply						
<b>Bass Gas</b>							
<b>Mortlake</b>							

Source: <http://www.aemo.com.au> (INT 131)

Notes: Origin = Origin Energy | AGL = AGL Sales | TRU = TRUenergy | Simply = Simply Energy | AETV = AETV Power | APG = Australian Power & Gas | CE = Country Energy | Lumo = Lumo Energy (formerly Victoria Electricity) | AGL (QLD) = AGL Sales (Queensland) | Red = Red Energy | Ausgrid = Ausgrid | Aurora = Aurora Energy |



## System withdrawals

Figure V6 shows the average daily gas usage on the DTS for the current and previous week, compared with the 2010-11 and 2009-10 equivalent financial year-to-date daily averages.

**Figure V6: Average daily withdrawals (TJ) from system demand zones on the DTS**

<b>System withdrawal zone:</b>	<b>30 October – 5 November</b>	<b>23 October – 29 October</b>	<b>2011-12 Financial YTD*</b>	<b>2010-11 Financial YTD**</b>
<b>Ballarat</b>	21	18	32	36
<b>Geelong^</b>	87	84	96	98
<b>Gippsland</b>	42	37	48	52
<b>Melbourne</b>	330	282	478	542
<b>Northern</b>	44	55	81	74
<b>TOTAL</b>	<b>524</b>	<b>476</b>	<b>736</b>	<b>804</b>

^Data presented also includes withdrawals for the Western system withdrawal zone or Western Transmission System (WTS).

\*Average daily estimated gas consumption measured from 1 July 2011 to the current week (inclusive)

\*\*Average daily estimated gas consumption measured from 1 July 2010 to the equivalent week in 2010-11 (inclusive)

Source: <http://www.aemo.com.au> (INT 150).

## Part C: STTM MARKET DATA

### What is the STTM?

The STTM is a market for the trading of natural gas at the wholesale level at defined hubs between pipelines and distribution systems. Currently the STTM has two hubs: Sydney and Adelaide. The AER first commenced reporting on the STTM in September. The report deliberately contains a significant amount of information on the STTM. It is envisaged that over time as readers become familiar with the market, the amount of information will be reduced, while being mindful not to compromise the quality of the report.

Although the STTM and Victorian gas markets (discussed in Part B of this report) are both spot markets for gas, there are a number of key differences. Some of these differences are listed in the table below.

Key area of difference	Victoria Gas Market	STTM
<b>AEMO role</b>	<ul style="list-style-type: none"> <li>Wholesale market operator,</li> <li>Retail market operator,</li> <li>Transmission pipeline system operator</li> </ul>	<ul style="list-style-type: none"> <li>Wholesale market operator,</li> <li>Retail market operator</li> </ul>
<b>Scheduling</b>	<ul style="list-style-type: none"> <li>On the day scheduling comprising five pricing and operating schedules at set times. Ad hoc schedules if required.</li> <li>Day ahead and 2-Day ahead schedules (forecast data only).</li> </ul>	<ul style="list-style-type: none"> <li>Day ahead market schedules</li> <li>Shippers may vary from their market schedules when they nominate to pipeline operators</li> <li>2-Day ahead and 3-Day ahead schedules (forecast data only).</li> </ul>
<b>Market Price</b>	<ul style="list-style-type: none"> <li>Five ex ante prices for imbalances set on the day</li> <li>Ex ante prices in subsequent schedules after the 6am schedule apply to deviations</li> <li>Market price is for commodity only. Transportation is charged separately by pipeline owner</li> </ul>	<ul style="list-style-type: none"> <li>One ex ante market price set the day before the gas day</li> <li>One ex post imbalance price set the day after the gas day</li> <li>Price includes both commodity and delivery to the hub and represents purchase of gas at the hub</li> </ul>
<b>Linepack management (pipeline balancing mechanism)</b>	<ul style="list-style-type: none"> <li>AEMO defines linepack target depending on operational conditions and is generally set seasonally not daily.</li> <li>Linepack account covers costs that includes costs of day to day linepack variations</li> </ul>	<ul style="list-style-type: none"> <li>On the day pipeline balancing through Market Operator Service (MOS), provided by MOS offers from shippers</li> </ul>
<b>Transmission pipeline constraint management</b>	<ul style="list-style-type: none"> <li>Ancillary payments for higher priced gas scheduled that relieves constraints</li> <li>Uplift payments to fund ancillary payments</li> </ul>	<ul style="list-style-type: none"> <li>Capacity payments from shippers with non-firm contracts to shippers with firm contracts if a pipeline is constrained (based on the pipeline capacity price)</li> </ul>

AEMO's website ([www.aemo.com.au](http://www.aemo.com.au)) contains documents that provide further detail on how the STTM works, including a glossary of terms.

### Participation in the market

Figures S1 and S2 show participant supply offers and withdrawal bids submitted in the Sydney and Adelaide STTM hubs. The orange shaded boxes indicate that the participant submitted offers and bids at that location on at least one occasion during the week. An "S" indicates that some of this gas was scheduled into the gas market, while "NS" indicates that none of the gas was scheduled. Green shading indicates where a change has occurred from the previous week.

Offers and Bids are scheduled in price merit order—this means offers that are less than the market clearing price will be scheduled, while withdrawal bids that are greater than the market clearing price will be scheduled into the market.

**Figure S1: Supply Offers and Withdrawal Bids (Sydney Hub)^**

Trading Participant	Participant type	No. of supply offers / withdrawal bid points	Offers			Bids			
			EGP	MSP	ROS	EGP	MSP	ROS	SYD - NET
AETV Power	Shipper								
AGL Energy Sales & Marketing Limited	STTM User,Shipper	3	S	S	S				
AGL Wholesale Gas Limited	Shipper	2	S	S					
Australian Power and Gas Limited	STTM User,Shipper	1	S						
BHP Billiton Petroleum (Bass Strait) PL	Shipper								
BlueScope Steel	STTM User,Shipper	1	S						
Commonwealth Steel Company Pty Limited (not active)	STTM User								
Delta Electricity	STTM User,Shipper								
Essential Energy	STTM User,Shipper	2	S				S		
Esso Australia Resources Pty Ltd	Shipper								
Lumo Energy (NSW) Pty Ltd	STTM User								
Lumo Energy Australia Pty Ltd	Shipper	2	S			NS	S		
OneSteel Coil Coaters Pty Ltd (not active)	STTM User								
OneSteel Manufacturing Pty Ltd	STTM User,Shipper	1	S						
OneSteel NSW Pty Ltd	STTM User,Shipper	1	S						
OneSteel Trading Pty Limited (not active)	STTM User								
Origin Energy LPG Limited	STTM User,Shipper								
Origin Energy Retail Ltd	STTM User,Shipper	1		S					
Santos Direct Pty Ltd	STTM User,Shipper	1	S						
TRUenergy Pty Ltd	STTM User,Shipper	2	S	S					
TRUenergy Pty Ltd No. 2	STTM User,Shipper								
Tyco Water	STTM User								

^Offers and bids taken from the (D-1) ex ante schedule

^STTM Users also submit price-taker bids to satisfy customer demand, which are not included in this table

Source: <http://www.aemo.com.au> INT 651, 659, 668

EGP=Eastern Gas Pipeline, MSP=Moomba to Sydney Pipeline, ROS=Rosalind Park Production facility, SYD-NET=Sydney Hub

**Figure S2: Supply Offers and Withdrawal Bids (Adelaide Hub)^**

Trading Participant	Participant type	No. of supply offers / withdrawal bid points	Offers		Bids		
			MAP	SEAGAS	MAP	SEAGAS	ADL - NET
AGL South Australia Pty Limited	STTM User,Shipper	1	S				
AGL Wholesale Gas (SA) Pty Ltd	Shipper	2	S	S			
Adelaide Brighton Cement Ltd	STTM User,Shipper	2	S	S			
Lumo Energy (SA) Pty Ltd	STTM User						
Lumo Energy Australia Pty Ltd	Shipper						
OneSteel Manufacturing Pty Ltd	Shipper						
Origin Energy Retail Ltd	STTM User,Shipper	2	S	S			
Pelican Point Power Limited	Shipper						
Simply Energy	STTM User,Shipper	2	S	S	NS		
TRUenergy Pty Ltd	STTM User,Shipper	2	S	S			

^ Offers and bids taken from the (D-1) ex ante schedule

^ STTM Users also submit price-taker bids to satisfy customer demand, which are not included in this table

Source: <http://www.aemo.com.au> INT 651, 659, 668

MAP=Moomba to Adelaide Pipeline, SEAGAS=SEA gas pipeline, ADL-NET=Adelaide Hub

## Ex ante and Ex post Market Prices

Figures S3 and S4 show ex ante and ex post prices at the Sydney and Adelaide Hubs. Differences between the ex ante and ex post price may arise where there are significant differences between price taker bids (demand forecasts) for the hub and actual demand in the hub. When this occurs, this leads to more or less gas being scheduled in the ex post market and a divergence between the ex ante and ex post prices.

