

9 – 15 October 2016

Weekly Summary

Market overview figure 1 shows average daily gas prices were higher this week than the previous week across all markets.

On Monday APLNG exported the first cargo from its second LNG train, marking the final major construction milestone for the three LNG export projects at Curtis Island.

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) for the current week, and demand levels, compared to historical averages. Regions shown include 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**). Price and demand information is also shown for the voluntary Wallumbilla and Moomba Gas Supply Hubs (**GSH**).

Figure 1: Average daily prices and demand – all markets (\$/GJ, TJ)¹

	Victoria		Sydney		Adelaide		Brisbane		Wallumbilla		Moomba	
	Price	Demand	Price	Demand	Price	Demand	Price	Demand	Price	Quantity	Price	Quantity
09 Oct - 15 Oct 2016	6.27	574	6.60	251	6.50	57	6.09	67	5.79	51	-	-
% change from previous week	2	7	17	9	9	-1	6	-15	5	-75	-	-
16-17 financial YTD	8.53	764	7.62	271	9.11	79	7.03	89	7.92	4216	-	-
% change from previous financial YTD	89	-6	55	2	68	-1	74	-6	110	33	-	-

¹ Average daily quantities are displayed for each region, with the exception of Gas Supply Hubs (GSH). The weighted average daily imbalance price applies for Victoria. The prices shown for the GSH in Wallumbilla and Moomba are volume weighted average prices for all products traded across the period. The total quantity contributing to the weighted price is displayed for these GSH.

Figure 2 illustrates the daily prices in each gas market, as defined in figure 1.

Figure 2: Daily gas market prices (\$/GJ)

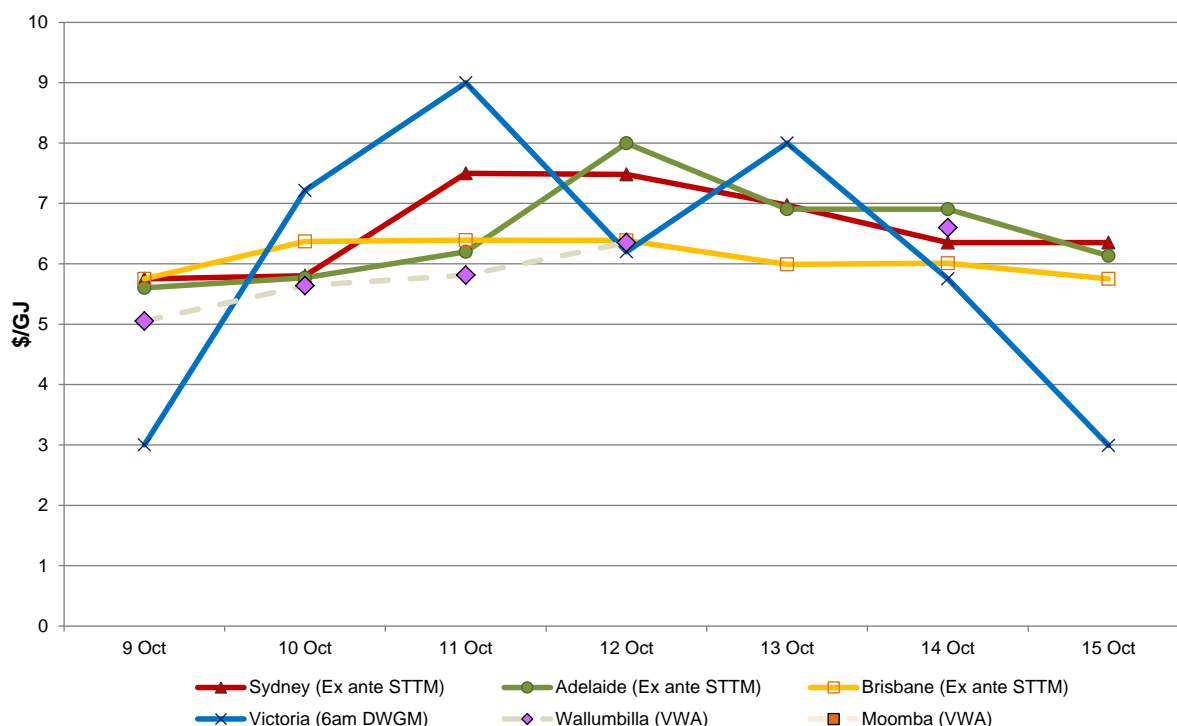


Figure 3 compares average ancillary market payments (VGM) and balancing gas service payments (STTM) against historical averages.

Figure 3: Average ancillary payments (\$000)

	Victoria Ancillary Payments*	Sydney MOS	Adelaide MOS	Brisbane MOS
09 Oct - 15 Oct 2016	-	69.20	19.04	1.63
% change from previous week	-	86	-53	-10
16-17 financial YTD		66.38	27.87	1.40
% change from previous financial YTD		163	126	-1

* Ancillary payments reflect the compensation costs for any additional injections offered at a price higher than the market price. Note: only positive ancillary payments, reflecting system constraints will be shown here.

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

Figure 4 shows the quantity and volume weighted prices of products traded in the Gas Supply Hub locations at Wallumbilla and Moomba.

