

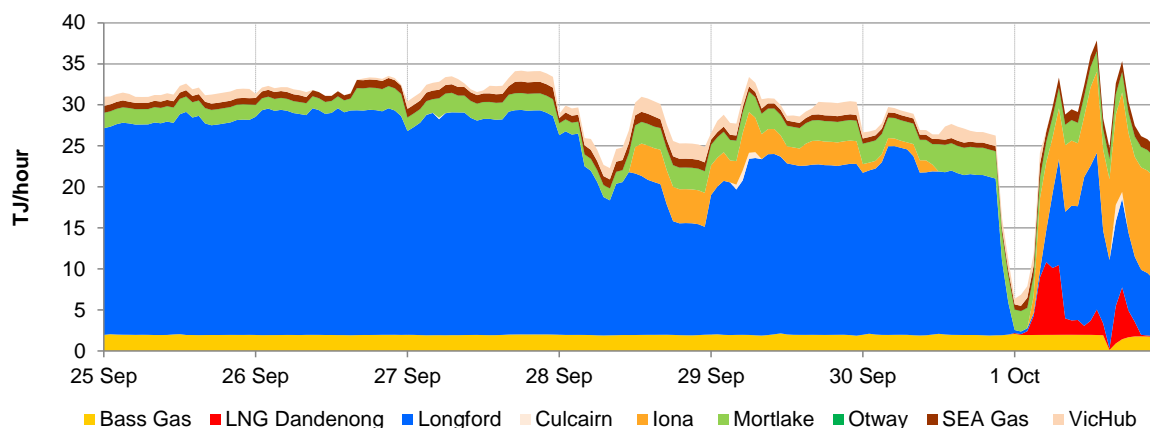
25 September – 1 October 2016

Weekly Summary

The market overview shows gas prices were higher this week in Victoria and the STTM compared to the previous week, however this did not equate to increased demand.

Longford’s capacity to inject into the Victorian market was constrained on 29 September. This was followed by an all plant power outage on the morning of 1 October that triggered an STTM Contingency Gas event for Sydney, as well as impacting the Victorian market with the facility’s flows reduced to zero into the declared transmission system (DTS) for several hours. As shown below the impact of the reduced supply from Longford into the Victorian market was a consequent increased supply from other sources.

Weekly Summary: Victorian Gas Market - Hourly metered injections by System Injection Point (TJ)*



* Hourly LNG injections are included (these are not generally displayed in figure 1.5, as outlined in the [user guide](#))

LNG injections from Dandenong into the market are shown in this figure. On this day 65 TJ of LNG was required across the day which is the largest quantity since 22 November 2008.

Figure 2.3 also shows that both days (29 September and 1 October) had reduced supply along the EGP from Victoria to Sydney and there were injections from the Newcastle Gas Storage Facility supply into the Sydney STTM.

There were further increases in MOS payments for the financial year to date in the Adelaide and Sydney STTM hubs. As stated in the prior report the AER continues to investigate the key drivers of higher MOS payments.

Gas used for GPG¹ was down on the previous week with the exception of SA with an increase in use against the wider NEM² decrease.

¹ Gas Powered Generation
² National Electricity Market

Market overview

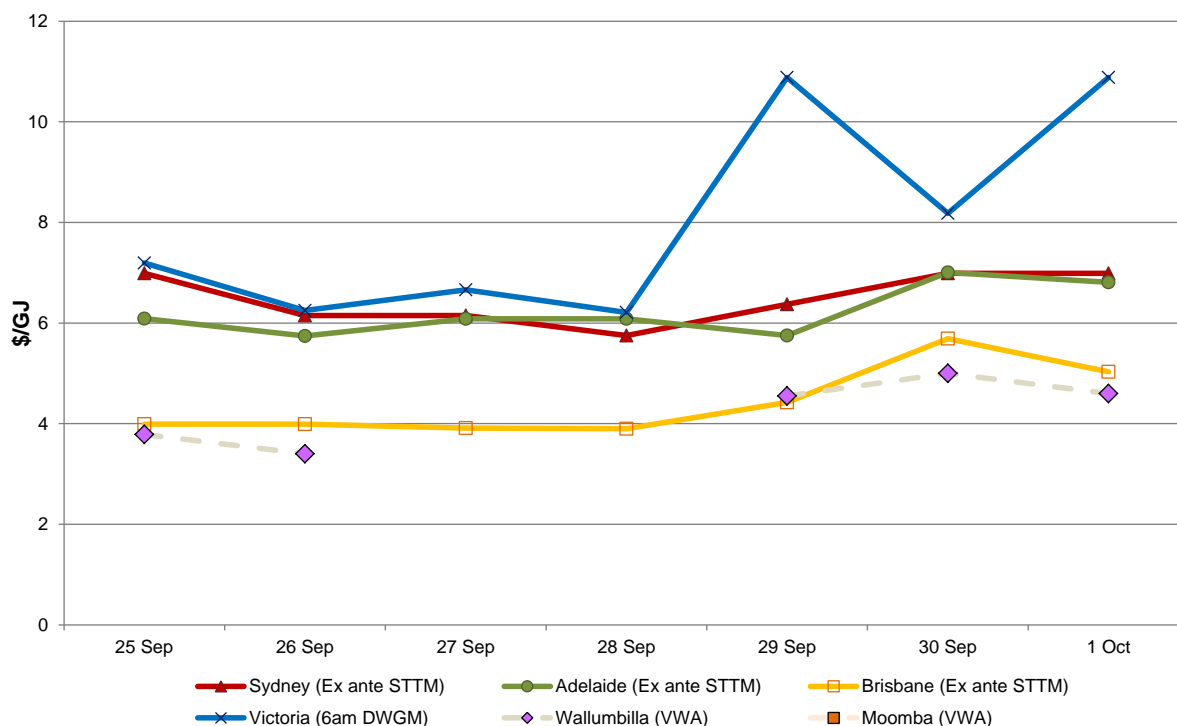
Figure 1 sets out the average daily prices (\$/GJ) for the current week, and demand levels, compared to historical averages. Regions shown include the Victorian Declared Wholesale Market (**VGM or Victorian gas market**) and for the Sydney (**SYD**), Adelaide (**ADL**) and Brisbane (**BRI**) Short Term 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)³