**Figure S3: Ex ante vs Ex post Price - Sydney Hub (\$/GJ)**

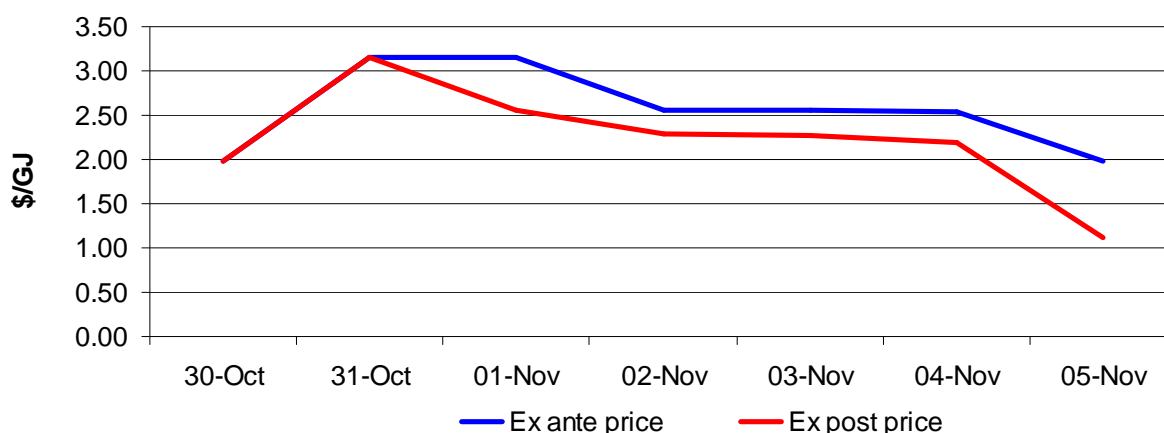
	30 October – 5 November	23 October – 29 October	2011-12 Financial YTD*	2010-11 Financial YTD**
Ex ante price	2.56	2.92	3.31	4.44
Ex post price	2.23	2.76	2.90	14.73

\*Financial Year to date figure from 1 July 2011 to the current week (inclusive)

\*\*Financial Year to date figure from 1 Sep 2010 (market start) to the equivalent week in 2010-11 (inclusive)

Note: 2010-11 data for Sydney is skewed by high prices which occurred on the 8 October 2010 and 1 November 2010 gas days

Source: <http://www.aemo.com.au> INT 651, 657



Source: <http://www.aemo.com.au> INT 651, 657

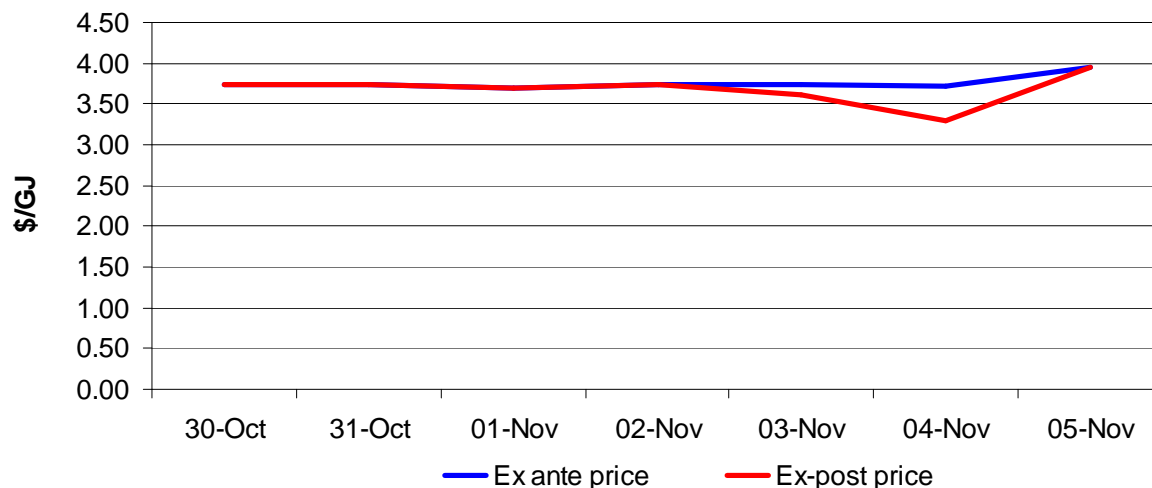
**Figure S4: Ex ante vs Ex post Price - Adelaide Hub (\$/GJ)**

	30 October – 5 November	23 October – 29 October	2011-12 Financial YTD*	2010-11 Financial YTD**
Ex ante price	3.77	3.66	3.77	3.06
Ex post price	3.69	3.42	3.71	3.11

\*Financial Year to date figure from 1 July 2011 to the current week (inclusive)

\*\*Financial Year to date figure from 1 Sep 2010 (market start) to the equivalent week in 2010-11 (inclusive)

Source: <http://www.aemo.com.au> INT 651, 657



Source: <http://www.aemo.com.au> INT 651, 657

## Scheduled gas

“Firm” and “non-firm” gas is scheduled to the STTM hubs. Firm capacity describes a facility contract that has the highest haulage priority. Non-firm (as available) capacity refers to facility contracts with lower order priority.

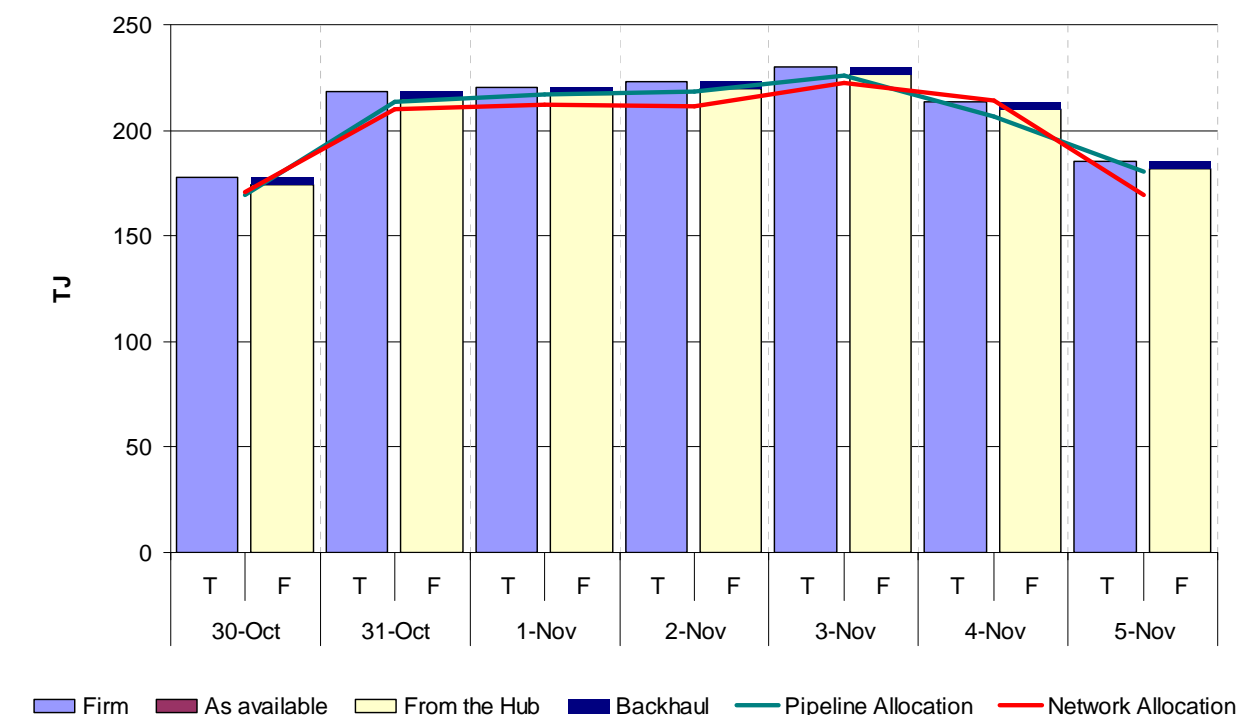
Gas can also be scheduled from the STTM hubs. This happens when Shippers “backhaul” gas from the hub or Users bid to take gas from the hub (including price taker bids).