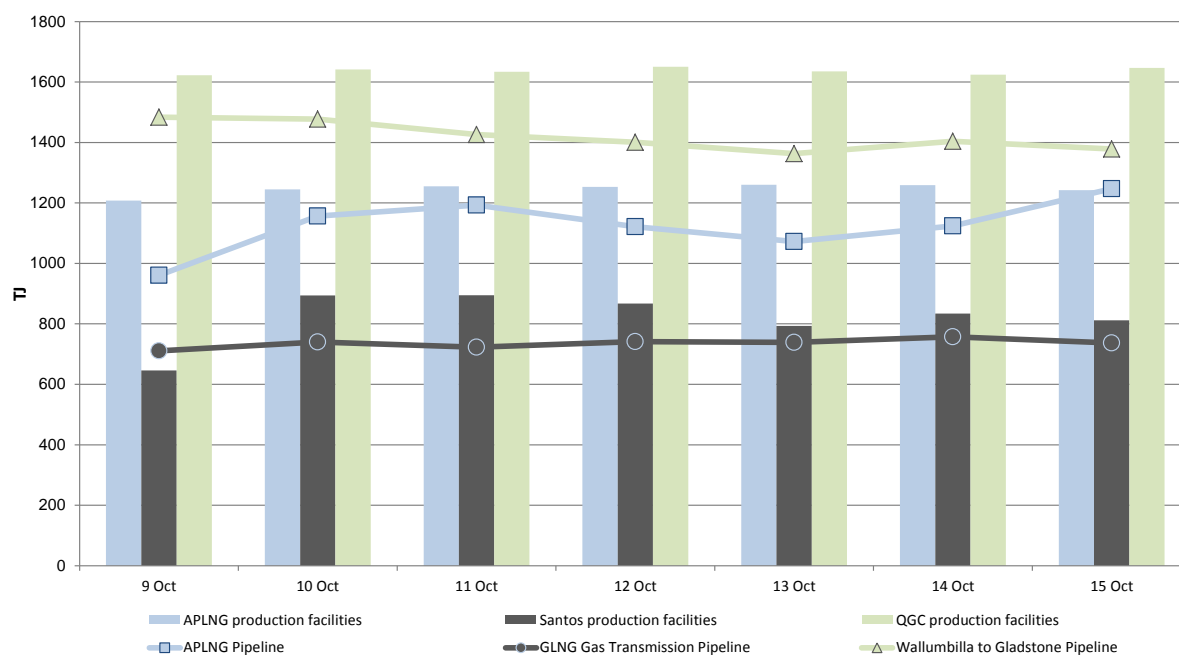
Figure 4: Gas supply hub products traded for the current week (\$/GJ, TJ)*

	RBP		SWQP		MAP		MSP		QGP	
	VWA price	Quantity	VWA price	Quantity	VWA price	Quantity	VWA price	Quantity	VWA price	Quantity
Balance of day	5.72	19.5	6.03	1.9	-	-	-	-	-	-
Daily	6.44	4.0	-	-	-	-	-	-	-	-
Day ahead	5.72	25.0	5.95	1.0	-	-	-	-	-	-
Weekly	-	-	-	-	-	-	-	-	-	-
Monthly	-	-	-	-	-	-	-	-	-	-

* Non-netted products are not shown here. For information about these products, refer to figure 6.1.

Figure 5 shows Bulletin Board pipeline flows for the three LNG export pipeline facilities and the production output at related production facilities in the Roma region.

Figure 5: LNG export pipeline and production flows (TJ)*



* Production quantities represent flows from facilities operated by APLNG, Santos and QGC in the Roma region. Gas from individual facilities may also supply the domestic market, other LNG projects or storage facilities.

Detailed market analysis

Figure 1.1 shows there were high prices for the 10 am (\$10.69/GJ) and 2 pm (\$11.89/GJ) schedules in the Victorian gas market on Tuesday 11 October. Participant under forecasting drove AEMO overrides² and the high prices on the day.

High schedule prices were also set on Thursday at 10 am (\$10.62/GJ) and Friday at 10 am (\$16.89/GJ). Constraints applied at Longford due to unplanned offshore maintenance meant the facility was unable to meet its beginning of day injection schedules.³

Participant over forecasting led to higher MOS payments in the Sydney STTM. Daily MOS service payments ranged from around \$64 600 to \$117 700 across five days this week, largely resulting from net decrease service requirements related to forecasting errors. Figure 2.4 shows counteracting MOS requirements also contributed.⁴

² Demand overrides are applied to adjust participants' aggregated demand forecast quantities when they deviate to far from AEMO's forecast levels. This is done to minimise market impacts of demand forecast errors. See our [user guide](#) for more information about the Wholesale Market Scheduling Procedures (Victoria).

³ A number of days recorded constraints due to planned and unplanned outages. This included an unplanned outage at the Brooklyn Compressor Station (9 October). Profiled injections from Longford of up to 650 TJ/day occurred due to unplanned maintenance (from 10 am on 11 October), 586.3 TJ/day (12 October), 570.4 TJ/day (13 October) and 480.6 TJ/day (14 October). Planned SEAGas heater maintenance occurred on 14 October. Constraints related to the commissioning of the Victorian North Interconnect Expansion (VNIE) project were also implemented from 12 October.

