WEEKLY GAS MARKET ANALYSIS

AUSTRALIAN ENERGY REGULATOR

23 October – 29 October 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 aerinquiry@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

23 October – 29 October	Victorian market*	STTM Sydney hub**	STTM Adelaide hub**
Average Price	1.65	2.92	3.66

*weighted average daily imbalance price
**ex ante market price

STTM Gas Markets (Adelaide and Sydney)

Figure S3 shows this week's average ex ante price in Sydney was slightly lower than for the previous week while the average ex post price was slightly higher than for the previous week. As shown in figure S4, average ex ante and ex post prices in Adelaide were higher this week than for the previous week. Average prices at both hubs were lower than their respective year to date averages.

Figure S6 shows there was around 10 TJ and 11.5 TJ of 'as available'[1] gas scheduled to the Adelaide hub for the 23 and 24 October (Sunday and Monday) gas days. At 16 per cent, this represented a large proportion of scheduled flows. These were matched by similar amounts of scheduled backhaul flows.[2]

Victorian Gas Market

As shown in figure N4, demand was lower than the previous week in Victoria, consistent with milder weather conditions. Figure V3 shows average injections fell from 513 TJ/day to 473 TJ/day and, at $1.65/GJ, the weekly average price was lower than for the previous week ($2.47/GJ).

National Gas Market Bulletin Board

Figure N4 shows overall gas demand, production volumes and gas for gas-powered generation volumes were lower than for the previous week.

Flows on the Moomba-Sydney Pipeline on Sunday 23 October and Saturday 29 October were low compared to other days during the week and lower than long term averages (see figure A1). The AER understands this is due to pipeline repairs.

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

1 'As available' gas offers are given less priority than 'firm' gas offers but will usually be delivered if there are no capacity constraints on a pipeline.

2 'Backhaul flows' along a pipeline are notional flows which are used to supply customer demand outside the hub either for usage or storage; these are subtracted from 'forward-haul' flows.

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

						QLD		
Average daily flows	**NSW**	**ACT**	**VIC**	**SA**	**TAS**	Brisbane	Mt Isa	Gladstone
23 October – 29 October	272	12	455	235	51	164	101	127
Financial Year-to-date 2011-12*	354	34	735	286	50	172	102	122
Financial Year-to-date 2010-11**	426	36	799	309	47	179	93	107

*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**
23 October – 29 October	27	6	119	34	143
Financial Year-to-date 2011-12*	56	15	161	33	133
Financial Year-to-date 2010-11**	85	17	176	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.

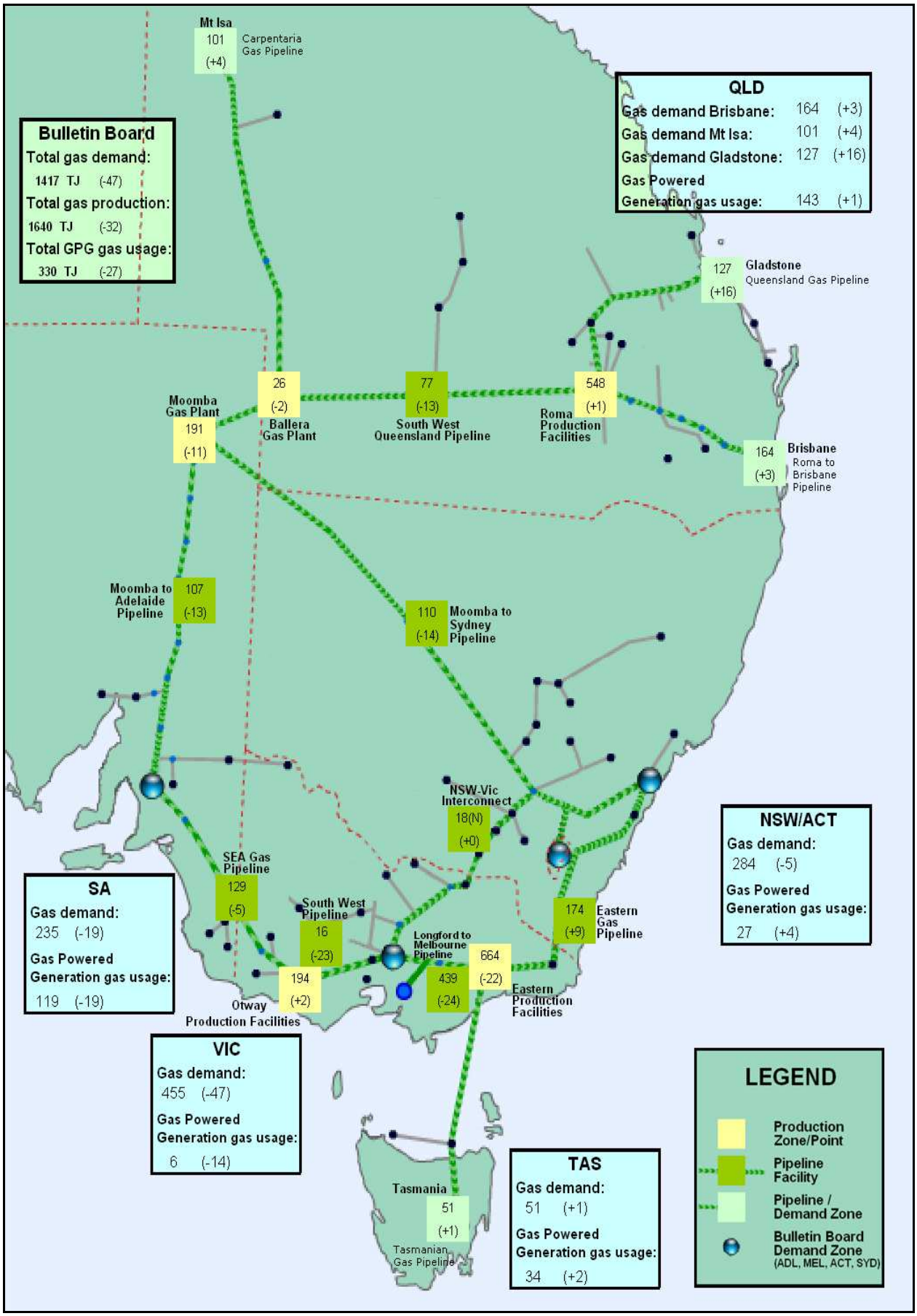
Figure N3 sets out the daily average flows from production and storage facilities from each production zone across the National Gas Market. A list of production/storage facilities for each zone is provided in Figure A2.

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

Average daily flows	**Roma (QLD)**	**Eastern Victoria**	**Otway Basin (VIC)**	**Moomba (SA/QLD)**
23 October – 29 October	548	664	194	217
Financial Year-to-date 2011-12*	554	846	321	271
Financial Year-to-date 2010-11**	549	939	320	338

*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)

