Gas Market Report

AUSTRALIAN ENERGY REGULATOR

6 – 12 December 2015

Weekly summary

Average daily prices were lower in all markets than for the previous week.

Long term statistics and explanatory material

The AER has published an explanatory note to assist with interpreting the data presented in its weekly gas market reports. The AER also publish a range of longer term statistics on the performance of the gas sector including gas prices, production, pipeline flows and consumer demand.

Market overview

Figure 1 sets out the average daily prices ($/GJ) in the Victorian Declared Wholesale Market **(VGM or Victorian gas market)** and for the Sydney **(SYD)**, Adelaide **(ADL)** and Brisbane **(BRI)** Short Term Trading Market hubs **(STTM)** for the current week compared to historical averages.

Figure 1: Average daily prices – all markets ($/GJ)[1]

Region	Victoria	Sydney	Adelaide	Brisbane
06 Dec - 12 Dec 2015	3.69	3.74	3.97	2.53
% change from previous week	-14	-5	-12	-11
15-16 financial YTD	4.38	4.59	4.96	3.65
% change from previous financial YTD	26	47	41	108

Figure 2 compares average weekly gas prices, ancillary market payments and scheduled injections against historical averages for the Victorian gas market.

Figure 2: Victorian Gas Market

	Price ($/GJ)	Ancillary payments ($000)*	BOD forecast demand quantity (TJ)
06 Dec - 12 Dec 2015	3.69	-	375
% change from previous week	-14	-	0
15-16 financial YTD	4.38	-	666
% change from previous financial YTD	26	-	7

* Note: only positive ancillary payments, reflecting system constraints will be shown here.

[1] The weighted average daily imbalance price applies for Victoria.

More detailed analysis on the VGM is provided in section 1.

Figures 3 to 5 show average ex ante and ex post gas prices, Market Operator Service **(MOS)** balancing gas service payments together with the related daily demand quantities against historical averages for the Sydney, Adelaide and Brisbane STTM hubs, respectively.

Figure 3: Sydney STTM

	Ex ante price ($/GJ)	Ex post price ($/GJ)	MOS payments ($000)	Ex ante quantity (TJ)	Ex post quantity (TJ)
06 Dec - 12 Dec 2015	3.74	2.83	57.19	202	186
% change from previous week	-5	-11	155	-5	-9
15-16 financial YTD	4.59	4.31	24.34	246	241
% change from previous financial YTD	47	35	67	-7	-10

Figure 4: Adelaide STTM

	Ex ante price ($/GJ)	Ex post price ($/GJ)	MOS payments ($000)	Ex ante quantity (TJ)	Ex post quantity (TJ)
06 Dec - 12 Dec 2015	3.97	4.58	4.75	48	58
% change from previous week	-12	-3	-41	1	12
15-16 financial YTD	4.96	5.08	9.54	69	71
% change from previous financial YTD	41	46	-21	0	2

Figure 5: Brisbane STTM

	Ex ante price ($/GJ)	Ex post price ($/GJ)	MOS payments ($000)	Ex ante quantity (TJ)	Ex post quantity (TJ)
06 Dec - 12 Dec 2015	2.53	2.44	1.79	85	81
% change from previous week	-11	-14	21	-1	-4
15-16 financial YTD	3.65	3.59	1.36	91	90
% change from previous financial YTD	108	133	12	-42	-43

More detailed analysis of the STTM hubs is found in sections 2 to 4.

Section 5 provides analysis on production and pipeline flows on the National Gas Bulletin Board **(Bulletin Board)**, as well as gas powered generation **(GPG)** volumes in each state, and section 6 provides information on the Gas Supply Hub **(GSH)** at Wallumbilla.

Detailed Market Analysis

Gas Powered Generation in Victoria and South Australia

Every day this week in the Adelaide STTM, changes were made between the scheduled and allocated quantities for both the Moomba to Adelaide pipeline (MAP) and the SEAGas pipeline. The changes are illustrated in figure 3.3 on page 9. Taking 6 December as an example, we can see that more gas was scheduled on SEAGas than the MAP, but through participant nominations, more gas was allocated on the MAP than SEAGas.

An explanation may be unscheduled backhaul gas deliveries on both pipelines. The backhaul service supplies gas to users physically located outside of the hub. A participant's total quantity of gas delivered to the hub (forward haul) is reduced when additional backhaul gas is allocated to it. If the participant's demand in the hub remains unchanged, it might chose to nominate additional gas to offset the reduction caused by the backhaul in order to minimise additional exposure to market prices. We have observed instances where participants appear to have offset unscheduled backhaul gas on one pipeline, with additional forward haul delivery on the other pipeline. For example, on 8 and 10 December, unscheduled backhaul on the MAP was fully offset by additional forward haul nominated on SEAGas (up to 5 TJ). From 6 to 11 December, additional forward haul on the MAP occurred at similar quantities to the unscheduled backhaul nominated on SEAGas (around 9 to 15 TJ per day).

Several gas powered electricity generators located outside the Adelaide hub, which are at times supplied with backhaul gas from either the MAP or the SEAGas pipeline. Unscheduled backhaul gas may have been used to supply gas to some of these generators. Fluctuating electricity demand throughout the week would have increased the difficulty for these generators to accurately forecast their gas requirements.

In Victoria, capacity on the South West pipeline was limited due to compressor maintenance. The South West pipeline is bidirectional, and can therefore change direction between South Australia and Victoria, depending on demand.

While gas was flowing towards South Australia for most of the week, on 7 December the flow switched towards Victoria.[2] This change corresponded with a much higher proportion of the Adelaide hub's gas being allocated to the MAP compared to the schedule. While on the day decrease MOS was allocated to the MAP (see figure 3.4) preliminary analysis suggests this was due to over forecast demand in the Adelaide hub rather than the effect of participants nominating supply between the two pipelines differently to the schedule.

