WEEKLY GAS MARKET ANALYSIS

AUSTRALIAN ENERGY REGULATOR

6 February – 12 February 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 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. The larger number of retailers participating in the Victorian gas market reflects the increased number of retailers in Victoria. 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

6 Feb – 12 Feb	Victorian market*	STTM Sydney hub**	STTM Adelaide hub**
Average Price	2.29	2.73	3.23

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

STTM Gas Markets (Adelaide and Sydney)

Figures S3 and S4 show average prices at both trading hubs were lower than the previous week. In Sydney, ex ante and ex post prices were almost equivalent; indicating that participants closely followed what was scheduled by the market operator.

The lower prices in both hubs this week were consistent with lower gas demand than the previous week when high temperatures drove high demand for gas for gas powered electricity generation (GPG) in both regions (see figure N4). Consistent with this, figures S1 and S2 show that fewer participants were scheduled to provide gas in the STTM this week.

Figure S17a shows that although market operator service (MOS) allocations in Sydney were relatively low this week, there was approximately $46 000 of MOS commodity charges to shippers on the Monday 7 February gas day (see figure S17b). This was a result of the decrease MOS allocations of around 13 TJ for the 5 February gas day (see previous week's report) which were charged at the day+2 ex ante price ($3.59/GJ on 7 February).

Moomba to Adelaide Pipeline – late allocation data for 27 January and 30 January gas days

AEMO was required to use default pipeline allocation data for the Moomba to Adelaide Pipeline (MAP) for the 27 January and 30 January gas days. On both occasions this was due to Epic Energy not providing the allocation data and MOS step allocation data for the MAP by the 11am Day+1 deadline. AEMO uses the *scheduled* flow volumes as default allocation data.

However, the *actual* flows on the MAP were approximately 10 TJ and 2.4 TJ lower than scheduled flows for the 27 January and 30 January gas days respectively. This meant the ex post prices for those gas days were marginally higher than what they would have been, if the correct allocation data had been used. As a result, deviation charges for participants, which are charged at the higher of the ex ante and ex post prices, would have also been higher than what they should have been. Further, deviation payments to participants, which are paid at the lower of the two prices, may have been higher.

For the 27 January gas day, the ex post price of $3.09/GJ was identical to the ex ante price. Therefore all deviations, positive or negative would have been paid or charged at this price. However, on the 30 January gas day, negative deviations were charged at $3.18/GJ (ex post price) and positive deviations paid at the ex ante price of $3.12/GJ.

The AER monitors and reviews the submission of data by pipeline operators and shippers, and is engaging with STTM participants as a matter of focus during 2011 to ensure that data requirements under the National Gas Rules are complied with.

Victorian Gas Market

Average daily prices this week were lower at $2.29/GJ compared to $3.25/GJ the previous week (see figure V2). This was consistent with lower injections into the Victorian Declared Transmission System (DTS) compared to the previous week (see figure V3). At 414 TJ average daily withdrawals were also lower than the previous week (563 TJ). As was the case for the Sydney and Adelaide hubs, demand for gas for power generation in Victoria was lower this week than the previous week (see figure N4) due to milder temperatures (see figure A3).

Figure V1 shows that fewer participants had injection bids scheduled on the DTS compared to the previous week. Further to this, with all LNG offers at or above $4.00/GJ (i.e. higher than other bids), no LNG was scheduled this week, (see figure V4). AEMO continued to apply supply demand point constraints (SDPC) for withdrawals at SEAGas which were issued on each day this week. SDPCs were also applied to injections at Longford on 6 February and

7 February and BassGas on 8 February. AEMO did not issue any demand overrides this week (see figure A5).

National Gas Market Bulletin Board

Figure A2 shows that Esso Australia Resources Pty Ltd failed to provide production data for its Longford Gas Plant within the required timeframe for the 10 February 2011 gas day. There were no other instances of missing or late data on the Bulletin Board this week.

In line with mild temperatures, figure N4 shows total average daily gas demand, gas production and gas-powered generation usage across the Bulletin Board were substantially lower than the previous week.

In Victoria, the Otway gas plant (part of the Otway Production Facilities) did not produce any gas this week, while the Lang Lang gas plant did not provide any gas from Tuesday to Saturday. In Queensland, the Ballera gas plant only produced 0.6 TJ (on Saturday 12 February), while the Kincora and Wallumbilla production plants in the Roma region continued to produce around 15 TJ/day and 3 TJ/day respectively (see figure A2).

As a result of the lower gas demand and lower production this week, pipeline flows were also lower across the Bulletin Board, with the exception of the Carpentaria Gas Pipeline which flows to Mt Isa. Daily net flows on the NSW-Victoria were positive for each day this week; with gas flowing north from Victoria to New South Wales at an average of 16 TJ/day. Due to the substantially lower demand in South Australia compared to the previous week, flows on the Moomba to Adelaide and SEAGas pipelines were 54 TJ/day (26 per cent) and 84 TJ/day (42 per cent) respectively lower than the previous week.

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
6 Feb – 12 Feb	338	6	397	266	42	156	95	103
Financial Year-to-date 2010-11*	385	23	614	290	45	171	94	109
Financial Year-to-date 2009-10**	372	21	582	285	38	167	85	70

*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
6 Feb – 12 Feb	93	30	159	31	134
Financial Year-to-date 2010-11*	90	26	170	30	155
Financial Year-to-date 2009-10**	75	47	169	21	146

^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.

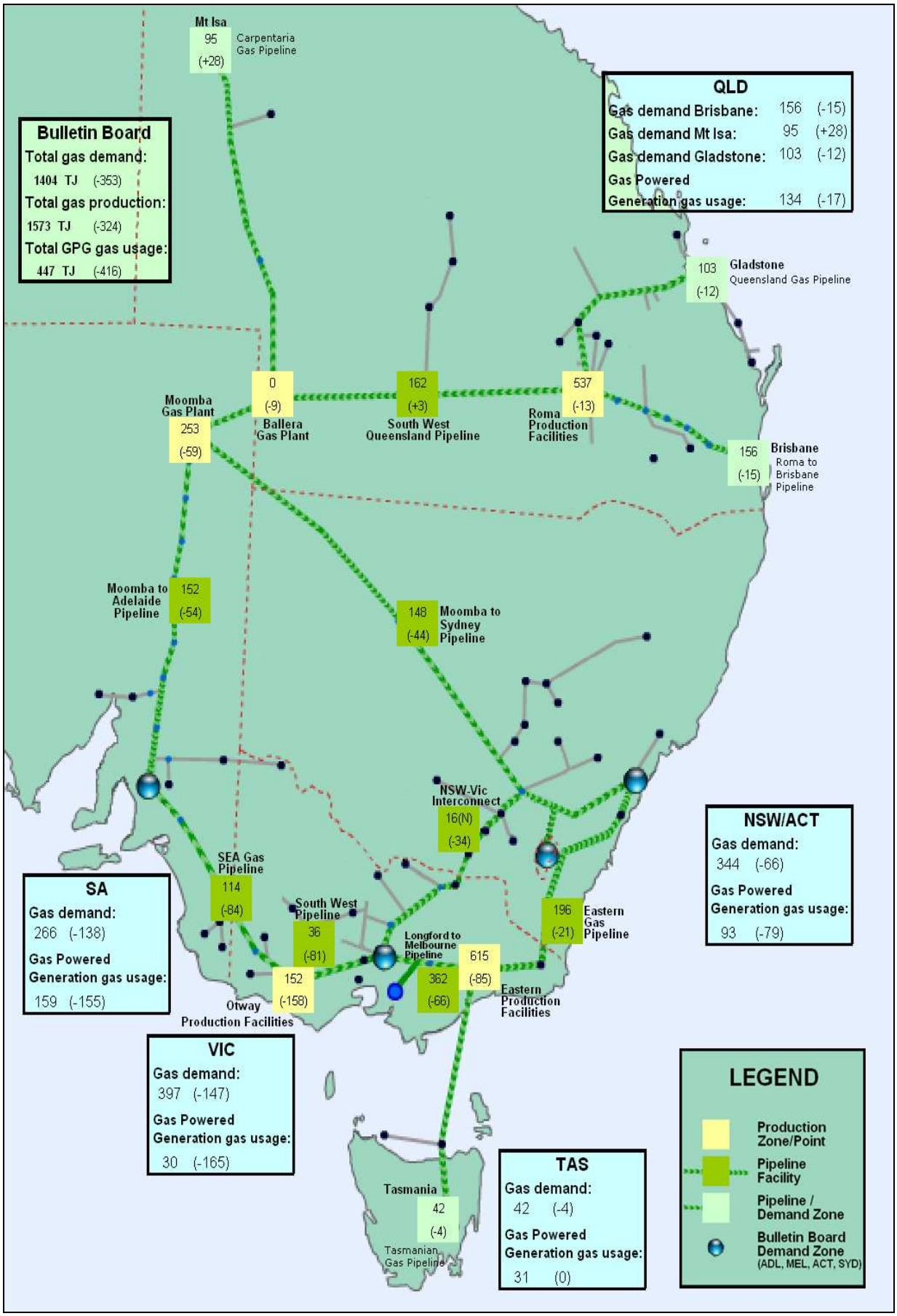
Figure N3: Daily average production flows (TJ) for each production zone