⁴ Counteracting MOS may occur when decrease MOS allocations on a pipeline offset an increase MOS allocation quantity on another pipeline. While this does not make a difference to the net supply/demand quantity in the hub which needs to be balanced, it contributes to extra costs for the additional increase and decrease services. A number of days may also have been affected by renominations including shifting gas supply from the Eastern Gas Pipeline (EGP) onto the Moomba to Sydney Pipeline (MSP) – 12, 13 and 14 October – or vice versa (15 October), or additional supply nominated on the MSP to offset unscheduled backhaul deliveries on the EGP (11 October).

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 price⁵ which is the schedule at which most gas is traded.

The main drivers⁶ 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 forecasts⁷, 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.

Ancillary payments for gas injected above the market price are shown above in figure 3.

Figure 1.1: Prices by schedule (\$/GJ)

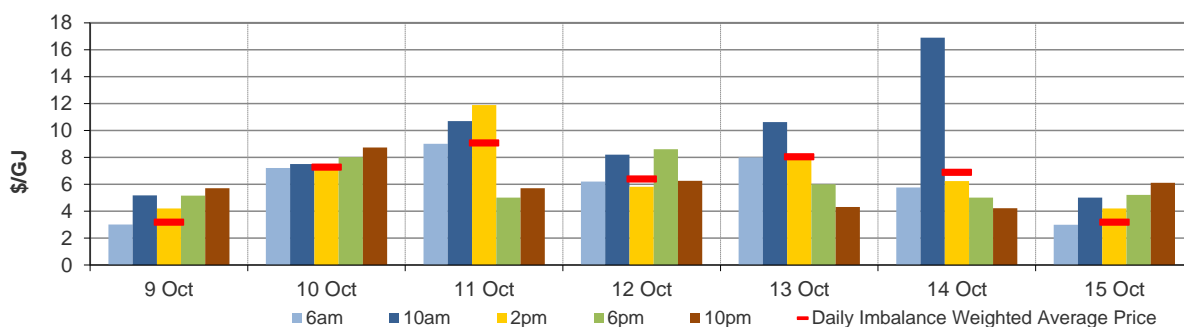
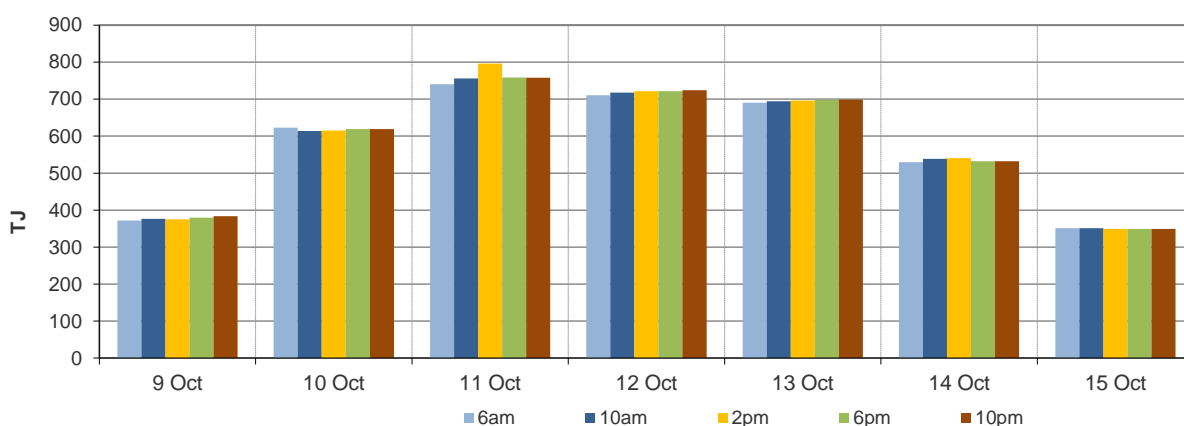


Figure 1.2: Demand forecasts (TJ)



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 (TJ)