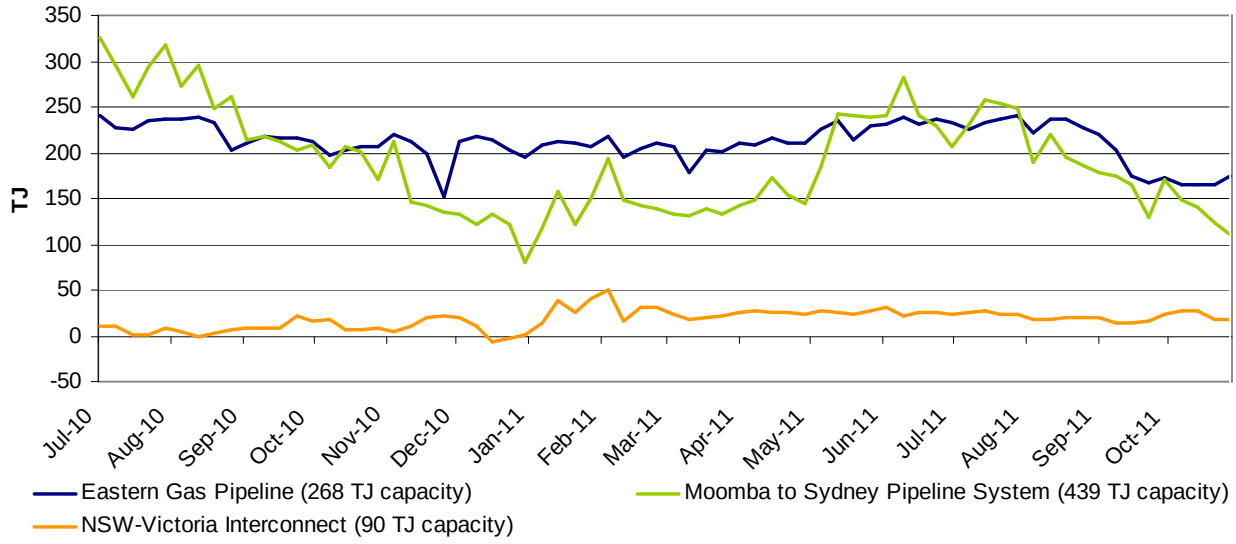


Source: Natural Gas Market Bulletin Board http://www.gasbb.com.au
Notes: Direction of aggregate daily flows along the NSW-Vic Interconnect indicated on map by S (South) or N (North).
Numbers in brackets indicate a change in average daily flow from the previous week.

Gas flows into demand regions

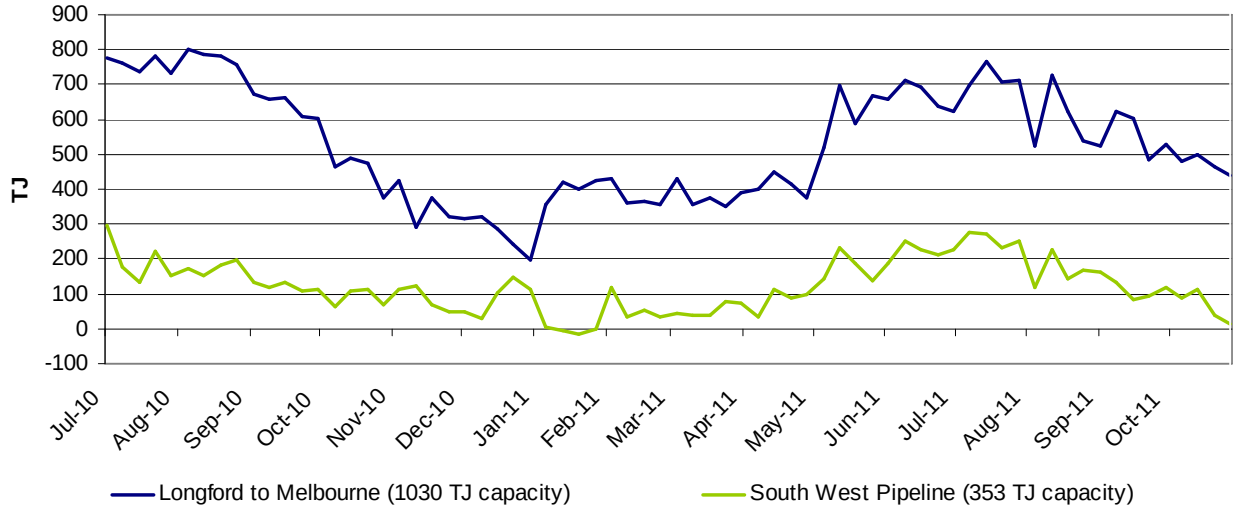
The figures below provide the average daily flows into each of the demand regions served by multiple pipelines and supply sources.

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



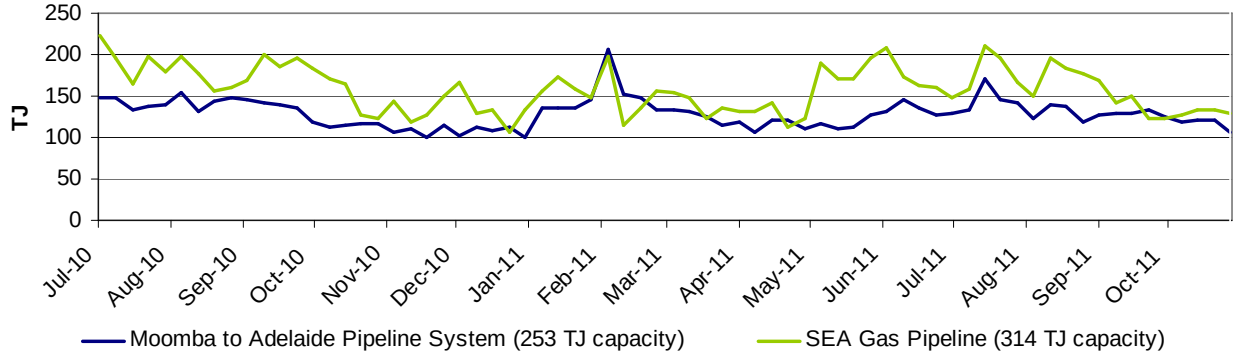
Source: Natural Gas Market Bulletin Board http://www.gasbb.com.au
Notes: Negative flows on the NSW-Victoria Interconnect represent flows out of NSW into VIC.

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^

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							NS						S
AGL (Qld)	Retailer	1				NS									
AGL	Retailer	3			NS	NS	S						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			
Origin (Uranquinty)	Trader	2					S					S			
Red Energy	Retailer	1					S								
Santos	Retailer	3			S			S	S						S
Simply Energy	Retailer	4			NS	NS	S	S					S	S	
TRU Energy	Retailer	4			S	NS	S		S				S		NS
TRU Energy 2	Retailer	2					S		NS						NS
Visy Paper	Distribution Customer	2					S					S			

^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)

	23 October – 29 October	16 October – 22 October	2011-12 Financial YTD*	2010-11 Financial YTD**
Average daily price	1.65	2.47	3.08	*2.07*

23 October – 29 October	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Daily price	0.98	2.49	1.60	2.42	2.45	0.97	0.65

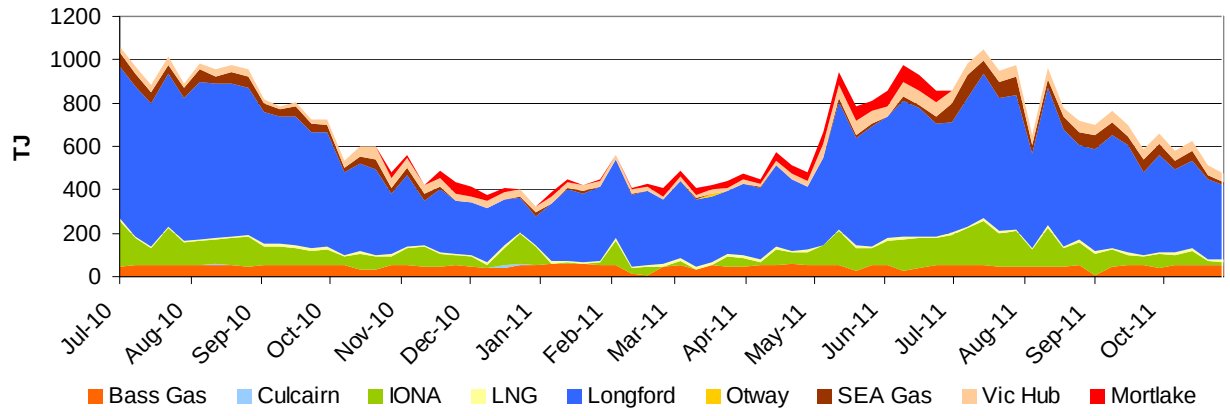
*Average daily imbalance weighted average price from 1 July 2011 to the current week (inclusive)
**Average daily imbalance weighted average price from 1 July 2010 to the equivalent week in 2010-11 (inclusive)
Source: http://www.aemo.com.au (INT 041)