Average daily flows	Roma (QLD)	Eastern Victoria	Otway Basin (VIC)	Moomba (SA/QLD)
6 Feb – 12 Feb	537	615	152	253
Financial Year-to-date 2010-11*	536	781	271	288
Financial Year-to-date 2009-10**	446	687	288	284

*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 shows the changes in average daily pipeline and production flows compared to the previous week, as well as the gas demand and GPG usage of gas in each region.

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

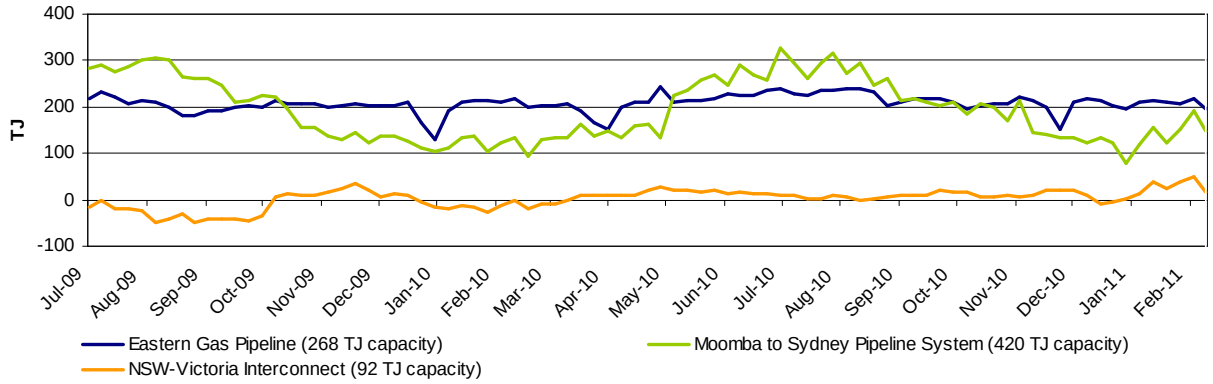


Source: Natural Gas Market Bulletin Board http://www.gasbb.com.au
Notes: Direction of aggregate daily flows along the NSW-Vic Interconnect indicated on map by S (South) or N (North).
Numbers in brackets indicate a change in average daily flow from the previous week.

Gas flows into demand regions

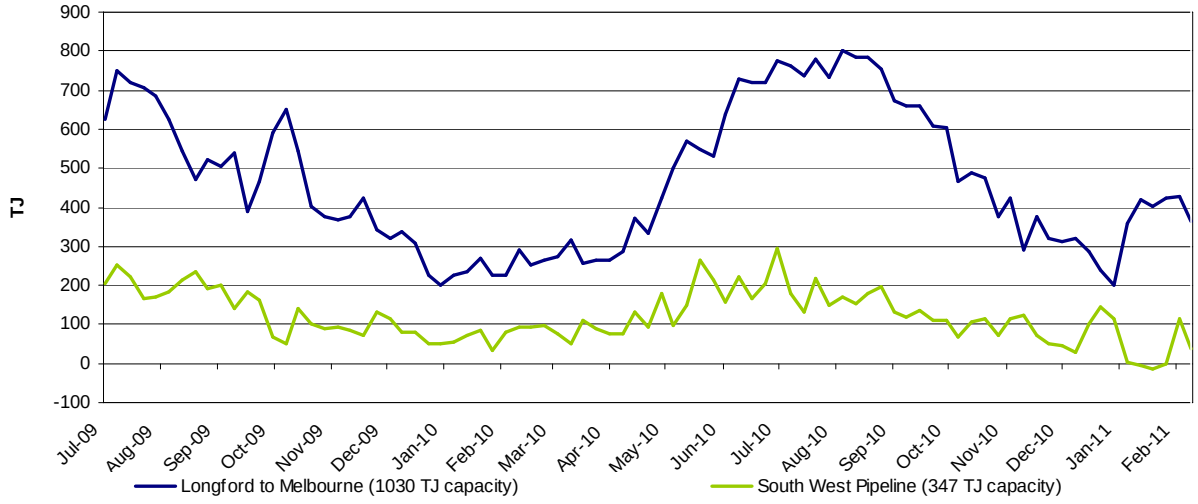
The figures below provide the average daily flows into each of the demand regions served by multiple pipelines and supply sources.

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



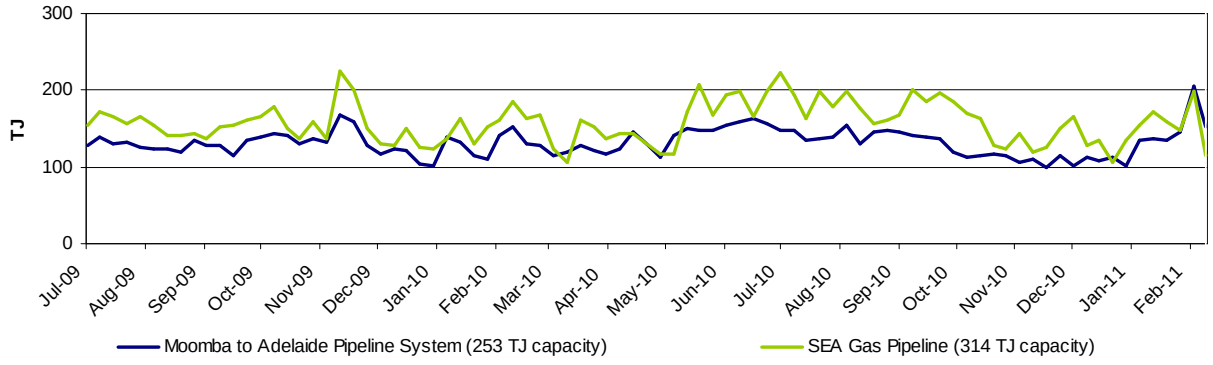
Source: Natural Gas Market Bulletin Board http://www.gasbb.com.au
Notes: Negative flows on the NSW-Victoria Interconnect represent flows out of NSW into VIC.