Figures S5 and S6 show scheduled versus allocated gas at each hub. To understand the figures, the quantities of firm and non-firm gas scheduled via offers to the hub are indicated by the columns marked “T” (or **to** the hub). Firm offers are indicated by light purple shading and as available gas is indicated by maroon shading. Bids to take gas from the hub are indicated by columns marked “F” (or **from** the hub). User bids are indicated by light yellow shading and backhaul is indicated by dark blue shading.

The red line shows network (or in other words hub or demand side) allocations and the green line shows pipeline allocations. Allocations show actual gas flows for the day based on pipeline and network metered data.

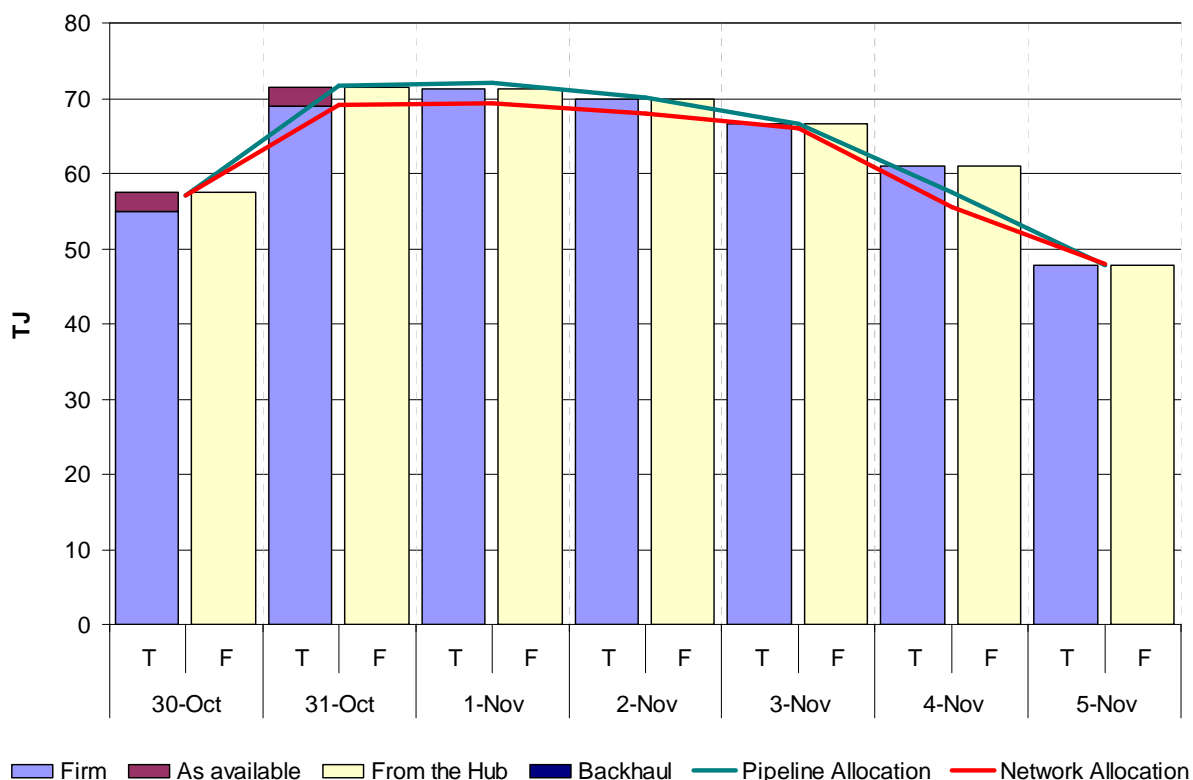
By comparing the level of the red line to the columns marked “F”, it can be shown whether demand (allocation) was higher than scheduled. Similarly, comparing the green line to the columns marked “T” shows how the actual flow of gas (allocation) compared to what was scheduled.

**Figure S5: Allocated vs scheduled ex ante quantity - Sydney Hub (TJ)^**



Source: <http://www.aemo.com.au> INT 651, 652, 658 and 664 (MOS allocations removed)

**Figure S6: Allocated vs scheduled ex ante quantity - Adelaide Hub (TJ)**



Source: <http://www.aemo.com.au> INT 651, 652, 658 and 664 (MOS allocations removed)

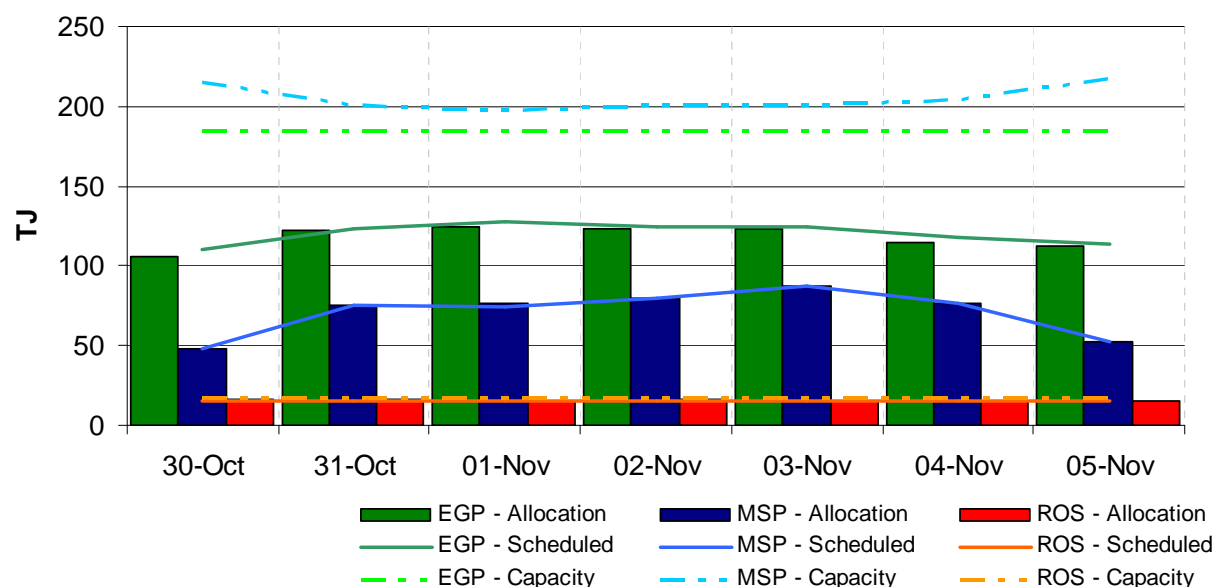
### Pipeline Facility Allocations

A number of pipelines supply the Adelaide and Sydney hubs. Figures S7 and S8 show, for each hub, the allocation (or actual flow) of gas to each of the pipeline facilities supplying the hub, the quantity of gas scheduled (ex ante) on the pipeline and the capacity of the pipeline.

For a gas day, the pipeline operator delivers gas to the hub, and users withdraw gas from the hub. However, the quantities delivered to or withdrawn from the hub may not, and generally will not, match with the ex ante schedules. In addition, during the day, as gas requirements become better known, and if permitted by their contracts, shippers may renominate quantities (“intraday nominations”) with their pipeline operators.

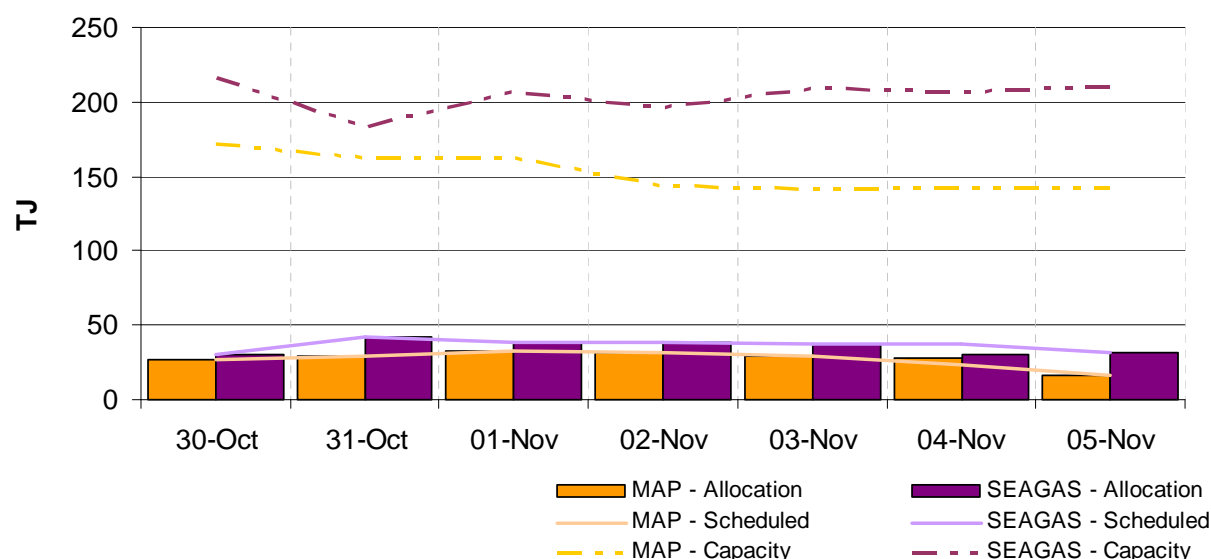
Differences between the amount of gas scheduled and what was actually allocated can result in variations between the ex ante and ex post price, as the ex post price is related to the offers actually allocated while ex ante is related to the offers scheduled.

