WEEKLY GAS MARKET ANALYSIS

AUSTRALIAN ENERGY REGULATOR

5 June – 11 June 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

5 June – 11 June	Victorian market*	STTM Sydney hub**	STTM Adelaide hub**
Average Price	4.31	3.80	4.17

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

Victorian Gas Market

Consistent with the highest beginning of day forecast gas demand for the year so far of 1201 TJ, the schedule price reached $7.99/GJ on the Wednesday 8 June gas day at the 6 am and 2 pm scheduling intervals (see figure A4). These were the highest schedule prices since the 22 November 2008 gas day (when the price reached $800/GJ (VoLL) at the 10 pm schedule).

Figure V2 shows the average daily market price was relatively high (for the third consecutive week). This was consistent with high average demand (852 TJ/day) driven by cold weather and

participants moving gas offers into higher price bands at Longford (see figure V4). AEMO issued demand overrides on 5 days this week; largely in response to market participants' forecasts being lower than AEMO's (see figureA5).

STTM Gas Markets (Adelaide and Sydney)

Figures S3 and S4 show this week's average ex ante and ex post prices were higher at both hubs than the previous week, and, with the exception of the ex post in Sydney, were higher than the financial year to date averages.

On the Thursday 9 June gas day in Sydney, the ex ante price reached $4.45/GJ and the ex post price reached $4.99/GJ, the highest this calendar year. Consistent with these high prices, pipeline allocations (deliveries to the Sydney hub) on this gas day were 357 TJ, the largest volume since market start.

On the same day in Adelaide the ex ante price was $4.50/GJ (the highest price since 2 February 2011) and pipeline allocations were 95 TJ. On 8 June pipeline allocations were 97 TJ, the largest volume this year.[1]

Adelaide STTM hub—Deviations and MOS

Figure S8 shows that, similar to the previous week in Adelaide over deliveries on the MAP coincided with under deliveries on the SEA Gas pipeline and vice versa. The largest on-the-gas-day deviations into the Adelaide hub this week occurred on the 7 June gas day. Figure 2 shows deviations on this day and resultant MOS requirements.

Figure 2: Adelaide hub deviations & MOS allocated

Gas Date	On-the-gas-day deviations (TJ)*	MOS required (TJ)
7-Jun	9.0 on MAP	0.2 decrease MOS on MAP
	-11.3 on SEAGas	0.003 MOS increase MOS on SEAGas
	2.5 at Adelaide Hub	

***Note:**

1. **Positive values represent over-deliveries on pipelines or under-consumption at the hub (compared to scheduled amounts).**
2. **Negative values represent under-deliveries on pipelines or over-consumption at the hub (compared to scheduled amounts).**

Source: http://www.aemo.com.au INT 652, 701, 703

Despite large opposing on-the-gas-day deviations on MAP and SEAGas on 7 June, MOS requirements were small. This week, there were no instances where large opposing on-the-gas-day pipeline deviations correlated with large amounts of MOS.

The only significant amount of MOS required this week was in response to a deviation in the hub of 11 TJ on 9 June (see figure S20). The AER is continuing with its enquiries into the extent to which opposing on-the-gas-day pipeline deviations (which are becoming more frequent) are affecting the requirement for MOS.

National Gas Market Bulletin Board

Figure N4 shows despite higher overall average gas demand and production than the previous week, with the exception of Queensland, the volume of gas used for gas-powered generation (GPG) was lower.

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

[1] The only gas day with higher pipeline allocations since market start was 6 September 2010 at 101 TJ.

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
5 June – 11 June	470	50	961	320	49	184	102	119
Financial Year-to-date 2010-11*	379	22	604	286	45	166	94	109
Financial Year-to-date 2009-10**	371	20	565	285	38	167	86	71

*Average daily estimated gas consumption measured from 1 July 2010 to the current week (inclusive)
**Average daily estimated gas consumption measured from 1 July 2009 to the equivalent week in 2009-10 (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**
5 June – 11 June	76	4	181	33	120
Financial Year-to-date 2010-11*	86	24	168	30	148
Financial Year-to-date 2009-10**	85	38	169	24	162

^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 2010 to the current week (inclusive)
**Average daily estimated gas consumption measured from 1 July 2009 to the equivalent week in 2009-10 (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.

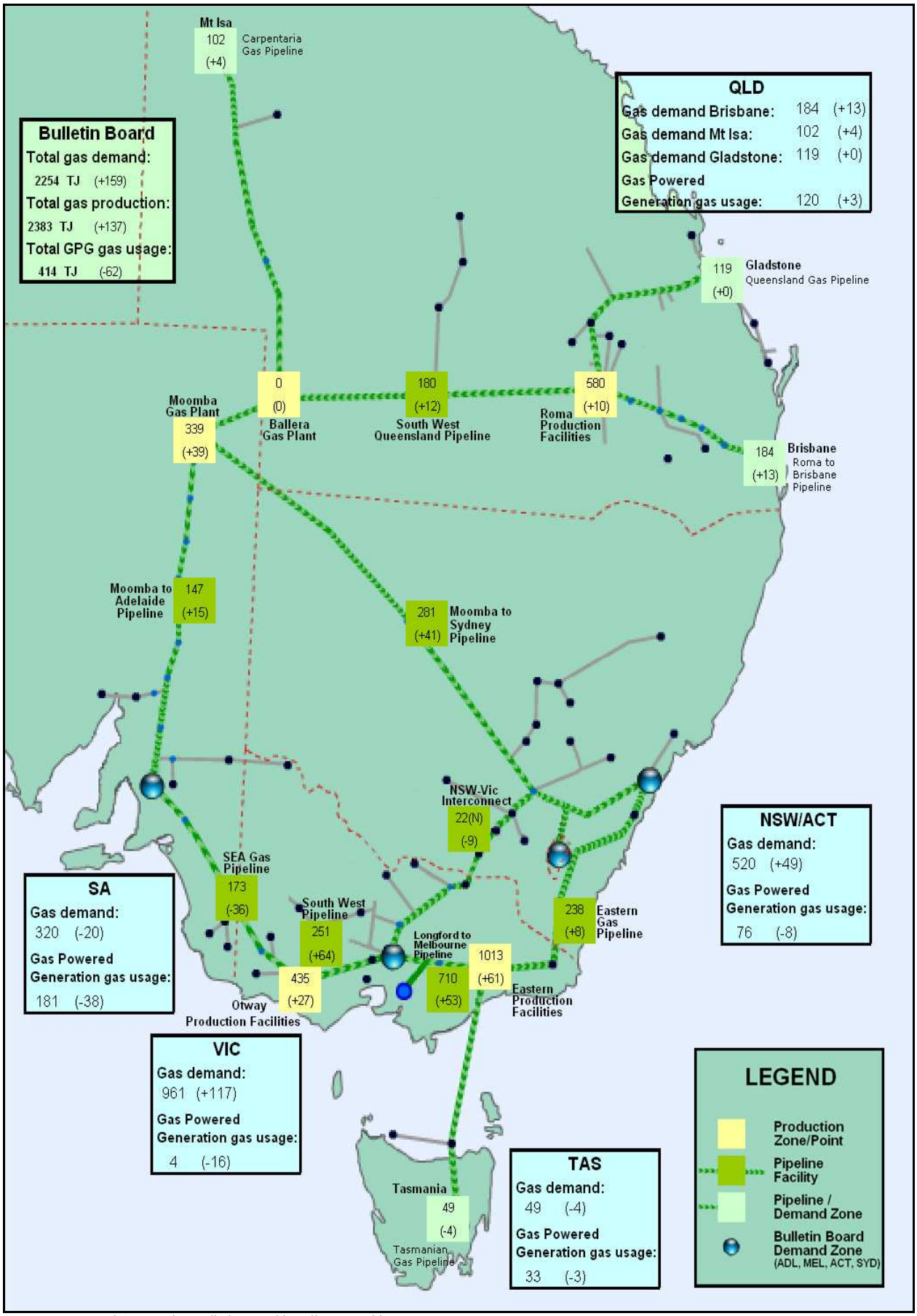
Figure N3 sets out the daily average flows from production and storage facilities from each production zone across the National Gas Market. A list of production/storage facilities for each zone is provided in Figure A2.