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:	23 October – 29 October	16 October – 22 October	2011-12 Financial YTD*	2010-11 Financial YTD**
Culcairn	0	0	0	1
Longford	348	367	492	584
LNG	7	7	9	8
IONA	16	20	95	97
VicHub	39	43	48	31
SEAGas	10	21	55	43
Bass Gas	53	53	47	48
Otway	0	0	0	0
Mortlake	0	0	0	7
TOTAL	**473**	**513**	**746**	**820**

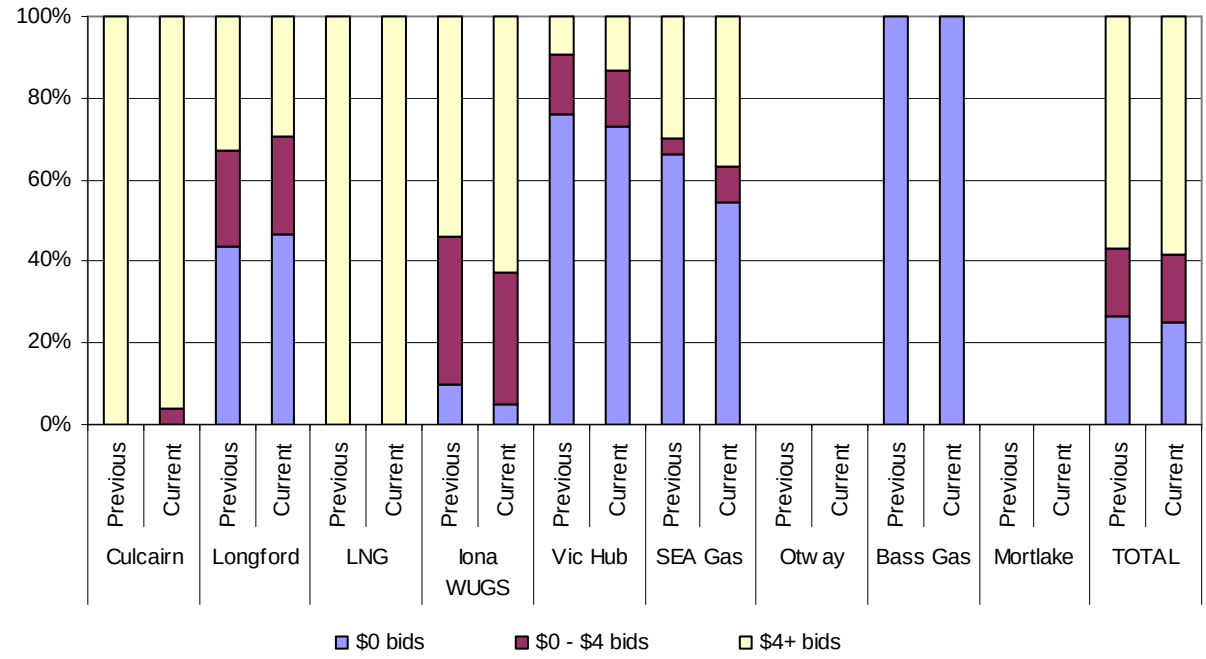


*Average daily estimated gas consumption measured from 1 July 2011 to the current week (inclusive)
**Average daily estimated gas consumption measured from 1 July 2010 to the equivalent week in 2010-11 (inclusive)
Source: http://www.aemo.com.au (INT 150)

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
Culcairn		Lumo	Lumo				
Longford	AGL Origin TRU	AGL Origin TRU	AGL Origin TRU	AGL Origin TRU	AGL Origin TRU	AGL Origin TRU	AGL Origin TRU
LNG							
Iona	Origin TRU APG Simply	Origin TRU APG Lumo	Origin TRU Lumo	Origin TRU Simply Lumo APG	Origin TRU Lumo	Origin TRU	TRU APG
VicHub	AETV Lumo	AETV TRU Lumo	AETV Lumo	AETV	AETV Lumo	AETV Lumo	TRU
SEAGas		Simply			Origin	Origin	
Bass Gas							
Mortlake							

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 I 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

System withdrawal zone:	23 October – 29 October	16 October – 22 October	2011-12 Financial YTD*	2010-11 Financial YTD**
Ballarat	18	18	32	37
Geelong^	84	88	97	99
Gippsland	37	40	48	53
Melbourne	282	308	487	553
Northern	55	58	84	76
TOTAL	**476**	**512**	**748**	**818**

^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
AEMO role	• Wholesale market operator, • Retail market operator, • Transmission pipeline system operator	• Wholesale market operator, • Retail market operator
Scheduling	• On the day scheduling comprising five pricing and operating schedules at set times. Ad hoc schedules if required. • Day ahead and 2-Day ahead schedules (forecast data only).	• Day ahead market schedules • Shippers may vary from their market schedules when they nominate to pipeline operators • 2-Day ahead and 3-Day ahead schedules (forecast data only).
Market Price	• Five ex ante prices for imbalances set on the day • Ex ante prices in subsequent schedules after the 6am schedule apply to deviations • Market price is for commodity only. Transportation is charged separately by pipeline owner	• One ex ante market price set the day before the gas day • One ex post imbalance price set the day after the gas day • Price includes both commodity and delivery to the hub and represents purchase of gas at the hub
Linepack management (pipeline balancing mechanism)	• AEMO defines linepack target depending on operational conditions and is generally set seasonally not daily. • Linepack account covers costs that includes costs of day to day linepack variations	• On the day pipeline balancing through Market Operator Service (MOS), provided by MOS offers from shippers
Transmission pipeline constraint management	• Ancillary payments for higher priced gas scheduled that relieves constraints • Uplift payments to fund ancillary payments	• Capacity payments from shippers with non-firm contracts to shippers with firm contracts if a pipeline is constrained (based on the pipeline capacity price)

AEMO's website (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 & Gas Pty Ltd	STTM User,Shipper	1	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	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	NS		
OneSteel Coil Coaters Pty Ltd	STTM User								
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	STTM User								
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	NS	S	S		
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

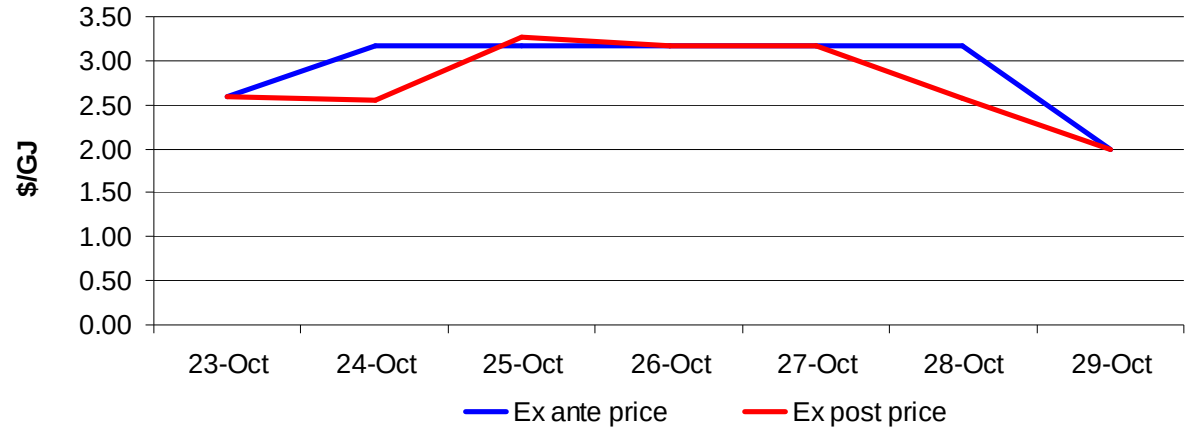
Ex ante and Ex post Market Prices

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)

	23 October – 29 October	16 October – 22 October	2011-12 Financial YTD*	2010-11 Financial YTD**
Ex ante price	2.92	2.97	3.35	2.34
Ex post price	2.76	2.50	2.94	9.38