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	Culcairn	IONA	SEA Gas	VicHub
AETV Power	Trader	1							NS					S
AGL (Qld)	Retailer	1				NS								
AGL	Retailer	4			S	NS	S		NS			S		
Aurora Energy	Retailer	1					S							
Aust. Power & Gas	Retailer	3			NS	NS	S					S		
Coogee Energy	Transmission Customer	1					S							
Country Energy	Transmission Customer	1		S										
Energy Australia	Retailer	2					S		NS					NS
International Power	Transmission Customer	1											S	
Lumo Energy	Retailer	3		NS		NS			S		NS			
Lumo Energy	Trader	2			NS				NS			S		S
Origin (Vic)	Retailer	5	S	NS	S	NS	S				S	S		
Origin (Uranquinty)	Trader	1					S							
Red Energy	Retailer	1					S							
Santos	Retailer	1							S					
Simply Energy	Retailer	4			NS	NS	S	NS				S		
TRU Energy	Retailer	4			S	NS	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)

	6 Feb – 12 Feb	30 Jan – 5 Feb	2010-11 Financial YTD*	2009-10 Financial YTD**
Average daily price	2.29	3.25	1.97	*1.62*

6 Feb – 12 Feb	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Daily price	2.07	2.77	2.06	2.47	2.47	2.10	2.10

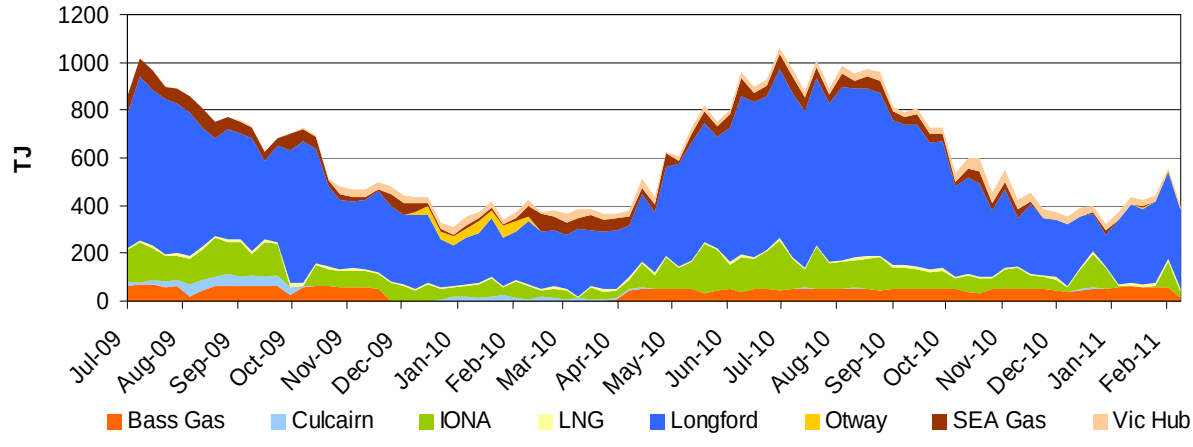
*Average daily imbalance weighted average price from 1 July 2010 to the current week (inclusive)
**Average daily imbalance weighted average price from 1 July 2009 to the equivalent week in 2009-10 (inclusive)
Source: http://www.aemo.com.au (INT 041)

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:	6 Feb – 12 Feb	30 Jan – 5 Feb	2010-11 Financial YTD*	2009-10 Financial YTD**
Culcairn	0	0	1	18
Longford	332	359	436	389
LNG	10	16	9	8
IONA	25	109	76	85
VicHub	19	17	31	15
SEAGas	1	3	27	39
Bass Gas	12	54	48	36
Otway	0	0	0	11
TOTAL	**399**	**559**	**629**	**602**

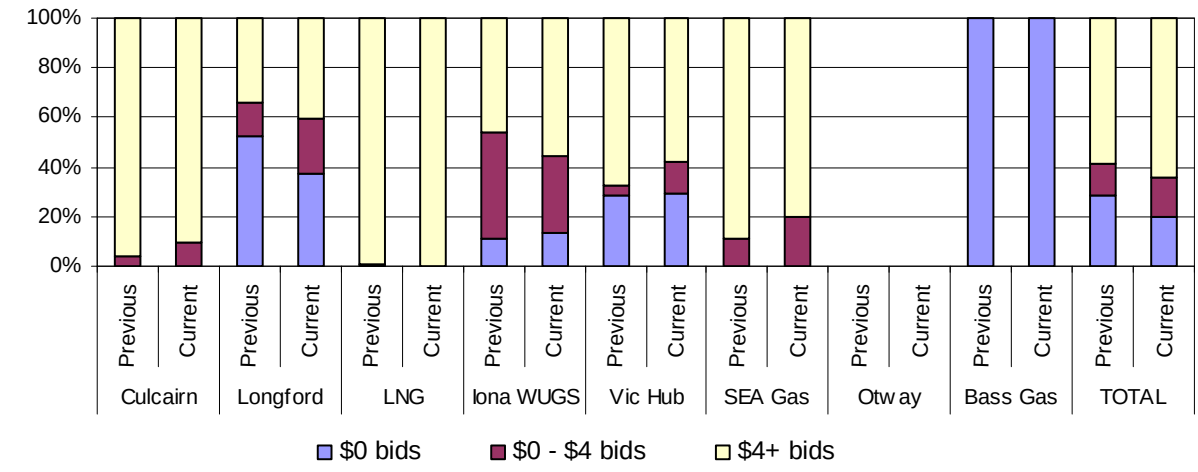


*Average daily estimated gas consumption measured from 1 July 2010 to the current week (inclusive)
**Average daily estimated gas consumption measured from 1 July 2009 to the equivalent week in 2009-10 (inclusive)
Source: http://www.aemo.com.au (INT 150)

Bidding Activity

Figure V4 compares the price structure of gas bid at each of the injection points on the VPTS, 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	CE	CE Lumo	CE	CE	CE	CE	
Longford	AGL Origin TRU	AGL Origin TRU	AGL Origin TRU	AGL TRU	AGL TRU	AGL TRU	TRU
LNG						APG	
Iona	Origin TRU	Origin TRU	AGL Origin TRU	AGL Origin TRU Simply	Origin TRU Simply	Origin TRU	Origin Simply
VicHub	AETV	AETV Lumo	AETV	AETV Lumo	AETV Lumo	AETV TRU Lumo	AETV
SEAGas	Simply			Simply			
Bass Gas							

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 |

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:	6 Feb – 12 Feb	30 Jan – 5 Feb	2010-11 Financial YTD*	2009-10 Financial YTD**
Ballarat	13	9	26	23
Geelong^	74	104	90	82
Gippsland	31	90	46	47
Melbourne	250	281	414	396
Northern	47	79	63	53
TOTAL	**414**	**563**	**639**	**602**

^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	1	NS			S			
AGL Energy Sales & Marketing Limited	STTM User,Shipper	4	S	S	S				S
AGL Wholesale Gas Limited	Shipper	2	S	NS					
BHP Billiton Petroleum (Bass Strait) PL	Shipper								
BlueScope Steel	STTM User,Shipper	1	S						
Country Energy	STTM User,Shipper	2	S				S		
Delta Electricity	STTM User,Shipper	2	S						S
EnergyAustralia	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	1				NS			
OneSteel Manufacturing Pty Ltd	STTM User,Shipper	1	S						
OneSteel NSW Pty Ltd	STTM User,Shipper	1	S						
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		NS			
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	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	NS	S		
TRUenergy Pty Ltd	STTM User,Shipper	2	NS	S		NS	