On 7 December, demand in Victoria was higher than previous days, as shown by the higher forecasts illustrated in figure 1.2. The increase in demand was linked to an increase in gas usage for electricity generation in Victoria. The estimated gas usage for GPG during the gas day increased to around 185 TJ, with a significant increase in output at the Newport power station.

MOS in Sydney

On a number of days throughout the week in the Sydney STTM, large quantities of decrease MOS were required on the Moomba to Sydney pipeline (MSP). On four days the net daily requirement for decrease MOS in Sydney exceeded 10 TJ.[3] Over forecast demand was the main contributor.

On 9 and 10 December, the demand over forecast was particularly significant. Decrease MOS requirements of 28.6 TJ and 19.5 TJ were required, for which the MOS service payments exceeded $177 000 and $87 700, for the respective gas days.[4] Figure 2.4 illustrates the MOS

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[2] The flows also moved towards Victoria on the 11 December gas day. At the same time flows on the SEAGas pipeline decreased to 66 TJ. Allocations to the Adelaide hub on SEAGas reduced to zero (see figure 3.3).

[3] The net amount takes into account any increase or decrease MOS volumes on both the MSP and the Eastern Gas pipeline.

[4] The resulting imbalance quantities led to lower ex post prices, decreasing from $4.30/GJ to $2.01/GJ on 9 December and from $4.10/GJ to $2.10/GJ on 10 December.

allocations and the service payments. On both days participants renominated to reduce supply from the Eastern Gas pipeline. It appears this may have reduced the amount of MOS that would have otherwise been required (see figure 2.3).

MOS in Brisbane

Demand was over forecast in Brisbane on 9 December, which had the effect decreasing the price to $0.51/GJ in the ex post schedule (see figure 4.1). The over forecast demand was offset by reduced supply on the RBP (see figure 4.3) which lowered the decrease MOS requirement for the gas day.

Over forecasting by a number of participants on 10 December was the main influence behind the increase MOS requirement exceeding 5 TJ. The higher increase MOS requirement also had the effect of lessening the drop in the ex post price compared to that of the previous day.

6 – 12 December 2015

1. Victorian Declared Wholesale Market

In the Victorian gas market, gas is priced five times daily at 6 am, 10 am, 2 pm, 6 pm and 10 pm. The imbalance weighted price on a gas day tends towards the 6 am price[5] which is the schedule at which most gas is traded.

The main drivers[6] of price are demand forecasts and bids to inject or withdraw gas from the market. Figures 1.1 to 1.4 below show the daily prices, demand forecasts[7], and injection/withdrawal bids for each of the five pricing schedules. Figure 1.5 provides information on which system injection points were used to deliver gas, in turn indicating the location and relative quantity of gas injection bids cleared through the market.

Figure 1.1: Prices by schedule

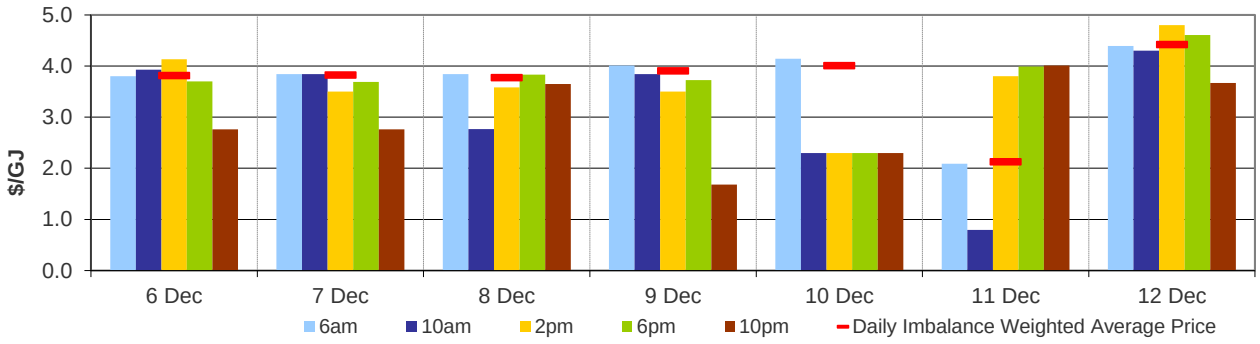
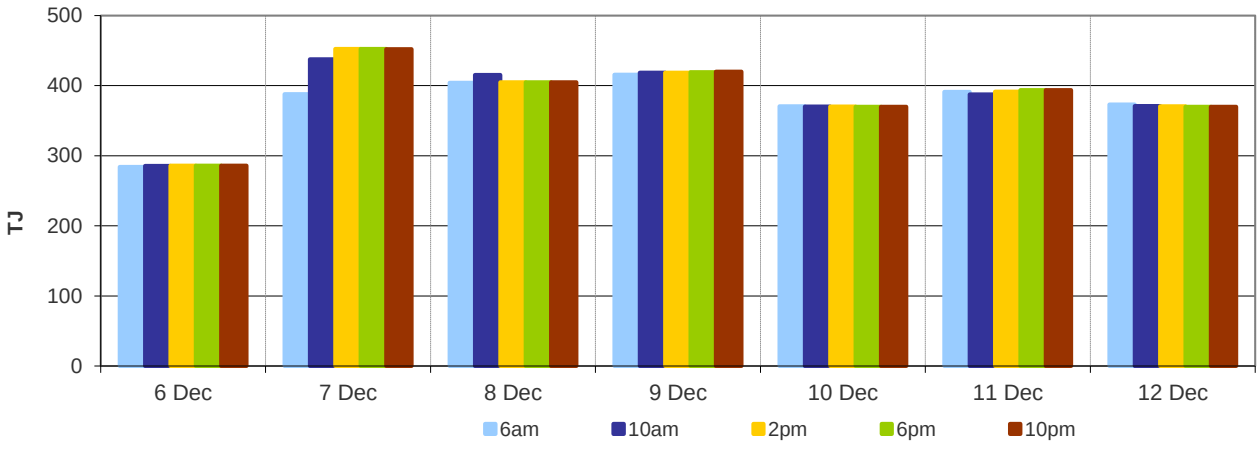


Figure 1.2: Demand forecasts



5 Prices for subsequent schedules are applied only to the differences in scheduled quantities (imbalances) to calculate the weighted price. The 6 am price applies to the entire scheduled quantity in the initial schedule.