	Victoria		Sydney		Adelaide		Brisbane		Wallumbilla		Moomba	
	Price	Demand	Price	Demand	Price	Demand	Price	Demand	Price	Quantity	Price	Quantity
25 Sep - 01 Oct 2016	8.28	643	6.48	243	6.22	76	4.42	87	3.85	60	-	-
% change from previous week	35	-3	12	0	6	-1	8	1	18	-49	-	-
16-17 financial YTD	8.88	795	7.84	275	9.54	82	7.20	92	8.08	3957	-	-
% change from previous financial YTD	90	-10	55	1	68	-2	70	-4	107	47	-	-

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

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



³ 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 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
25 Sep - 01 Oct 2016	443.31	47.20	61.60	1.17
% change from previous week	-	-28	116	5
16-17 financial YTD	33.67	68.36	27.58	1.35
% change from previous financial YTD	-	163	109	-5

* 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.

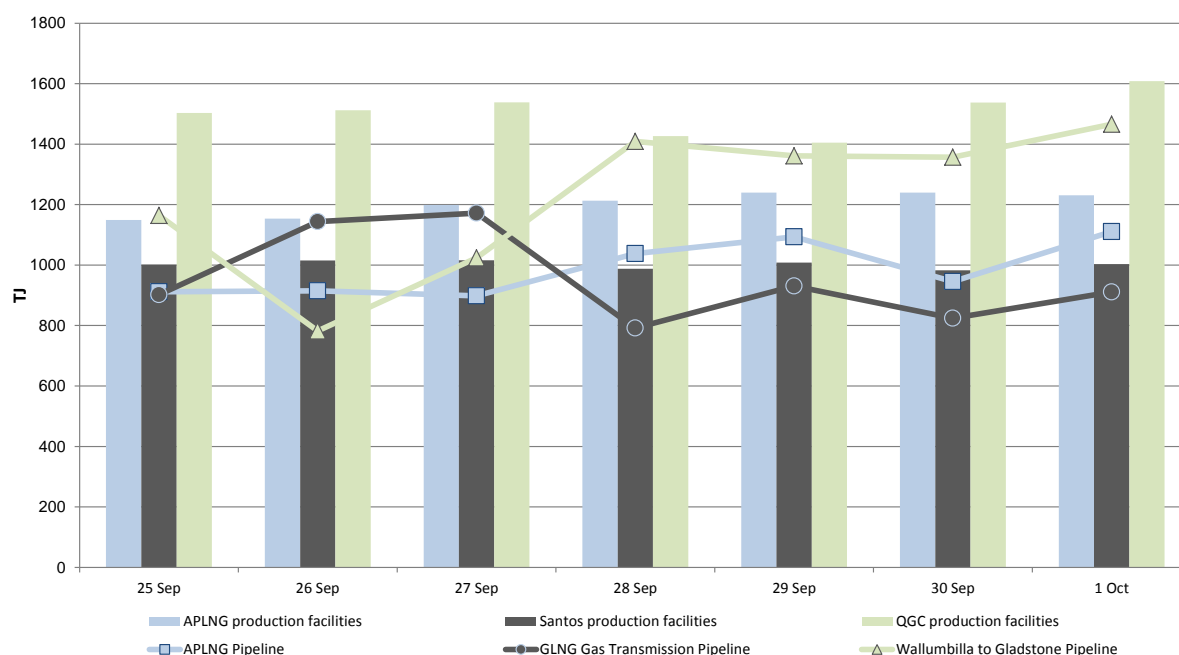
Figure 4: Gas supply hub products traded for the current week (\$/GJ, TJ)*

	RBP		SWQP		MAP		MSP		QGP	
	VWA price	Quantity	VWA price	Quantity	VWA price	Quantity	VWA price	Quantity	VWA price	Quantity
Balance of day	3.99	3.8	3.38	8.0	-	-	-	-	-	-
Daily	-	-	-	-	-	-	-	-	-	-
Day ahead	3.78	18.0	4.00	30.0	-	-	-	-	-	-
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

On Saturday 1 October, a significant price variation (SPV) trigger was exceeded in the Victorian gas market when the ancillary payment amount for the gas day exceeded \$250 000 (the ancillary payment amount for 1 October was \$3 103 145).