*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

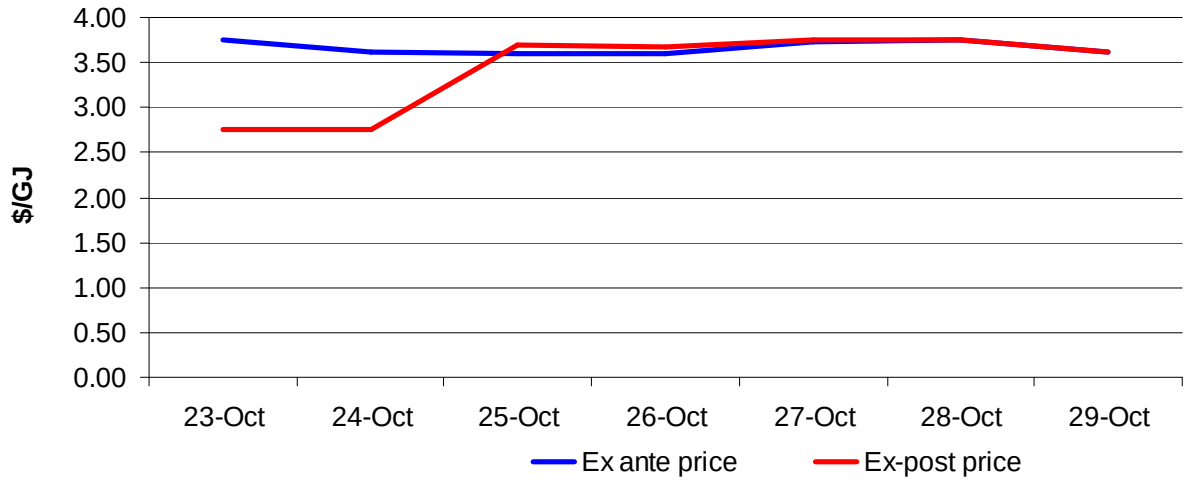


Source: http://www.aemo.com.au INT 651, 657

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

	23 October – 29 October	16 October – 22 October	2011-12 Financial YTD*	2010-11 Financial YTD**
Ex ante price	3.66	3.61	3.77	3.16
Ex post price	3.42	3.22	3.71	3.21

*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.

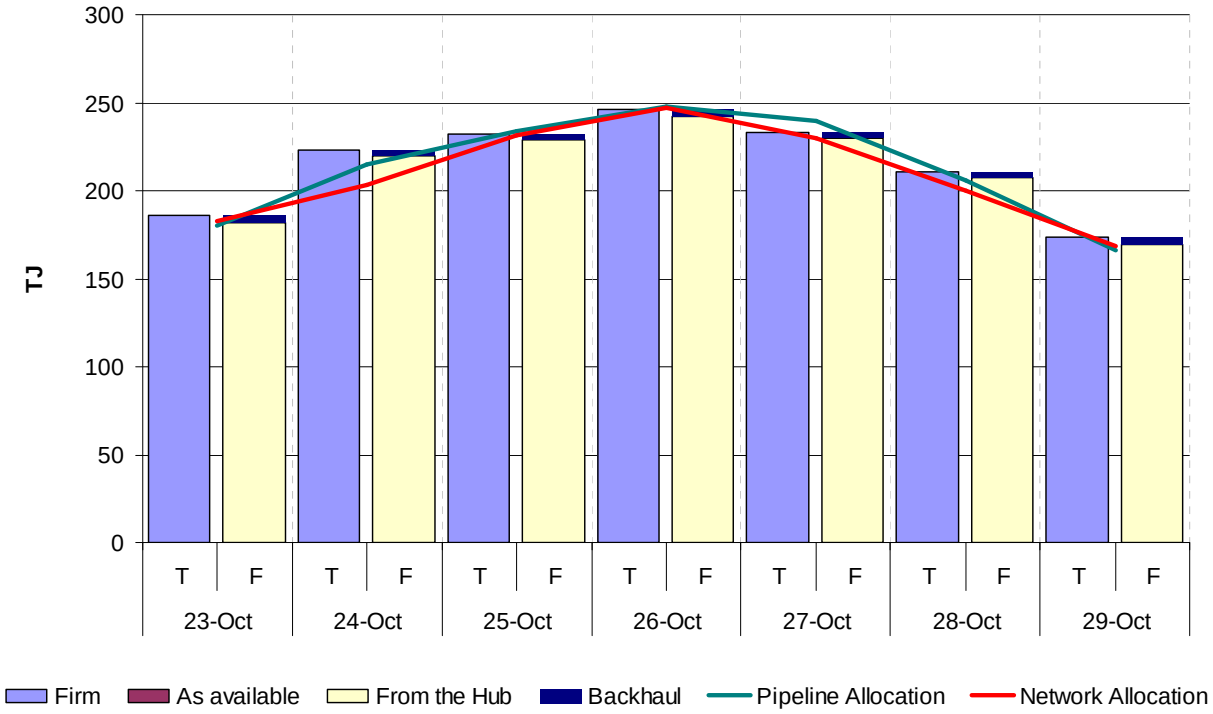
Gas can also be scheduled from the STTM hubs. This happens when Shippers "backhaul" gas from the hub or Users bid to take gas from the hub (including price taker bids).

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.

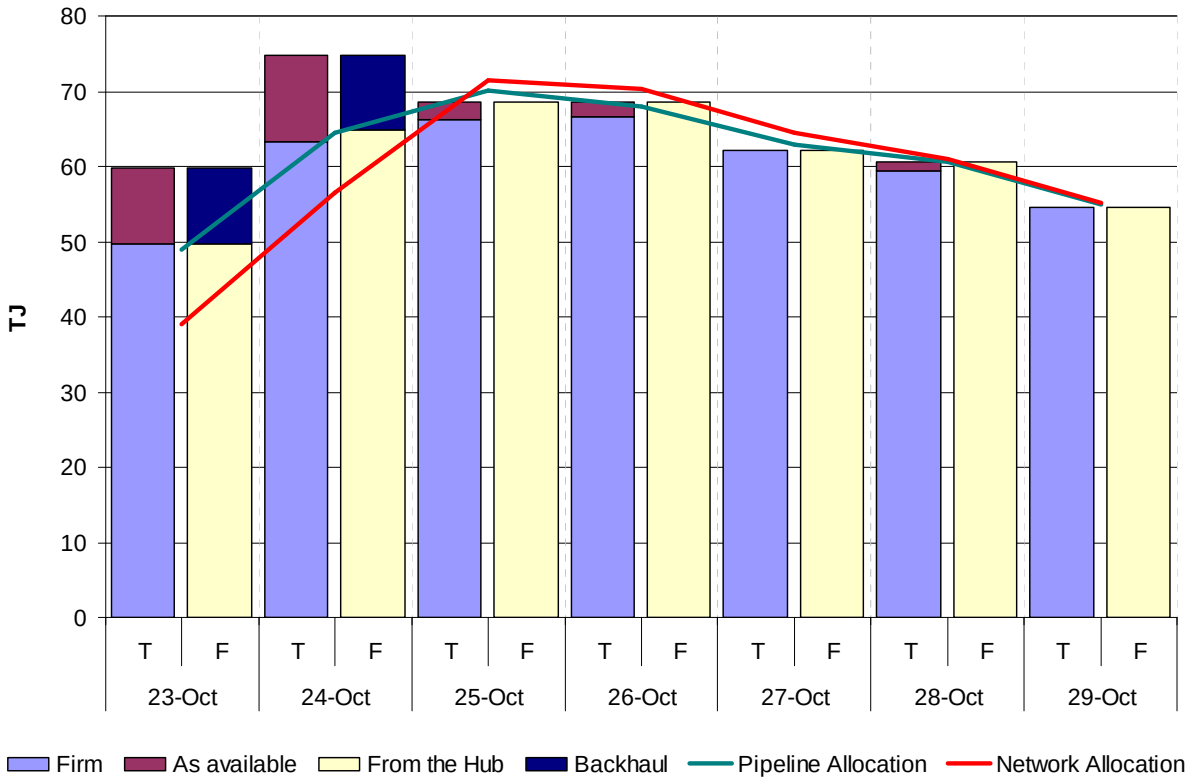
By comparing the level of the red line to the columns marked "F", it can be shown whether demand (allocation) was higher than scheduled. Similarly, comparing the green line to the columns marked "T" shows how the actual flow of gas (allocation) compared to what was scheduled.

