Gas market significant price variation report

Sydney STTM, 13 & 23 January 2016

23 May 2016

AUSTRALIAN ENERGY REGULATOR

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1 Background

This report details two significant price variations that occurred in the Sydney gas short term trading market **(Sydney STTM – or Sydney hub)** in January 2016.[1]

1.1 The AER's reporting obligation

Rule 498(3)(b) of the National Gas Rules **(NGR)** requires the AER to publish a report setting out any significant price variations (SPV).

In 2012 the AER published a guideline that sets out what constitutes an SPV in the STTM.[2] The guideline provides five different reporting thresholds, one of which is when market operator service **(MOS)** service payments exceed $250 000.[3]

On the 13 and 23 January gas days in the Sydney hub, the MOS service payments reached $586 003 and $470 935 respectively, exceeding the $250 000 threshold.

1.2 Market operator service (MOS)

MOS, also known as balancing gas, is required to manage everyday pipeline deviations.[4] A pipeline deviation occurs when there is a difference between the total quantity of gas nominated by the pipeline's shippers (typically gas retailers) and the quantity of gas physically delivered. There are two kinds of pipeline deviations; positive (when more gas is delivered) and negative (when less gas is delivered).

When actual gas flows are higher than final nominations, the difference is allocated as increase MOS. When actual gas flows are lower than final nominations, the difference is allocated as decrease MOS.

In Sydney, there are two pipelines that can provide MOS; the Eastern Gas pipeline **(EGP)** and the Moomba to Sydney pipeline **(MSP)**.

AEMO publishes, amongst other things, an estimate of the maximum quantities of increase and decrease MOS likely to be required for a given gas day.

Participants are requested to provide MOS offers on a monthly basis which specify the:

- type of MOS (increase or decrease)
- price (up to $50/GJ)
- quantity
- transmission pipeline

1 Adelaide and Brisbane also have short term trading markets.

2 Rule 498(2) of the NGR

3 There are two kinds of payments which relate to MOS; service payments (which cover the cost of providing the service) and commodity payments (which cover the cost of the actual gas). This report relates to MOS service payments.

4 MOS, and pipeline deviations, are explained further in the appendix.

When MOS is required, the offers are allocated in merit order (i.e. from lowest price to highest price) until the required quantity is met.

If an increase MOS offer is used, gas is moved from the transmission pipeline to the STTM hub. If a decrease MOS offer is used, gas is stored on the transmission pipeline (instead of flowing to the STTM hub).

If the quantity of required MOS exceeds the amount of offers, overrun MOS provides the excess. The occurrence of overrun MOS is relatively rare as there is usually sufficient MOS offers available.[5]

On 13 and 23 January, however, overrun MOS was required. There were a number of unique aspects about each gas day which influenced the large MOS requirements.