Under Rule 355 of the Gas Rules, the AER is required to identify and report on any significant price variations (SPVs) in the Victorian gas market. In accordance with the Gas Rules, we will publish a separate detailed report into the events leading to the significant price variation on 1 October.

The daily injection capacity at Longford Gas Plant had reduced from 28 September due to a reported gas leak at the facility, reducing their capacity to inject into the Victorian market down to 489 TJ/day on 29 September.⁴ Nominations on the Eastern Gas Pipeline reduced by 40 TJ⁵ on 28 September, and by 56 TJ⁶ on 29 September with Newcastle Gas Storage injecting 62.7 TJ.

The Longford plant tripped at 4.26 am due to a reported power outage on 1 October⁷, and an ad-hoc schedule was published at around 9 am to address a threat to system security. Approximately \$3.1 million in ancillary payments were generated across the market as gas was scheduled out of merit order including from Dandenong LNG. Subsequent scheduling intervals saw increased prices as gas was scheduled from alternative supply sources.

⁴ <http://www.gippslandtimes.com.au/story/4203138/longford-gas-plants-evacuated/>

AEMO DWGM Intervention Report – 1 October 2016,

<https://www.aemo.com.au/Gas/Declared-Wholesale-Gas-Market-DWGM/-/media/FE72B18E72A04D9DBCC25E9D31124AA8.ashx>

⁵ Reduction from 210.5 TJ in the ex ante schedule to 170.2 TJ in the ex post schedule for 28 September.

⁶ Reduction from 154 TJ in the ex ante schedule to 98.2 TJ in the ex post schedule for 29 September.

⁷ <http://www.gippslandtimes.com.au/story/4203138/longford-gas-plants-evacuated/>

Figure 1.1 shows schedule prices ranged between \$9.99/GJ and \$33.75/GJ over the gas day.

A Contingency Gas Trigger event also occurred for the Sydney STTM on 1 October. The Longford gas plant shut down also caused a potential supply shortfall in the Sydney hub (Longford supplies Sydney via the Eastern Gas Pipeline) which was resolved following industry conferences in part through participants' renominations on to the Moomba Sydney Pipeline and balancing gas (MOS). As a result, and also because Longford started producing greater volumes later in the day, contingency gas was not required.

The South Australia system black event in the electricity market on 28 September had an apparent notable impact on the Adelaide STTM with consistently high MOS requirements towards the end of the week. Figure 3.4 shows service costs ranged between \$78 500 and \$188 300 over three days.

On 28 September, the large net decrease MOS requirement in Adelaide was largely driven by over forecasting inside the hub, while further counteracting MOS requirements on the day may have been influenced by renominations to supply throughout the gas day. Around 1.6 TJ of gas supply scheduled on the MAP was shifted onto the SEAGas pipeline, likely to free up supply to gas generators sourcing gas from the MAP, which were dispatched above forecast levels in the electricity market.

On 29 September, under forecast demand was the main contributor to net increase MOS requirements, with pipeline renominations not appearing to amplify counteracting MOS allocations on the day. Over supply on 30 September reduced the MOS requirement which resulted from under forecasting.

In Sydney, MOS payments exceeded \$50 000 on two occasions. On 26 September, over forecast demand in the hub resulted in decrease MOS requirements and led to MOS costs of \$62 170. On 1 October, over supply drove significantly higher decrease requirements on the day, alongside just under 6 TJ of over forecast demand in the hub. MOS payments on the day reached \$186 281.

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 price⁸ which is the schedule at which most gas is traded.

The main drivers⁹ 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 forecasts¹⁰, 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)

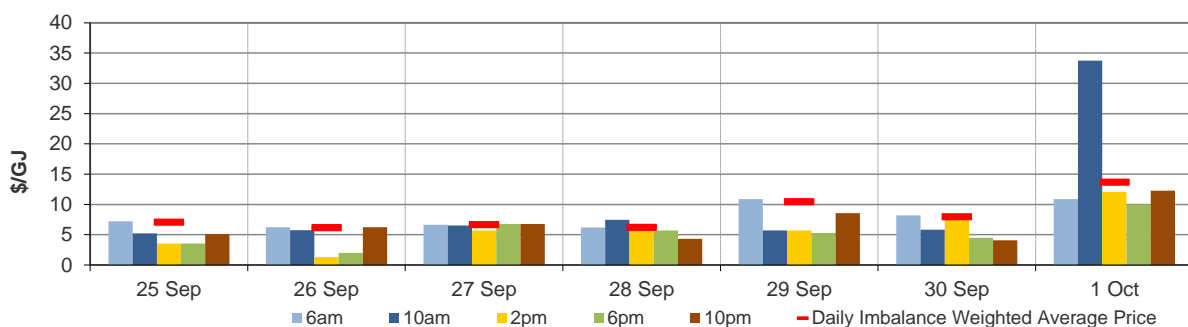
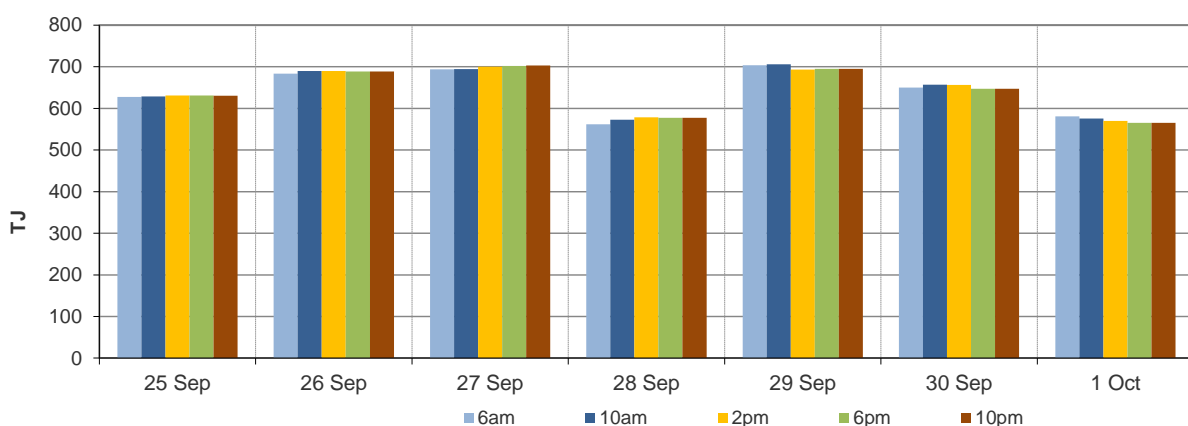


