

17 - 23 January 2016

Weekly summary

Figure 1.1 on page 6 shows that some schedule prices in Victoria fell to zero on Wednesday 20 January. Our analysis shows that this was caused by rebidding late in the day. Hot weather in South Australia saw high levels of gas demand for gas powered generation driving high prices in the Adelaide hub. Average prices in Brisbane and Sydney were lower than the previous week.

Long term statistics and explanatory material

The AER has published an <u>explanatory note</u> to assist with interpreting the data presented in its weekly gas market reports. The AER also publish a range of <u>longer term statistics</u> 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.

Region	Victoria	Sydney	Adelaide	Brisbane
17 Jan - 23 Jan 2016	4.54	4.36	7.22	4.83
% change from previous week	11	-10	5	-18
15-16 financial YTD	4.40	4.64	5.20	3.86
% change from previous financial YTD	26	45	45	75

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

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

The weighted average daily imbalance price applies for Victoria.

Figure 2: Victorian Gas Market

	Price (\$/GJ)	Ancillary payments (\$000)*	BOD forecast demand quantity (TJ)
17 Jan - 23 Jan 2016	4.54	-	319
% change from previous week	11	-	-7
15-16 financial YTD	4.40	-	596
% change from previous financial YTD	26	-	7

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

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)
17 Jan - 23 Jan 2016	4.36	3.52	81.37	216	208
% change from previous week	-10	-5	-53	-12	-7
15-16 financial YTD	4.64	4.32	31.62	239	233
% change from previous financial YTD	45	33	130	-5	-8

Figure 4: Adelaide STTM

	Ex ante price (\$/GJ)	Ex post price (\$/GJ)	MOS payments (\$000)	Ex ante quantity (TJ)	Ex post quantity (TJ)
17 Jan - 23 Jan 2016	7.22	7.45	9.99	44	45
% change from previous week	5	12	140	-2	7
15-16 financial YTD	5.20	5.32	8.75	64	65
% change from previous financial YTD	45	50	-33	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)
17 Jan - 23 Jan 2016	4.83	5.11	2.23	81	83
% change from previous week	-18	-21	-20	2	1
15-16 financial YTD	3.86	3.86	1.60	88	88
% change from previous financial YTD	75	89	10	-40	-40

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 (GPG) in Adelaide and counteracting MOS

The completion of compressor maintenance saw the linepack capacity adequacy (LCA) flag on the Bulletin Board for the SEAGas pipeline change back to green from amber this week.

Figure 6 shows the association between recent high temperatures, demand for gas for GPG and high hub prices in Adelaide. With temperatures around 36 degrees for several consecutive days, the price reached \$9.99/GJ on 21 January.

Our analysis shows that renominations to supply, and back haul on the Moomba to Adelaide Pipeline, potentially contributed to counteracting MOS in the Adelaide hub on 19 and 21 January. This can be observed in figures 3.3 and 3.4 on page 10, in the changes to net pipeline proportions, and positive and negative allocation quantities in the respective figures.



Figure 6: Gas powered generation, gas prices and temperature in Adelaide

Gas flows to Tasmania

Following the loss of the Basslink interconnector on 20 December 2015, Tasmania has been isolated from the rest of the National Electricity Market (NEM). Basslink is expected to be repaired sometime in March.

The loss of the Basslink interconnector, combined with low water reserves placing a constraint on hydro generation (the major source of generation), has seen the need for Hydro Tasmania to bring their Tamar Valley combined cycle gas generator back into service.² As a result, flows on the Tasmanian Gas Pipeline have reached their highest level since October 2010. Figure 7 shows flows on the pipeline have increased to around 80 TJ/day following the generator coming online from 19 January. Before the loss of Basslink flows were around 20 TJ/day or lower.



Figure 7: Gas powered generation, and pipeline flows for Tasmania

Newcastle Gas Storage (NGS)

On 20 January, AGL scheduled gas from its NGS facility in Sydney. This is only the 4th time the facility has supplied gas to the hub since it began operation in June 2015.