**Figure S7: Allocated vs scheduled pipeline quantities - Sydney Hub (TJ)**



Source: <http://www.aemo.com.au> INT 652, 653, 658 and 664 (MOS allocations removed)  
EGP=Eastern Gas Pipeline, MSP=Moomba to Sydney Pipeline, ROS=Rosalind Park production facility

**Figure S8: Allocated vs scheduled pipeline quantities - Adelaide Hub (TJ)**



Source: <http://www.aemo.com.au> INT 652, 653, 658 and 664 (MOS allocations removed)  
MAP=Moomba to Adelaide Pipeline, SEAGAS=SEA gas pipeline

## Offers and Bids

Trading Participants submit offers to sell gas into an STTM hub and withdrawal bids to take gas from a hub. Figures S9 and S11 show for the Sydney and Adelaide hubs respectively, total offers within various price bands for the current week compared to the previous week for each of the pipeline facilities.

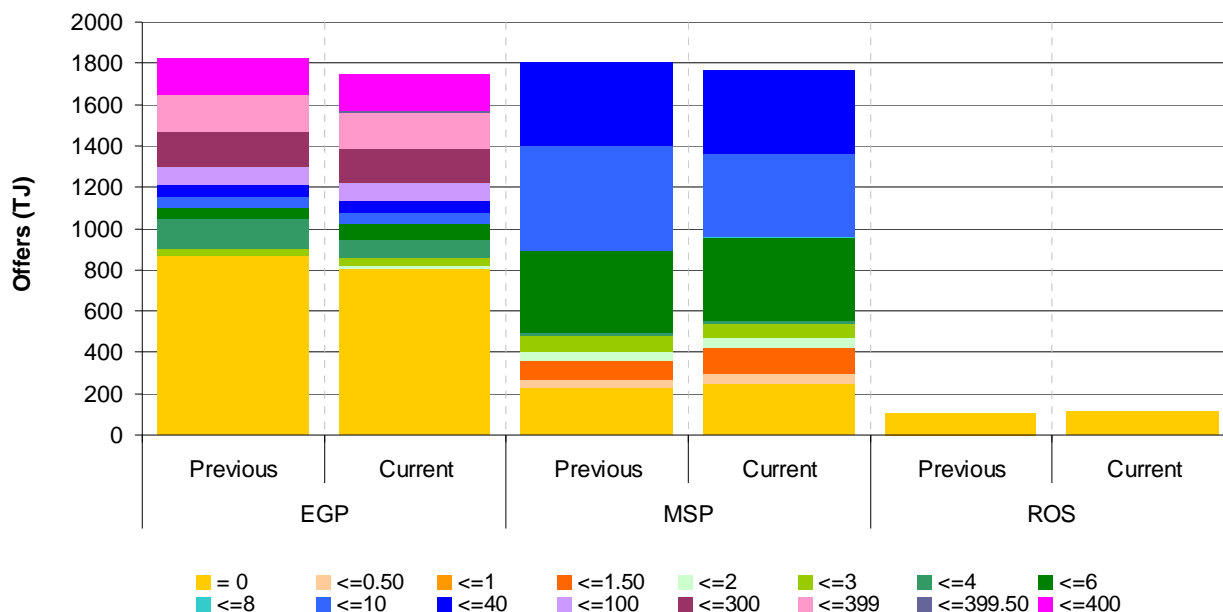
Figures S10 and S12 show for the Sydney and Adelaide hubs respectively, total bids within various price bands for the current week compared to the previous week for each of the pipeline facilities and the hubs themselves (NETSYD1 and NETADL1).

These figures also include information on price-taker bids. A price-taker bid is a bid for a quantity of gas that the user will accept at any price. Only STTM users are able to place price-taker bids, that is, to purchase gas at any price. These bids (which represent customer demand forecasts) must be submitted on a daily basis. Price-taker bid data is read against the right-hand-

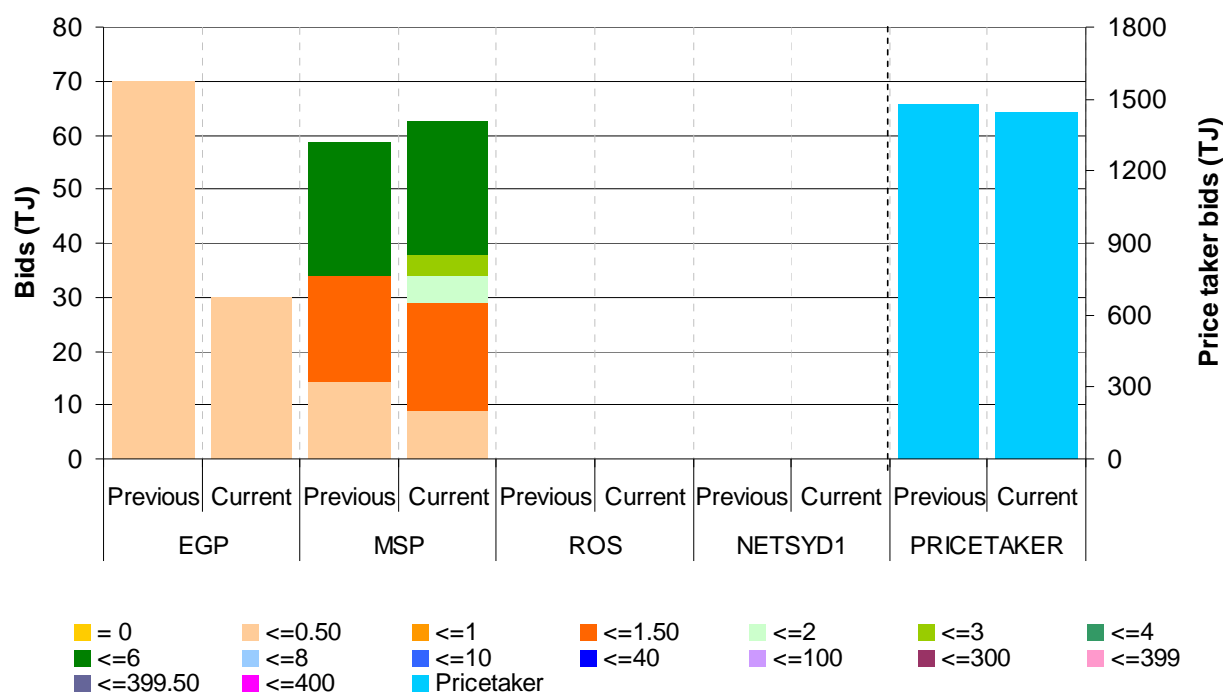


side axis. Because scheduling is price-driven, offers for lower-priced gas are scheduled ahead of offers for higher-priced gas and bids for higher-priced gas are scheduled ahead of bids for lower-priced gas.