Figure 1.2: Demand forecasts (TJ)

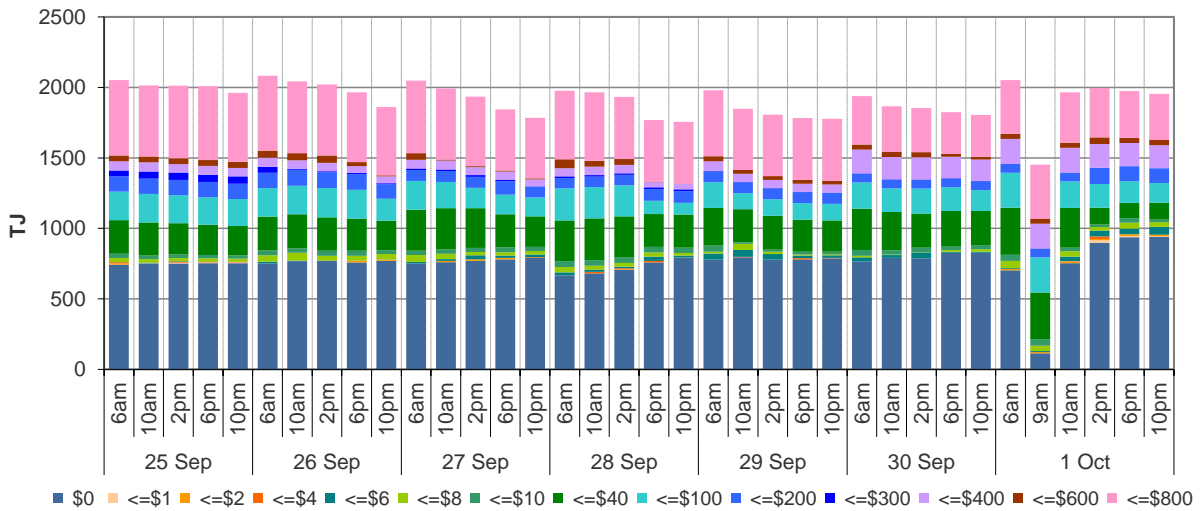


⁸ Prices for subsequent schedules are applied only to the differences in scheduled quantities (imbalances) to calculate the weighted price. The 6 am price applies to the entire scheduled quantity in the initial schedule.

⁹ 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.

¹⁰ 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)



Note that in figure 1.3, an additional schedule at 9 am has been included to demonstrate the offers available in the 6 am schedule with Longford injection bids removed. This reduction illustrates the change in the relative cost of gas offers at 6 am which contributed to large ancillary payments on the day. Out of merit order gas was also required to mitigate a threat to system security.

Figure 1.4: Withdrawal bids by price bands (TJ)