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

Average daily flows	**Roma (QLD)**	**Eastern Victoria**	**Otway Basin (VIC)**	**Moomba (SA/QLD)**
5 June – 11 June	580	1013	435	339
Financial Year-to-date 2010-11*	535	768	274	270
Financial Year-to-date 2009-10**	467	675	285	279

*Average daily estimated gas consumption measured from 1 July 2010 to the current week (inclusive)
**Average daily estimated gas consumption measured from 1 July 2009 to the equivalent week in 2009-10 (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)

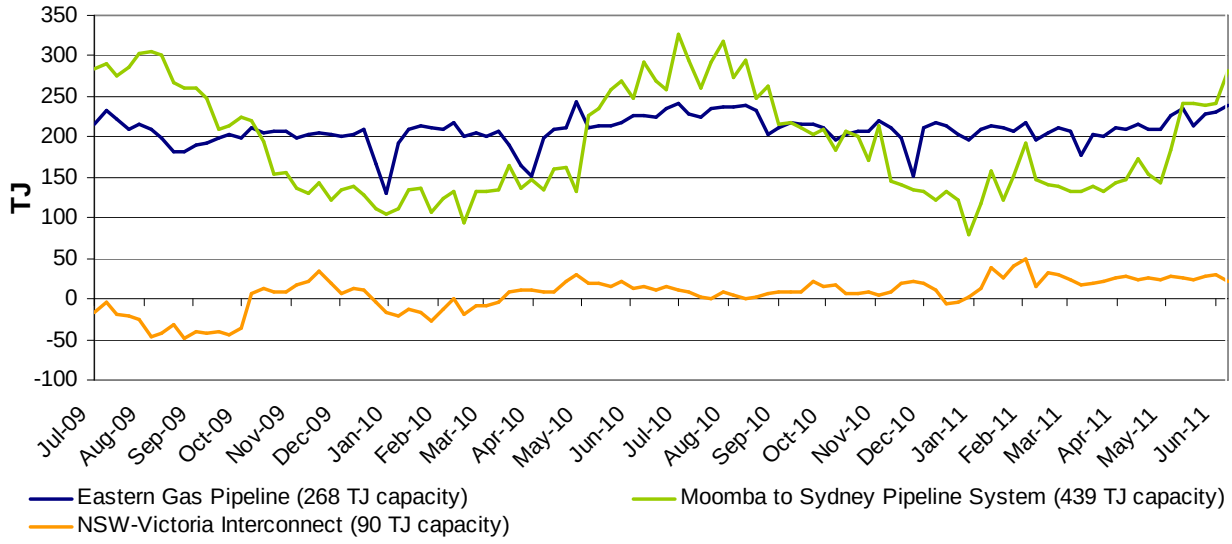


Source: Natural Gas Market Bulletin Board http://www.gasbb.com.au
Notes: Direction of aggregate daily flows along the NSW-Vic Interconnect indicated on map by S (South) or N (North).
Numbers in brackets indicate a change in average daily flow from the previous week.

Gas flows into demand regions

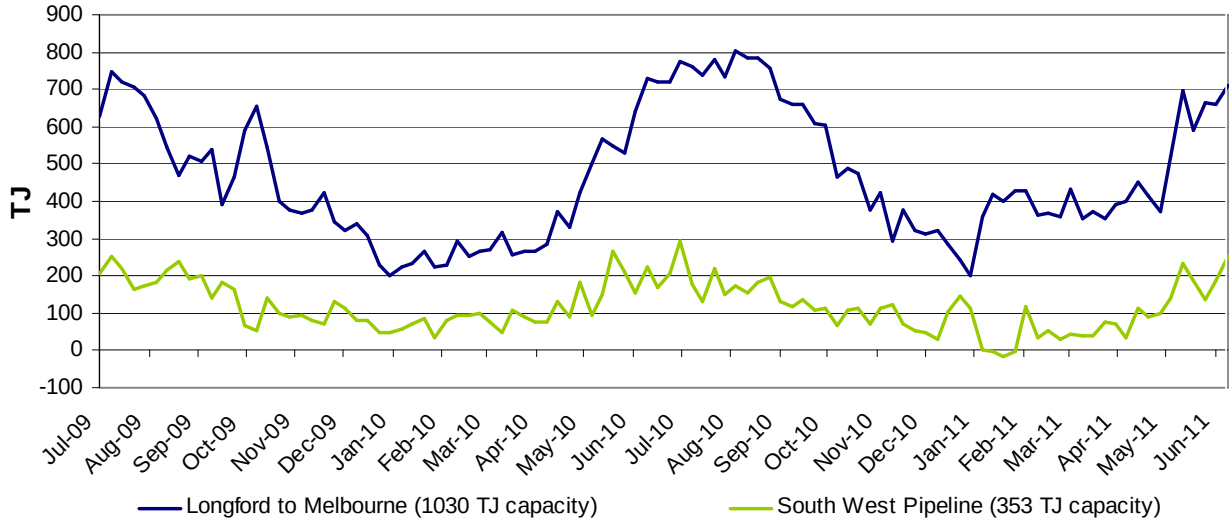
The figures below provide the average daily flows into each of the demand regions served by multiple pipelines and supply sources.

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



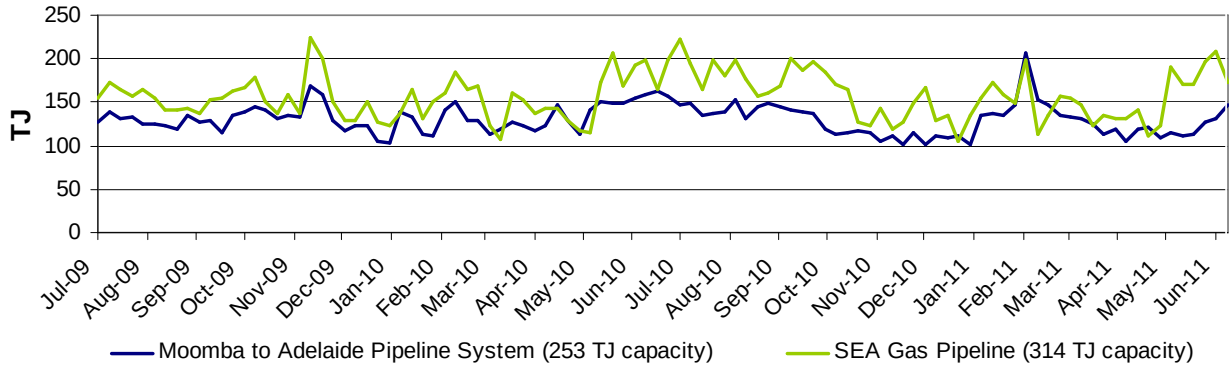
Source: Natural Gas Market Bulletin Board http://www.gasbb.com.au
Notes: Negative flows on the NSW-Victoria Interconnect represent flows out of NSW into VIC.

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

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							S						NS
AGL (Qld)	Retailer	1				NS									
AGL	Retailer	4			S	NS	S		NS				S		
Aurora Energy	Retailer	1					S								
Ausgrid	Retailer	2					S		S						NS
Aust. Power & Gas	Retailer	3			S	S	S						S		
Aust. Power & Gas	Trader	1					S								
Coogee Energy	Transmission Customer	1					S								
Essential Energy	Transmission Customer	1										S			
International Power	Transmission Customer	1						NS							
Lumo Energy	Retailer	3		S		NS			S		S	NS			
Lumo Energy	Trader	2			S				S				S		NS
Origin (Vic)	Retailer	5	S	S	S	NS	S				S	S	NS		
Origin (Uranquinty)	Trader	2					S					S			
Red Energy	Retailer	1					S								
Santos	Retailer	1							S						
Simply Energy	Retailer	4			S	NS	S	S					S	S	
TRU Energy	Retailer	4			S	NS	S		S				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)

	5 June – 11 June	29 May – 4 June	2010-11 Financial YTD*	2009-10 Financial YTD**
Average daily price	4.31	3.82	2.39	*1.79*