6 The price might also be affected by transmission or production (contractual) constraints limiting how much gas can be delivered from a locale or System Injection Point (SIP) from time to time.

7 These are Market Participants' aggregate demand forecasts adjusted for any override as applied by AEMO from time to time. These forecasts must be scheduled and cannot respond to price like withdrawal bids.

Figure 1.3: Injection bids by price bands

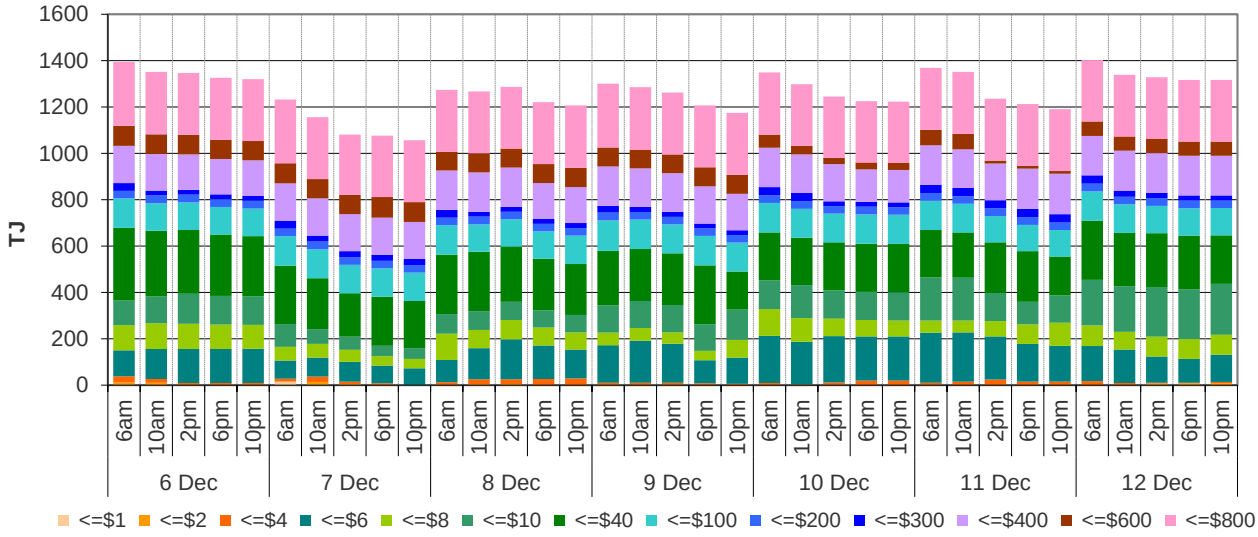


Figure 1.4: Withdrawal bids by price bands

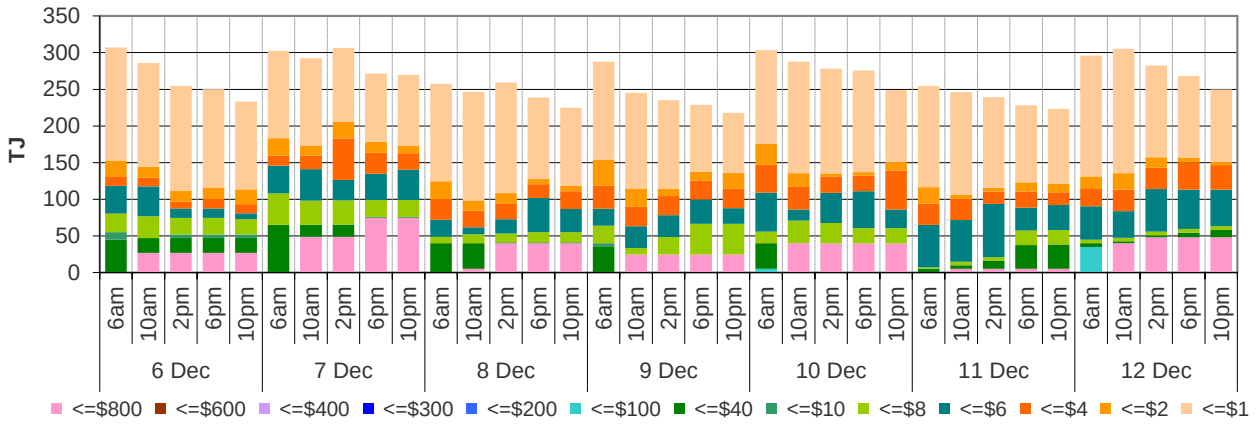
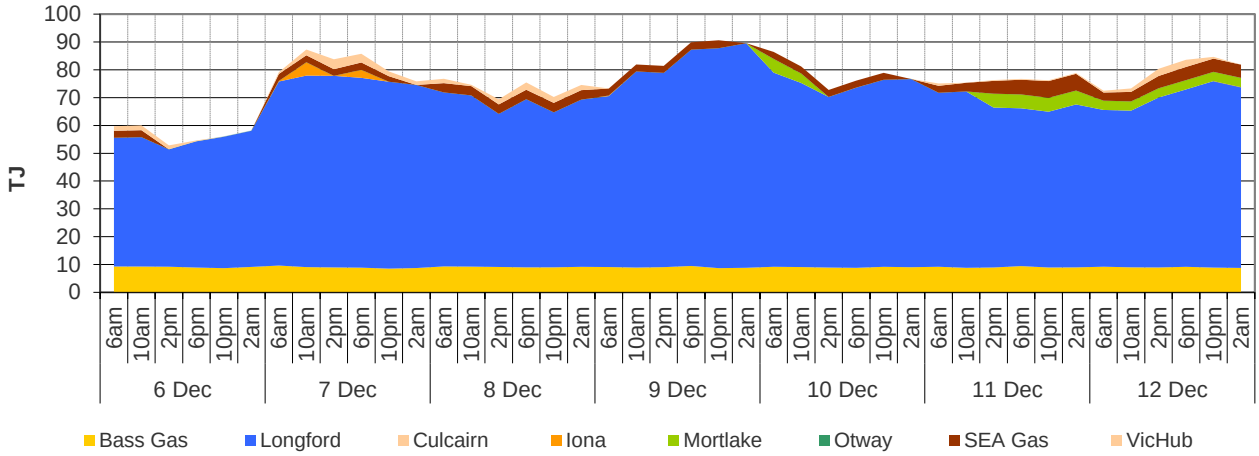