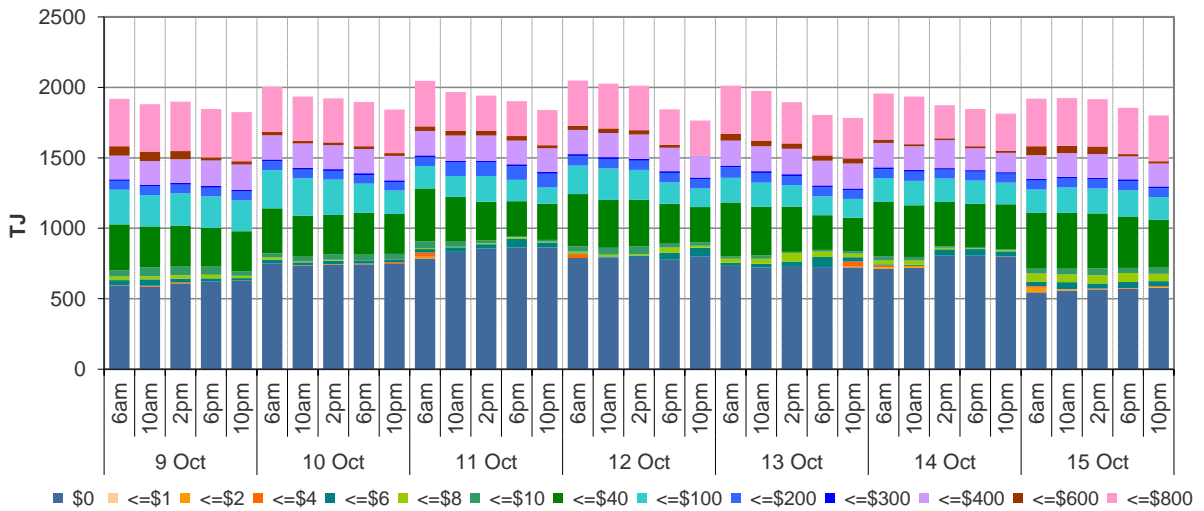


Figure 1.4: Withdrawal bids by price bands (TJ)

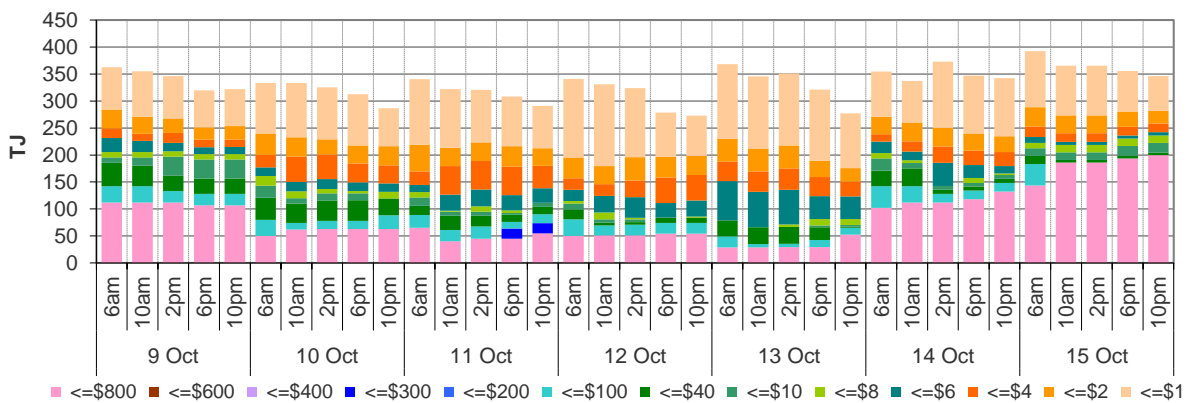
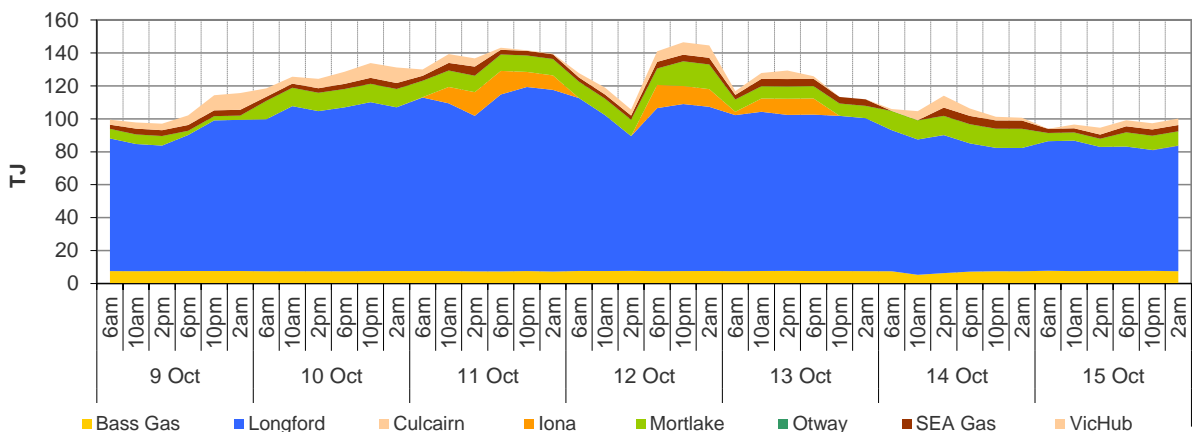


Figure 1.5: Metered Injections by System Injection Point (TJ)



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](#).