5 June – 11 June	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Daily price	3.15	4.21	3.47	7.72	3.78	4.10	3.74

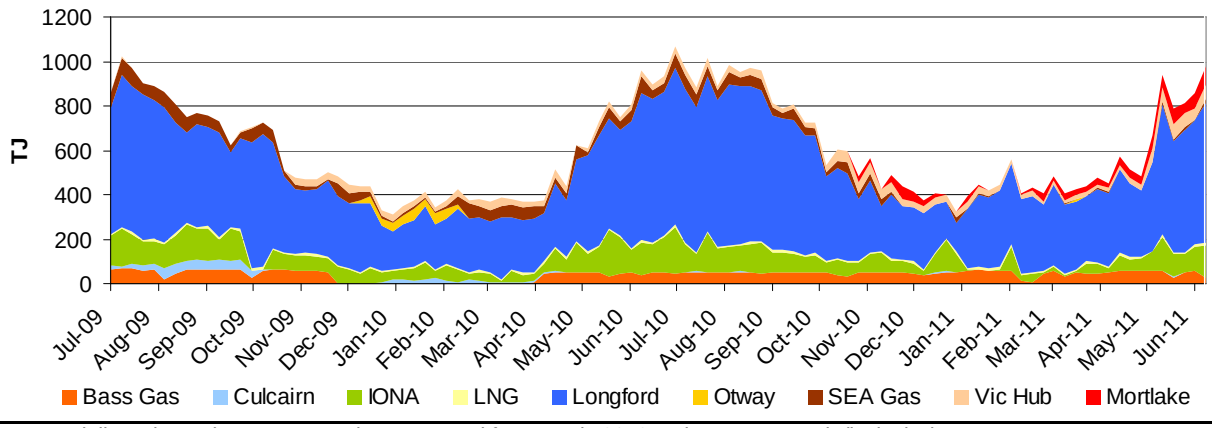
*Average daily imbalance weighted average price from 1 July 2010 to the current week (inclusive)
**Average daily imbalance weighted average price from 1 July 2009 to the equivalent week in 2009-10 (inclusive)
Source: http://www.aemo.com.au (INT 041)

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:	5 June – 11 June	29 May – 4 June	2010-11 Financial YTD*	2009-10 Financial YTD**
Culcairn	1	0	1	14
Longford	624	559	423	375
LNG	12	10	9	8
IONA	147	113	71	83
VicHub	67	49	32	18
SEAGas	20	2	19	42
Bass Gas	26	55	47	33
Otway	0	0	0	7
Mortlake	78	67	26	–
TOTAL	**975**	**854**	**629**	**580**

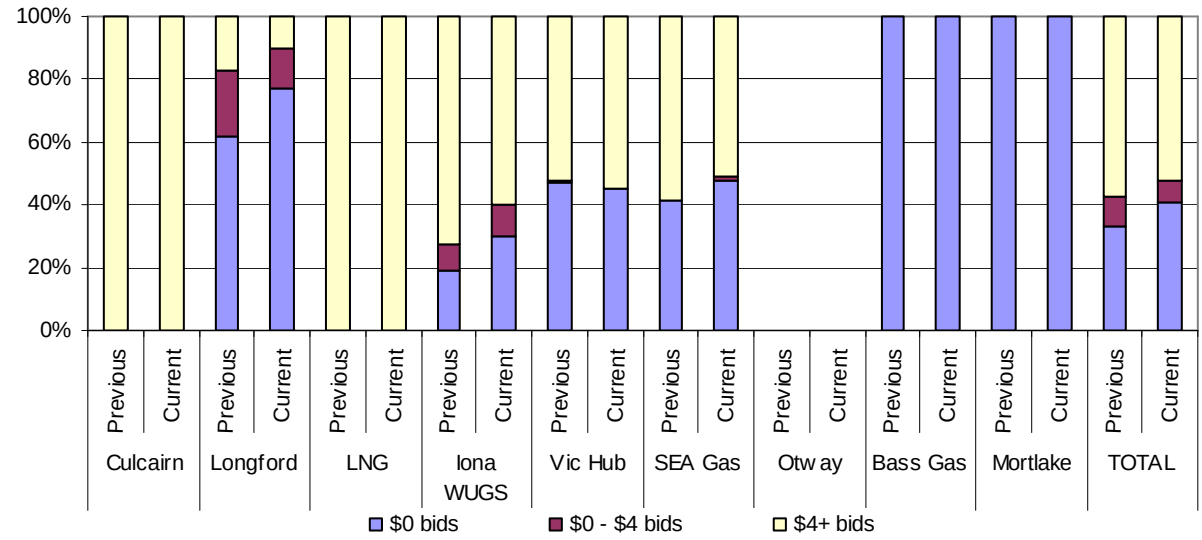


*Average daily estimated gas consumption measured from 1 July 2010 to the current week (inclusive)
**Average daily estimated gas consumption measured from 1 July 2009 to the equivalent week in 2009-10 (inclusive)
Source: http://www.aemo.com.au (INT 150)

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	Lumo	Origin Lumo		Lumo	
Longford	AGL Origin TRU	TRU	Origin TRU	AGL Origin	TRU	AGL Origin TRU	AGL Origin TRU Ausgrid
LNG		Simply		Origin TRU APG Lumo AGL (QLD)			APG
Iona	TRU APG	TRU APG Simply Lumo	AGL Origin TRU APG Simply Lumo	AGL Origin TRU APG	AGL Origin TRU APG	AGL Origin TRU APG Lumo	TRU APG
VicHub	Lumo Ausgrid	AETV Ausgrid	Lumo Ausgrid	AETV AGL TRU Lumo Ausgrid	AETV	AETV Lumo	AETV Lumo
SEAGas	Simply			Simply		Simply	Simply
Bass Gas						Origin	
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 |

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:	5 June – 11 June	29 May – 4 June	2010-11 Financial YTD*	2009-10 Financial YTD**
Ballarat	48	37	25	22
Geelong^	114	109	91	80
Gippsland	57	53	43	45
Melbourne	655	560	399	378
Northern	106	100	67	56
TOTAL	**979**	**859**	**625**	**581**

^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 2010 to the current week (inclusive)
**Average daily estimated gas consumption measured from 1 July 2009 to the equivalent week in 2009-10 (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	4	S	S	S				S
AGL Wholesale Gas Limited	Shipper	2	S	S					
Ausgrid	STTM User,Shipper	2	S	S					
Australian Power & Gas Pty Ltd	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	2	S						S
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	S		
OneSteel Coil Coaters Pty Ltd	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								
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		S			
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	S		
Adelaide Brighton Cement Ltd	STTM User,Shipper	1	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

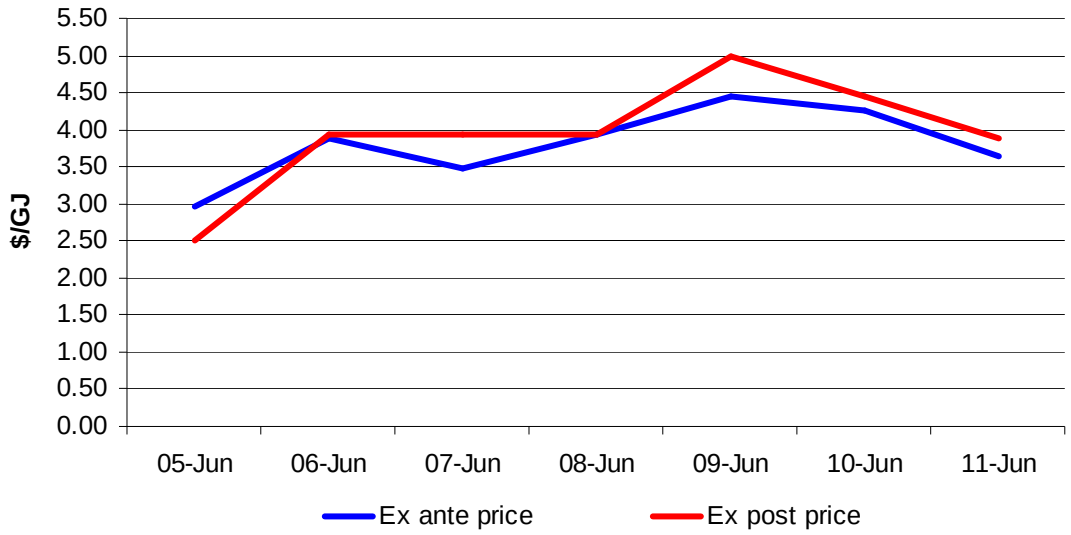
Ex ante and Ex post Market Prices

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)^

	5 June – 11 June	29 May – 4 June	2010-11 Financial YTD*
Ex ante price	3.80	3.70	2.81
Ex post price	3.95	3.79	5.38

***Financial Year to date figures exclude market trial data (year-to-date from 1 September 2010)
Source: http://www.aemo.com.au INT 651, 657