Figure 1.5: Metered Injections by System Injection Point



Note that in figure 1.5, the last 8-hour schedule from 10 pm has been separated into two 4-hour blocks to provide a consistent comparison with earlier scheduled injection volumes.

2. Sydney STTM

In each STTM hub, a daily gas price is calculated before the gas day (the ex ante price) and after the gas day (the ex post price). The main drivers of these prices are participant demand forecasts, and offers to inject or bids to withdraw gas traded at the hub.[8] Divergences in ex ante and ex post prices for a gas day may occur due to differences in scheduled (forecast) and allocated (actual) quantities. Pipeline acronyms are defined in the user guide.

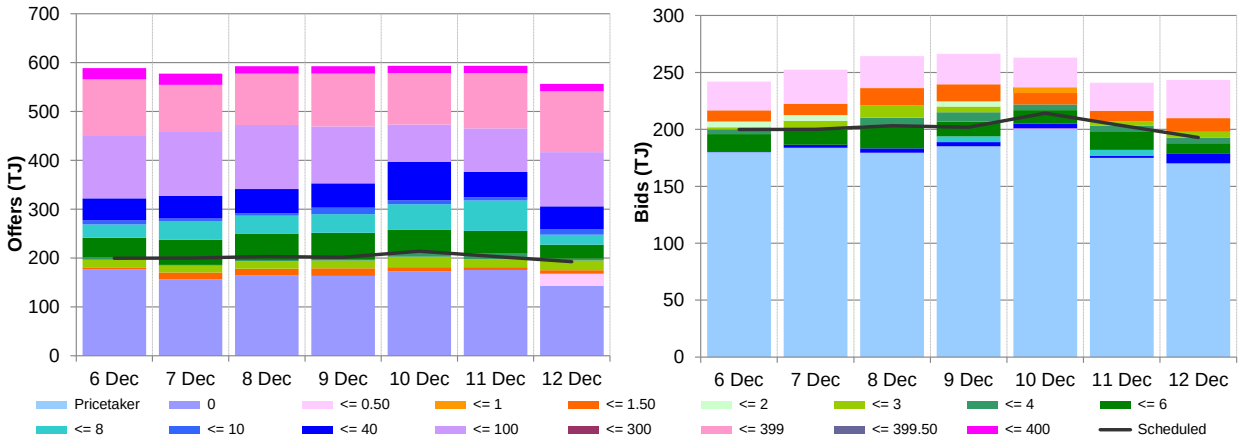
Market Operator Service balancing gas (MOS) payments arise because the amount of gas nominated on pipelines for delivery on a gas day will either exceed or fall short, by some amount, of the amount of gas consumed in the hub. In such circumstances, MOS payments are made to participants for providing a service to park gas on a pipeline or to loan gas from a pipeline to the hub.[9]

Figures 2.1 and 2.2 show daily prices, demand, offers and bids. Figures 2.3 and 2.4 show gas scheduled and allocated on pipelines to supply the hub, indicating the location and relative quantity of gas offers across pipelines and also the amount of MOS allocated for each pipeline.

Figure 2.1: SYD STTM daily ex ante and ex post prices and quantities

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Ex ante price ($/GJ)	3.28	4.31	4.20	4.30	4.55	3.24	2.30
Ex ante quantity (TJ)	200	200	203	202	214	203	193
Ex post price ($/GJ)	2.01	4.25	4.20	2.01	2.10	3.24	2.01
Ex post quantity (TJ)	185	188	203	162	182	205	174

Figure 2.2: SYD daily hub offers and daily hub bids in price bands ($/GJ)



8 The main driver of the amount of gas scheduled on a gas day is the 'price-taker' bid, which is forecast hub demand that cannot respond to price and which must be delivered, regardless of the price.

9 MOS service payments involve a payment for a MOS increase service when the actual quantity delivered exceeds final gas nominations for delivery to a hub, and a payment for a MOS decrease service when the actual quantity delivered is less than final nominations. As well as a MOS 'service' payment, as shown in figure 2.4, MOS providers are paid for or pay for the quantity of MOS sold into the market or bought from the market (MOS 'commodity' payments/charges).