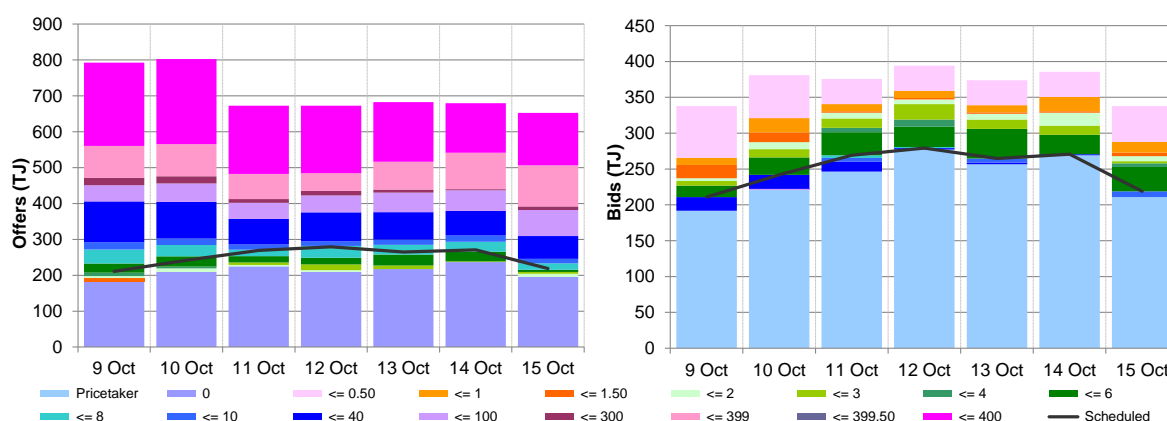
Market Operator Service balancing gas (MOS) payments arise because the amount of gas nominated on pipelines for delivery on a gas day will either exceed or fall short, by some amount, of the amount of gas consumed in the hub. In such circumstances, MOS payments are made to participants for providing 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)	5.75	5.80	7.50	7.48	6.97	6.35	6.35
Ex ante quantity (TJ)	211	242	269	279	265	271	219
Ex post price (\$/GJ)	5.75	5.77	6.97	6.42	6.43	5.85	6.97
Ex post quantity (TJ)	211	233	263	268	261	263	223

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)

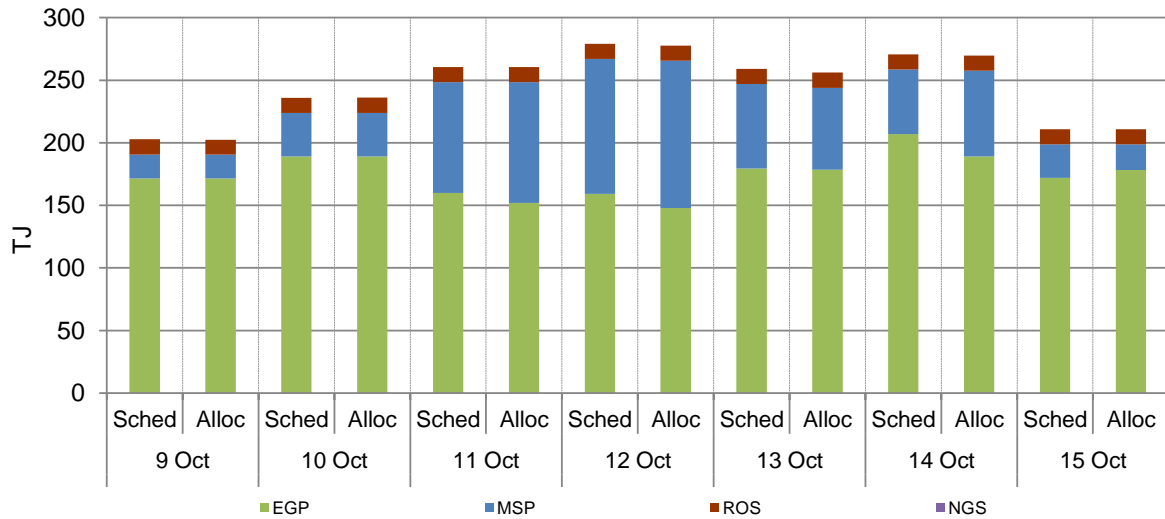
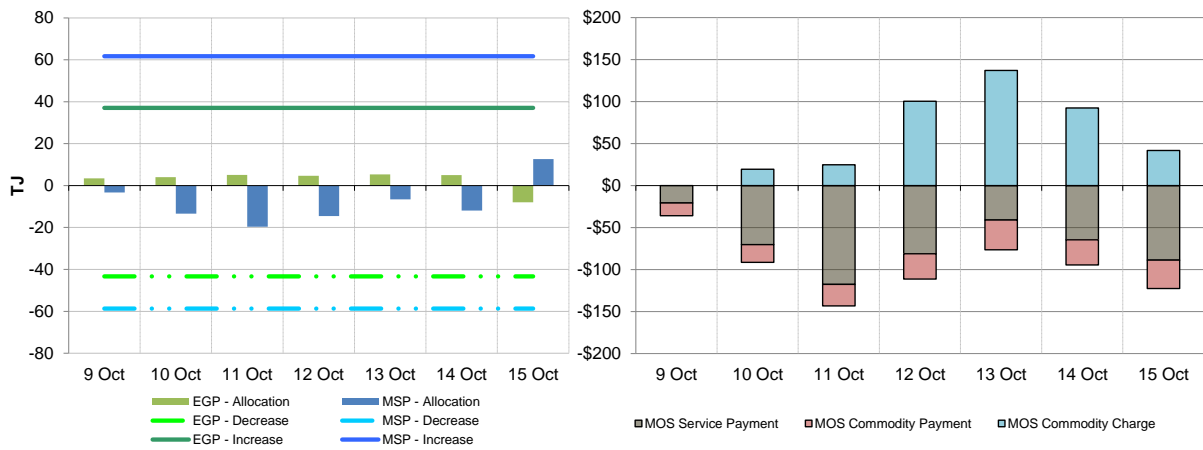