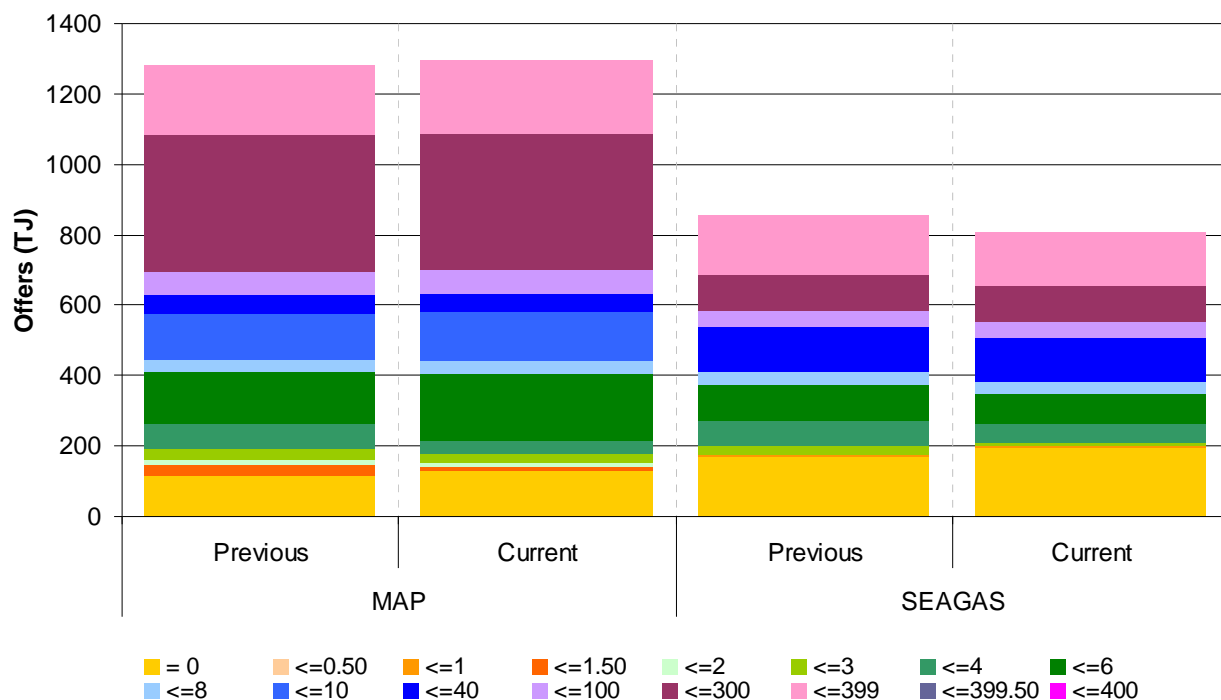
**Figure S9: Total weekly Sydney hub offers (TJ) within price bands (\$/GJ)**



**Figure S10: Total weekly Sydney hub bids (TJ) within price bands (\$/GJ)**



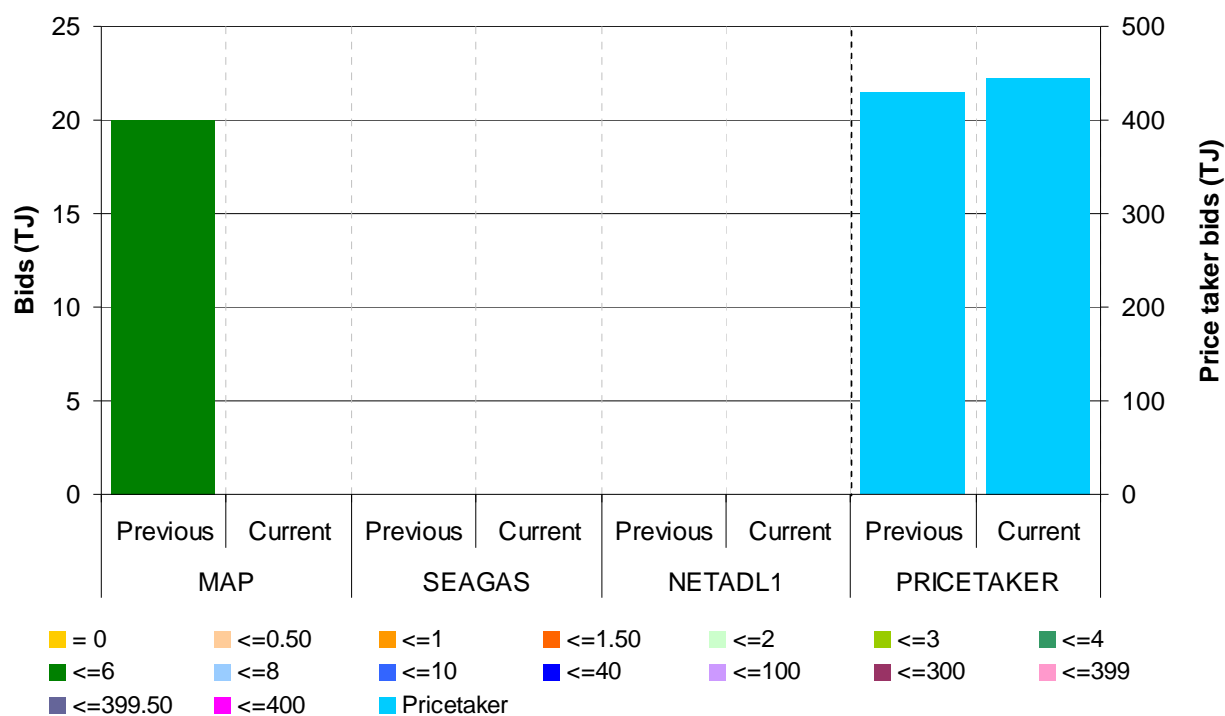
**Figure S11: Total weekly Adelaide hub offers (TJ) within price bands (\$/GJ)**



Source: <http://www.aemo.com.au> INT 652, 659

MAP=Moomba to Adelaide Pipeline, SEAGAS=SEA gas pipeline

**Figure S12: Total weekly Adelaide hub bids (TJ) within price bands (\$/GJ)**



Source: <http://www.aemo.com.au> INT 652, 659

MAP=Moomba to Adelaide Pipeline, SEAGAS=SEA gas pipeline, NETADL1=Adelaide Hub

## Re-offers and re-bids

In the STTM, offers and bids must first be submitted three days before the gas day (D-3), leading to an initial provisional price and schedule for the gas day. Re-offers and re-bids are then allowed for the D-2 schedule and finally for the D-1 “ex ante” schedule.

Re-offers and re-bids can lead to significant changes between D-3 and D-2 provisional prices and the ex ante price. Figures S13, S14, S15 and S16 show the participants that made inter-day re-offers and re-bids at the hubs for the different pipeline facilities.

**Figure S13: Inter-day resubmission of offers at Sydney Hub**

Pipeline	Schedule	Sun	Mon	Tue	Wed	Thu	Fri	Sat
EGP	D-3 to D-2	BluSc SANTOS TRU	TRU	TRU	Lumo SANTOS TRU	SANTOS TRU	BluSc Lumo OneStl(NSW) TRU	TRU
	D-2 to D-1	TRU	TRU	BluSc Lumo SANTOS TRU	BluSc Lumo SANTOS TRU	BluSc Lumo TRU	Lumo SANTOS TRU	APG BluSc Lumo SANTOS TRU
MSP	D-3 to D-2	AGL(ESM) Origin TRU	AGL(ESM) Origin TRU	AGL(ESM) Origin TRU	AGL(ESM) Origin TRU	AGL(ESM) Origin TRU	AGL(ESM) Origin TRU	AGL(ESM) Origin TRU
	D-2 to D-1	AGL(ESM) Origin TRU	AGL(ESM) Origin TRU	AGL(ESM) Origin TRU	AGL(ESM) Origin TRU	AGL(ESM) Origin TRU	AGL(ESM) Origin TRU	AGL(ESM) Origin TRU
ROS	D-3 to D-2					AGL(ESM)		AGL(ESM)
	D-2 to D-1			AGL(ESM)	AGL(ESM)	AGL(ESM)	AGL(ESM)	

Source: <http://www.aemo.com.au> INT 659

BluSc= BlueScope Steel | Country= Country Energy | Origin=Origin Energy Retail Ltd | TRU= TRUenergy Pty Ltd |

AGL(WG)= AGL Wholesale Gas Limited | EA=EnergyAustralia | OneStl(NSW)= OneSteel NSW Pty Ltd |

SANTOS= Santos Direct Pty Ltd | AGL(ESM)= AGL Energy Sales & Marketing Pty Ltd | Lumo = Lumo Energy Australia Pty Ltd |

APG= Australian Power & Gas Pty Ltd |

EGP=Eastern Gas Pipeline, MSP=Moomba to Sydney Pipeline, ROS=Rosalind Park Production facility

**Figure S14: Inter-day resubmission of bids at Sydney Hub**

Pipeline	Schedule	Sun	Mon	Tue	Wed	Thu	Fri	Sat
EGP	D-3 to D-2							
	D-2 to D-1							
MSP	D-3 to D-2	Country			Lumo		Lumo	
	D-2 to D-1			Country Lumo	Country	Lumo	Country	Country Lumo
NETSYD1	D-3 to D-2							
	D-2 to D-1							
ROS	D-3 to D-2							
	D-2 to D-1							Lumo

Source: <http://www.aemo.com.au> INT 659

Country= Country Energy | AETV = Aurora Energy Tamar Valley | Country= Country Energy | TRU= TRUenergy Pty Ltd |