Figure 2.3: SYD net scheduled and allocated gas hub supply (excluding MOS)

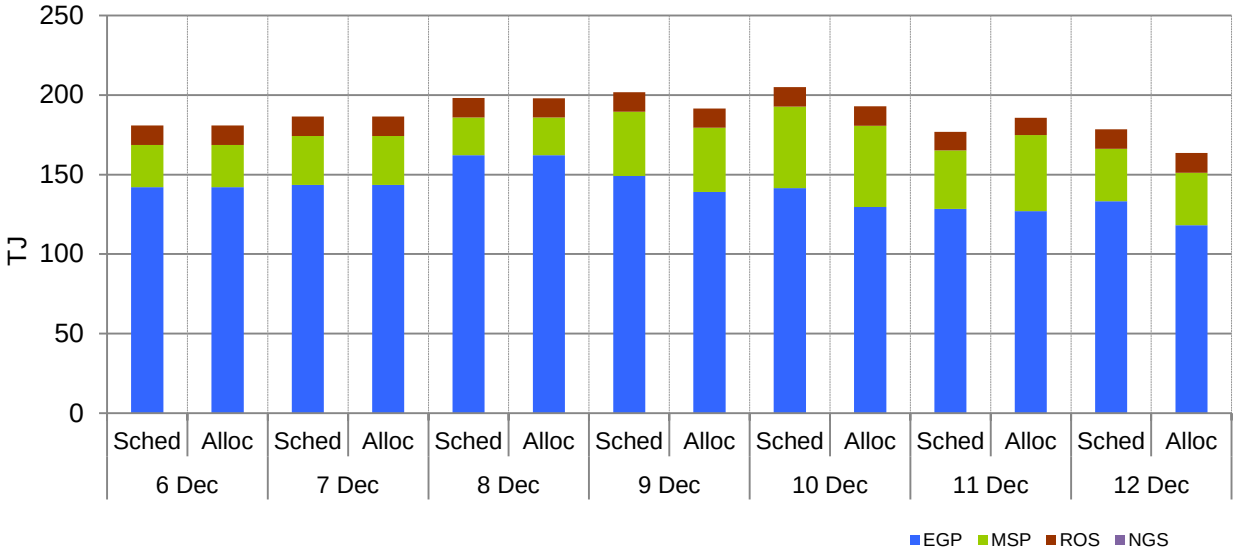
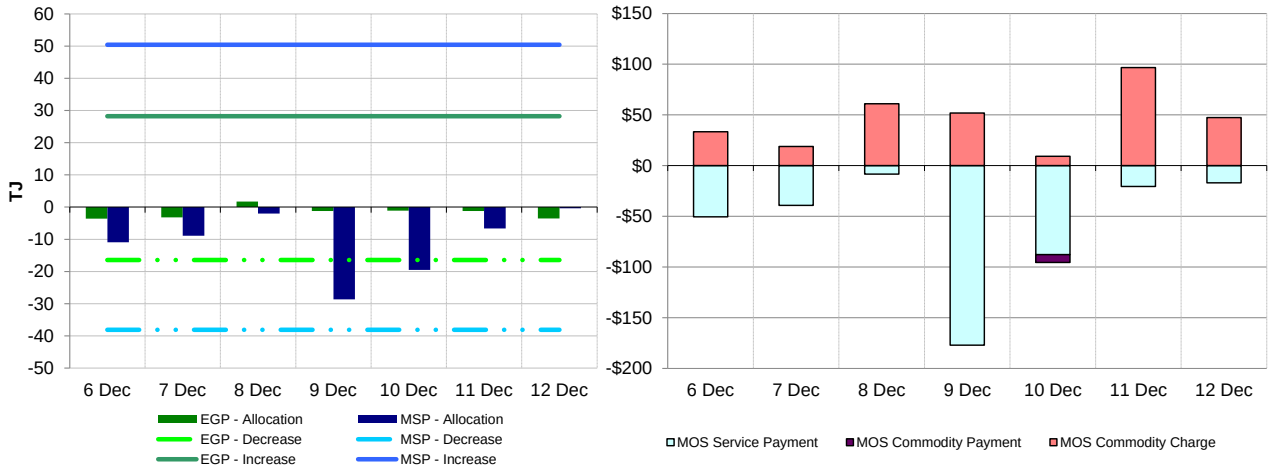


Figure 2.4: SYD MOS allocations (TJ), service payments and commodity payments/charges ($000)



3. Adelaide STTM

The Adelaide STTM hub functions in the same way as the Sydney STTM hub. The same data that was presented for the Sydney hub is presented for the Adelaide hub in the figures below.

Figure 3.1: ADL STTM daily ex ante and ex post prices and quantities

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Ex ante price ($/GJ)	4.31	4.31	3.20	3.22	4.25	4.25	4.25
Ex ante quantity (TJ)	43	49	51	52	51	51	40
Ex post price ($/GJ)	5.08	5.02	3.78	3.78	4.99	5.15	4.25
Ex post quantity (TJ)	57	58	61	61	64	66	41

Figure 3.2: ADL daily hub offers and daily hub bids in price bands ($/GJ)

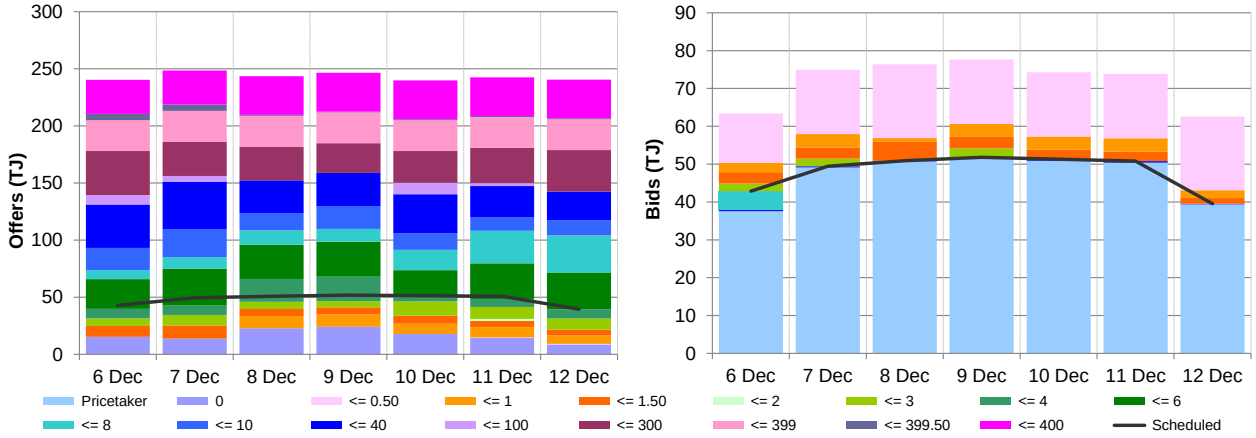


Figure 3.3: ADL net scheduled and allocated gas hub supply (excluding MOS)