Figure 2.4: SYD MOS allocations (Tj), service payments and commodity payments/charges (\$000)¹⁰



¹⁰ The commodity cost of MOS illustrated on the right of the figure represents the commodity quantity at the D+2 ex ante price. Commodity payments and charges for a given gas day relate to quantities traded two days earlier. That is, the commodity cost for services provided on Sunday will appear in the chart for Tuesday, when the D+2 price is set. In contrast, service payments are shown alongside the day they occurred.

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)	5.60	5.77	6.20	8.00	6.90	6.90	6.13
Ex ante quantity (TJ)	40	68	65	65	61	56	45
Ex post price (\$/GJ)	6.00	5.77	6.03	8.00	6.05	6.05	6.25
Ex post quantity (TJ)	56	64	62	65	59	48	45

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

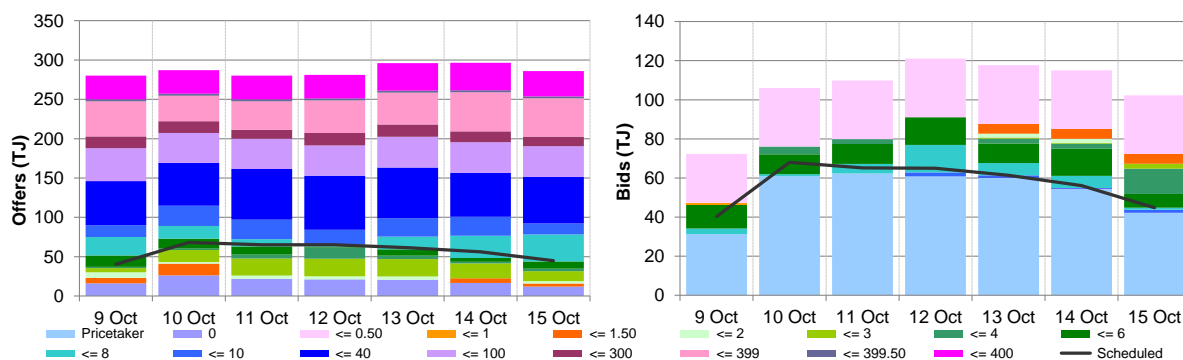


Figure 3.3: ADL net scheduled and allocated gas hub supply (excluding MOS)

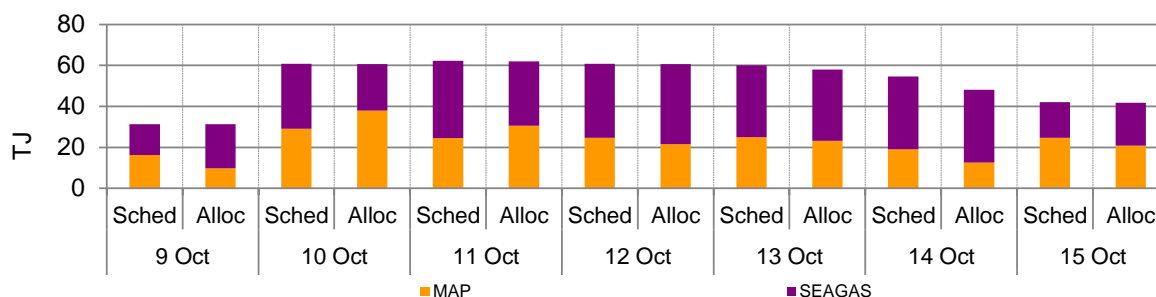
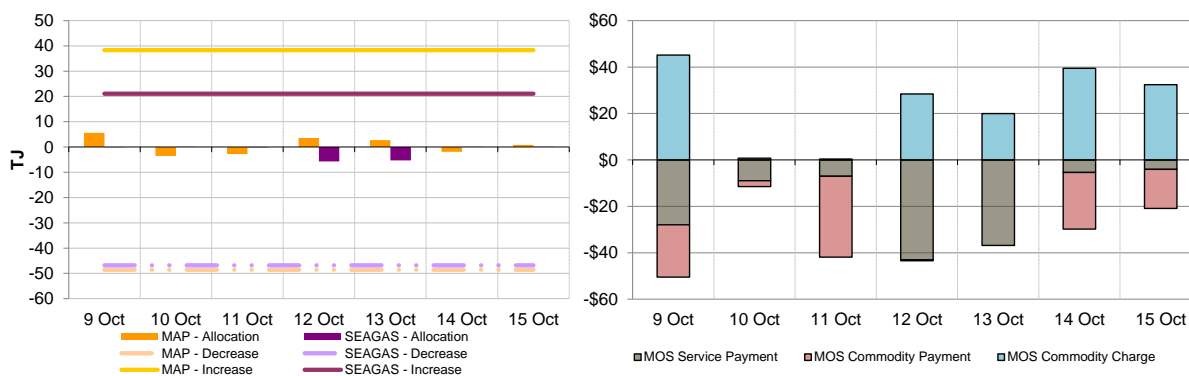