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)

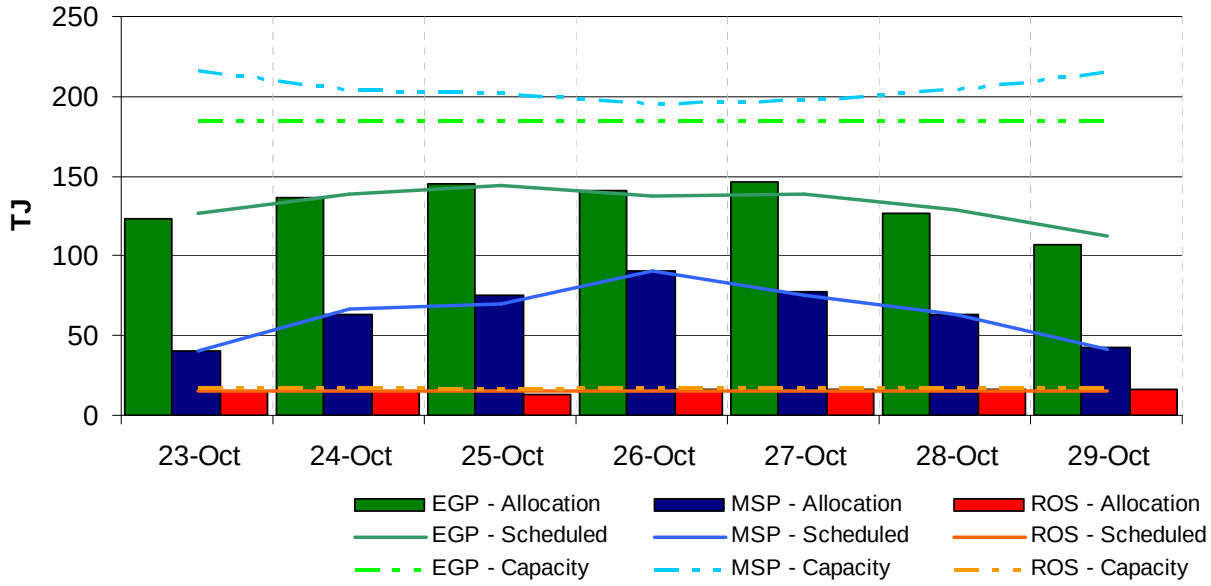
Pipeline Facility Allocations

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.

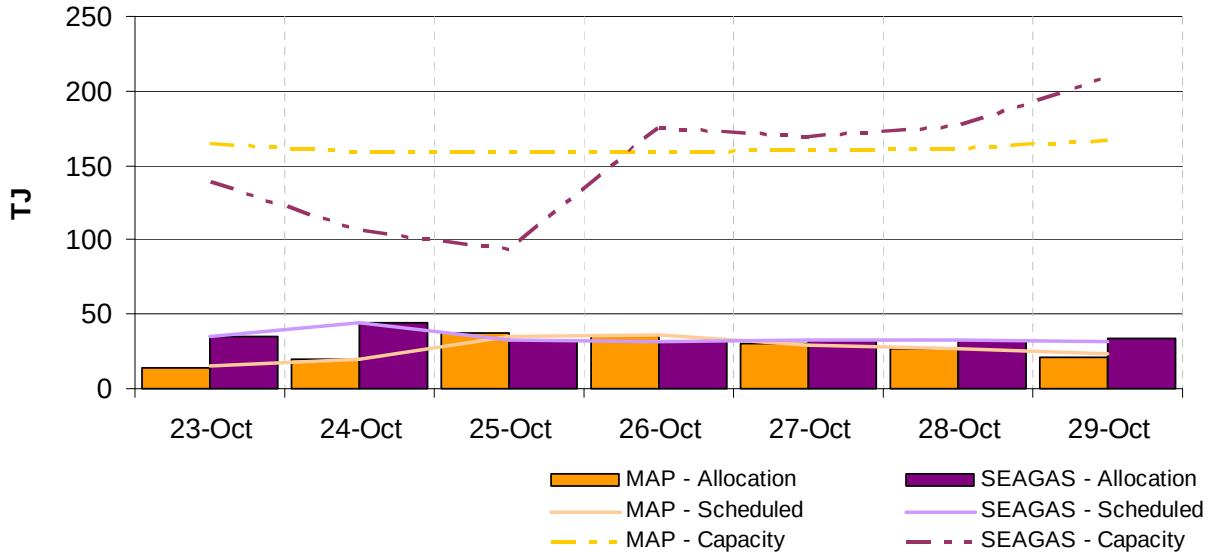
Differences between the amount of gas scheduled and what was actually allocated can result in variations between the ex ante and ex post price, as the ex post price is related to the offers actually allocated while ex ante is related to the offers scheduled.

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

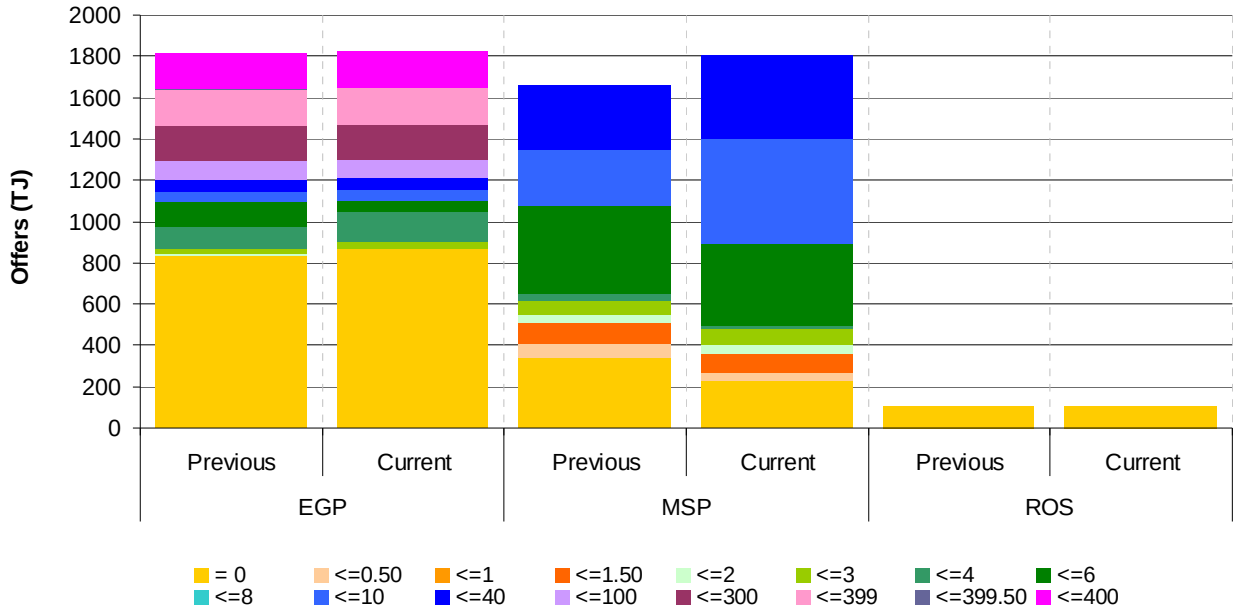
Trading Participants submit offers to sell gas into an STTM hub and withdrawal bids to take gas from a hub. Figures S9 and S11 show for the Sydney and Adelaide hubs respectively, total offers within various price bands for the current week compared to the previous week for each of the pipeline facilities.