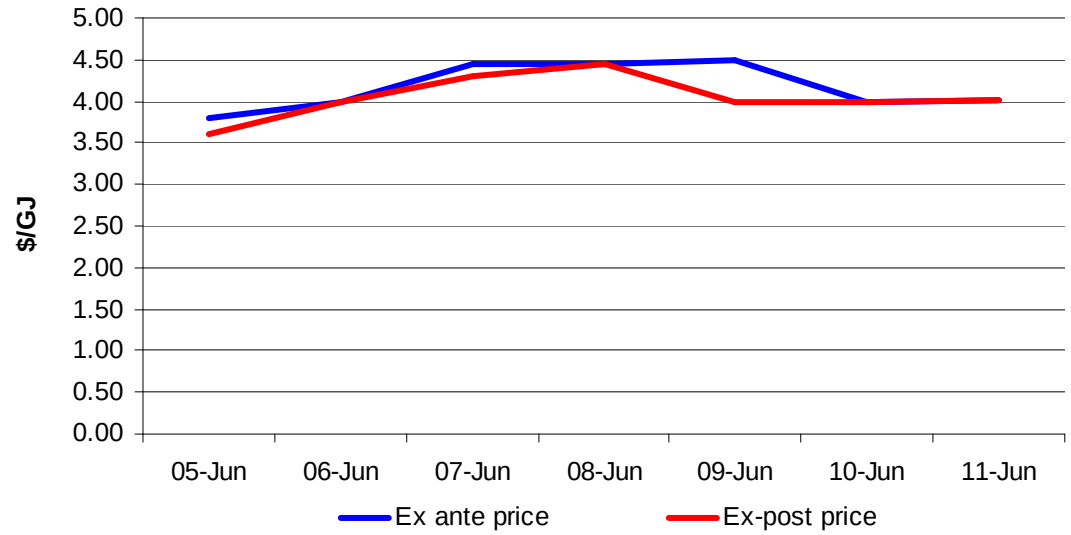


Source: http://www.aemo.com.au INT 651, 657

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

	5 June – 11 June	29 May – 4 June	2010-11 Financial YTD*
Ex ante price	4.17	3.89	3.13
Ex post price	4.05	3.76	3.25

* Financial Year to date figures exclude market trial data (year-to-date from 1 September 2010)



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.

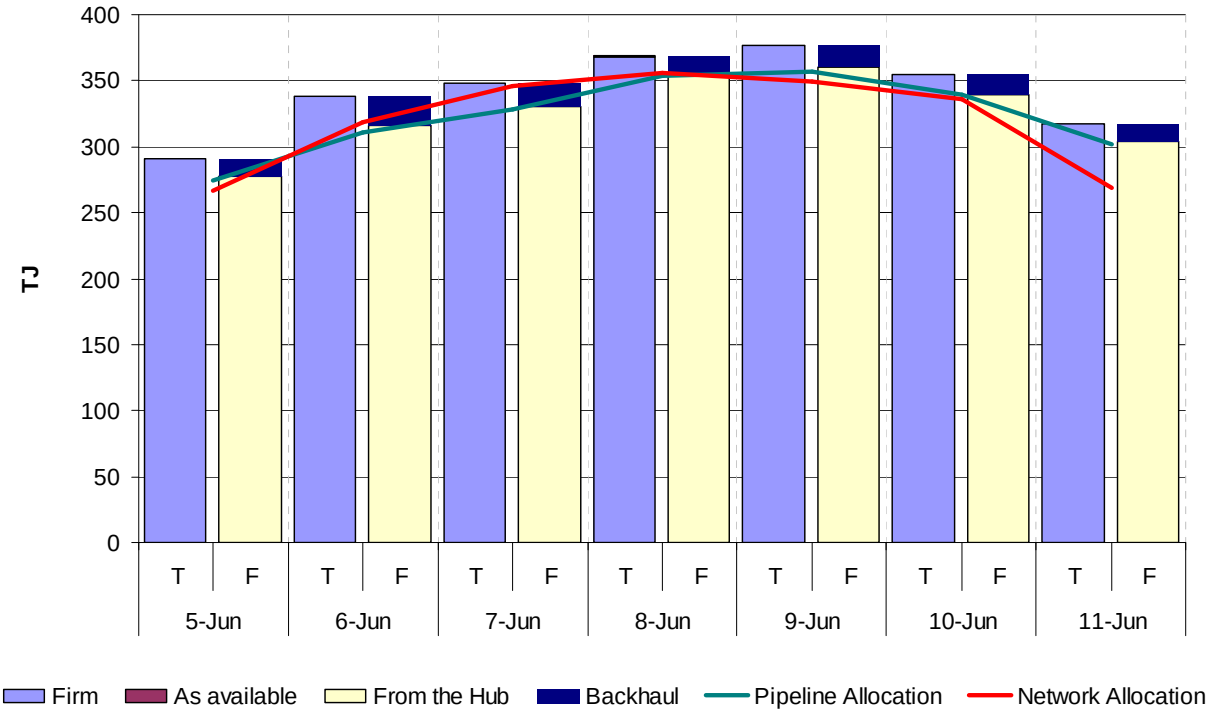
Gas can also be scheduled from the STTM hubs. This happens when Shippers "backhaul" gas from the hub or Users bid to take gas from the hub (including price taker bids).

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.

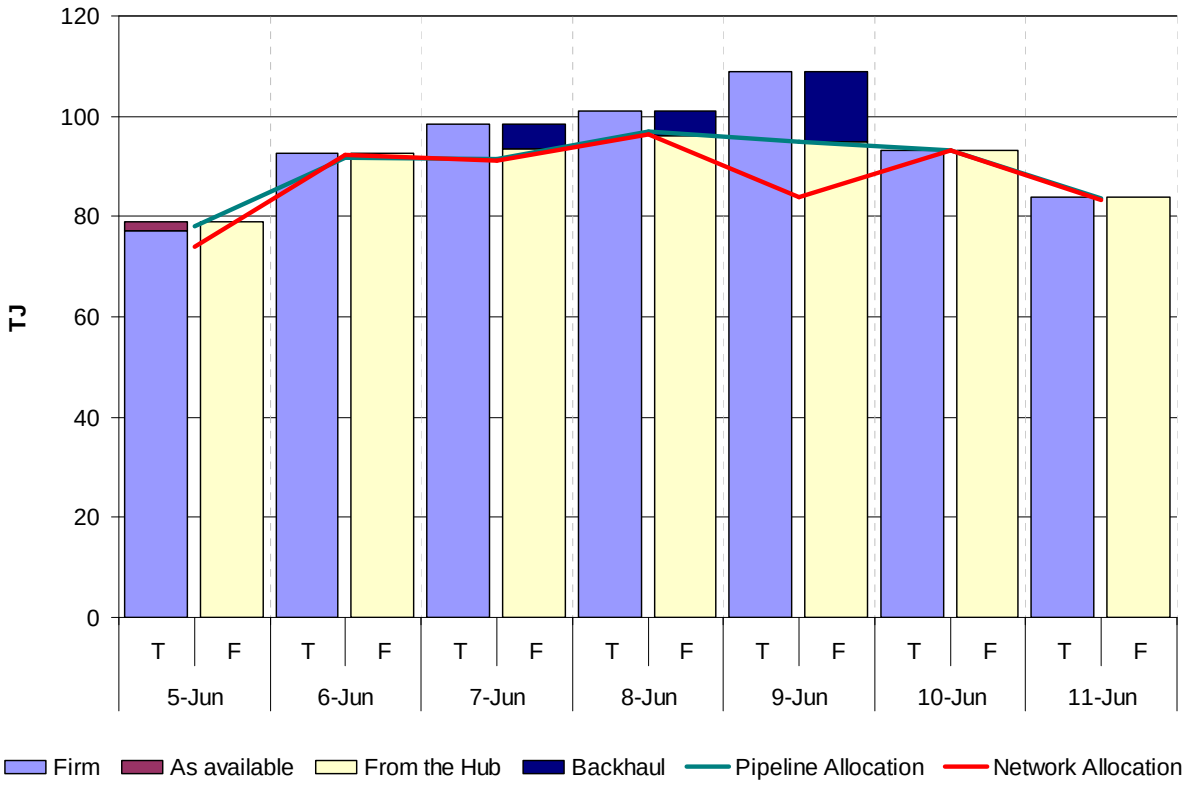
By comparing the level of the red line to the columns marked "F", it can be shown whether demand (allocation) was higher than scheduled. Similarly, comparing the green line to the columns marked "T" shows how the actual flow of gas (allocation) compared to what was scheduled.