Figure 3.4: ADL MOS allocations (TJ), service payments and commodity payments/charges (\$000)



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)	5.75	6.37	6.39	6.39	5.99	6.01	5.75
Ex ante quantity (TJ)	52	67	76	76	76	69	54
Ex post price (\$/GJ)	6.38	7.37	6.39	5.74	5.78	5.78	5.75
Ex post quantity (TJ)	62	75	75	73	71	66	51

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

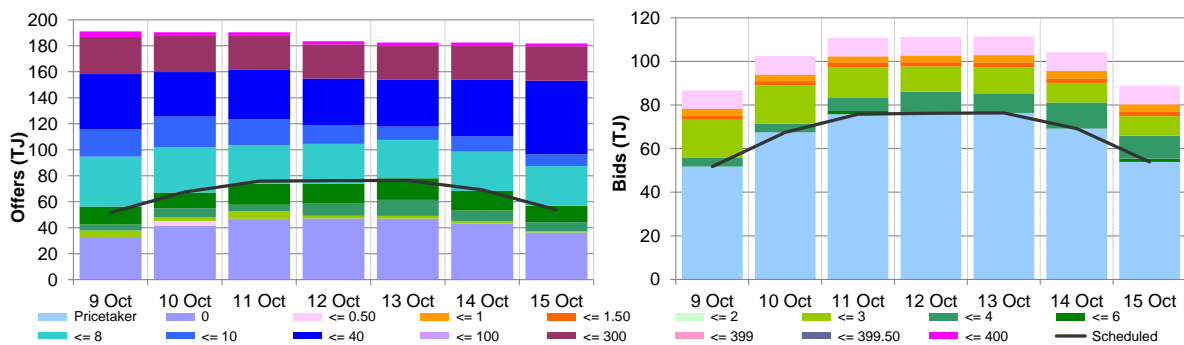


Figure 4.3: BRI net scheduled and allocated gas hub supply (excluding MOS)

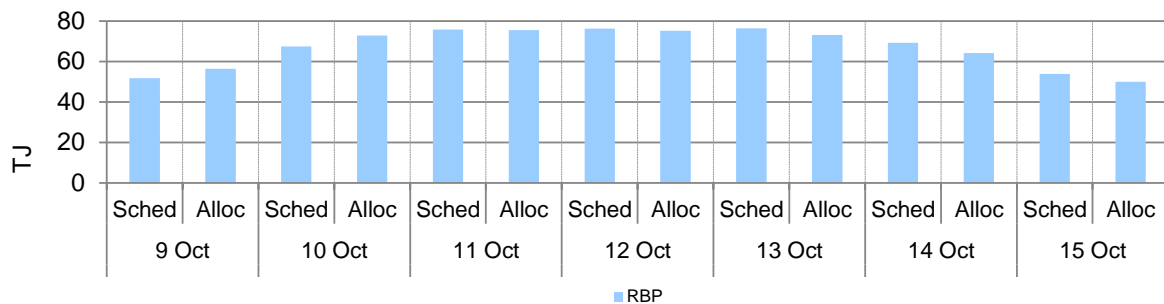
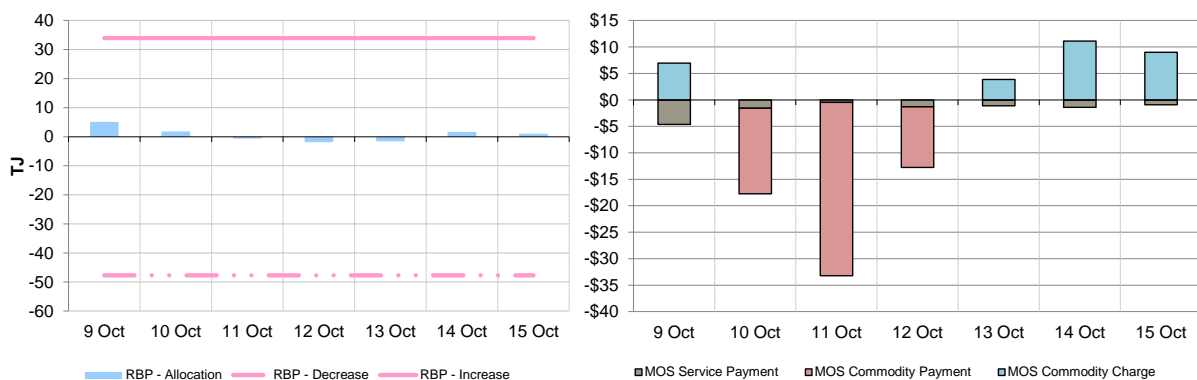


Figure 4.4: BRI MOS allocations (TJ), service payments and commodity payments/charges (\$000)



5. National Gas Bulletin Board

Figure 5.1 shows average daily actual flows for the current week¹¹ from the Bulletin Board (changes from the previous week's average are shown in brackets). Average daily prices¹² are provided for gas markets and gas supply hubs. Average daily quantities are provided for gas powered generation for each region.