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-

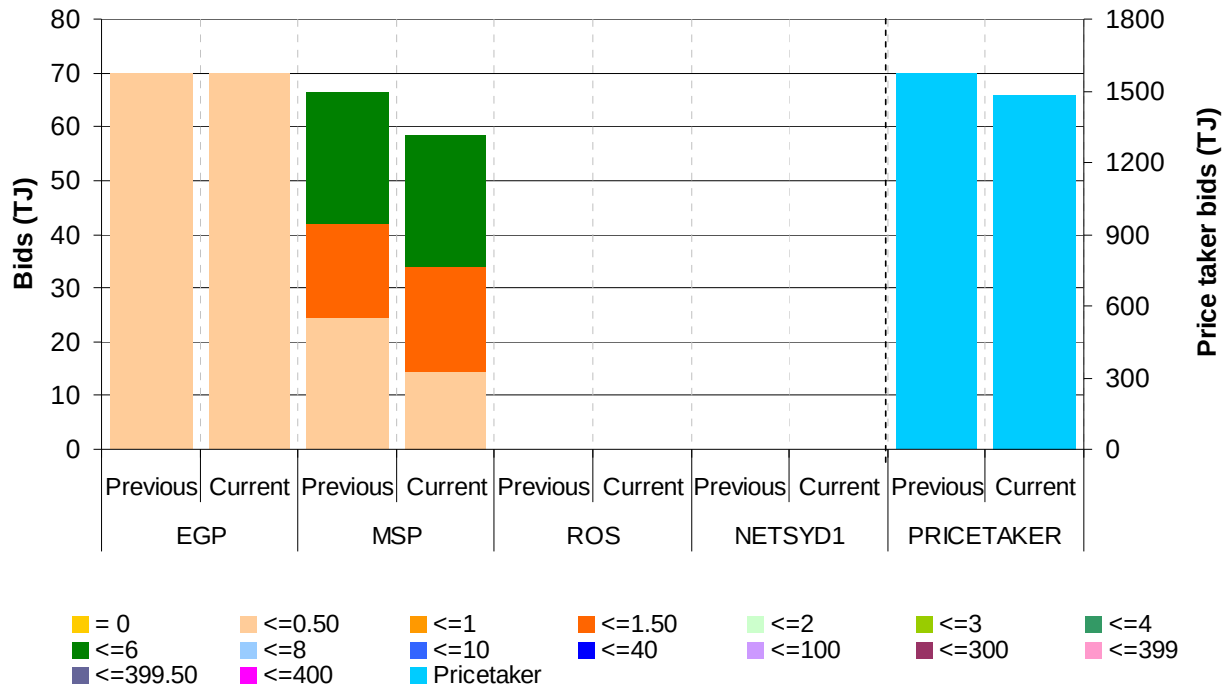
side axis. Because scheduling is price-driven, offers for lower-priced gas are scheduled ahead of offers for higher-priced gas and bids for higher-priced gas are scheduled ahead of bids for lower-priced gas.

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



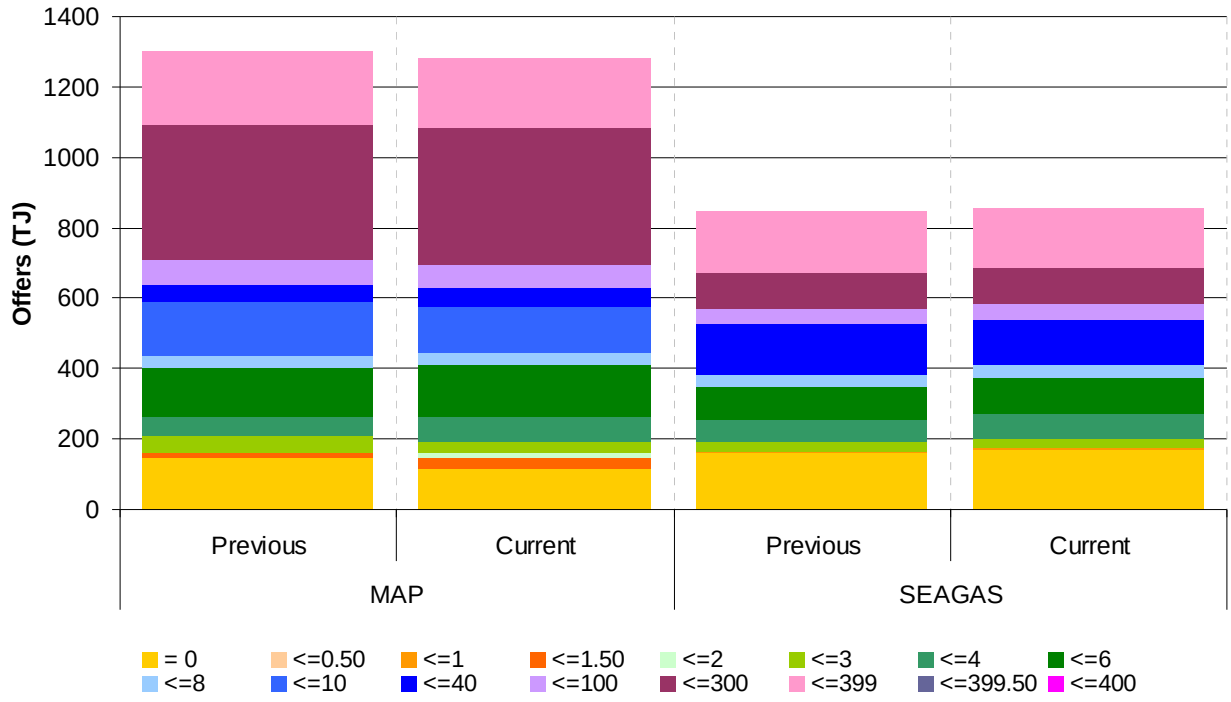
Source: http://www.aemo.com.au INT 652, 659
EGP=Eastern Gas Pipeline, MSP=Moomba to Sydney Pipeline, ROS=Rosalind Park Production facility

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



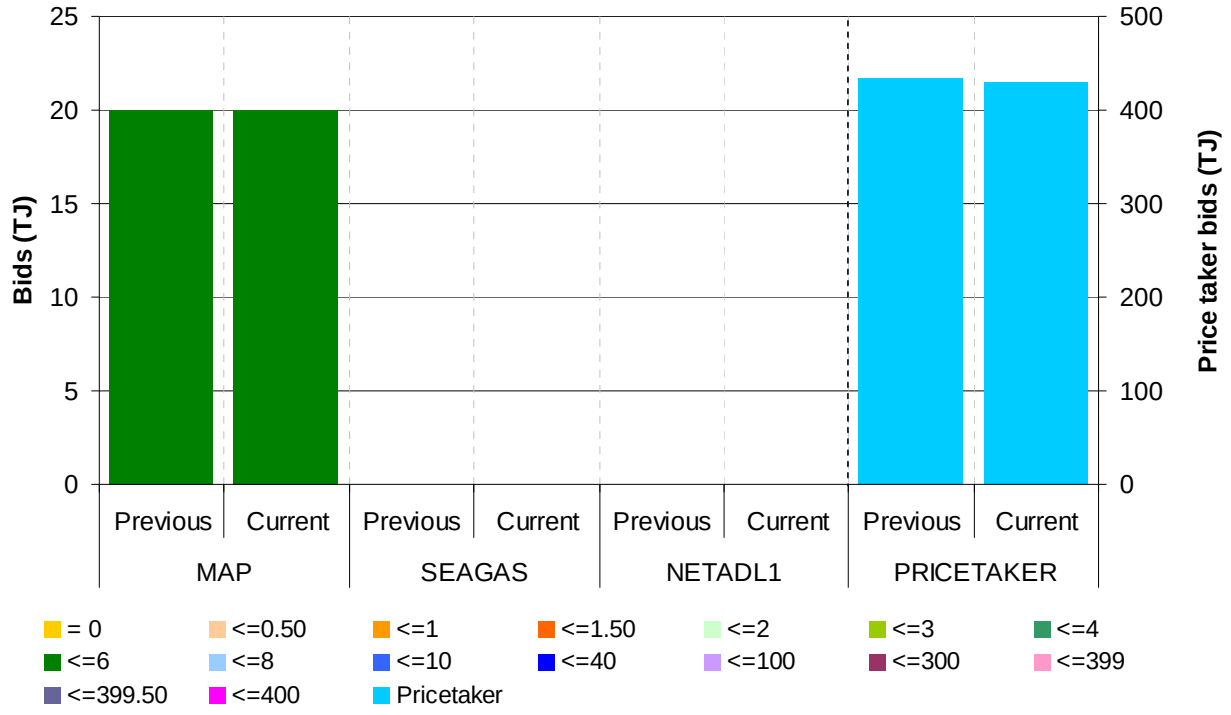
Source: http://www.aemo.com.au INT 652, 659
EGP=Eastern Gas Pipeline, MSP=Moomba to Sydney Pipeline, ROS=Rosalind Park Production facility, NETSYD1=Sydney Hub