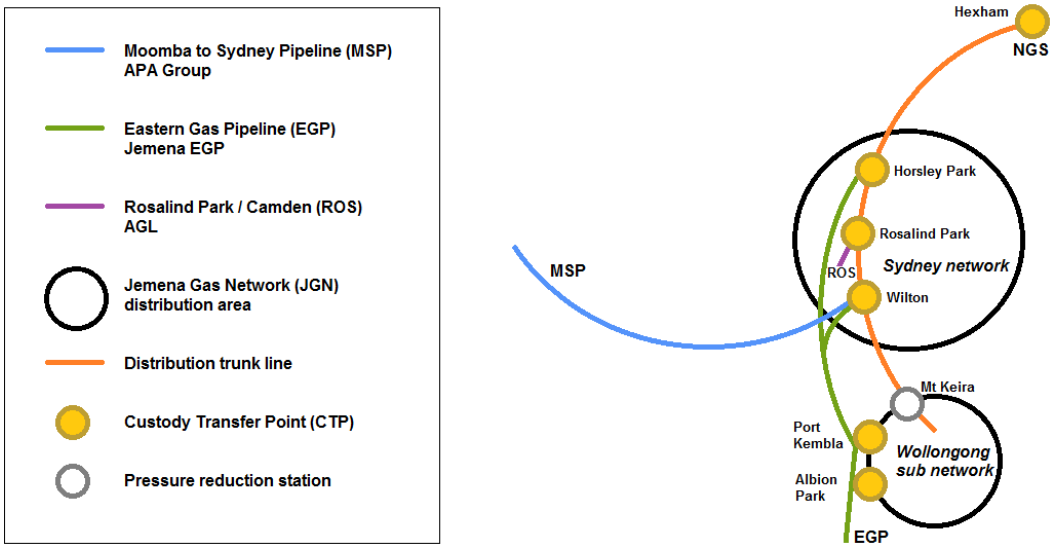
1.3 The Sydney hub

Figure 1 illustrates the connection points of the Sydney hub.

There are two pipelines that can provide MOS to Sydney; the EGP and the MSP.

Sydney also sources gas from the Rosalind Park/Camden facility **(ROS)** and the Newcastle gas storage facility **(NGS)**.

Figure 1: The Sydney hub



The Sydney hub has experienced a number of significant changes recently:

- In September 2015, construction was completed to allow bi-directional flow of gas on the MSP (which enables it to flow gas towards Moomba instead of only towards Sydney).

5 Overrun is priced at the highest priced MOS price step in the applicable MOS stack when the requirement is greater than AEMO's estimate. When the requirement is less than AEMO's estimate, overrun is priced at the weighted average cost of the service (capped at MOS cost cap of $50/GJ) determined by the cost of MOS in the stack.

- The Wilton connection point, previously only connected to the MSP, is now also connected to the EGP.
- The EGP has been connected directly into the MSP. We understand one of the reasons for this investment was to enable more gas flows towards Moomba.
- A trend for the majority of demand to be supplied from the EGP, with the MSP more frequently having low (or sometimes zero) net flows into Sydney. This limits the ability of the MSP to provide decrease MOS.[6]
- The commissioning of the Newcastle gas storage facility.[7]

6 A pipeline's net flow to a hub cannot be less than 0 TJ. This means a pipeline's capacity to provide decrease MOS cannot exceed its flow to the hub. If the MSP is already supplying 0 TJ to the Sydney hub, it cannot provide decrease MOS.

7 The Newcastle LNG facility was built to support peak demand and provide emergency supply to the Sydney STTM up to around 120 TJ/d. The facility has only been used on a small number of occasions to date, and only provided a small quantity of gas on one day during the month (20 January).

2 Summary

This section provides a summary of the two gas days and the main factors which led to the large MOS service payments.

2.1 The 13 January gas day

On 13 January 2016, 41.1 TJ of MOS was required, which resulted in MOS service payments of $586 003.

The total MOS quantity was made up of 40.4 TJ of decrease MOS on the MSP and 679 GJ of increase MOS on the EGP.

The main factors which led to the large MOS service payments were:

- participants over forecasting demand
- disproportionate renominations between the MSP and the EGP

Large over forecast of demand

Participants will usually instruct pipelines to deliver a quantity of gas to meet their forecast level of demand. However, as demand was lower on the day than forecast, the quantities of gas participants instructed the pipelines to deliver were higher than necessary. This contributed to over 25 TJ of gas being stored on the MSP as decrease MOS.

Disproportionate renominations on the two pipelines

At the beginning of the day, the EGP was scheduled to deliver 198.4 TJ to the Sydney hub.

At 2.30 pm, a compressor on the EGP tripped. The EGP estimated this would reduce the amount of gas it could deliver to Sydney by around 30 TJ.

To alleviate the estimated supply short fall, participants voluntarily increased supply from the MSP by 26.8 TJ. However, flows on the EGP were only reduced by 11.8 TJ. The effect of these two renominations was a net increase of flow to the hub of 15 TJ.

This contributed to a further quantity of decrease MOS being parked on the MSP, of around 15 TJ.

2.2 The 23 January gas day

On 23 January 2016, 18.7 TJ of decrease MOS on the EGP was required, which resulted in MOS service payments of $470 935.