^ 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

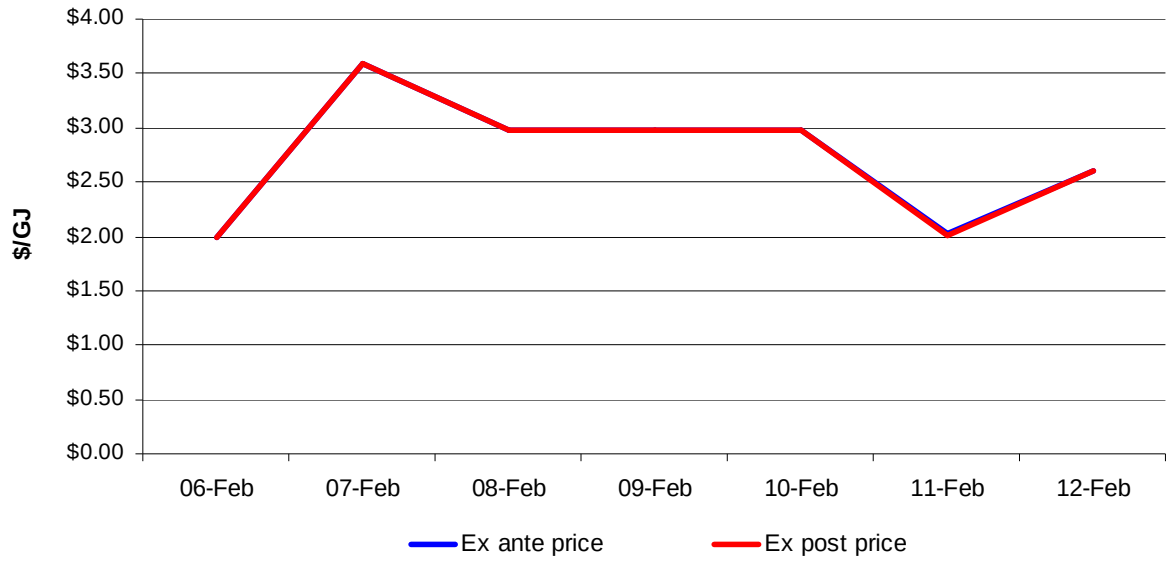
Ex ante and Ex post Market Prices

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)^

	6 Feb – 12 Feb	30 Jan – 5 Feb	2010-11 Financial YTD*
Ex ante price	2.73	2.97	2.53
Ex post price	2.73	2.95	6.84

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

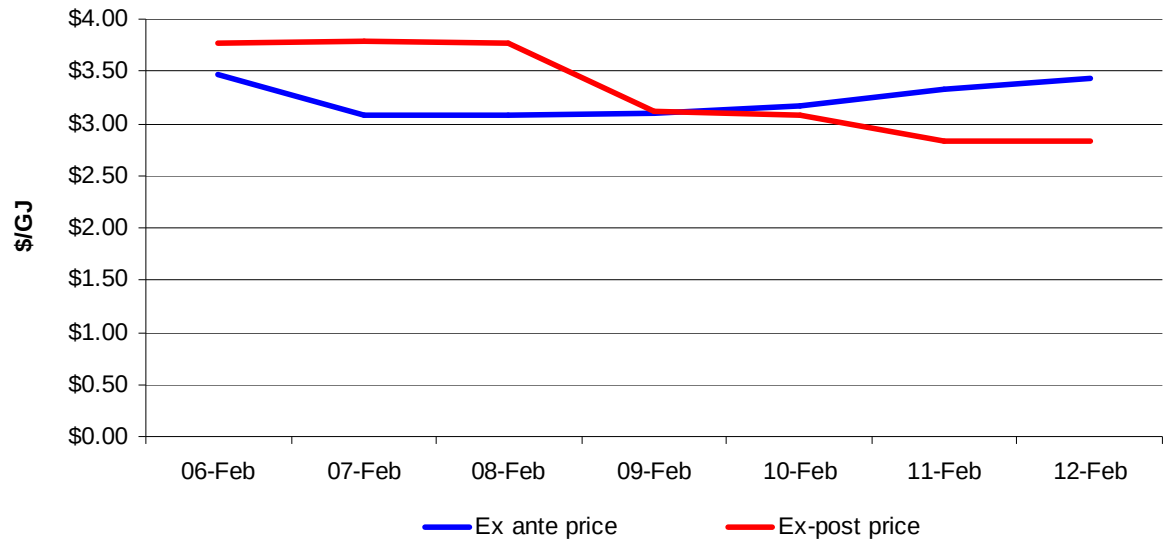


Source: http://www.aemo.com.au INT 651, 657

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

	6 Feb – 12 Feb	30 Jan – 5 Feb	2010-11 Financial YTD*
Ex ante price	3.23	3.77	2.74
Ex post price	3.31	3.82	2.86

* 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.

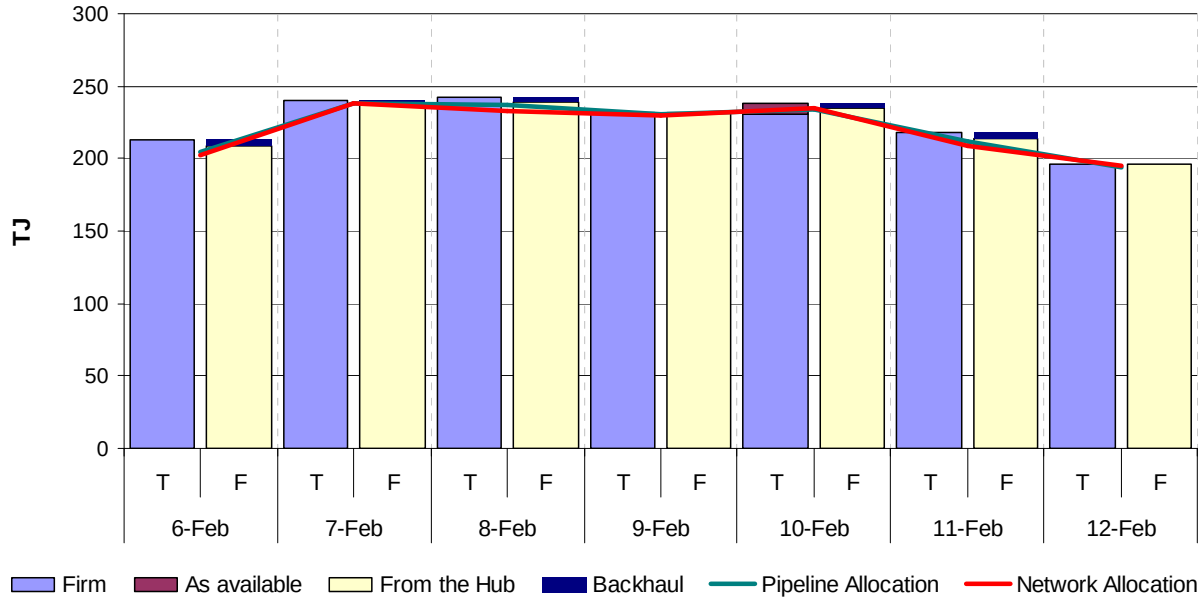
Gas can also be scheduled from the STTM hubs. This happens when Shippers "backhaul" gas from the hub or Users bid to take gas from the hub (including price taker bids).

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.

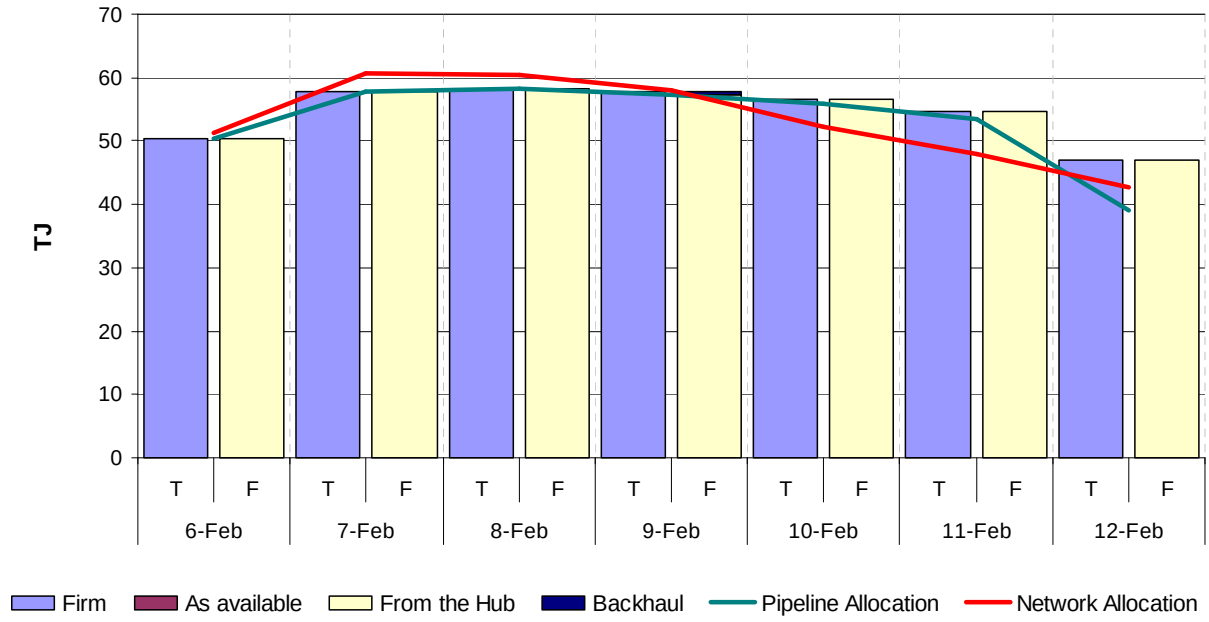
By comparing the level of the red line to the columns marked "F", it can be shown whether demand (allocation) was higher than scheduled. Similarly, comparing the green line to the columns marked "T" shows how the actual flow of gas (allocation) compared to what was scheduled.