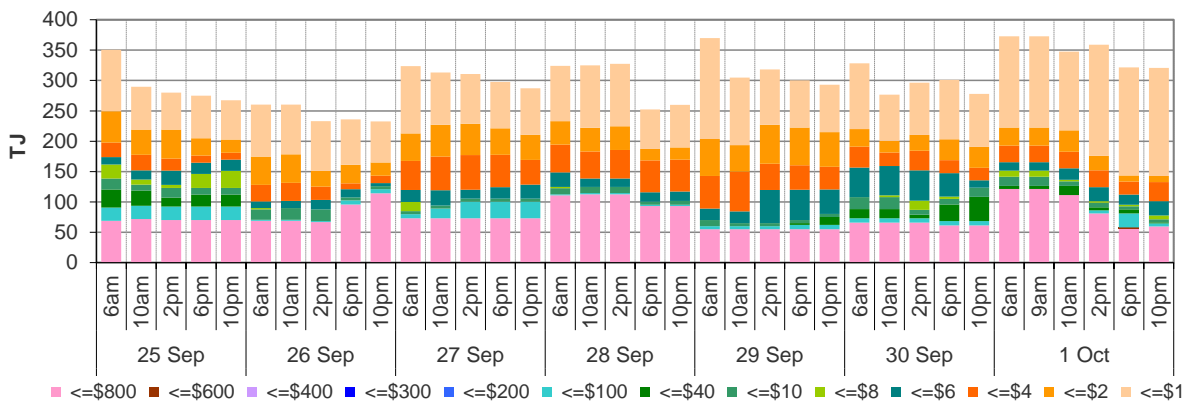
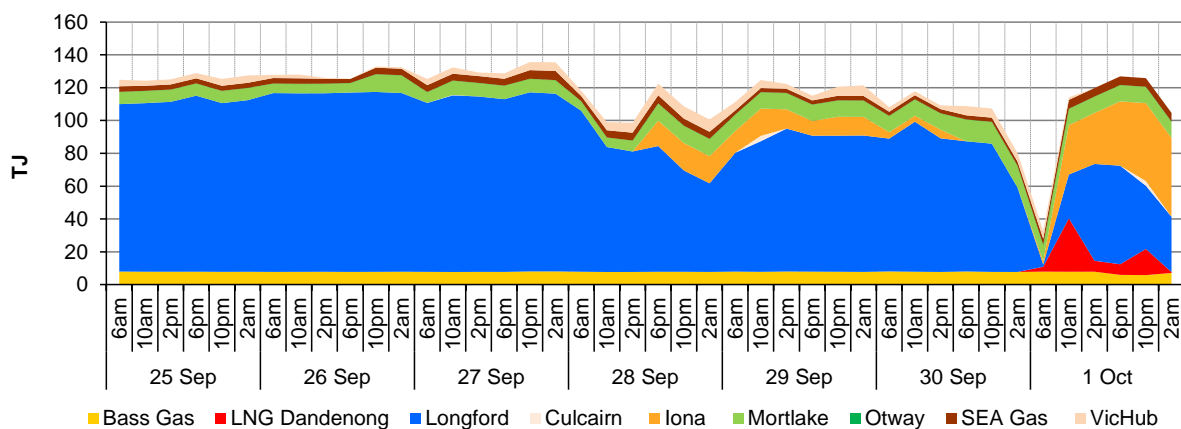


Figure 1.5: Metered Injections by System Injection Point (TJ)



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. This figure has been adjusted to include LNG injections.

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.¹¹ 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](#).

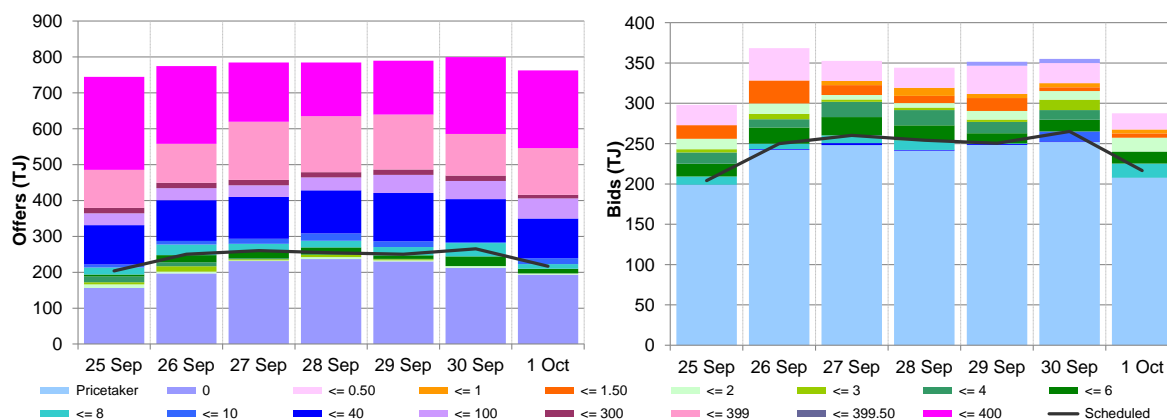
Market Operator Service balancing gas (MOS) payments arise because the amount of gas nominated on pipelines for delivery on a gas day will either exceed or fall short, by some amount, of the amount of gas consumed in the hub. In such circumstances, MOS payments are made to participants for providing a service to park gas on a pipeline or to loan gas from a pipeline to the hub.¹²

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)	6.99	6.15	6.15	5.75	6.37	6.99	6.99
Ex ante quantity (TJ)	204	250	260	254	250	265	217
Ex post price (\$/GJ)	6.99	5.75	6.15	4.04	6.00	6.01	6.37
Ex post quantity (TJ)	206	238	258	240	246	253	208

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



¹¹ 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.

¹² 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)