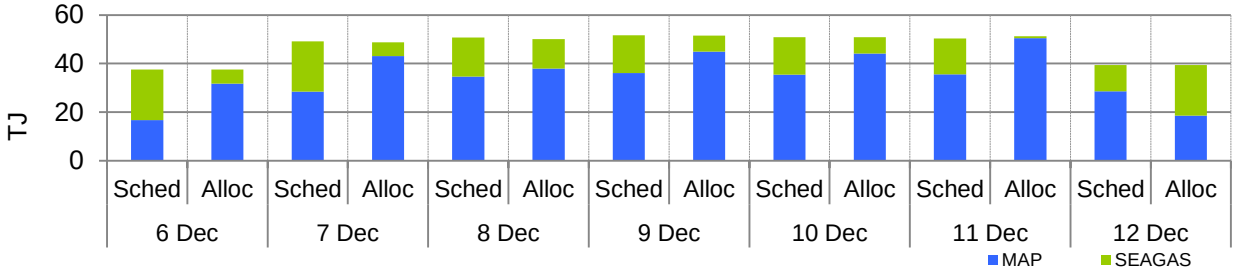
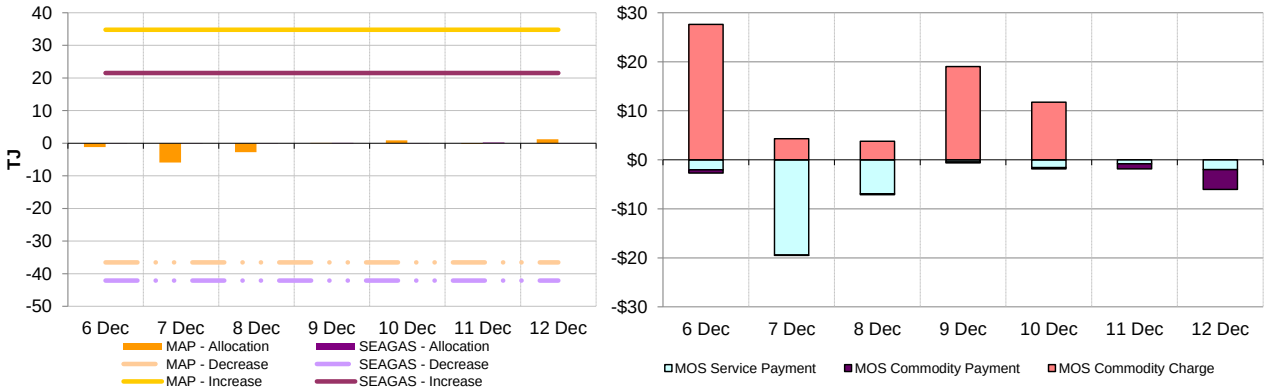


Figure 3.4: ADL MOS allocations (TJ), service payments and commodity payments/charges ($000)



4. Brisbane STTM

The Brisbane STTM hub functions in the same way as the Sydney STTM hub. The same data that was presented for the Sydney hub is presented for the Brisbane hub in the figures below.

Figure 4.1: BRI STTM daily ex ante and ex post prices and quantities

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Ex ante price ($/GJ)	2.41	2.46	2.25	2.20	2.50	2.75	3.15
Ex ante quantity (TJ)	73	90	89	91	95	83	72
Ex post price ($/GJ)	2.50	2.46	2.50	0.51	2.10	2.95	4.09
Ex post quantity (TJ)	77	91	91	68	78	84	78

Figure 4.2: BRI daily hub offers and daily hub bids in price bands ($/GJ)

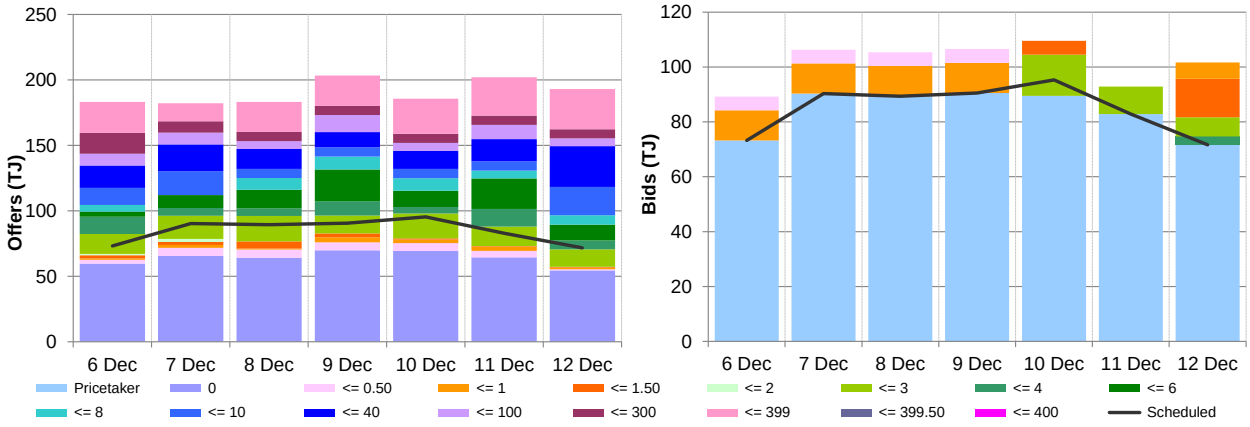


Figure 4.3: BRI net scheduled and allocated gas hub supply (excluding MOS)