The main factors which led to the large MOS service payments were:

- participants over forecasting demand
- the MSP had 0 TJ net flow to the hub which meant only the EGP could provide decrease MOS

Large over forecast of demand

As demand was lower on the day than forecast, the quantity of gas nominated on the EGP by participants was higher than necessary.

This ultimately caused the MOS requirement. It resulted in 18.7 TJ of gas being stored on the EGP as decrease MOS.

The EGP provided all of the decrease MOS

The majority of low priced gas offers to supply the Sydney hub were offered on the EGP. The scheduling of backhaul gas (away from the hub) on the MSP resulted in 0 TJ of net flow to the hub.

This meant decrease MOS could only be supplied by the EGP.

However, there was a relatively low quantity of decrease MOS offers on the EGP overall, which resulted in high priced MOS offers being used. This contributed to the overall MOS service payment being comparable to the payment on 13 January, despite the quantity being much lower.

2.3 Demand over forecasting in Sydney

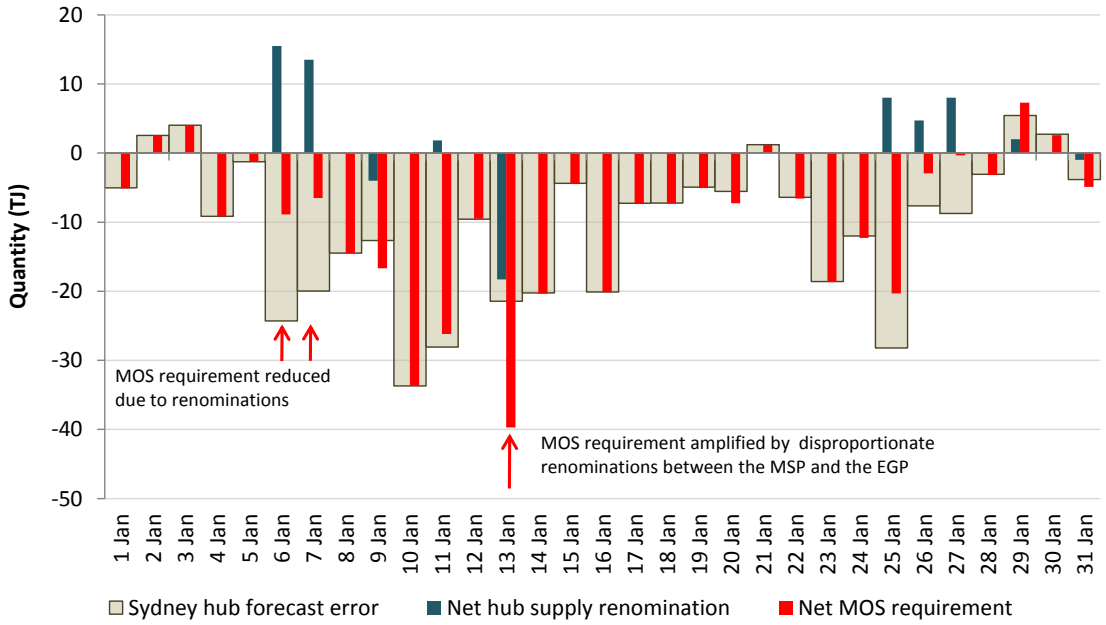
Participants over forecast demand on both the 13 and 23 January gas days.

However further analysis shows the over forecasting of demand was not limited to these two gas days.

Figure 2 below shows that aggregate demand was over forecast by at least 10 TJ on 12 occasions across the month of January. This was the main driver of the large quantities of decrease MOS required.[8]

[8] Over 2015 the average requirement for decrease MOS in Sydney was 6.4 TJ compared to a net decrease requirement of 12 TJ over January 2016 (only counting days where there were net decrease requirements).

Figure 2: Hub forecasting errors and supply renominations



* **Sydney hub forecast error –** The forecast error is the difference between actual and forecast demand in the Sydney hub (actual minus forecast) and represents the quantity of increase (positive) or decrease (negative) MOS that would potentially be required to balance the deviation.