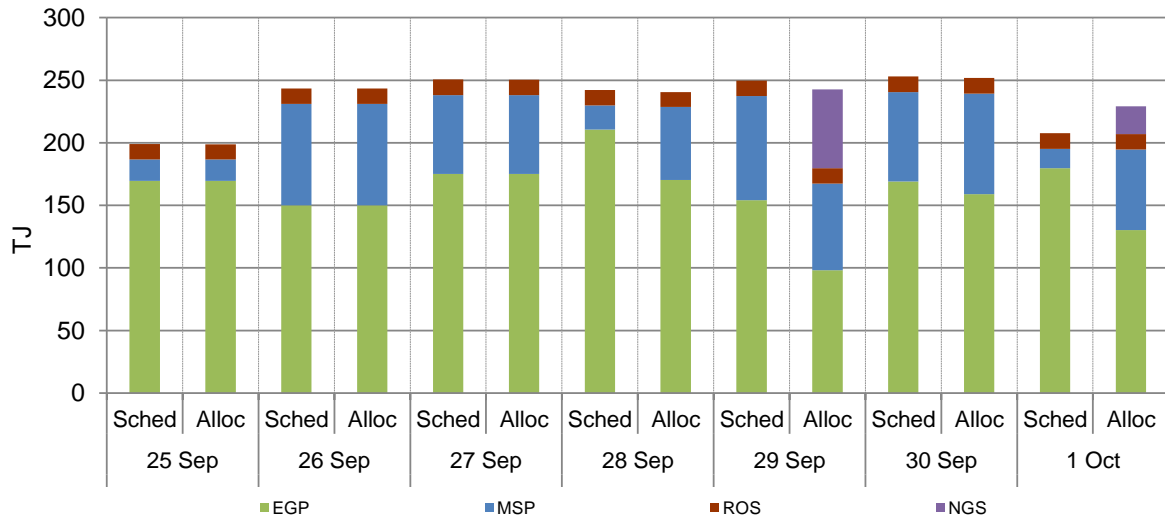
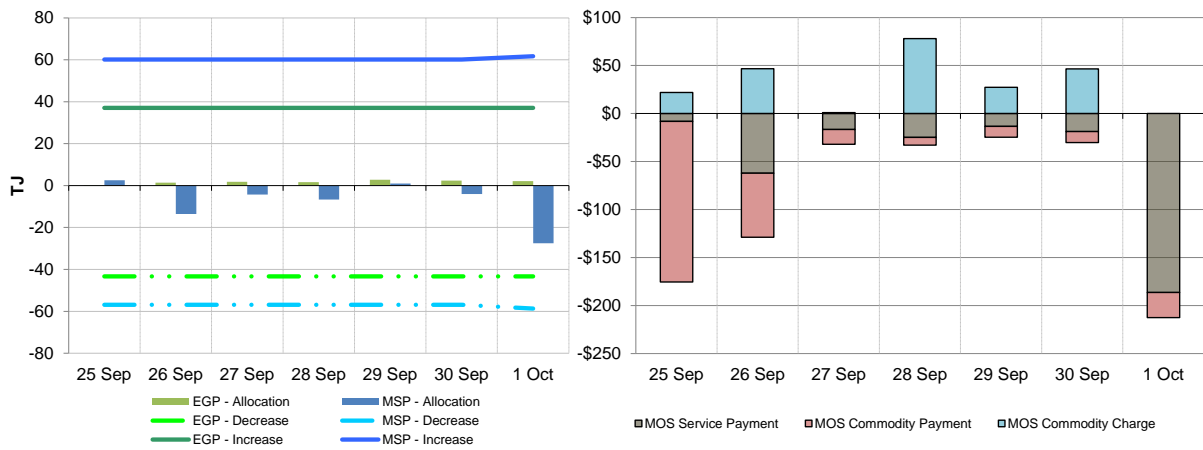


Figure 2.4: SYD MOS allocations (Tj), service payments and commodity payments/charges (\$000)¹³



¹³ 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)	6.09	5.74	6.08	6.08	5.75	7.00	6.81
Ex ante quantity (TJ)	68	81	80	78	87	81	55
Ex post price (\$/GJ)	6.09	5.75	5.75	3.44	5.75	7.84	7.19
Ex post quantity (TJ)	71	82	76	61	91	89	62

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

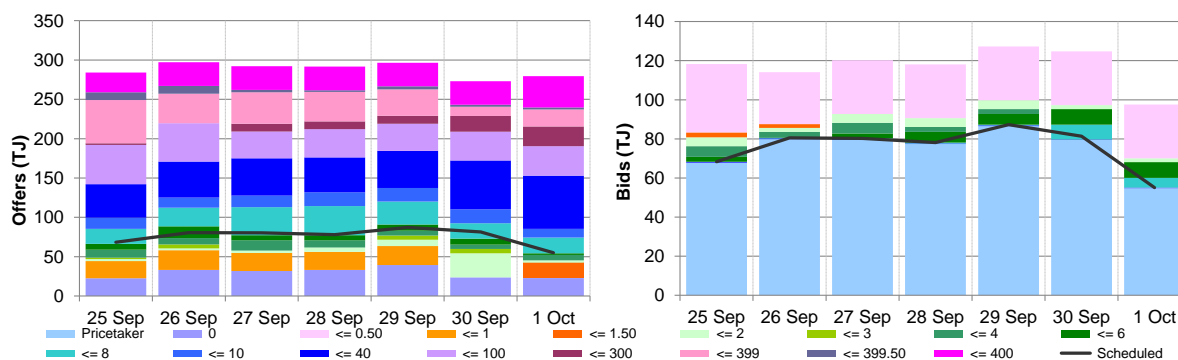


Figure 3.3: ADL net scheduled and allocated gas hub supply (excluding MOS)