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)

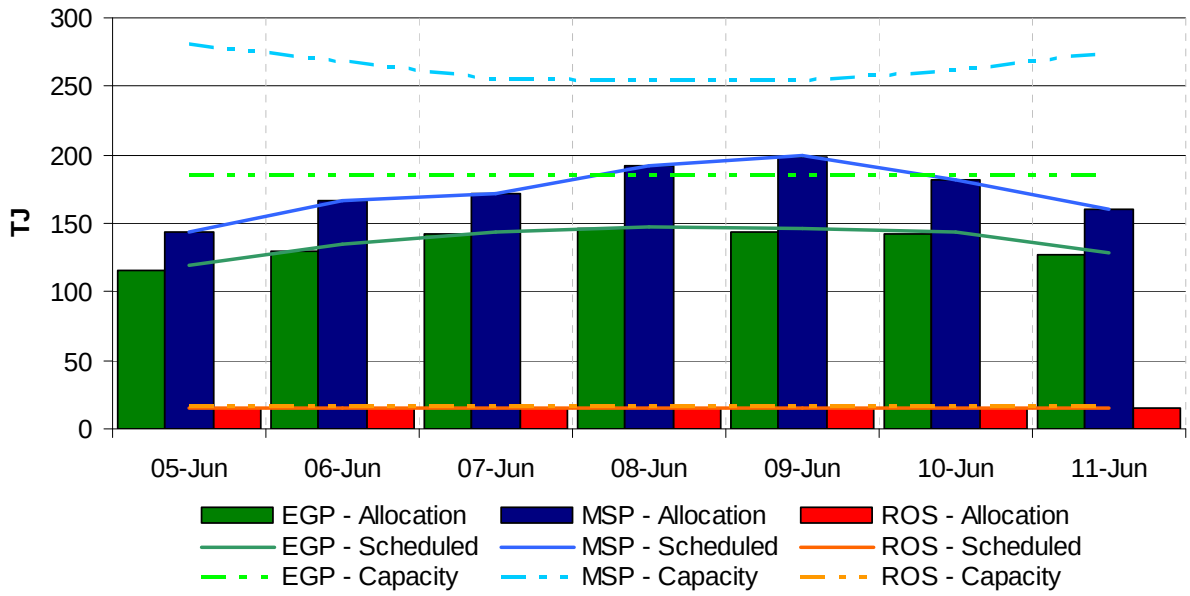
Pipeline Facility Allocations

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.

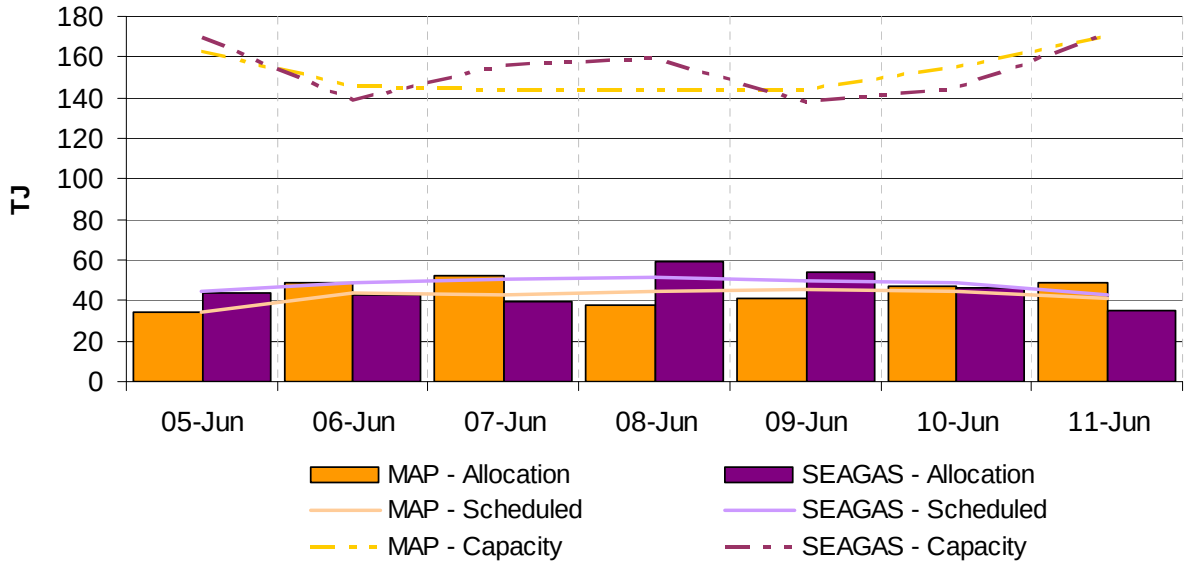
Differences between the amount of gas scheduled and what was actually allocated can result in variations between the ex ante and ex post price, as the ex post price is related to the offers actually allocated while ex ante is related to the offers scheduled.

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

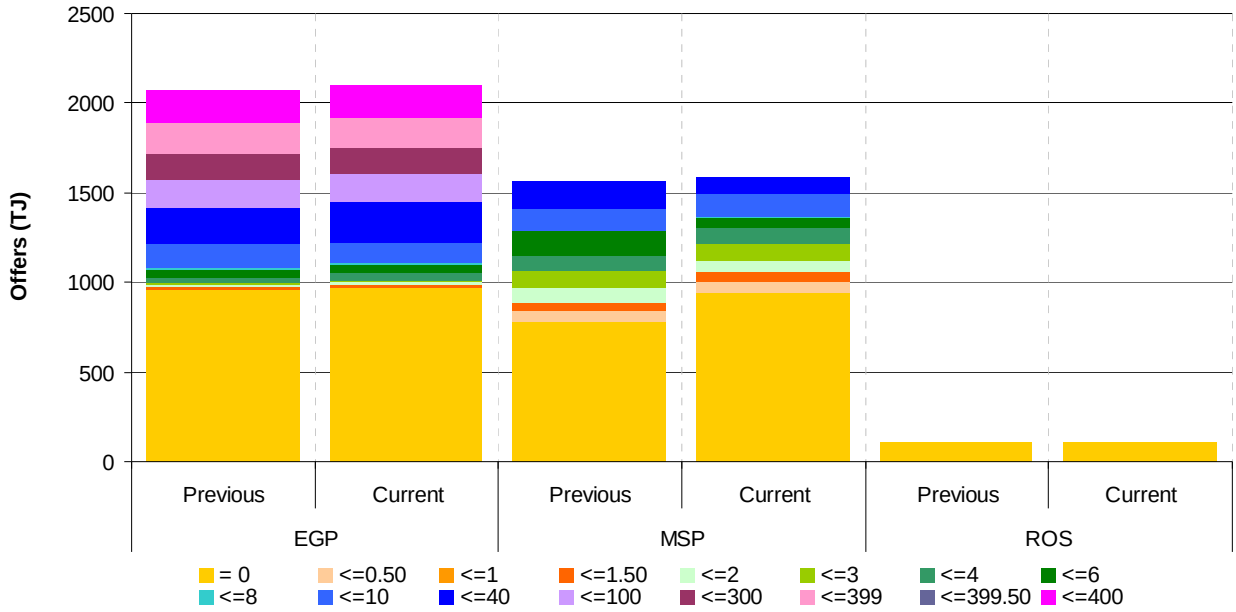
Trading Participants submit offers to sell gas into an STTM hub and withdrawal bids to take gas from a hub. Figures S9 and S11 show for the Sydney and Adelaide hubs respectively, total offers within various price bands for the current week compared to the previous week for each of the pipeline facilities.