Lumo= Lumo Energy Australia Pty Ltd |

EGP=Eastern Gas Pipeline, MSP=Moomba to Sydney Pipeline, ROS=Rosalind Park Production facility, NETSYD1=Sydney Hub

**Figure S15: Inter-day resubmission of offers at Adelaide Hub**

Pipeline	Schedule	Sun	Mon	Tue	Wed	Thu	Fri	Sat
MAP	D-3 to D-2	AGL(SA) Origin TRU	AGL(SA) Origin TRU	AGL(SA) Origin Simply TRU	AGL(SA) Origin TRU	AGL(SA) Origin TRU	AGL(SA) Origin TRU	AGL(SA) Origin Simply TRU
	D-2 to D-1	ABC AGL(SA) Origin TRU	ABC AGL(SA) Origin TRU	ABC AGL(SA) Origin TRU	ABC AGL(SA) Origin	ABC AGL(SA) Origin TRU	ABC AGL(SA) Origin Simply TRU	ABC AGL(SA) Origin TRU
SEA-GAS	D-3 to D-2	TRU	Origin TRU	Origin Simply TRU	TRU	TRU	Origin TRU	Origin TRU
	D-2 to D-1	ABC Origin TRU	ABC TRU	ABC TRU	ABC TRU	ABC Origin TRU	ABC Origin TRU	ABC Origin TRU

Source: <http://www.aemo.com.au> INT 659

ABC= Adelaide Brighton Cement Ltd I AGL(WGSA)= AGL Wholesale Gas (SA) Pty Ltd I Origin=Origin Energy Retail Ltd I Simply= Simply Energy I TRU= TRUenergy Pty Ltd I AGL(SA)= AGL South Australia Pty Limited I  
MAP=Moomba to Adelaide Pipeline, SEAGAS=SEA gas pipeline

**Figure S16: Inter-day resubmission of bids at Adelaide Hub**

Pipeline	Schedule	Sun	Mon	Tue	Wed	Thu	Fri	Sat
MAP	D-3 to D-2			Simply				
	D-2 to D-1							
NETADL1	D-3 to D-2							
	D-2 to D-1							
SEA-GAS	D-3 to D-2							
	D-2 to D-1							

Source: <http://www.aemo.com.au> INT 659

Simply= Simply Energy I TRU= TRUenergy Pty Ltd I

## Market Operator Service

The Market Operator Service (MOS) is a daily mechanism for allocating balancing gas provided by pipelines to maintain pressures at receipt points. This balancing gas is the difference between what was scheduled by a pipeline operator (the pipeline schedule) and the actual quantities of gas that flowed on a pipeline on the day.

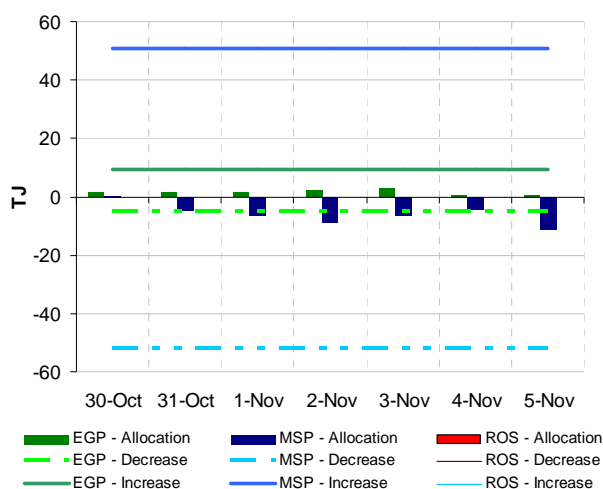
MOS offers are made by participants who have contracts with pipeline facilities to “park” gas (on the pipeline) or “loan” gas (from the pipeline). Based on these contracts, two types of MOS are offered: increase offers to increase flows on a pipeline to a hub; and decrease offers to decrease flows on a pipeline to a hub. Where a pipeline deviation<sup>1</sup> occurs on a gas day and there is a requirement for MOS from a MOS provider (either an increase or decrease offer), the MOS provider is paid according to their MOS offer price (the MOS service payment).

In addition, where this MOS service is required, AEMO pays or charges the MOS provider for the MOS gas allocation on the gas day at the ex ante market price two days after the gas day, which covers the cost of restoring its inventory of MOS gas (the MOS commodity payment or charge). The MOS provider can then choose to submit bids or offers for the gas it needs to replace or run down its MOS gas allocation on the gas day.

Figure S17a and S18a show quantities of MOS allocated on a daily basis compared to total MOS increase and decrease offers (from potential providers) on each pipeline at each hub. MOS allocations are shown by the columns in these figures; whereas total MOS increase and decrease

offers on each pipeline are shown by horizontal lines (as indicated in the legend). Figures S17b and S18b show MOS service payments and MOS commodity payments or charges. Payments fall below the horizontal axis and charges are displayed above the axis.

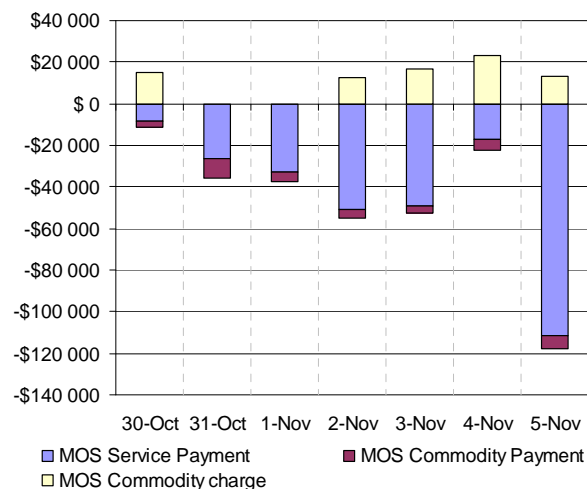
**Figure S17a: Sydney MOS allocations**



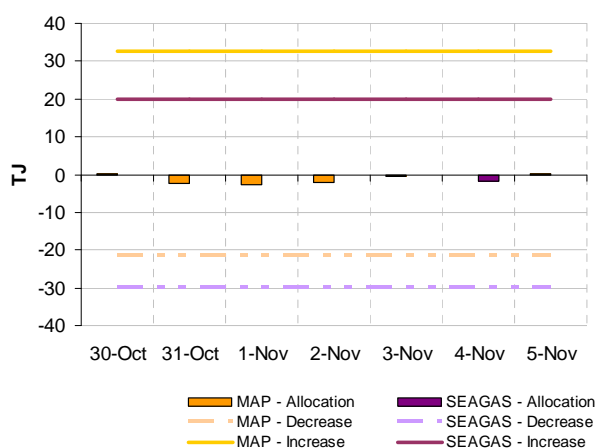
Source: <http://www.aemo.com.au> INT 663, 664, 665

EGP=Eastern Gas Pipeline, MSP=Moomba to Sydney Pipeline, ROS=Rosalind Park Production facility

**Figure S17b: Sydney MOS payments/charges**



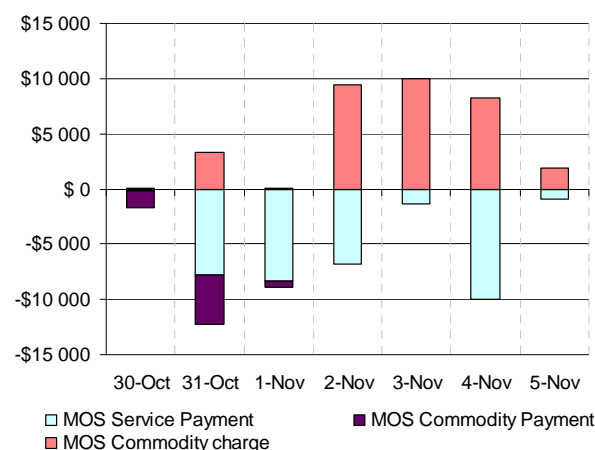
**Figure S18a: Adelaide MOS allocations**