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)

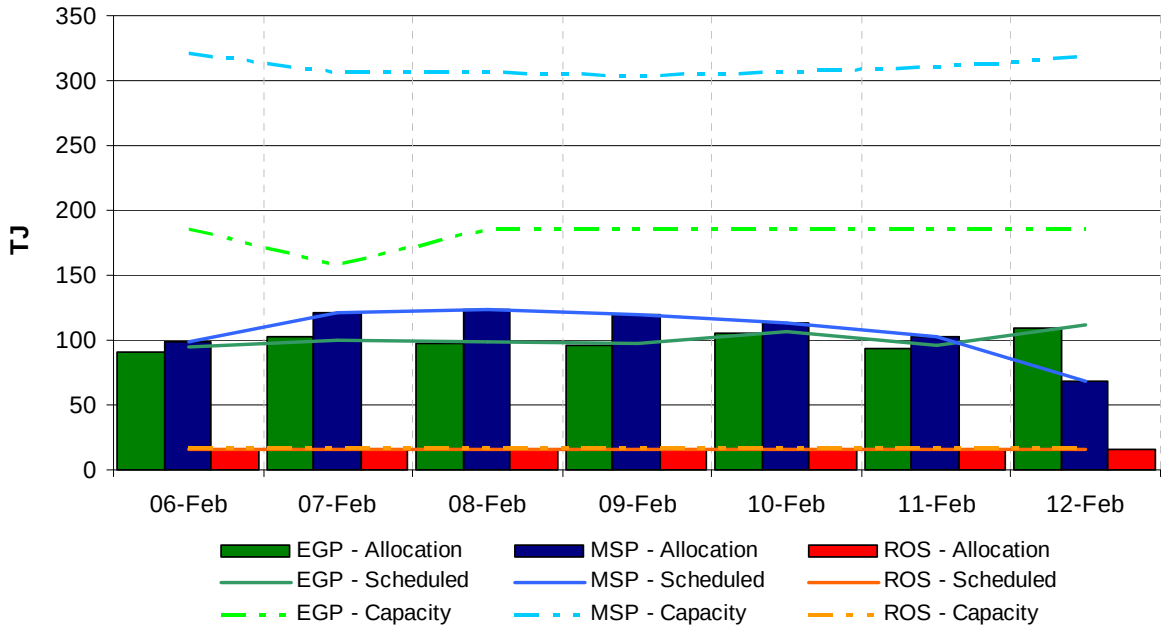
Pipeline Facility Allocations

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.

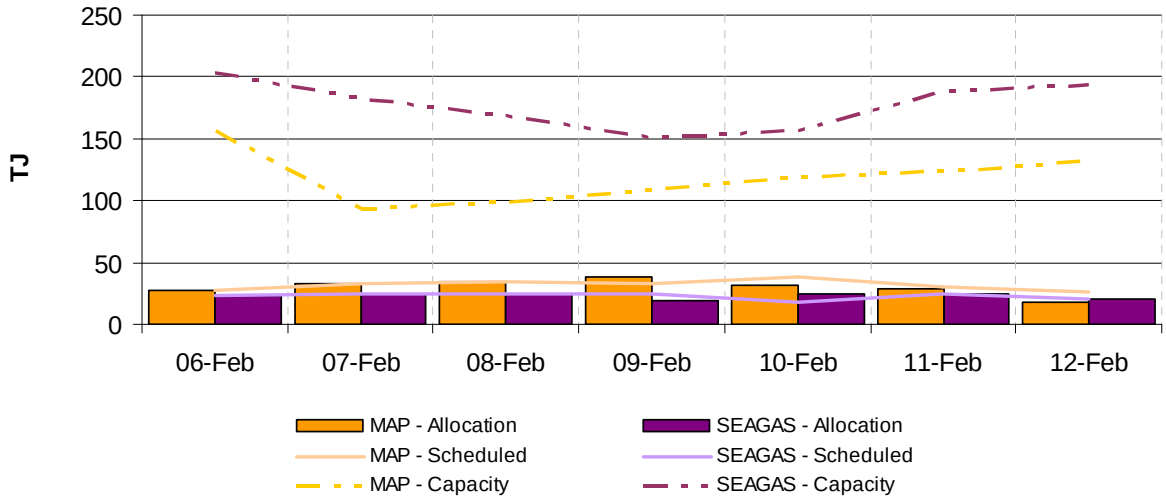
Differences between the amount of gas scheduled and what was actually allocated can result in variations between the ex ante and ex post price, as the ex post price is related to the offers actually allocated while ex ante is related to the offers scheduled.

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

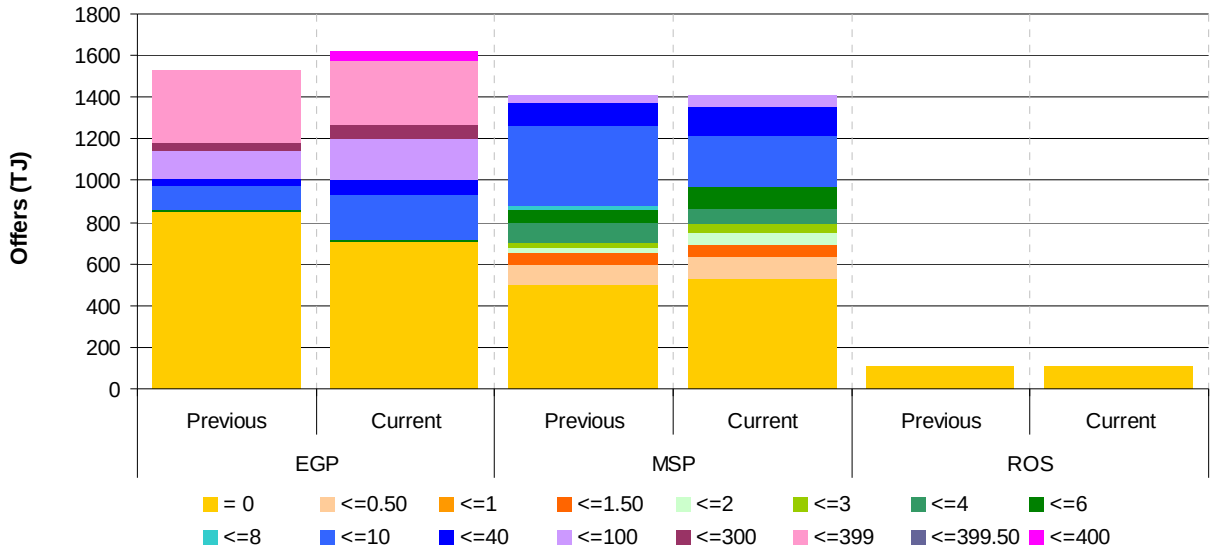
Trading Participants submit offers to sell gas into an STTM hub and withdrawal bids to take gas from a hub. Figures S9 and S11 show for the Sydney and Adelaide hubs respectively, total offers within various price bands for the current week compared to the previous week for each of the pipeline facilities.

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.