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-

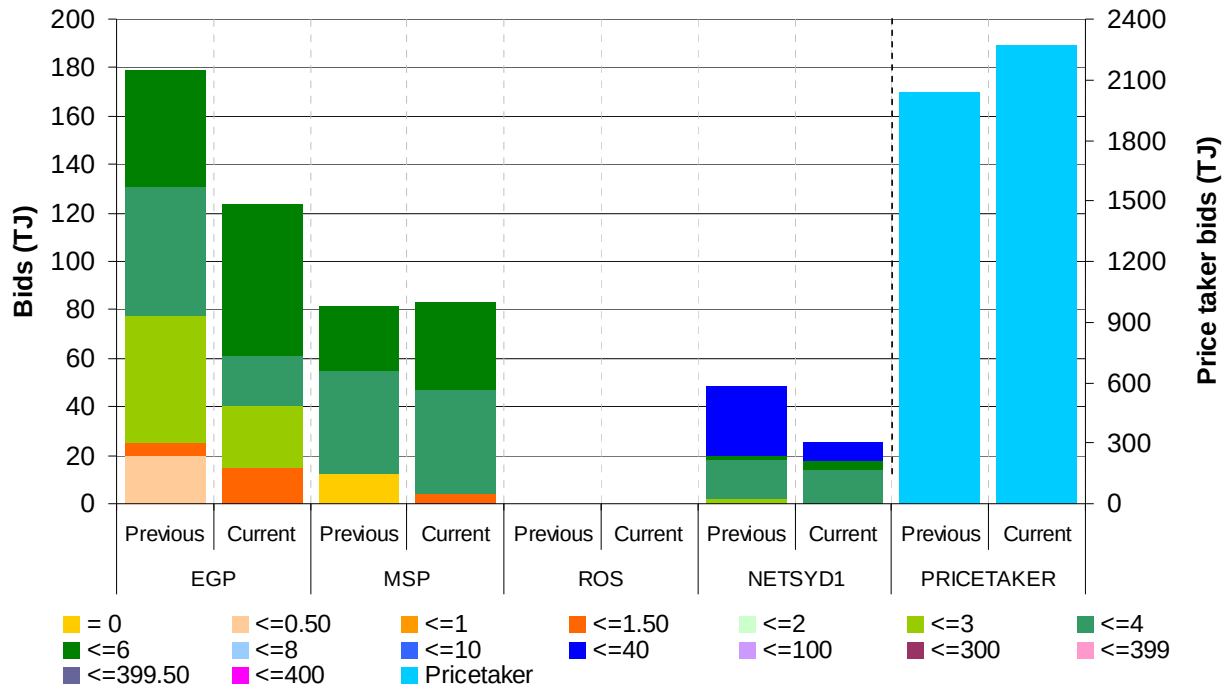
side axis. Because scheduling is price-driven, offers for lower-priced gas are scheduled ahead of offers for higher-priced gas and bids for higher-priced gas are scheduled ahead of bids for lower-priced gas.

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



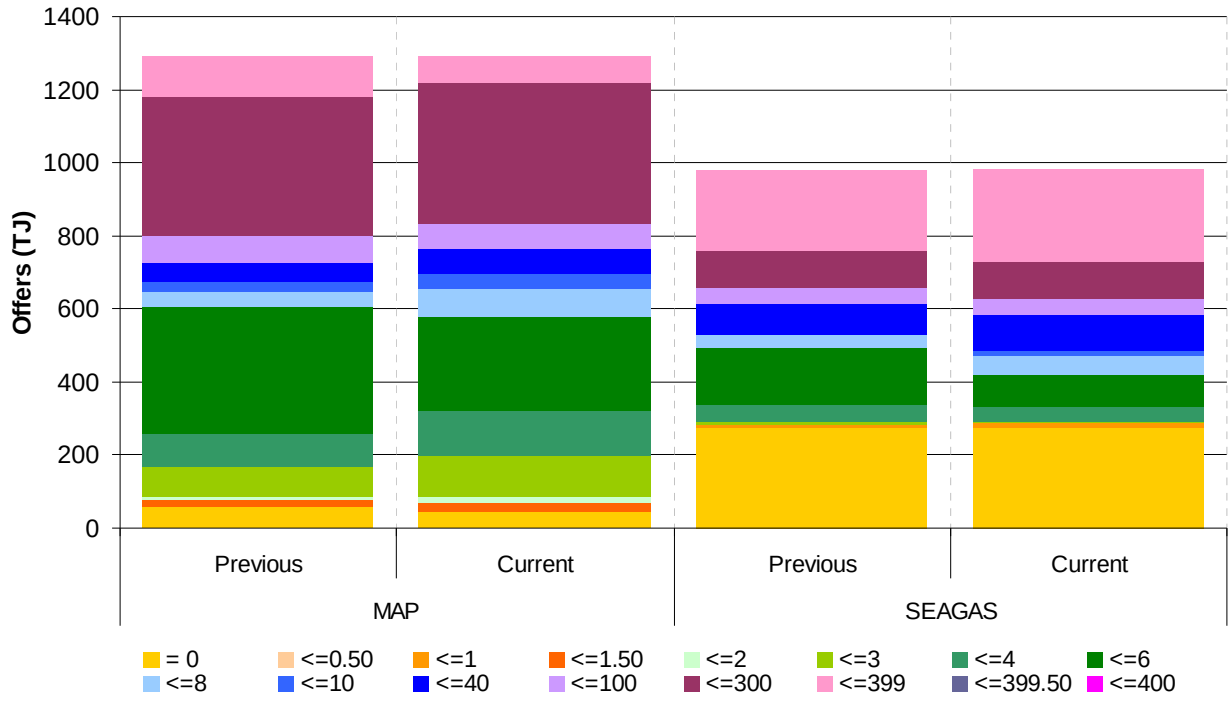
Source: http://www.aemo.com.au INT 652, 659
EGP=Eastern Gas Pipeline, MSP=Moomba to Sydney Pipeline, ROS=Rosalind Park Production facility

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



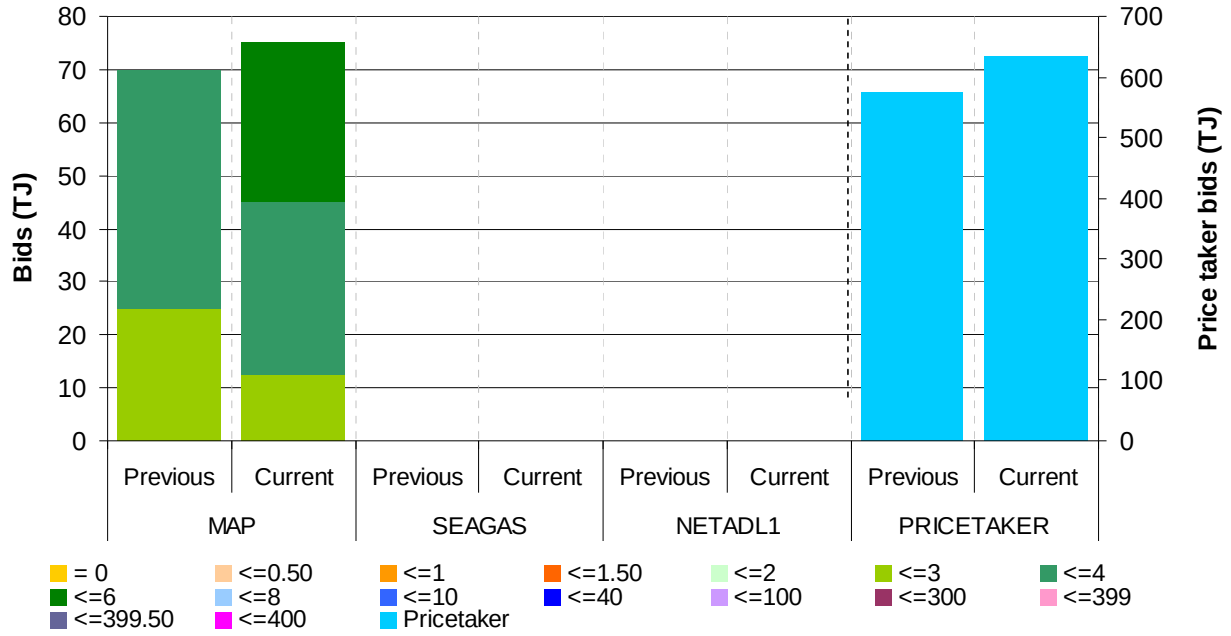
Source: http://www.aemo.com.au INT 652, 659
EGP=Eastern Gas Pipeline, MSP=Moomba to Sydney Pipeline, ROS=Rosalind Park Production facility, NETSYD1=Sydney Hub