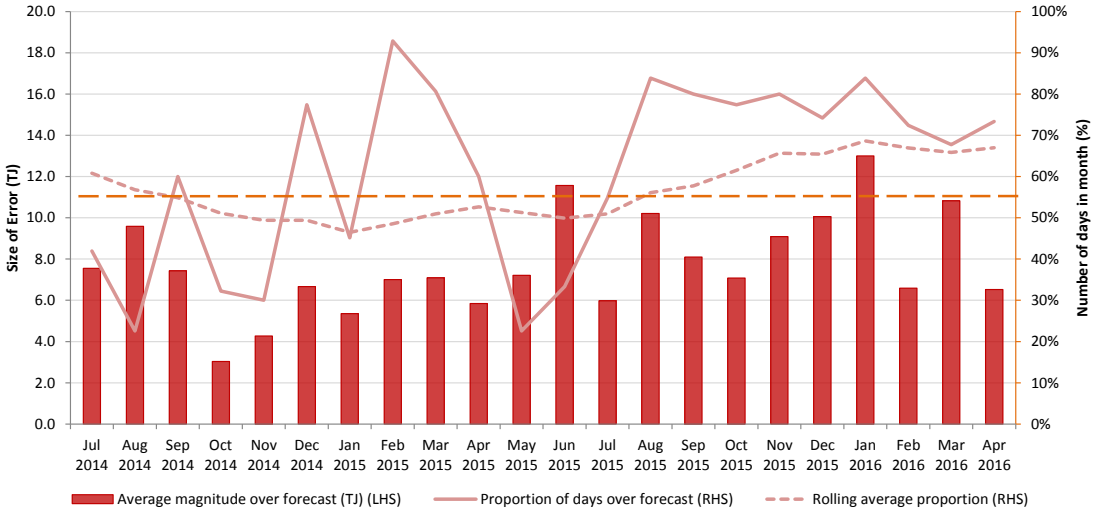
** **Net hub supply renominations –** Changes to supply nominations (forward haul minus back haul) are shown as negative numbers. That is, an additional 1 TJ of gas supplied to the hub will show as -1 TJ, representing the influence this would have on the (decrease) MOS requirement.

*** **Net MOS requirement –** The net MOS requirement (increase MOS minus decrease MOS) is equivalent to the difference between:

- the forecast demand error inside the hub; and
- the changes made to the net hub supply (forward haul minus back haul).

Figure 3 indicates demand has been over forecast in Sydney on around 70–80 per cent of the gas days in each month since August 2015 (the solid line).[9]

Figure 3: Hub forecasting performance metric (since July 2014)



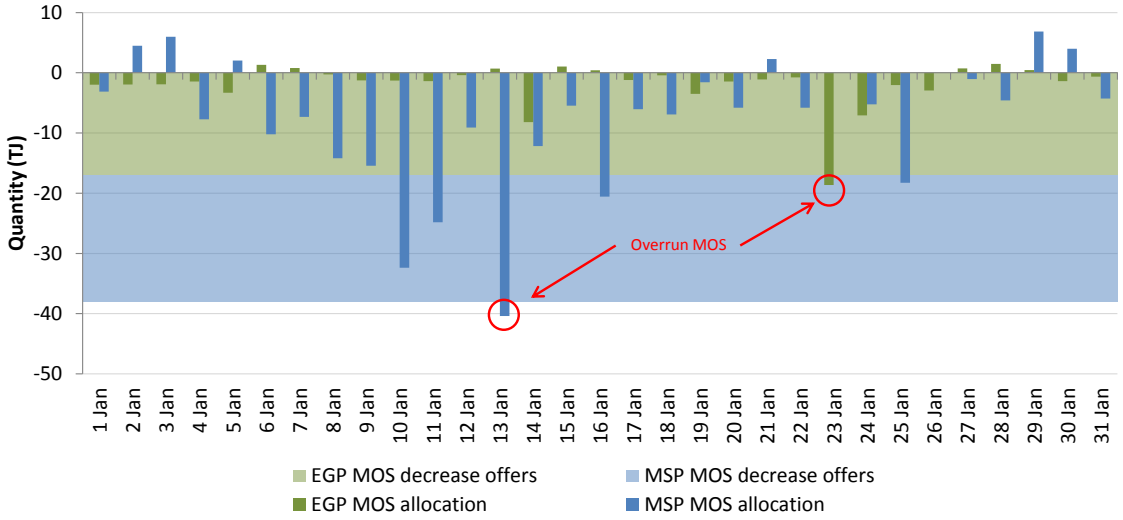
9 This chart was first reported in the AER's April–June 2014 Quarterly Compliance Report: https://www.aer.gov.au/wholesale-markets/compliance-reporting/quarterly-compliance-report-april-june-2014