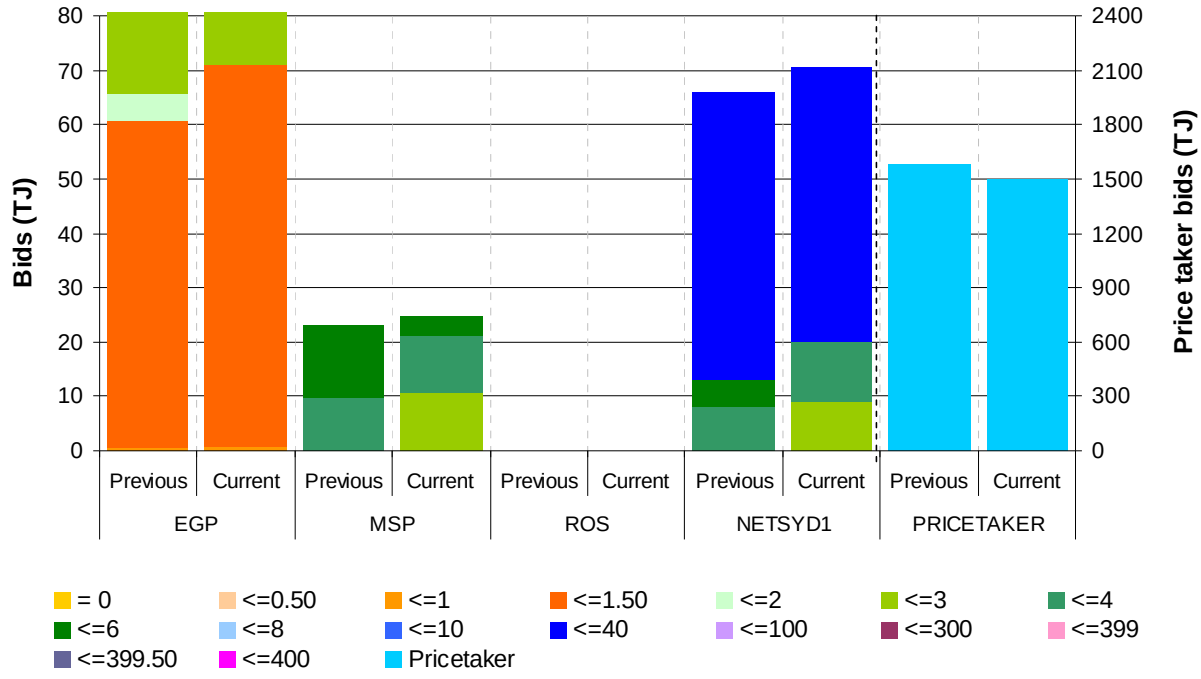
Because scheduling is price-driven, offers for lower-priced gas are scheduled ahead of offers for higher-priced gas and bids for higher-priced gas are scheduled ahead of bids for lower-priced gas.

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



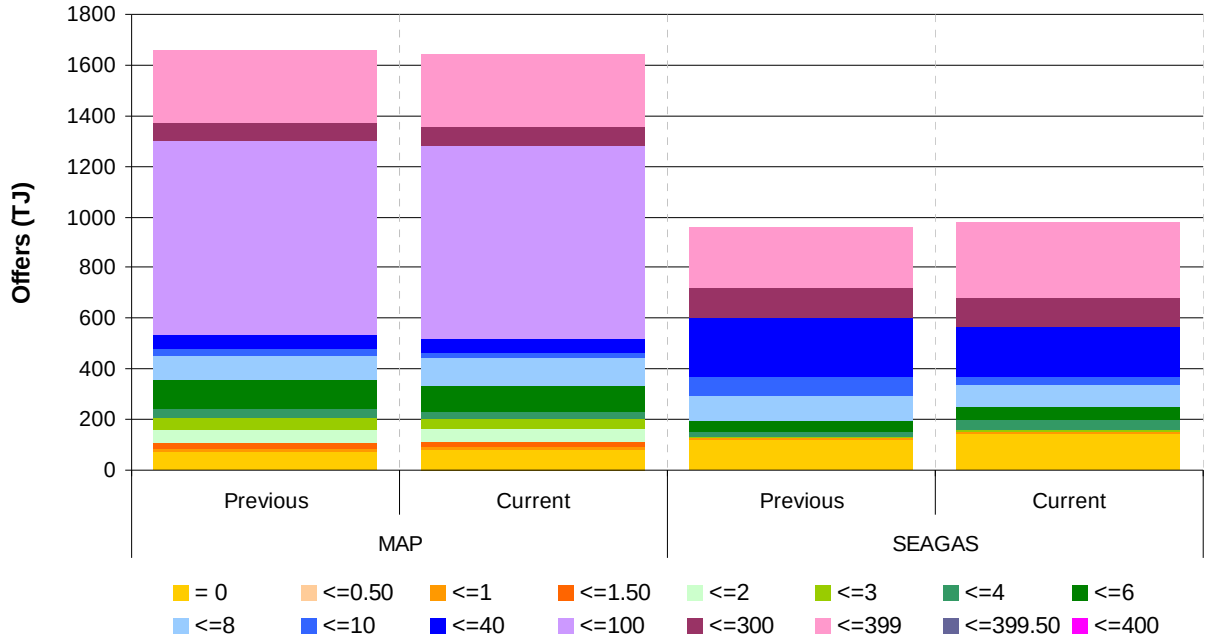
Source: http://www.aemo.com.au INT 652, 659
EGP=Eastern Gas Pipeline, MSP=Moomba to Sydney Pipeline, ROS=Rosalind Park Production facility

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



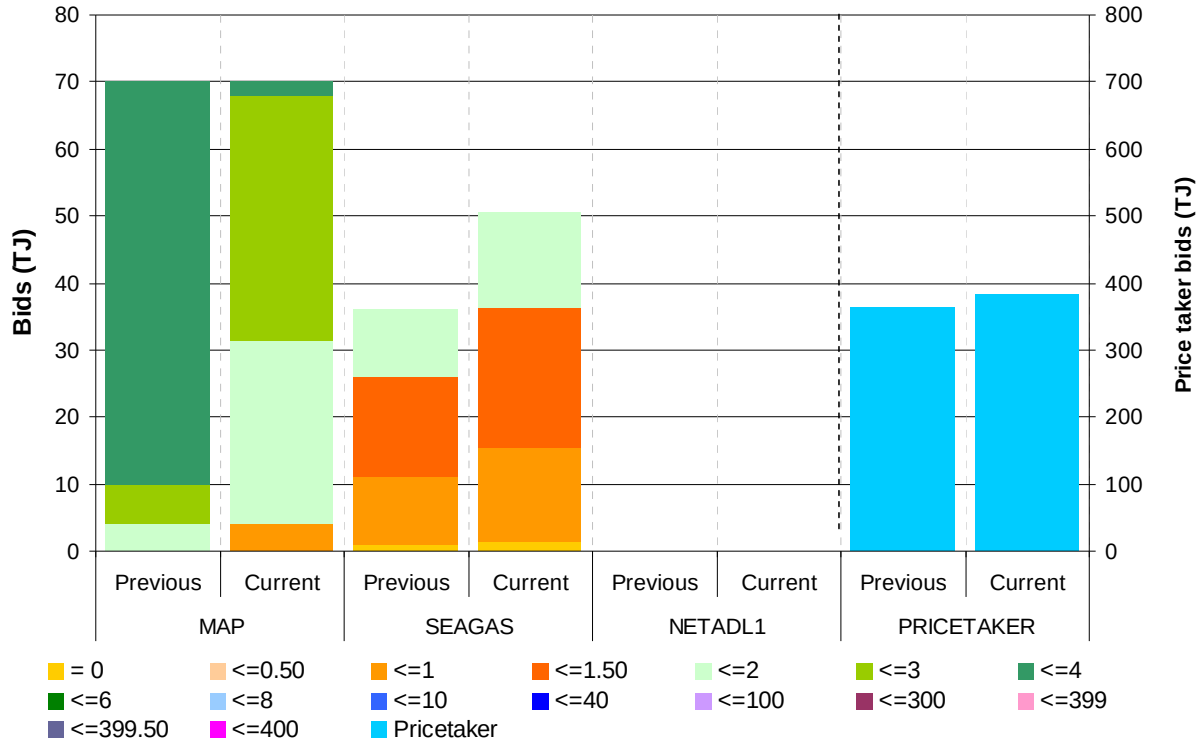
Source: http://www.aemo.com.au INT 652, 659
EGP=Eastern Gas Pipeline, MSP=Moomba to Sydney Pipeline, ROS=Rosalind Park Production facility, NETSYD1=Sydney Hub