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 EA SANTOS TRU	EA TRU	EA TRU	APG EA SANTOS TRU	EA TRU	EA OneStl(NSW) TRU	EA OneStl(NSW) SANTOS TRU
	D-2 to D-1	EA SANTOS	EA SANTOS TRU	BluSc EA SANTOS	BluSc Delta EA SANTOS	BluSc Delta EA OneStl(NSW) SANTOS TRU	BluSc Delta EA OneStl(NSW) SANTOS TRU	BluSc EA SANTOS TRU
MSP	D-3 to D-2	AGL(ESM) Origin TRU	AGL(ESM) EA Origin TRU	AGL(ESM) AGL(WG) EA Origin TRU	AGL(ESM) Origin TRU	AGL(ESM) EA Origin TRU	AGL(ESM) EA Origin TRU	AGL(ESM) EA Origin TRU
	D-2 to D-1	AGL(ESM) EA Origin TRU	AGL(ESM) AGL(WG) EA Origin TRU	AGL(ESM) Origin TRU	AGL(ESM) EA Origin TRU	AGL(ESM) EA Origin TRU	AGL(ESM) Origin TRU	AGL(ESM) EA Origin TRU
ROS	D-3 to D-2				AGL(ESM)		AGL(ESM)	
	D-2 to D-1			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= Australiian 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	Lumo		Lumo	Lumo		
	D-2 to D-1	Lumo TRU	TRU	Lumo TRU	Lumo TRU	Lumo TRU	TRU	TRU
MSP	D-3 to D-2	Lumo	Country Lumo		Lumo	Country Lumo	Country	Country
	D-2 to D-1	Lumo		Country Lumo	Country Lumo	Country Lumo	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 TRU	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
	D-2 to D-1	AGL(SA) Origin	AGL(SA) Origin	AGL(SA) Origin Simply	AGL(SA) Origin	AGL(SA) Origin TRU	AGL(SA) Origin	AGL(SA) Origin
SEA-GAS	D-3 to D-2	Origin Simply TRU	TRU	Simply TRU	Origin Simply TRU	Origin TRU	Origin Simply TRU	TRU
	D-2 to D-1	Simply TRU	Simply TRU	Origin Simply TRU	Origin TRU	Origin Simply TRU	TRU	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		Simply	Simply	AGL(WGSA) Simply	Simply	Simply
	D-2 to D-1		Simply	Simply		Simply	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

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[2] 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

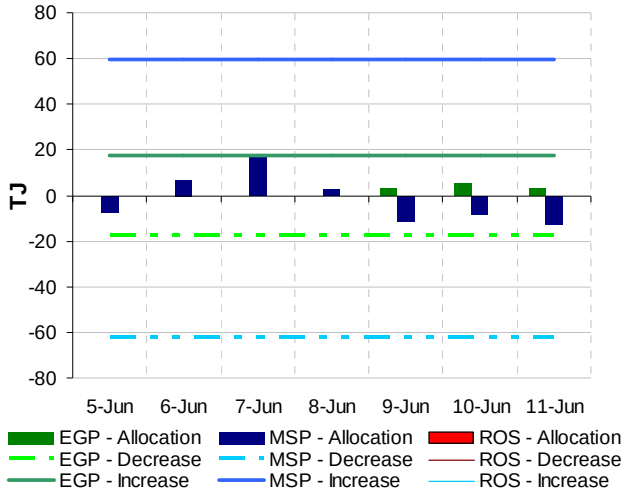
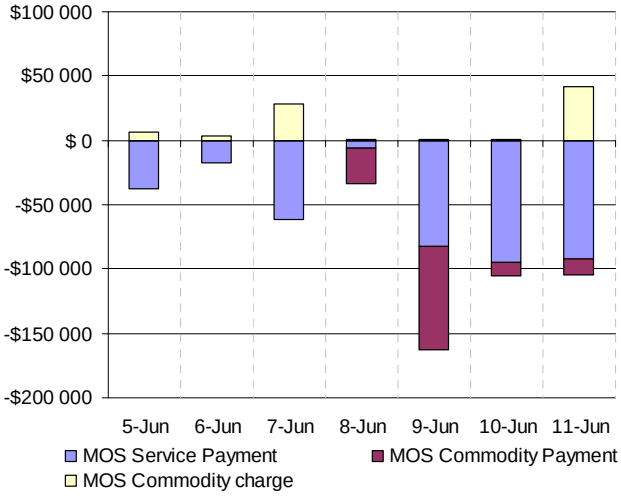


Figure S17b: Sydney MOS payments/charges



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

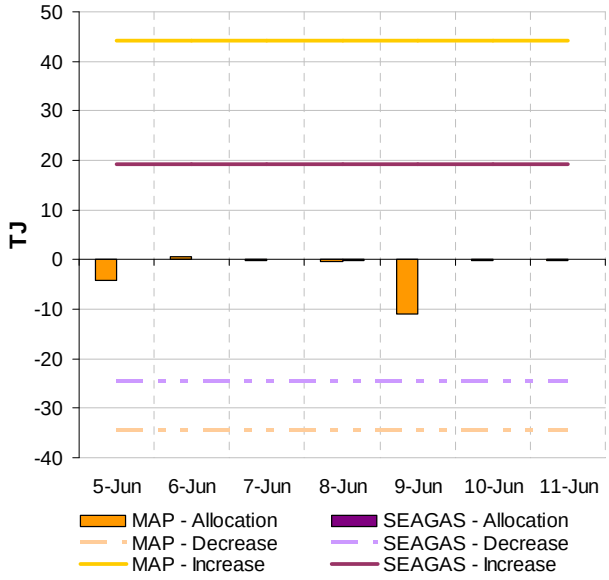
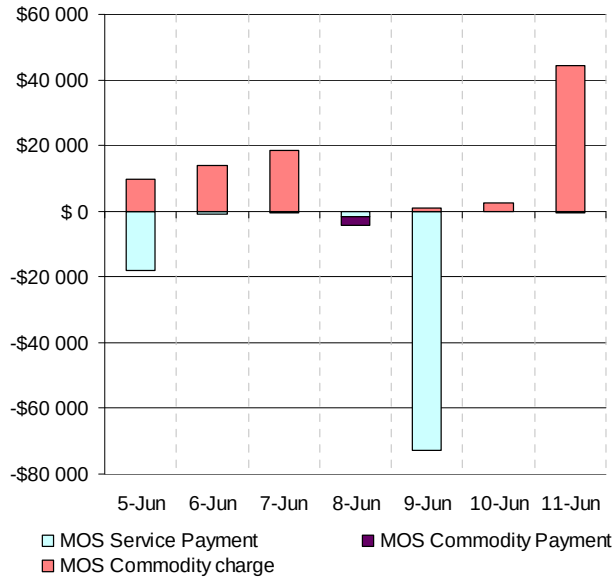


Figure S18b: Adelaide MOS payments/charges

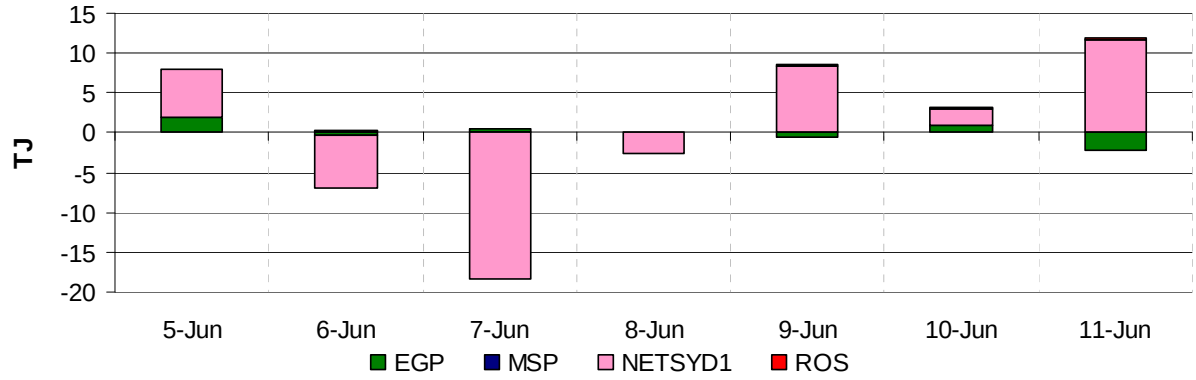


Source: http://www.aemo.com.au INT 663, 664, 665
MAP=Moomba to Adelaide Pipeline, SEAGAS=SEA gas pipeline