Figure 4 shows the MOS requirements in Sydney and the quantity of decrease MOS offers available in January 2016. The gas days circled are the 13 and 23 January gas days – the subjects of this report.

The figure also illustrates a number of larger than average MOS requirements which occurred on other days throughout the month. The average quantity of decrease MOS allocated on gas days in 2015 on the MSP was 6.8 TJ, while the average decrease requirement on the EGP was 2.1 TJ. This compares to 10.5 TJ on the MSP and 2.8 TJ on the EGP for the month of January 2016.

Section 3 of this report also notes the market response which addresses higher MOS requirements on the EGP.

Figure 4: Sydney MOS requirements over January 2016



We are concerned by the frequency of demand over forecasting. This may be indicative of a bias in forecasting by one or more participants. This report demonstrates inaccurate demand forecasting can result in significant costs to the market.

We will conduct further analysis into this issue at an individual participant level and will pursue any compliance concerns that arise. Noting that, we have already commented on some instances of over forecasting by Origin in January and reported on the causes.[10]

[10] See the AER's January–March 2016 Quarterly Compliance Report: https://www.aer.gov.au/wholesale-markets/compliance-reporting/quarterly-compliance-report-january-march-2016

3 Analysis

This section provides a more detailed explanation of the 13 and 23 January gas days.

3.1 The 13 January gas day

On 13 January 2016, 41.1 TJ of MOS was required, which resulted in MOS service payments of $586 003. This is significantly higher than the average cost for MOS services in Sydney of around $28 000 for the 2015–16 financial year to date.[11]

The total MOS quantity was made up of 40.4 TJ of decrease MOS on the MSP and 679 GJ of increase MOS on the EGP.

With only 38 TJ of gas offered in the decrease MOS stack for January on the MSP, the remaining requirement was allocated as overrun MOS. The overrun MOS allocation was priced at the maximum available MOS price in the offer stack ($49.99/GJ), contributing to $119 726 of the total cost for MOS services on the gas day.

The main factors which led to the large MOS service payments were:

- participants over forecasting demand
- disproportionate renominations on the MSP and EGP

3.1.1 Participants over forecasting demand

The Gas Rules provide that participants must submit offers and bids to AEMO in good faith that reflect their best estimate.[12] AEMO schedules these bids and offers to maximise the value of the bids less the value of the offers subject to a number of considerations such as the physical capabilities of the network.[13] Participants make nominations to the relevant pipelines after taking into account AEMO's schedule. A participant must not make a nomination for the purpose of creating or increasing a pipeline deviation for which MOS may be required.[14]

Demand is influenced by many different factors, some of which have a high level of variability. Because of this, it is not possible to forecast demand with 100 per cent accuracy all of the time. All gas days will have inaccurate demand forecasts to some extent, usually by a small amount relative to overall consumption.

However, on 13 January, actual demand was significantly lower than forecast. Accordingly, the quantity of gas participants nominated on the pipelines to deliver was higher than necessary. This over forecasting contributed to over 25 TJ of gas being stored on the MSP as decrease MOS.

11 2015–16 FYTD average calculated at 30 April 2016
12 Rule 410(1) of the NGR
13 Rule 405(1) of the NGR
14 Rule 399(6) of the NGR

3.1.2 Disproportionate renominations on pipelines

The majority of gas to supply the Sydney hub was scheduled on the EGP (over 198 TJ of net supply, compared to just under 40 TJ on the MSP).

At 2.30 pm, the EGP's midline compressor at Mila failed. Technicians tried to resolve the problem; however the pressure at the Horsley Park connection point continued to fall.