Source: <http://www.aemo.com.au> INT 663, 664, 665

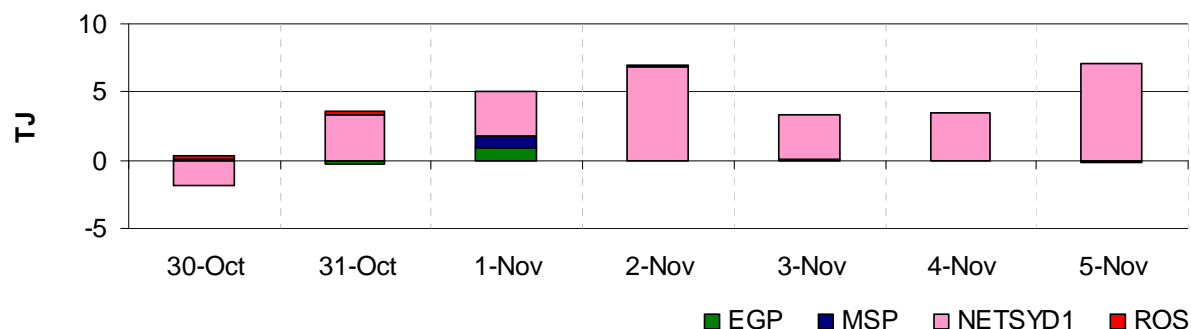
MAP=Moomba to Adelaide Pipeline, SEAGAS=SEA gas pipeline

**Figure S18b: Adelaide MOS payments/charges**

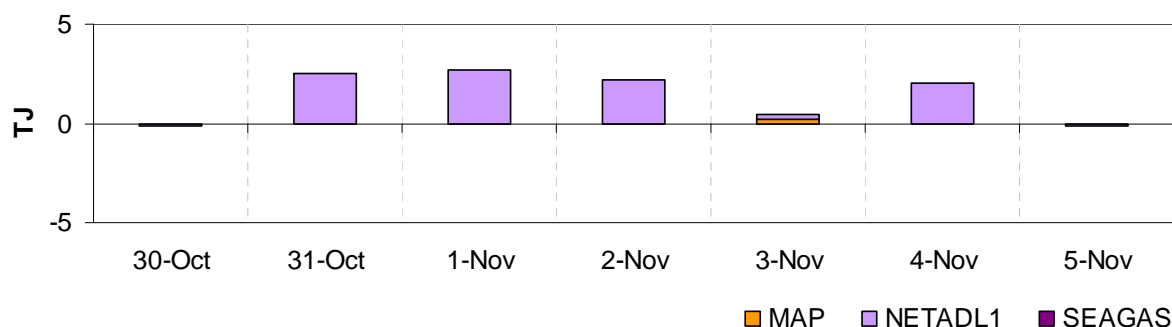


## Deviations

Deviations occur when the gas flowed on pipelines into hubs on a gas day differ from the modified market schedule, or when gas taken out of the hub is different to the schedule. The most likely reason for deviations is where participants incorrectly forecast the demand of customers within the hub. As discussed previously, figures S5 and S6 show allocated quantities versus scheduled. Where they differ, there is a deviation. Net deviations may lead to requirements for MOS services. Figures S19 and S20 show net deviations at the STTM hubs.

**Figure S19: Net Deviations – Sydney Hub**

Source: <http://www.aemo.com.au> INT652

**Figure S20: Net Deviations – Adelaide Hub**

Source: <http://www.aemo.com.au> INT652

### Market Schedule Variations

When a shipper deviates from the ex ante schedule, it can submit a “market schedule variation” (MSV) to AEMO. The variation must be matched by an opposite variation from either another shipper or a user. Market schedule variations allow shippers to adjust their schedules in line with their pipeline allocations and so avoid deviation charges. A variation can include flows from the hub, which must also be matched with variation of flows to the hub.

Variations that cause a change in withdrawals at the hub attract a variation charge (but no deviation charge), which is designed to encourage more accurate day-ahead forecasting. The variation charge has a sliding scale such that the bigger the variation, the bigger the charge. However, variations that do not change the demand at the hub are exempt. Figures S21 and S22 show MSV quantities and charges at the STTM Hubs.

**Figure S21: Average Daily Market Variations - Sydney Hub**

	30 October – 5 November	23 October - 29 October	2011-12 Financial YTD*	2010-11 Financial YTD**
Syd Quantity (TJ)	4.86	6.66	6.10	4.42
Syd Charges (\$)	164.00	185.35	215.00	2149.71

\*Financial Year to date figure from 1 July 2011 to the current week (inclusive)

\*\*Financial Year to date figure from 1 Sep 2010 (market start) to the equivalent week in 2010-11 (inclusive)

Source: <http://www.aemo.com.au> INT 651, 657

**Figure S22: Average Daily Market Variations - Adelaide Hub**

	30 October – 5 November	23 October - 29 October	2011-12 Financial YTD*	2010-11 Financial YTD**
Adl Quantity (TJ)	0.90	0.55	1.68	1.40
Adl Charges (\$)	40.45	16.25	95.10	32.84

\*Financial Year to date figure from 1 July 2011 to the current week (inclusive)

\*\*Financial Year to date figure from 1 Sep 2010 (market start) to the equivalent week in 2010-11 (inclusive)

Source: <http://www.aemo.com.au> INT 651, 657

## APPENDIX

Figures A1 and A2 display the daily gas flows from each pipeline and production/storage facility in the National Gas Market over the current week. The nameplate capacity or MDQ (Maximum Daily Quantity) for each facility are also provided, along with the proportion of MDQ used on average over the current week and the year to date at each facility. Flow data not provided by bulletin board polling time is indicated by N/A.

**Figure A1: Daily flows (TJ) for pipeline facilities**

Demand zone and pipeline facility	Sun	Mon	Tue	Wed	Thu	Fri	Sat	MDQ (TJ)	YTD average capacity usage (%)	Current week average daily flows	Current YTD average daily flows*	Previous YTD average daily flows**
<b>QLD</b>												
Carpentaria Pipeline	112	109	104	111	111	110	96	119	86	107	102	93
QLD Gas Pipeline	134	127	129	134	131	130	123	142	86	130	123	108
Roma to Brisbane Pipeline	146	174	177	173	173	163	152	219	78	166	172	180
South West QLD Pipeline	81	101	111	108	91	90	91	181	63	96	114	123
<b>NSW/ACT</b>												
Eastern Gas Pipeline	164	172	167	166	167	171	208	268	76	174	202	219
Moomba to Sydney Pipeline	89	116	109	117	125	112	69	439	41	105	180	240
NSW-VIC Interconnect	10	9	6	0	11	16	11	90	22	9	20	8
<b>VIC</b>												
Longford to Melbourne	513	545	491	566	565	486	373	1030	56	506	581	645
South West Pipeline^	45	7	-7	-5	-14	-15	-19	353	40	-1	142	138
<b>SA</b>												
Moomba to Adelaide Pipeline	105	114	131	134	132	130	127	253	51	125	130	132
SEA Gas Pipeline	97	128	118	123	129	122	98	314	49	116	154	173
<b>TAS</b>												
Tasmanian Gas Pipeline	59	56	56	52	51	50	49	129	39	53	50	47

\*Average daily estimated gas consumption measured from 1 July 2011 to the current week (inclusive)

\*\*Average daily estimated gas consumption measured from 1 July 2010 to the equivalent week in 2010-11 (inclusive)

Source: Natural Gas Market Bulletin Board <http://www.gasbb.com.au>

Notes: Operational ranges for each pipeline facility range from a minimum of 20 per cent to a maximum of 120 per cent of the respective MDQs. The exceptions are the South West Queensland Pipeline and the NSW-VIC Interconnect which have operational ranges 40 per cent to 120 per cent and 0 to 120 per cent of MDQ respectively.



**Figure A2: Daily flows (TJ) for production / storage facilities compared to operational ranges and use of production/storage capacity**

Production zone and production / storage facility	Sun	Mon	Tue	Wed	Thu	Fri	Sat	MDQ (TJ)	YTD average capacity usage* (%)	Current week average daily flows	Current YTD average daily flows*	Previous YTD average daily flows**
<b>Roma (QLD)</b>												
Berwyndale South	95	92	94	96	95	95	95	140	67	95	94	99
Fairview	97	88	110	105	119	115	106	130	79	106	103	119
Kenya Gas Plant	95	96	97	96	96	96	95	160	52	96	83	62
Kincora	10	10	10	10	10	10	10	25	38	10	10	3
Kogan North	9	8	8	9	9	9	8	12	60	9	7	9
Peat	8	8	8	8	8	8	8	15	51	8	8	10
Rolleston	11	11	11	10	10	11	10	30	33	11	10	11
Scotia	30	30	29	30	30	27	27	29	96	29	28	26
Spring Gully	40	44	45	45	45	41	40	69	63	43	43	52
Strathblane	40	44	45	45	45	41	40	69	63	43	43	52
Taloona	24	27	27	27	27	25	24	42	63	26	26	32
Yellowbank	9	8	9	9	10	8	8	30	31	9	9	13
Talinga	99	97	85	76	76	75	81	120	75	84	90	52
<b>Moomba (SA/QLD)</b>												
Moomba Gas Plant	152	182	228	224	221	185	181	430	58	196	250	313
Ballera	33	33	33	25	33	28	30	150	12	31	19	22
<b>Eastern (VIC)</b>												
Orbost Gas Plant	69	69	64	64	64	59	64	100	67	64	67	9
Lang Lang Gas Plant	53	53	52	52	52	53	52	70	68	52	48	48
Longford Gas Plant	598	672	626	665	600	654	510	1145	63	618	725	867
LNG Storage Dandenong	0	0	0	0	0	0	0	158	0	0	0	0
<b>Otway Basin (VIC)</b>												
Minerva Gas Plant	35	70	86	86	86	86	86	90	65	76	59	68
Otway Gas Plant	134	0	0	0	0	0	0	205	70	19	143	148
Iona Underground Gas Storage	33	81	39	20	50	43	48	440	25	45	110	102

\*Average daily estimated gas consumption measured from 1 July 2011 to the current week (inclusive)

\*\*Average daily estimated gas consumption measured from 1 July 2010 to the equivalent week in 2010-11 (inclusive)

Source: Natural Gas Market Bulletin Board <http://www.gasbb.com.au>

Notes: Operational ranges for each production and storage facility range from minimum of 0 per cent to a maximum of 120 per cent of the respective MDQs. The exception is the Longford Gas Plant which has a minimum operational range of 20 per cent to 120 per cent of its MDQ.