Figure 5.1: Gas market data (\$/GJ, TJ); Production and Pipeline flows (TJ)¹³



¹¹ **Domestic gas flows** are calculated as the total of: **SA** = MAP + SEAGAS; **VIC** = SWP + LMP + (absolute quantity of negative flows only on the 'NSW-VIC interconnect'); **NSW/ACT** = EGP + MSP; **TAS** = TGP; **QLD (Brisbane)** = RBP; **QLD (Mt Isa)** = CGP; and **QLD (Gladstone)** = QGP.

Export gas flows are calculated as the total of: the APLNG pipeline; the GLNG pipeline; and the Wallumbilla to Gladstone pipeline.

GPG volumes may include gas usage that does not show up on Bulletin Board pipeline flows.

¹² GSH supply is the average daily volume of gas 'traded', while price is a volume weighted average.

¹³ Numbers for QSN Link, Port Campbell (Otway basin) and Gippsland (Eastern Victoria) have been adjusted to account for changes to Bulletin Board flows which came into effect from 6 October (see [gas report 2-8 October 2016](#)). Individual facilities are now required to report 'receipts' separate to 'deliveries', rather than net flows.

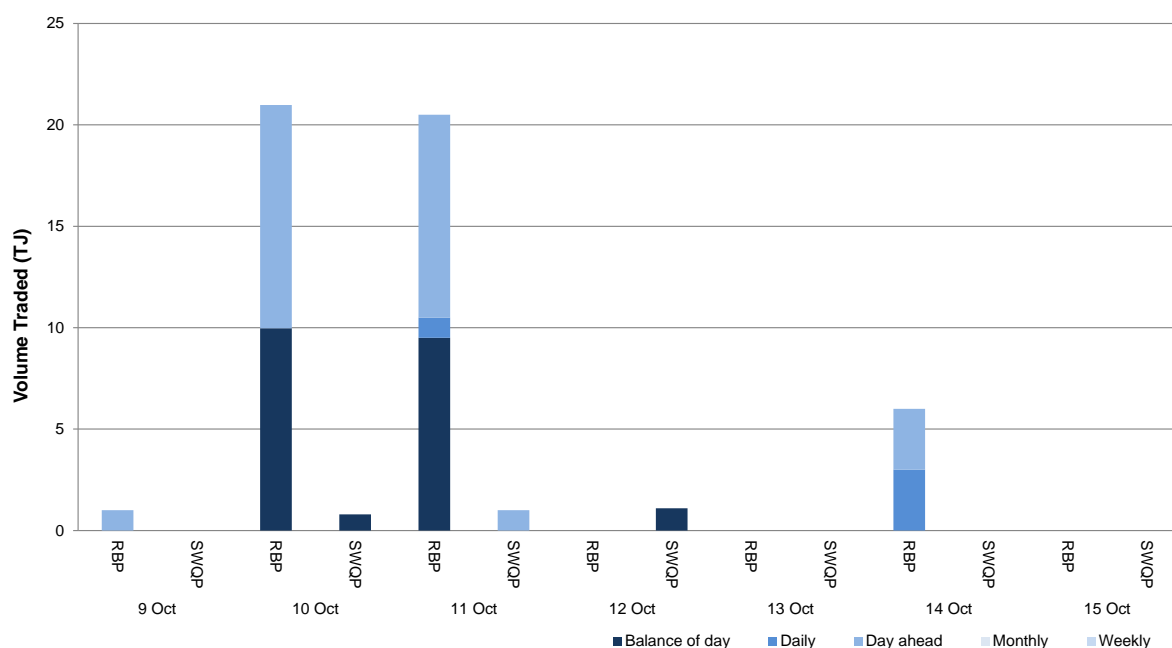
6. Gas Supply Hub

The Gas Supply Hub (**GSH**) was established in March 2014 for the trading of gas at Wallumbilla. The GSH is a voluntary market¹⁴ for the supply of gas traded¹⁵ between separate participants, with products listed for sale and purchase at delivery points on three major connecting pipelines at Wallumbilla – the **QGP**, the **SWQP** and the **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, weekly and monthly products). In June 2016, a new supply hub at Moomba was created to facilitate trade on the **MAP** and **MSP**, and also allow for trading between the Wallumbilla and Moomba markets on the SWQP through a spread product (representing the price differential between the two hubs).

This week in the Wallumbilla hub there were 12 trades for a total of 51.38 TJ at a volume weighted price of \$5.79/GJ. Trades on the RBP consisted of five day-ahead, two daily and two balance-of-day products (48.48 TJ at \$5.78/GJ), with one day-ahead and two balance-of-day products on the SWQP (2.9 TJ at \$6.01/GJ).

Figure 6.1 shows the quantity of gas traded by product type for each trading day on pipeline trading locations in the Wallumbilla and Moomba Gas Supply Hubs.

Figure 6.1: GSH traded quantities



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¹⁴ 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.

¹⁵ Volume weighted average prices and traded quantities provided in this report may include off-market trades, which are not included in AEMO's reference price calculations.