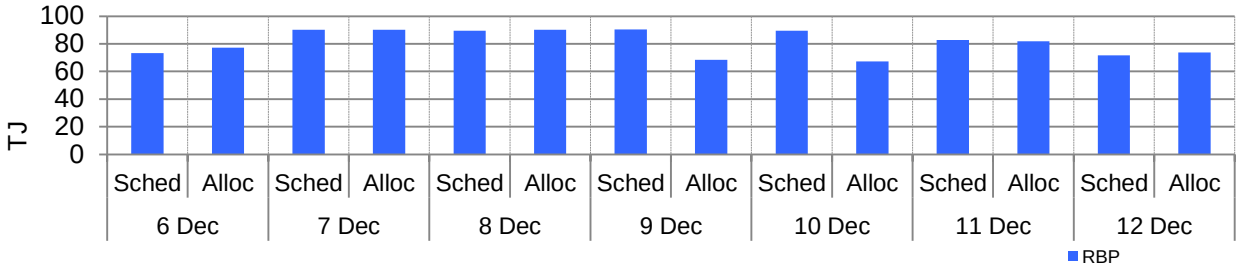
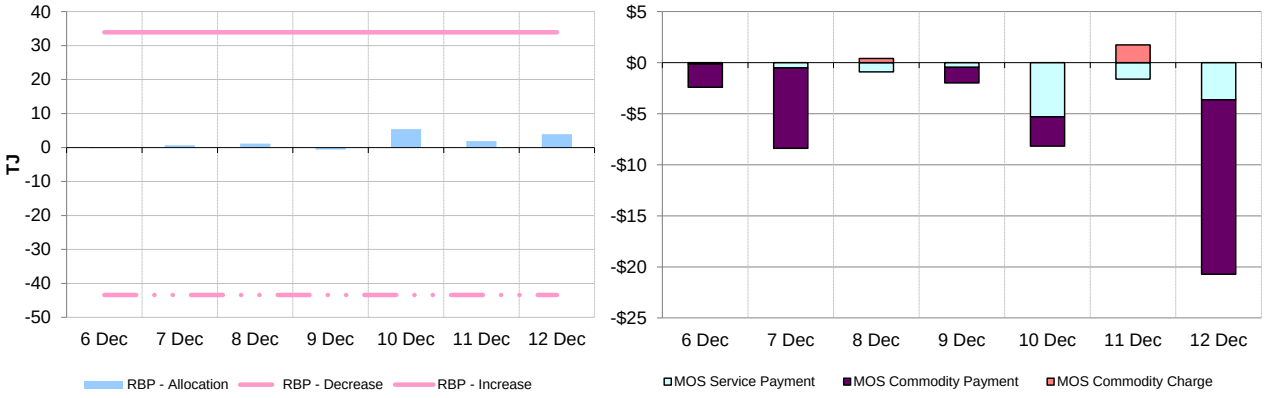


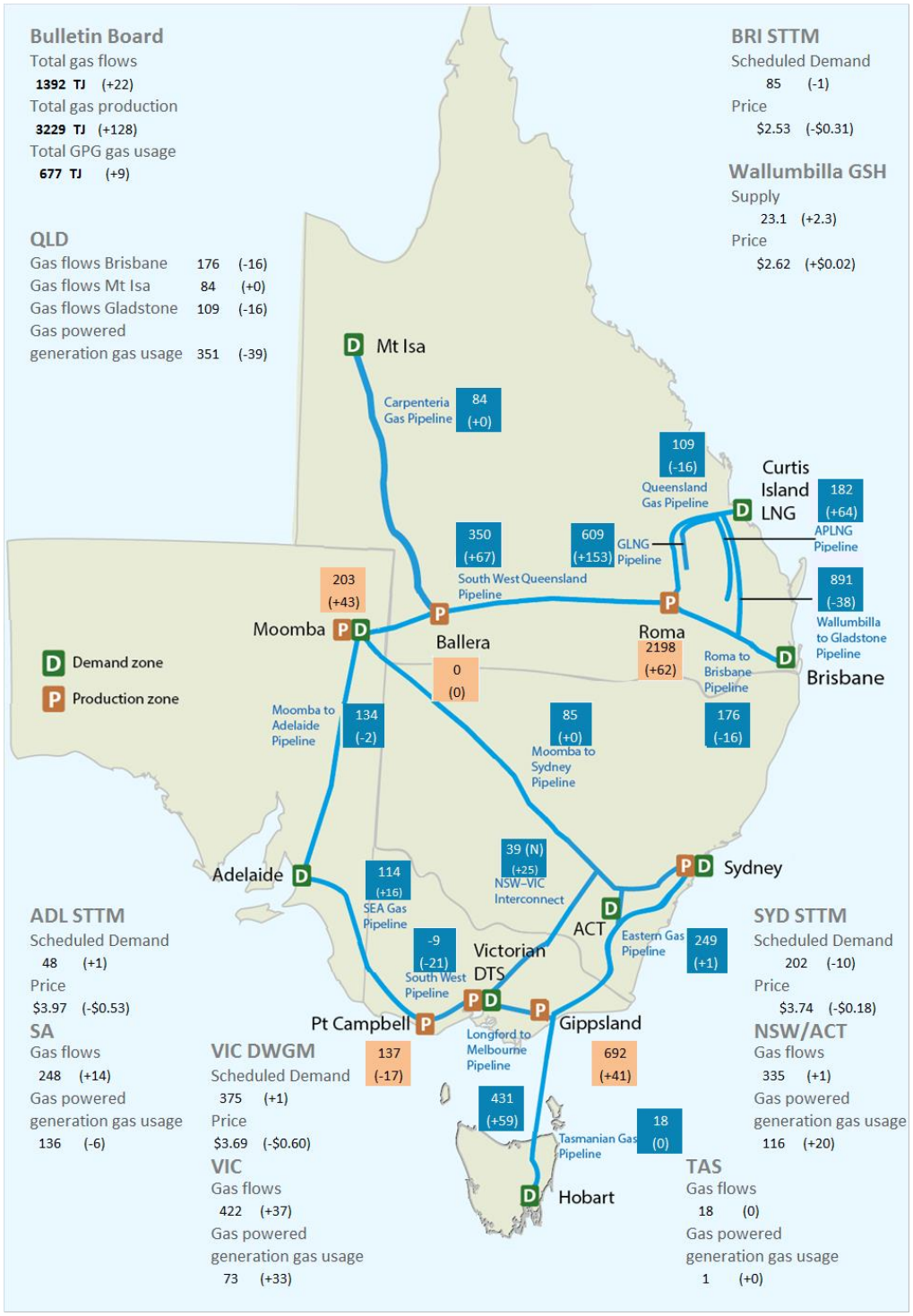
Figure 4.4: BRI MOS allocations (TJ), service payments and commodity payments/charges ($000)