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 Lumo OneStl(NSW) SANTOS TRU	TRU	Lumo SANTOS TRU	Lumo OneStl(NSW) SANTOS TRU	Lumo TRU	OneStl(NSW) TRU	AGL(WG) Lumo TRU
	D-2 to D-1	TRU	Lumo SANTOS TRU	BluSc Lumo OneStl(NSW) SANTOS TRU	BluSc Lumo SANTOS TRU	APG BluSc OneStl(NSW) SANTOS TRU	BluSc SANTOS TRU	BluSc SANTOS TRU
MSP	D-3 to D-2	AGL(ESM) Origin TRU	AGL(ESM) 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)	

Source: http://www.aemo.com.au INT 659
BluSc= BlueScope Steel I Country= Country Energy I Origin=Origin Energy Retail Ltd I TRU= TRUenergy Pty Ltd I
AGL(WG)= AGL Wholesale Gas Limited I EA=EnergyAustralia I OneStl(NSW)= OneSteel NSW Pty Ltd I
SANTOS= Santos Direct Pty Ltd I AGL(ESM)= AGL Energy Sales & Marketing Pty Ltd I 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				Lumo			
	D-2 to D-1							
MSP	D-3 to D-2	Country		Country	Lumo		Country	
	D-2 to D-1		Country		Country	Country		Country
NETSYD1	D-3 to D-2							
	D-2 to D-1							
ROS	D-3 to D-2							
	D-2 to D-1							Country

Source: http://www.aemo.com.au INT 659
Country= Country Energy | AETV = Aurora Energy Tamar Valley I Country= Country Energy I TRU= TRUenergy Pty Ltd I
Lumo= Lumo Energy Australia Pty Ltd I
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 Simply TRU	AGL(SA) Simply TRU	AGL(SA) Origin TRU	AGL(SA) Origin TRU	AGL(SA) Origin TRU	AGL(SA) Origin TRU	AGL(SA) Origin TRU
	D-2 to D-1	ABC AGL(SA) Origin TRU	ABC AGL(SA) Origin TRU	ABC AGL(SA) Origin	ABC AGL(SA) Origin TRU	ABC AGL(SA) Origin TRU	ABC AGL(SA) Origin	ABC AGL(SA) Origin TRU
SEA-GAS	D-3 to D-2	Origin Simply TRU	TRU	Origin Simply TRU	Origin TRU	Simply TRU	Simply TRU	Origin TRU
	D-2 to D-1	ABC Origin Simply TRU	ABC Origin Simply TRU	ABC Origin TRU	ABC Simply TRU	ABC Simply TRU	ABC TRU	ABC 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	Simply	Simply					
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[3] 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

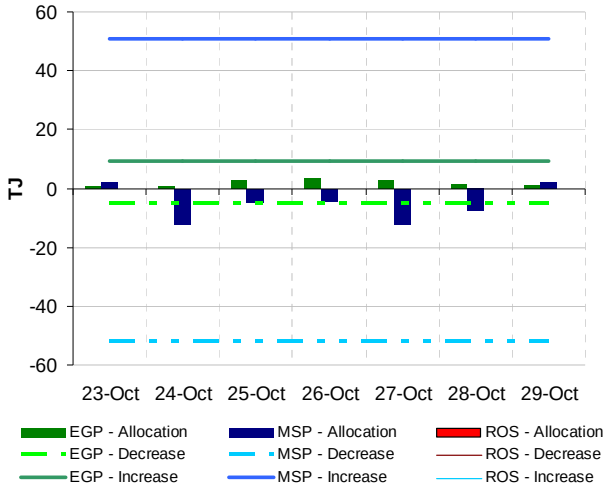
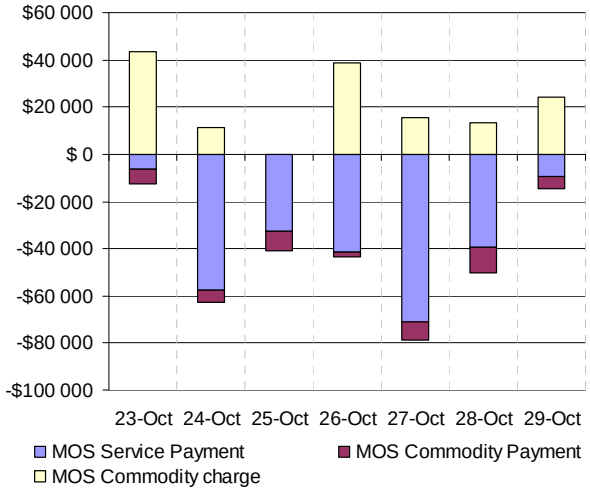


Figure S17b: Sydney MOS payments/charges



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 S18a: Adelaide MOS allocations

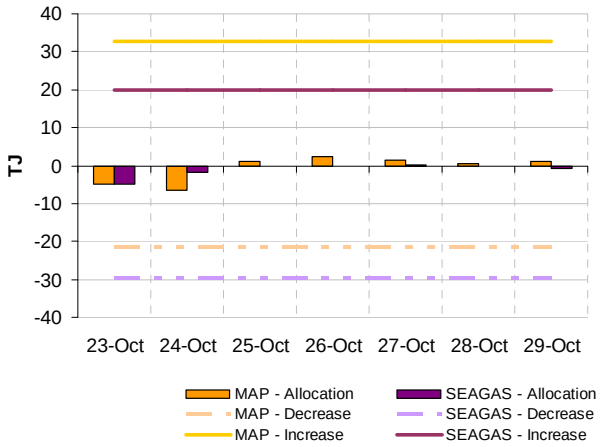
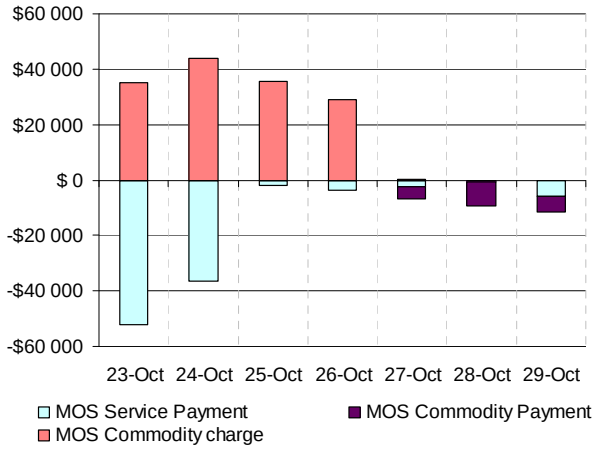