Large decrease MOS requirement and significant price variation in Sydney on 23 January

Figure 2.4 shows there was a significant decrease MOS requirement on the Eastern Gas Pipeline (EGP) for the 23 January gas day. The decrease requirement was the result of demand in the hub being over forecast by 18.6 TJ - decrease MOS allocations were supplied entirely on the EGP. MOS decrease payments reached \$470 935, exceeding our significant price variation (SPV) reporting threshold of \$250 000.³ As required by the Gas Rules, we will be writing a report on the SPV event.

Preliminary analysis shows that while the majority of decrease MOS requirements in the hub are usually supplied on the Moomba to Sydney Pipeline (MSP), events on the day led to zero MOS deliveries on the MSP for the first time since market start. Injections on the EGP generally have priority over MSP supply as the EGP is a flow-controlled pipeline. The MSP is a pressure-controlled pipeline and usually absorbs decrease MOS when less gas is required to meet demand in the hub.

Figure 2.3 shows that zero net deliveries to the hub were scheduled on the MSP, with the entire 22.1 TJ of scheduled forward haul supply offset by back haul scheduled through the market. This led to zero nominations being received by APA to flow gas through the Wilton Custody Transfer Point (CTP) into the Jemena distribution network. Additional supply was scheduled on the MSP through the Pipeline Flow Direction Constraint (PFDC) mechanism. This mechanism allows additional forward haul on a pipeline to be scheduled which can economically supply gas to match backhaul bids on the same pipeline. The PFDC price was \$1.64/GJ.

² The Tamar Valley 208 MW gas turbine was mothballed in August 2015 and has not generated since June 2014.

³ <u>http://www.aer.gov.au/wholesale-markets/market-guidelines/significant-price-variations-in-the-sttm-reporting-triggers</u>

The low quantity of decrease MOS offers for the EGP meant the demand error had to be met by overrun MOS (priced at \$49.50/GJ). Overrun MOS quantities are residual pipeline deviations allocated when the quantity of a given service in the monthly MOS offer stack has been exhausted. These are allocated to separate underlying contracts for gas delivery, outside of the trading rights for MOS held by participants.



17 – 23 January 2016

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 price⁴ which is the schedule at which most gas is traded.

The main drivers⁵ 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 forecasts⁶, 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

⁴ 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.

⁵ 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.

⁶ 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









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.⁷ 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 <u>user guide</u>.

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.⁸

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.

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	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Ex ante price (\$/GJ)	4.01	4.25	4.65	4.01	5.19	4.90	3.50
Ex ante quantity (TJ)	187	223	221	218	234	231	195
Ex post price (\$/GJ)	3.54	3.54	3.99	3.70	5.19	4.70	0.02
Ex post quantity (TJ)	175	216	216	213	235	224	176

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



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

⁷ 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.

⁸ 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)





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)	5.01	6.99	8.00	7.49	9.99	6.70	6.36
Ex ante quantity (TJ)	37	45	46	47	48	46	37
Ex post price (\$/GJ)	5.10	7.28	9.41	7.50	9.99	6.48	6.36
Ex post quantity (TJ)	38	51	50	49	49	43	37













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)	4.25	5.00	4.81	5.00	5.00	5.00	4.75
Ex ante quantity (TJ)	69	86	83	85	87	86	72
Ex post price (\$/GJ)	5.94	5.00	5.00	5.06	5.00	5.00	4.74
Ex post quantity (TJ)	74	89	89	89	88	83	71













5. National Gas Bulletin Board

Figure 5.1 shows average daily actual flows for the current week⁹ from the Bulletin Board (changes from the previous week's average are shown in brackets). Average daily scheduled volumes and prices¹⁰ are provided for gas markets and gas powered generation for each region.





⁹ 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. Roma included export LNG production from October 2014 and LNG pipeline flows are shown from October 2015.

¹⁰ 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 market¹¹ 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 7 products traded this week at a volume weighted price of \$5.07/GJ, 21.7 TJ was traded on the RBP at \$5/GJ and 55 TJ on the SWQP at \$5.10/GJ. There was one weekly product traded this week.

Figure 6.1 shows volumes traded¹² on each gas day and trading day for the current week.



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

¹¹ 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.

¹² Volumes shown for weekly products include the 'daily' volume for each relevant 'gas day', and the 'weekly' volume for each relevant 'trading day'.