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	AETV AGL(ESM) BluSc EA SANTOS TRU		AETV	EA OneStl(NSW) TRU	OneStl(NSW) SANTOS TRU	AGL(WG) EA	EA
	D-2 to D-1	SANTOS	AETV SANTOS	BluSc EA SANTOS TRU	AGL(WG) BluSc EA OneStl(NSW) SANTOS TRU	AGL(WG) Delta EA TRU	AGL(WG) BluSc EA SANTOS	AGL(ESM) AGL(WG) BluSc EA SANTOS
MSP	D-3 to D-2	AGL(ESM) Origin TRU	AGL(ESM) Origin TRU	AGL(ESM) Origin TRU	AGL(ESM) EA Origin TRU	AGL(ESM) TRU	AGL(ESM) EA Origin TRU	AGL(ESM) EA Origin TRU
	D-2 to D-1	AGL(ESM) Origin TRU	AGL(ESM) TRU	AGL(ESM) Origin TRU	AGL(ESM) TRU	AGL(ESM) EA Origin TRU	AGL(ESM) AGL(WG) EA Origin TRU	AGL(ESM) AGL(WG) 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 | 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	AETV			Lumo Energy Australia Pty Ltd	Lumo Energy Australia Pty Ltd		Lumo Energy Australia Pty Ltd
	D-2 to D-1			Lumo Energy Australia Pty Ltd	Lumo Energy Australia Pty Ltd		Lumo Energy Australia Pty Ltd	Lumo Energy Australia Pty Ltd
MSP	D-3 to D-2	Country						
	D-2 to D-1			Country	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 EGP=Eastern Gas Pipeline, MSP=Moomba to Sydney Pipeline, ROS=Rosalind Park Production facility, NETSYD1=Sydney Hub

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	AGL(SA) Origin	AGL(SA) Origin	AGL(SA) Origin	AGL(SA)	AGL(SA) Origin	AGL(SA) Origin Simply
	D-2 to D-1	ABC AGL(SA) Origin	ABC AGL(SA)	ABC AGL(SA) Origin	AGL(SA)	ABC AGL(SA) Origin	ABC AGL(SA) Origin Simply	ABC AGL(SA) Origin
SEA-GAS	D-3 to D-2	Origin Simply TRU	Origin TRU	Origin TRU	TRU	TRU	Origin TRU	Origin Simply TRU
	D-2 to D-1	Origin TRU			TRU	Origin TRU	Origin Simply 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 S15: 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	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[1] 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

[1] 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.

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

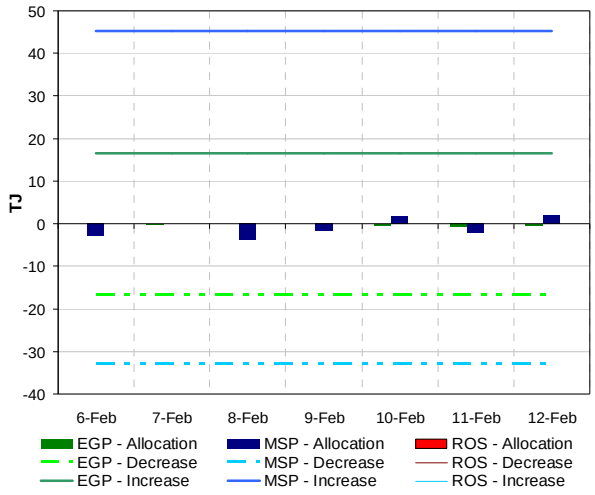
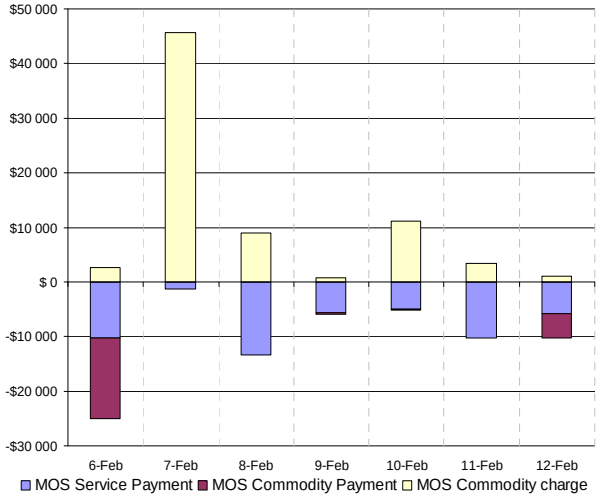


Figure S17b: Sydney MOS payments/charges



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

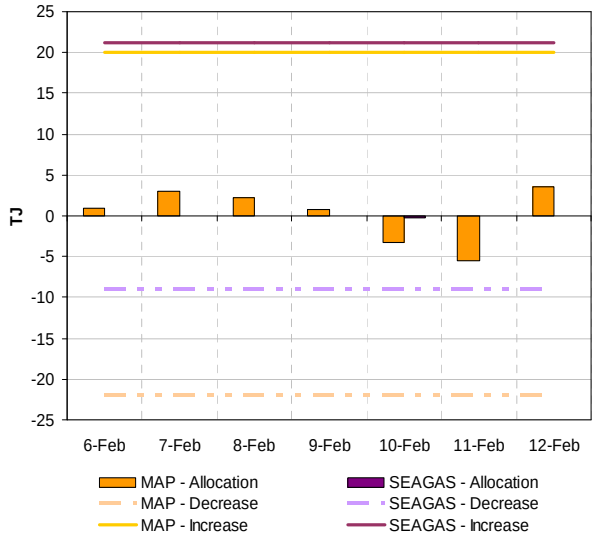
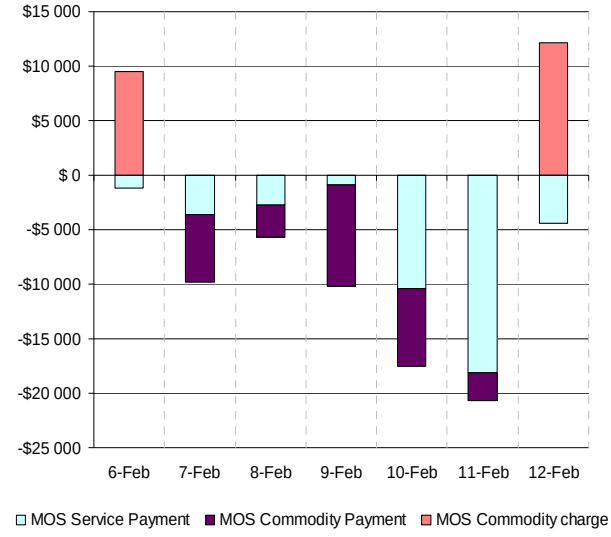


Figure S18b: Adelaide MOS payments/charges

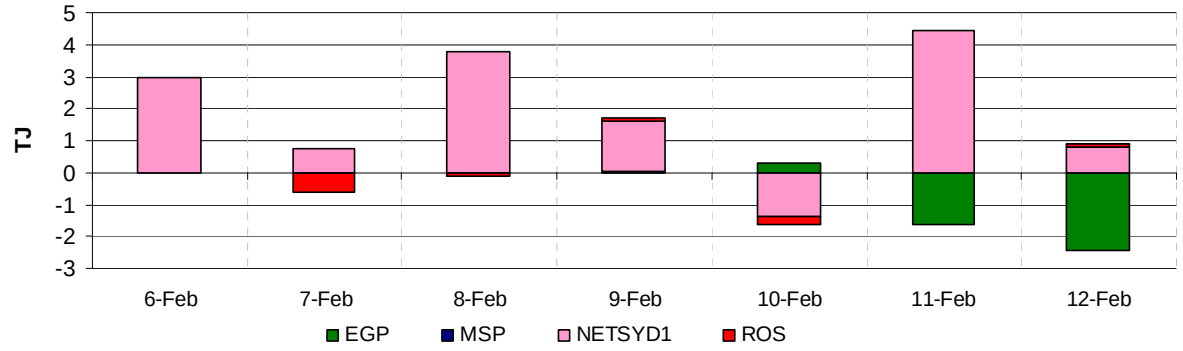


Source: http://www.aemo.com.au INT 663, 664, 665
MAP=Moomba to Adelaide Pipeline, SEAGAS=SEA gas pipeline