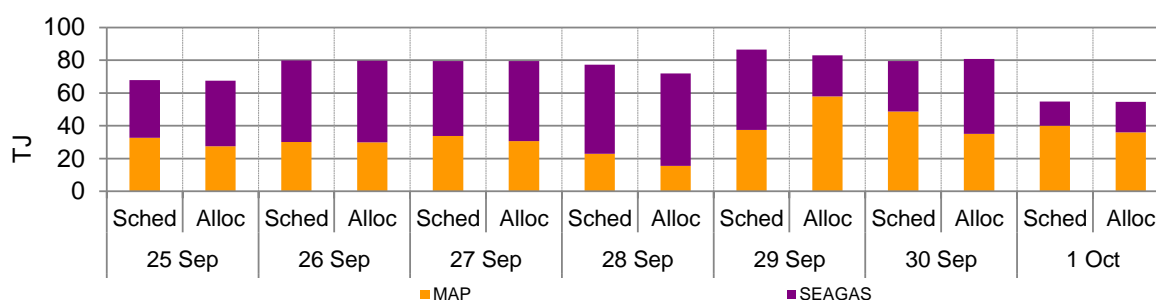
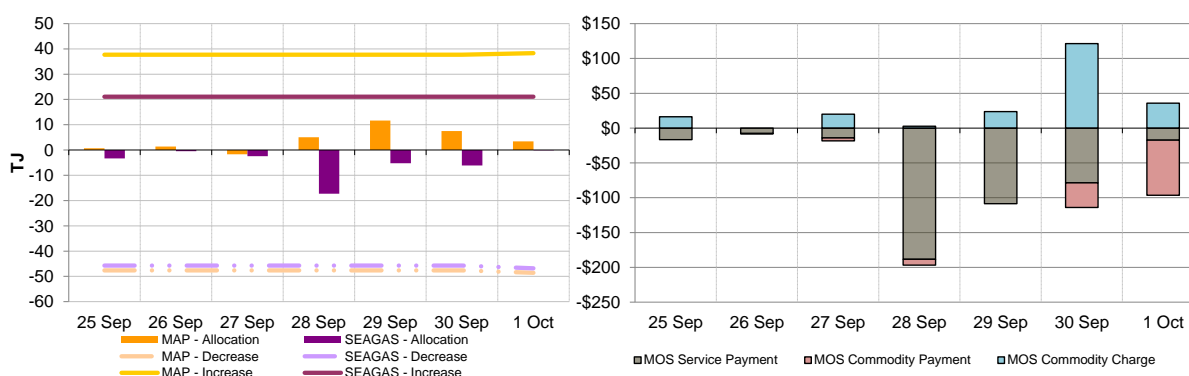


Figure 3.4: ADL MOS allocations (TJ), service payments and commodity payments/charges (\$000)



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)	3.99	3.99	3.91	3.90	4.43	5.69	5.03
Ex ante quantity (TJ)	75	92	94	92	92	87	74
Ex post price (\$/GJ)	4.45	3.99	3.40	3.05	4.99	5.69	5.03
Ex post quantity (TJ)	78	92	90	90	94	88	75

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

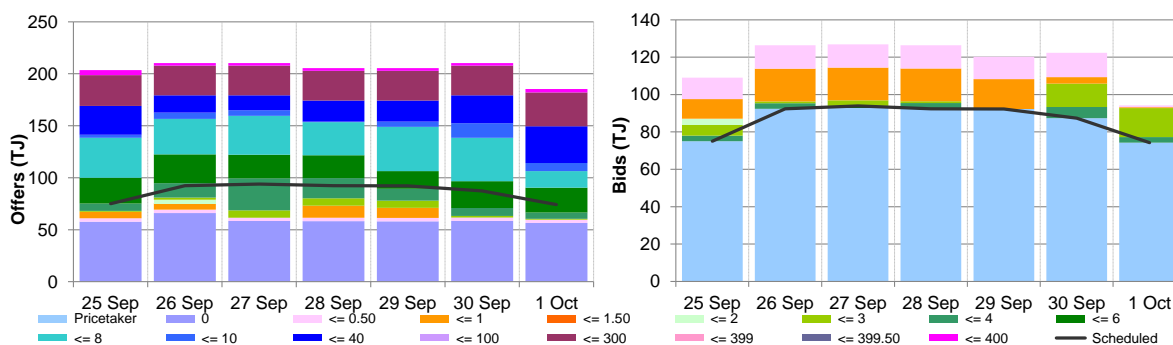


Figure 4.3: BRI net scheduled and allocated gas hub supply (excluding MOS)