5. National Gas Bulletin Board

Figure 5.1 shows average daily actual flows for the current week[10] from the Bulletin Board (changes from the previous week's average are shown in brackets). Average daily scheduled volumes and prices[11] are provided for gas markets and gas powered generation for each region.

Figure 5.1: Gas market data ($/GJ, TJ/day); Production, Consumption and Pipeline flows (TJ)



[10] Gas flows shown under regional headings: **SA** = MAP + SEAGAS, **VIC** = SWP + LMP – negative(NSW-VIC), **NSW/ACT** = EGP + MSP, **TAS** = TGP, **QLD (Brisbane)** = RBP, **QLD (Mt Isa)** = CGP, **QLD (Gladstone)** = QGP
GPG volumes may include gas usage that does not show up on Bulletin Board pipeline flows.

[11] Roma included export LNG production from October 2014 and LNG pipeline flows are shown from October 2015.
Wallumbilla supply is the average daily volume of gas 'traded', while price is a volume weighted average.

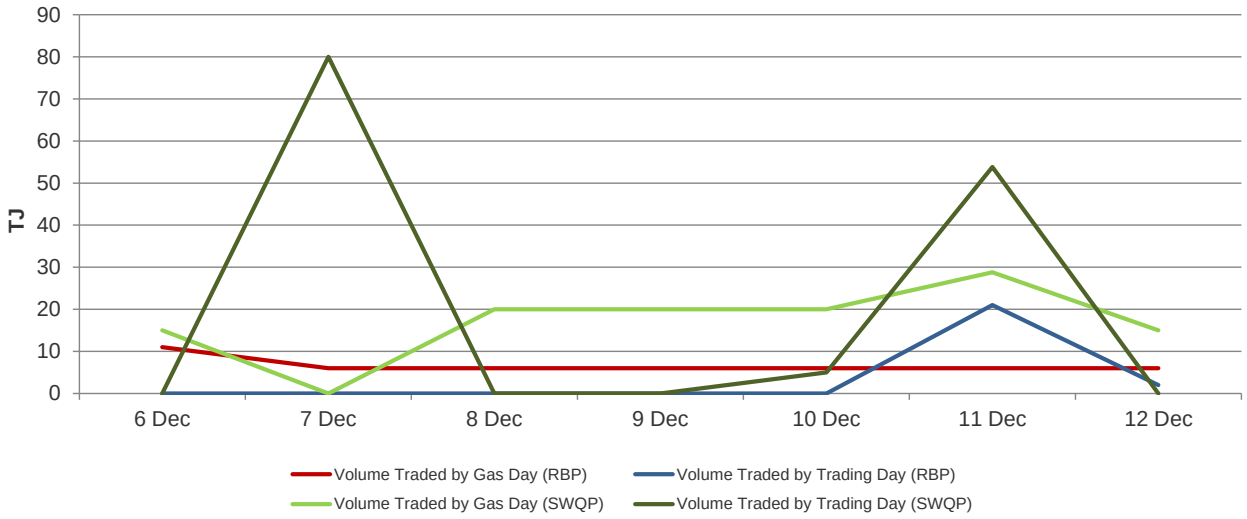
6. Gas Supply Hub

The Gas Supply Hub **(GSH)** was established for the trading of gas at Wallumbilla because it is located in close proximity to significant gas supply sources and demand locations and is a major transit point between Queensland and the gas markets on Australia's east coast. The GSH is a voluntary market[12] for the supply of gas traded between separate participants, with products listed for sale and purchase at delivery points on three major connecting pipelines at Wallumbilla – the Queensland Gas Pipeline **(QGP)**, the South West Queensland Pipeline **(SWQP)** and the Roma to Brisbane Pipeline **(RBP)**. There are separate products for each pipeline (each pipeline is considered a trading location, and each has a number of delivery points) and delivery period (daily, day-ahead, balance-of-day and weekly).

There were 14 trades for 162 TJ of gas this week at a volume weighted price of $2.62/GJ. The majority of the 23 TJ of gas traded on the RBP was through a weekly product trade, with only one other daily product trade on the pipeline for the week. The volume weighted price for the RBP was $3.13/GJ. The 139 TJ of gas sold on the SWQP was traded at a volume weighted price of $2.53/GJ.

Figure 6.1 shows volumes traded[13] on each gas day and trading day for the current week.

Figure 6.1: Volume Traded (by Gas Day and by Trading Day)



[12] Market trade is facilitated through an electronic trading platform, with standardised terms and conditions and a market settlement facility for the short-term trading of physical gas and related products. The market is designed to complement existing bilateral gas supply arrangements and gas transportation agreements, through the placement of anonymous offers (to sell) or bids (to buy) at specified quantity and price increments, which are automatically matched on the exchange to form transactions.

[13] Volumes shown for weekly products include the 'daily' volume for each relevant 'gas day', and the 'weekly' volume for each relevant 'trading day'.