Figure A3 provides the average minimum and maximum temperatures for each of the demand regions for the current week. The average temperatures for the previous week are also provided. (Note: only the demand regions where temperature is a driver of gas demand are included).

**Figure A3: Average daily temperatures (°C) at each demand region**

Average daily temperatures (°C)		QLD (Brisbane)	NSW (Sydney)	ACT (Canberra)	VIC (Melbourne)	SA (Adelaide)	TAS (Hobart)
30 October – 5 November	Average min.	18.7	15.0	6.4	11.4	11.6	8.8
	Average max.	26.7	22.5	24.1	19.6	24.9	17.5
23 October – 29 October	Average min.	17.4	16.9	9.6	13.2	13.8	8.5
	Average max.	26.2	23.8	22.1	23.2	23.7	16.8

Source: <http://www.bom.gov.au/climate/dwo>

Figure A4 shows the market prices at each of the scheduling intervals on each day during the current week. The imbalance weighted average prices for each gas day are also provided.

**Figure A4: Daily Victorian gas market prices (\$/GJ) at each scheduling interval**

30 October – 5 November	Scheduling Interval					Daily Imbalance Weighted Average Price
	6am	10am	2pm	6pm	10pm	
Sun	2.14	2.79	2.90	2.90	3.10	2.19
Mon	2.49	2.79	2.94	2.93	0.80	2.49
Tue	0.65	2.98	2.98	2.98	1.64	0.82
Wed	2.46	2.79	2.78	2.11	1.99	2.47
Thu	2.98	2.13	2.71	2.13	1.60	2.95
Fri	1.10	2.97	2.97	2.96	1.63	1.26
Sat	2.79	2.96	1.63	1.61	1.16	2.77

Source: <http://www.aemo.com.au> (INT 041).

Figure A5 compares the market participants and market operator demand forecasts and each of the scheduling intervals on each gas day during the current week. Total actual demand for each gas day is also provided, along with the total demand override (if any) from AEMO.

**Figure A5: Daily demand forecasts (TJ) and daily demand overrides (TJ)**

Gas Day	Demand Forecasts (TJ)	Schedule					Total Demand Override (TJ)
		1	2	3	4	5	
30-Oct	MP:	510	521	534	532	533	0
	AEMO:	495	512	541	532	551	
	MP as % of AEMO	103	102	99	100	97	
31-Oct	MP:	546	548	562	574	575	0
	AEMO:	559	549	582	577	567	
	MP as % of AEMO	98	100	97	99	101	
1-Nov	MP:	482	483	480	490	493	-7
	AEMO:	444	480	480	486	474	
	MP as % of AEMO	109	101	100	101	104	
2-Nov	MP:	567	578	588	589	589	0
	AEMO:	581	571	590	599	582	
	MP as % of AEMO	98	101	100	98	101	
3-Nov	MP:	564	567	572	567	567	0
	AEMO:	560	549	550	540	536	
	MP as % of AEMO	101	103	104	105	106	
4-Nov	MP:	438	438	438	439	440	0
	AEMO:	478	491	492	468	463	
	MP as % of AEMO	92	89	89	94	95	
5-Nov	MP:	331	334	334	334	334	0
	AEMO:	303	331	319	328	325	
	MP as % of AEMO	109	101	105	102	103	

Source: <http://www.aemo.com.au> (INT 108, INT 126, INT 153)

Figures A6 to A8 present information that was previously published by AEMO in its monthly Victorian Gas Market Reports.

Figure A6 shows “unaccounted for gas” as a percentage of the gas used on a 28-day rolling average basis. A positive “unaccounted for gas” indicates more gas purchased than sold, and negative indicates more gas is purchased from a supplier than sold to customers. The difference may be caused by measurement errors, leakages, pressure regulation, construction activities, theft or damage to the pipeline system. The increased quantity over November 2009 was related to pigging substitutions.

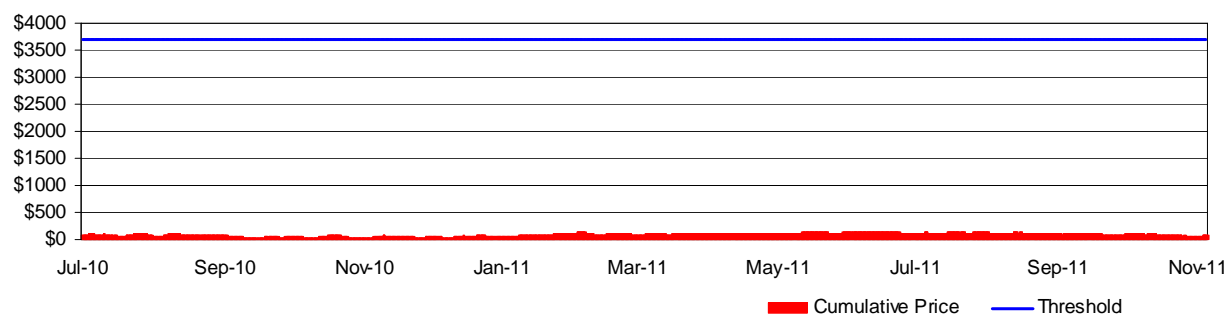
**Figure A6: Unaccounted for Gas – 28 Day Rolling Average**



Source: <http://www.aemo.com.au> (INT 312)

Figure A7 shows the cumulative weekly price and the cumulative price threshold (CPT), which is set at \$3700. The cumulative price is measured over a rolling weekly period, (35 scheduling intervals). When the cumulative price breaches the CPT, an administered price cap (APC) is applied to the market at \$40/GJ. AEMO may declare the end of an administered price period subsequent to the cumulative price falling below the threshold.

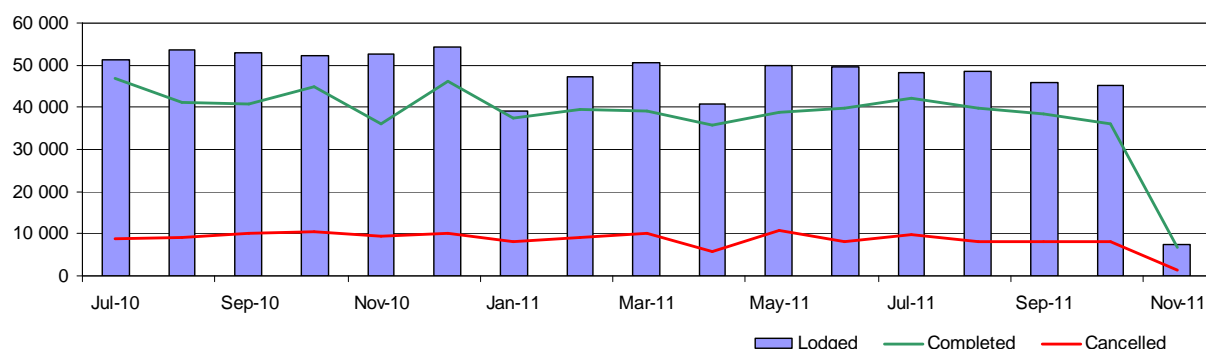
**Figure A7: Cumulative Price and Threshold**



Source: <http://www.aemo.com.au> (INT 199)

Figure A8 shows the monthly (and current month to date) retail customer transfers lodged, completed or cancelled in the Victorian gas market.

**Figure A8: Customer Transfers**



Source: <http://www.aemo.com.au> (INT 311)