Figure S18b: Adelaide MOS payments/charges

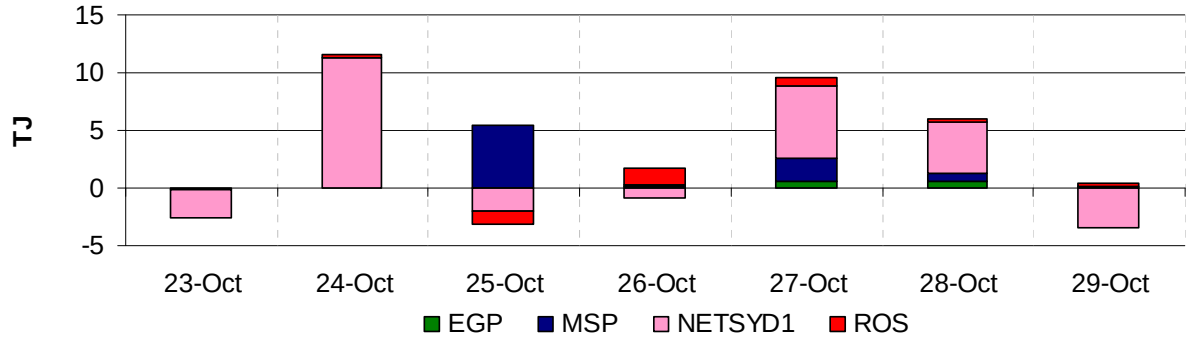


Source: http://www.aemo.com.au INT 663, 664, 665
MAP=Moomba to Adelaide Pipeline, SEAGAS=SEA gas pipeline

Deviations

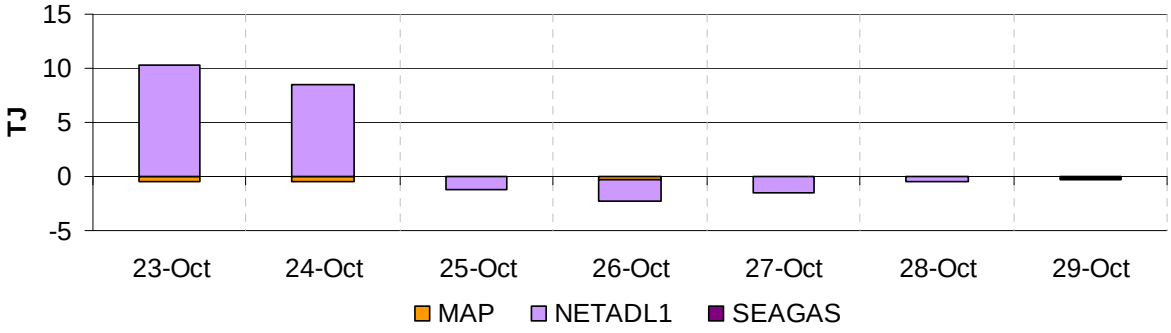
Deviations occur when the gas flowed on pipelines into hubs on a gas day differ from the modified market schedule, or when gas taken out of the hub is different to the schedule. The most likely reason for deviations is where participants incorrectly forecast the demand of customers within the hub. As 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

	23 October - 29 October	16 October - 22 October	2011-12 Financial YTD*	2010-11 Financial YTD**
Syd Quantity (TJ)	6.66	10.16	6.17	3.22
Syd Charges ($)	185.35	398.16	217.95	86.28

*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

	23 October - 29 October	16 October - 22 October	2011-12 Financial YTD*	2010-11 Financial YTD**
Adl Quantity (TJ)	0.55	2.09	1.72	1.48
Adl Charges ($)	16.25	149.59	98.27	36.43

*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**
QLD												
Carpentaria Pipeline	100	93	93	97	105	108	111	119	86	101	102	93
QLD Gas Pipeline	123	123	121	128	131	134	132	142	86	127	122	107
Roma to Brisbane Pipeline	147	167	166	177	173	168	150	219	79	164	172	179
South West QLD Pipeline	78	73	78	73	75	81	81	181	64	77	115	123
NSW/ACT												
Eastern Gas Pipeline	155	171	189	186	190	173	154	268	76	174	204	219
Moomba to Sydney Pipeline	76	90	125	145	126	127	81	439	42	110	184	242
NSW-VIC Interconnect	22	7	12	13	26	23	21	90	23	18	21	8
VIC												
Longford to Melbourne	358	530	533	493	420	383	358	1030	57	439	585	658
South West Pipeline^	-7	25	65	9	3	7	7	353	43	16	150	140
SA												
Moomba to Adelaide Pipeline	94	113	115	120	109	105	92	253	51	107	130	133
SEA Gas Pipeline	107	124	120	151	146	146	106	314	50	129	156	176
TAS												
Tasmanian Gas Pipeline	48	58	50	50	49	48	50	129	38	51	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**
Roma (QLD)												
Berwyndale South	95	97	95	96	96	96	96	140	67	96	94	99
Fairview	80	80	116	108	113	99	103	130	79	100	103	119
Kenya Gas Plant	95	86	84	93	95	98	96	160	52	92	83	63
Kincora	0	1	10	10	10	10	10	25	38	7	10	3
Kogan North	8	8	8	8	8	8	9	12	59	8	7	9
Peat	8	8	8	8	8	8	8	15	51	8	8	10
Rolleston	10	10	11	11	10	11	11	30	33	11	10	11
Scotia	30	30	28	28	27	29	30	29	95	29	28	25
Spring Gully	42	44	42	42	41	40	40	69	63	42	43	53
Strathblane	42	44	42	42	41	40	40	69	63	42	43	53
Taloona	26	27	26	26	25	24	24	42	63	25	26	32
Yellowbank	10	10	9	9	9	9	9	30	32	9	9	13
Talinga	75	75	74	73	75	96	93	120	75	80	90	51
Moomba (SA/QLD)												
Moomba Gas Plant	160	203	202	220	221	180	150	430	59	191	253	315
Ballera	29	27	21	26	27	26	28	150	12	26	18	22
Eastern (VIC)												
Orbost Gas Plant	69	40	69	69	69	69	69	100	68	65	68	6
Lang Lang Gas Plant	53	53	54	53	53	53	53	70	68	53	47	48
Longford Gas Plant	468	652	656	614	533	485	418	1145	64	547	731	885
LNG Storage Dandenong	0	0	0	0	0	0	0	158	0	0	0	0
Otway Basin (VIC)												
Minerva Gas Plant	30	45	45	55	71	45	45	90	64	48	58	69
Otway Gas Plant	157	127	116	138	181	139	131	205	73	141	150	148
Iona Underground Gas Storage	-25	12	47	4	-3	0	0	440	26	5	114	103

*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)
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
16 October – 22 October	Average min.	16.4	14.7	4.2	12.3	15.1	9.4
	Average max.	24.8	23.3	24.2	22.1	25.8	20.8

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

23 October – 29 October	Scheduling Interval					Daily Imbalance Weighted Average Price
	6am	10am	2pm	6pm	10pm	
Sun	0.99	1.59	1.01	0.10	0.10	0.98
Mon	2.46	1.61	1.62	2.47	3.59	2.49
Tue	1.57	2.16	1.80	2.16	2.91	1.60
Wed	2.46	2.98	1.66	2.05	0.60	2.42
Thu	2.49	2.96	1.00	1.05	1.05	2.45
Fri	0.99	1.06	0.10	0.64	2.40	0.97
Sat	0.65	1.06	0.90	0.64	0.15	0.65

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	
23-Oct	**MP:**	365	366	367	367	370	**-6**
	AEMO:	350	350	332	320	328	
	MP as % of AEMO	104	105	111	115	113	
24-Oct	**MP:**	568	542	547	581	581	**0**
	AEMO:	566	490	546	555	583	
	MP as % of AEMO	100	111	100	105	100	
25-Oct	**MP:**	597	613	611	617	617	**0**
	AEMO:	615	615	581	585	600	
	MP as % of AEMO	97	100	105	106	103	
26-Oct	**MP:**	556	541	524	532	533	**-1**
	AEMO:	527	539	529	506	495	
	MP as % of AEMO	105	100	99	105	108	
27-Oct	**MP:**	440	439	439	438	438	**-14**
	AEMO:	385	390	385	385	395	
	MP as % of AEMO	114	112	114	114	111	
28-Oct	**MP:**	403	401	400	403	403	**-20**
	AEMO:	350	338	322	329	359	
	MP as % of AEMO	115	118	124	122	112	
29-Oct	**MP:**	368	375	377	378	378	**0**
	AEMO:	342	373	354	345	354	
	MP as % of AEMO	108	100	107	110	107	

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