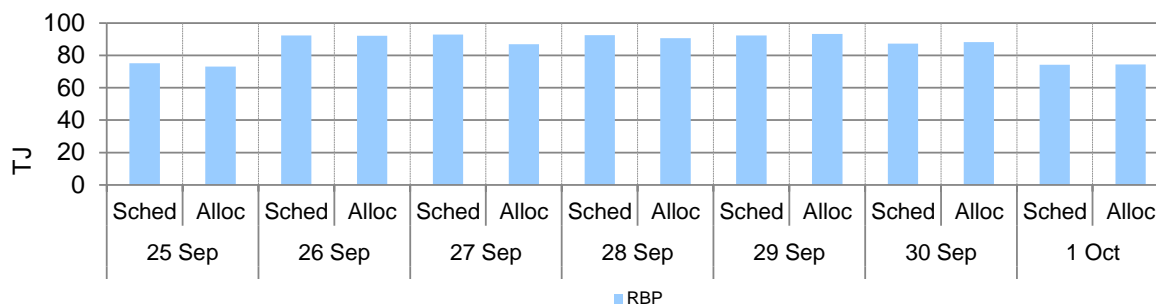
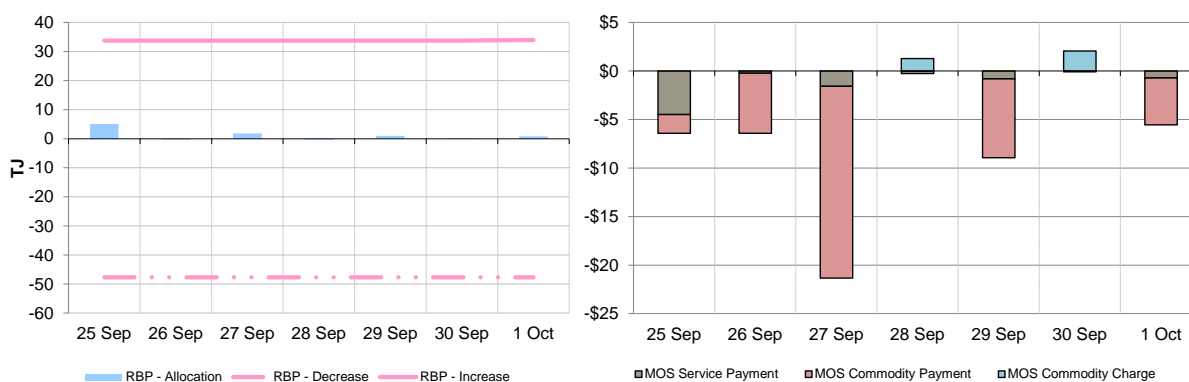


Figure 4.4: BRI MOS allocations (TJ), service payments and commodity payments/charges (\$000)



5. National Gas Bulletin Board

Figure 5.1 shows average daily actual flows for the current week¹⁴ from the Bulletin Board (changes from the previous week's average are shown in brackets). Average daily prices¹⁵ 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)



¹⁴ **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.

¹⁵ **GPG volumes** may include gas usage that does not show up on Bulletin Board pipeline flows. GSH supply is the average daily volume of gas 'traded', while price is a volume weighted average.

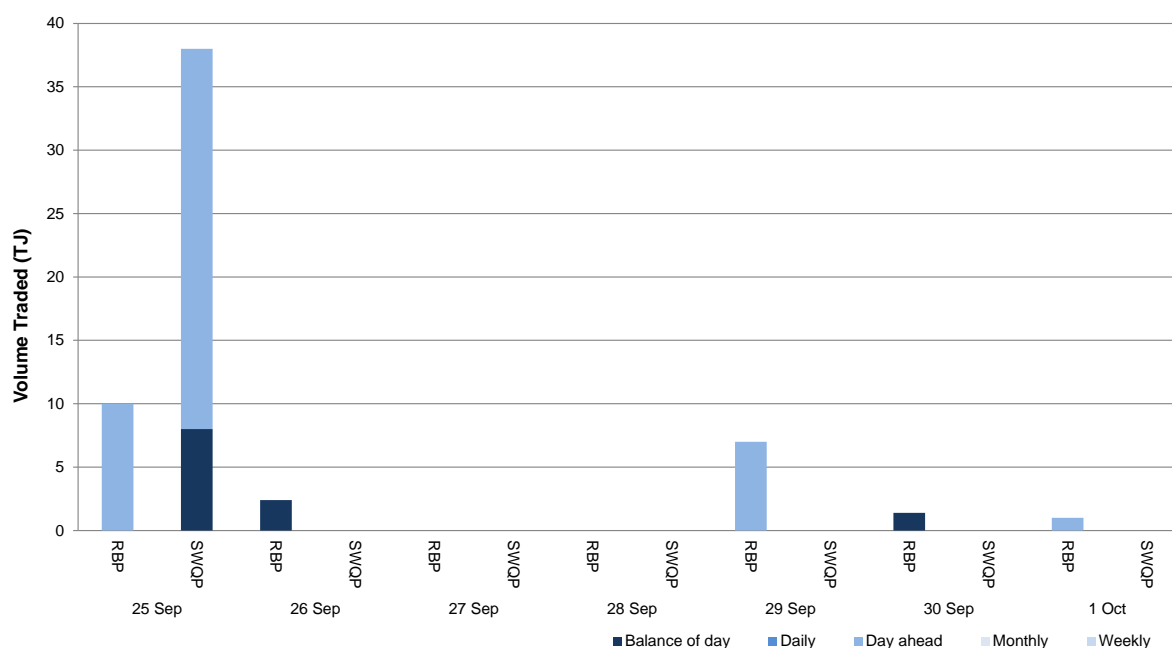
6. Gas Supply Hub

The Gas Supply Hub (**GSH**) was established in March 2014 for the trading of gas at Wallumbilla. The GSH is a voluntary market¹⁶ for the supply of gas traded¹⁷ 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).

There were 9 trades this week for 59.8 TJ of gas at a volume weighted price of \$3.85/GJ in the Wallumbilla hub. Trades on the RBP consisted of four day-ahead and two balance-of-day products (21.8 TJ at \$3.81/GJ), with one day-ahead and two balance-of-day products on the SWQP (38 TJ at \$3.87/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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¹⁶ 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.

¹⁷ 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.