Deviations

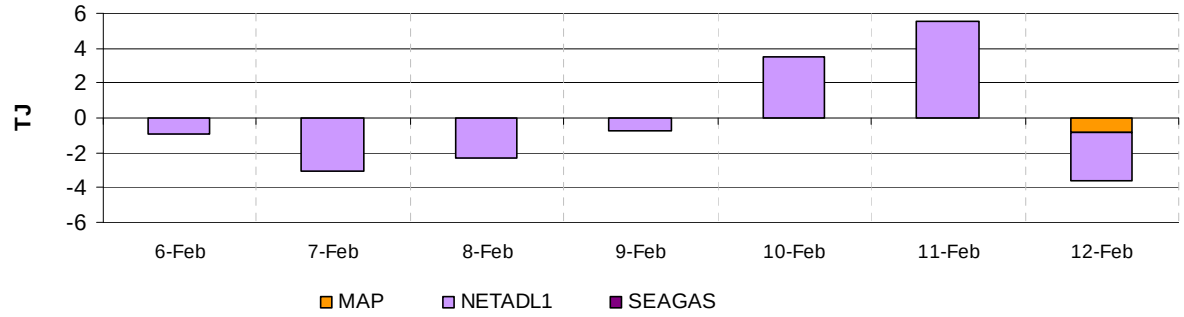
Deviations occur when the gas flowed on pipelines into hubs on a gas day differ from the modified market schedule, or when gas taken out of the hub is different to the schedule. The most likely reason for deviations is where participants incorrectly forecast the demand of customers within the hub. As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

	6 Feb – 12 Feb	30 Jan – 5 Feb	2010-11 Financial YTD*
Quantity (TJ)	2.63	5.26	3.94
Charges ($)	71.86	275.63	887.74

*** 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

	6 Feb – 12 Feb	30 Jan – 5 Feb	2010-11 Financial YTD*
Quantity (TJ)	1.25	1.21	0.86
Charges ($)	94.58	61.47	23.89

*** 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	83	101	95	99	98	95	95	117	80	95	94	85
QLD Gas Pipeline	117	106	103	96	99	102	100	142	77	103	109	70
Roma to Brisbane Pipeline	142	169	165	161	161	155	141	219	78	156	171	167
South West QLD Pipeline	167	143	161	160	169	187	147	181	74	162	133	143
NSW/ACT												
Eastern Gas Pipeline	180	206	198	196	204	192	197	268	79	196	213	201
Moomba to Sydney Pipeline	175	160	163	154	152	136	98	420	46	148	195	192
NSW-VIC Interconnect	40	16	0	13	20	4	21	92	14	16	13	-12
VIC												
Longford to Melbourne	320	406	345	383	398	351	328	1030	49	362	510	438
South West Pipeline^	30	55	51	67	24	24	-3	347	30	36	103	126
SA												
Moomba to Adelaide Pipeline	143	144	145	175	179	152	127	253	51	152	129	130
SEA Gas Pipeline	79	128	117	131	158	111	75	314	51	114	160	155
TAS												
Tasmanian Gas Pipeline#	33	45	44	44	46	43	41	129	35	42	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)
^ Negative flows represent back-haul flows along the South West Pipeline back into storage at Iona

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

Production zone 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	86	87	87	88	89	91	91	140	68	88	96	90
Fairview	120	120	126	124	128	128	102	130	90	121	117	113
Kenya Gas Plant	44	53	52	52	52	50	50	160	35	50	56	51
Kincora	15	15	15	5	15	15	15	25	17	14	4	1
Kogan North	10	10	10	10	10	10	10	12	78	10	9	8
Peat	11	6	6	11	6	11	11	15	62	9	9	8
Rolleston	8	9	8	8	8	9	9	30	35	8	10	11
Scotia	30	30	30	30	30	30	30	29	91	30	27	22
Spring Gully	48	48	47	41	46	48	40	69	71	45	49	44
Strathblane	48	48	47	41	46	48	40	69	71	45	49	44
Taloona	29	29	28	25	28	29	24	42	71	27	30	27
Wallumbilla	3	3	3	3	3	3	3	20	37	3	7	11
Yellowbank	12	11	11	11	12	12	13	30	40	12	12	14
Talinga	80	80	72	51	77	80	74	90	67	73	60	0
Moomba (SA/QLD)												
Moomba Gas Plant	281	288	242	258	289	241	174	430	63	253	272	275
Ballera	0	0	0	0	0	0	1	150	11	0	16	9
Eastern (VIC)												
Orbost Gas Plant	39	37	37	37	39	38	36	100	28	37	28	16
Lang Lang Gas Plant	57	29	0	0	0	0	0	70	69	12	48	35
Longford Gas Plant	545	576	586	590	N/A	557	536	1145	62	565	705	635
LNG Storage Dandenong	0	0	0	0	0	0	0	158	0	0	0	0
Otway Basin (VIC)												
Minerva Gas Plant	50	70	55	81	70	65	45	84	77	62	64	74
Otway Gas Plant	0	0	0	0	0	0	0	205	55	0	113	128
Iona Underground Gas Storage	78	110	109	120	104	69	42	440	21	90	94	86

*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)
6 Feb – 12 Feb	Average min.	21.7	20.9	12.8	14.5	16.7	11.1
	Average max.	29.8	26.6	24.4	24.0	27.9	20.0
30 Jan – 5 Feb	Average min.	23.3	23.2	17.9	19.1	24.4	13.2
	Average max.	31.4	33.9	34.5	30.7	34.9	22.2

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

6 Feb – 12 Feb	Scheduling Interval					Daily Imbalance Weighted Average Price
	6am	10am	2pm	6pm	10pm	
Sun	2.00	2.75	2.75	3.00	2.99	2.07
Mon	2.83	3.49	2.00	2.00	2.02	2.77
Tue	2.05	2.05	2.60	2.70	3.10	2.06
Wed	2.47	2.60	3.09	2.50	2.08	2.47
Thu	2.45	2.50	3.09	3.08	2.08	2.47
Fri	2.09	2.44	2.10	2.09	2.13	2.10
Sat	2.09	2.44	2.44	2.44	3.00	2.10

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	
6-Feb	**MP:**	334	341	338	331	331	**0**
	AEMO:	310	310	333	332	331	
	MP as % of AEMO	108	110	101	100	100	
7-Feb	**MP:**	450	465	438	439	439	**0**
	AEMO:	447	472	441	428	418	
	MP as % of AEMO	101	98	99	102	105	
8-Feb	**MP:**	394	395	394	393	392	**0**
	AEMO:	391	388	388	390	391	
	MP as % of AEMO	101	102	101	101	100	
9-Feb	**MP:**	426	427	427	426	426	**0**
	AEMO:	401	411	413	410	409	
	MP as % of AEMO	106	104	103	104	104	
10-Feb	**MP:**	385	430	433	428	428	**0**
	AEMO:	345	400	404	410	404	
	MP as % of AEMO	112	108	107	104	106	
11-Feb	**MP:**	403	420	417	417	417	**0**
	AEMO:	405	409	386	363	361	
	MP as % of AEMO	99	103	108	115	116	
12-Feb	**MP:**	315	315	315	314	314	**0**
	AEMO:	318	318	317	307	324	
	MP as % of AEMO	99	99	99	102	97	

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