Deviations

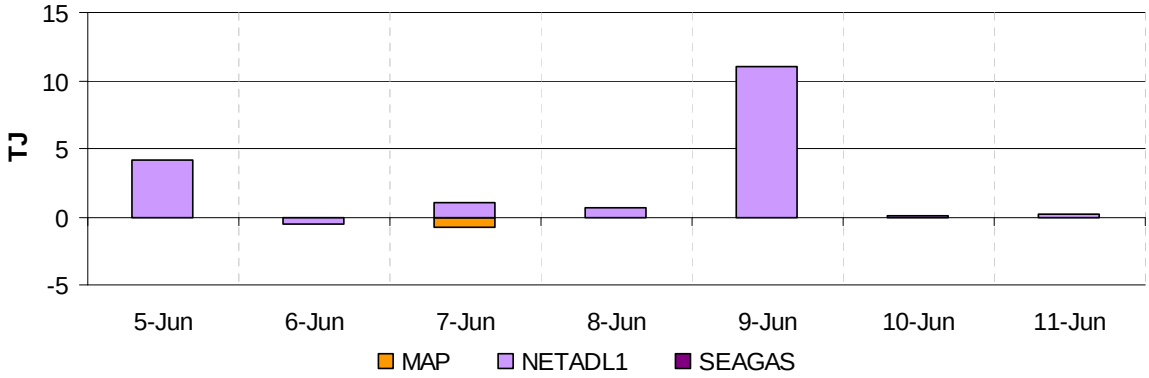
Deviations occur when the gas flowed on pipelines into hubs on a gas day differ from the modified market schedule, or when gas taken out of the hub is different to the schedule. The most likely reason for deviations is where participants incorrectly forecast the demand of customers within the hub. As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

	5 June – 11 June	29 May – 4 June	2010-11 Financial YTD*
Quantity (TJ)	6.93	4.27	4.25
Charges ($)	322.70	120.41	580.77

*** Financial** Year to date figures exclude market trial data (year-to-date from 1 September 2010)
Source: http://www.aemo.com.au INT663

Figure S22: Average Daily Market Variations - Adelaide Hub

	5 June – 11 June	29 May – 4 June	2010-11 Financial YTD*
Quantity (TJ)	0.57	4.35	1.06
Charges ($)	7.01	295.37	47.76

*** Financial** Year to date figures exclude market trial data (year-to-date from 1 September 2010)
Source: http://www.aemo.com.au INT663

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	98	101	104	103	102	104	99	119	79	102	94	86
QLD Gas Pipeline	117	120	118	119	118	120	120	142	76	119	109	71
Roma to Brisbane Pipeline	173	189	192	190	198	180	169	219	76	184	166	167
South West QLD Pipeline	178	197	194	181	182	158	169	181	82	180	149	138
NSW/ACT												
Eastern Gas Pipeline	200	238	248	257	251	254	222	268	79	238	213	203
Moomba to Sydney Pipeline	220	280	318	330	315	281	226	439	43	281	189	188
NSW-VIC Interconnect	31	30	23	7	14	25	24	90	19	22	17	-5
VIC												
Longford to Melbourne	650	793	785	771	729	681	565	1030	48	710	498	425
South West Pipeline^	165	232	341	375	200	214	226	353	30	251	105	126
SA												
Moomba to Adelaide Pipeline	120	154	169	157	158	133	137	253	50	147	127	131
SEA Gas Pipeline	148	215	169	209	183	174	111	314	50	173	158	154
TAS												
Tasmanian Gas Pipeline	47	50	51	53	51	46	42	129	35	49	45	38

*Average daily estimated gas consumption measured from 1 July 2010 to the current week (inclusive)
**Average daily estimated gas consumption measured from 1 July 2009 to the equivalent week in 2009-10 (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	76	93	95	96	94	91	89	140	67	90	93	92
Fairview	128	122	128	118	123	128	128	130	88	125	115	112
Kenya Gas Plant	63	66	65	65	65	55	51	160	33	62	53	56
Kincora	14	15	15	16	17	17	15	25	28	16	7	2
Kogan North	7	7	7	7	7	7	7	12	77	7	9	9
Peat	7	7	8	8	8	8	8	15	60	8	9	9
Rolleston	11	11	11	11	11	11	11	30	34	11	10	11
Scotia	29	29	29	29	29	29	29	29	93	29	27	23
Spring Gully	47	47	49	48	48	48	48	69	70	48	48	43
Strathblane	47	47	49	48	48	48	48	69	70	48	48	43
Taloona	28	29	30	29	29	29	29	42	69	29	29	26
Yellowbank	10	10	10	10	10	10	10	30	38	10	11	12
Talinga	90	101	99	100	100	100	99	108	63	98	68	18
Moomba (SA/QLD)												
Moomba Gas Plant	285	316	340	371	370	355	333	430	60	339	259	267
Ballera	0	0	0	0	0	0	0	150	7	0	11	12
Eastern (VIC)												
Orbost Gas Plant	85	85	86	86	86	86	86	100	37	85	37	18
Lang Lang Gas Plant	55	55	27	0	0	12	29	70	68	25	47	33
Longford Gas Plant	760	936	959	962	971	942	766	1145	60	899	684	624
LNG Storage Dandenong	0	0	0	22	0	0	0	158	0	3	0	0
Otway Basin (VIC)												
Minerva Gas Plant	71	81	81	81	81	81	67	84	75	77	63	71
Otway Gas Plant	185	192	183	190	190	191	190	205	60	189	123	126
Iona Underground Gas Storage	97	160	244	276	137	158	114	440	20	170	89	88

*Average daily estimated gas consumption measured from 1 July 2010 to the current week (inclusive)
**Average daily estimated gas consumption measured from 1 July 2009 to the equivalent week in 2009-10 (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)
5 June – 11 June	Average min.	11.1	8.8	0.4	7.4	8.3	6.5
	Average max.	19.2	16.0	11.5	14.5	14.9	12.3
29 May – 4 June	Average min.	12.4	12.4	3.8	8.1	8.0	4.4
	Average max.	22.5	19.2	16.0	16.9	17.4	14.7

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

5 June – 11 June	Scheduling Interval					Daily Imbalance Weighted Average Price
	6am	10am	2pm	6pm	10pm	
Sun	3.12	3.52	3.79	3.53	3.90	3.15
Mon	4.22	4.40	4.05	3.78	3.53	4.21
Tue	3.46	3.50	4.04	3.50	4.04	3.47
Wed	7.99	3.50	7.99	3.29	3.29	7.72
Thu	3.80	3.50	3.50	3.29	3.50	3.78
Fri	4.15	3.51	3.50	3.17	3.30	4.10
Sat	3.80	3.29	2.54	3.60	3.98	3.74

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	
5-Jun	**MP:**	785	806	821	827	828	**–16**
	AEMO:	745	777	785	809	814	
	MP as % of AEMO	105	104	105	102	102	
6-Jun	**MP:**	1008	1014	1014	1013	1012	**–2**
	AEMO:	1015	989	986	992	968	
	MP as % of AEMO	99	103	103	102	105	
7-Jun	**MP:**	1088	1105	1129	1122	1132	**–15**
	AEMO:	1049	1070	1125	1100	1134	
	MP as % of AEMO	104	103	100	102	100	
8-Jun	**MP:**	1200	1188	1172	1173	1167	**3**
	AEMO:	1201	1184	1158	1145	1120	
	MP as % of AEMO	100	100	101	102	104	
9-Jun	**MP:**	1041	996	974	977	977	**0**
	AEMO:	1078	984	960	945	944	
	MP as % of AEMO	97	101	101	103	103	
10-Jun	**MP:**	952	925	919	914	914	**0**
	AEMO:	883	890	890	858	867	
	MP as % of AEMO	108	104	103	107	105	
11-Jun	**MP:**	871	839	807	817	818	**–18**
	AEMO:	798	784	739	742	737	
	MP as % of AEMO	109	107	109	110	111	

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