At 5.30 pm, the EGP notified AEMO to declare a contingency gas **(CG)** trigger event.[15]

At 7.30 pm, at the first assessment conference, the EGP estimated there would be a shortfall of 30 TJ to the Sydney hub. The conference identified that if participants renominated supply to Sydney from the EGP to the MSP this may alleviate the estimated supply shortfall and the potential need to schedule CG.

However, participants did not renominate the same quantity from the EGP to the MSP.

On the EGP, participants reduced nominations by 11.8 TJ (of the estimated 30 TJ). On the MSP, participants increased nominations by 26.8 TJ. This resulted in a net increase of gas flow to the hub of 15 TJ.

The actual supply shortfall was a lot less than EGP's estimate as overnight deliveries at other connection points reduced and ambient temperatures fell (assisting the efficacy of compression). This contributed to a further quantity of decrease MOS being parked on the MSP, of around 15 TJ.

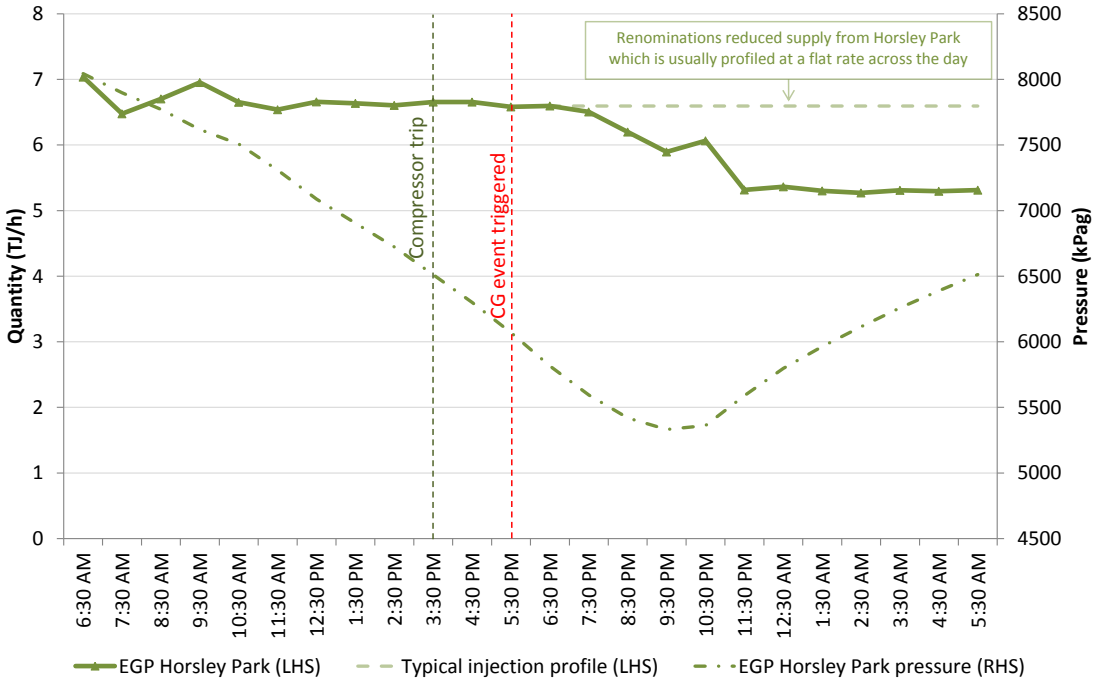
AEMO's report on the CG trigger event notes that if participants matched the renominations on the EGP with the MSP, the total MOS requirement would have only related to the overall demand forecast by participants at an estimated cost of $160 361.

Figure 5 shows the reduction in deliveries through Horsley Park across the gas day.[16] Flows and pressure levels are shown for Horsley Park (EGP) and Wilton (MSP) custody transfer points.

15 AEMO has prepared a report detailing the CG trigger event. It is available here: http://www.aemo.com.au/Gas/Market-Operations/Short-Term-Trading-Market/STTM-Notices. We have used information from AEMO's report when preparing this SPV report.

16 Jemena advised that once minimum delivery pressures at Horsley Park were reached, gas flow would stop to hold minimum pressure and instigate an increase in flows on the MSP. Delivery issues on the EGP were resolved on the following day and there was no contingency gas requirement.

Figure 5: Hourly pressure and flow levels on the Eastern Gas Pipeline at Horsley Park



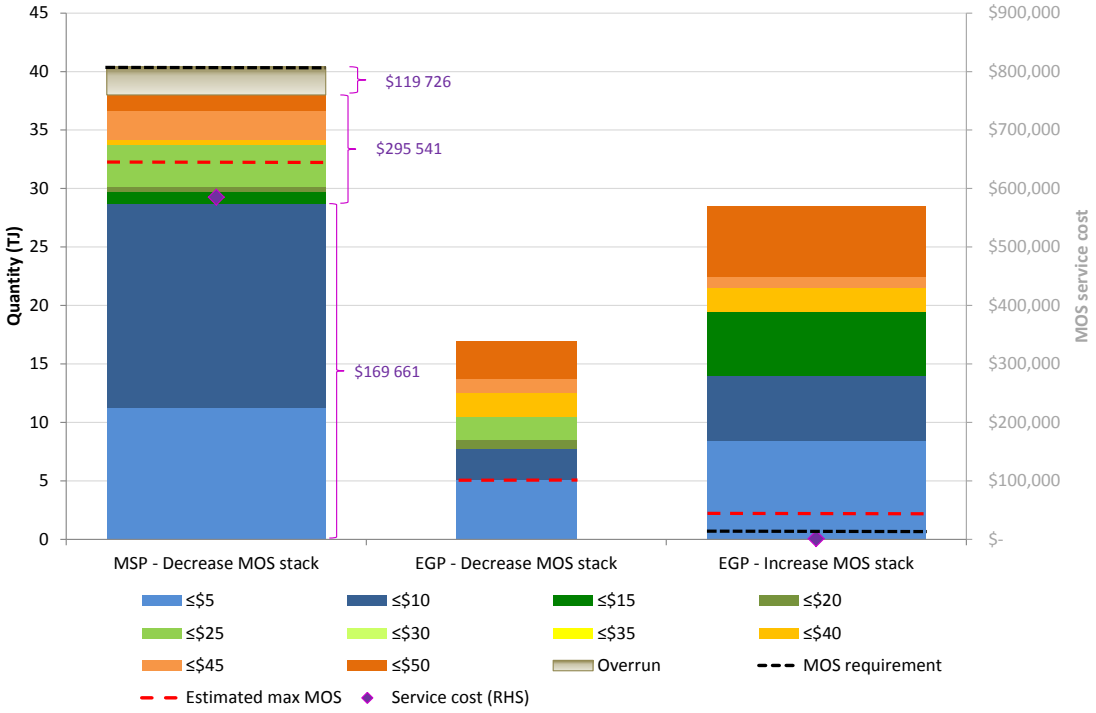
* Typically, injections on the EGP at flow controlled system points are profiled at a flat rate across the day (assuming participants do not renominate scheduled supply).

3.1.3 Market operator service (MOS)

Figure 6 shows, for the month of January, the decrease MOS offers for the MSP and the increase MOS offers for the EGP. The figure also provides the EGP decrease MOS offers – although these were not used on the day.

The dotted black lines show the MOS requirement on the day. The dotted red lines show AEMO's estimated maximum quantity of MOS on the day.

Figure 6: MOS stacks and allocation requirements for 13 January



On the day, the decrease MOS requirement of 40.4 TJ was provided by the MSP. The amount of increase MOS on the EGP was negligible – at just 0.7 TJ.

The majority of decrease MOS offers on the MSP were priced relatively low, with 28.7 TJ being offered at or below $10/GJ. However, prices rose sharply above this quantity, with less than 10 TJ offered between $10/GJ and $49.99/GJ.

The total quantity of decrease MOS required on the MSP exceeded the amount of offers (38 TJ) and AEMO's estimated maximum requirement (32.27 TJ). Therefore, the difference of 2.4 TJ was allocated as overrun MOS. As noted earlier, the NGR requires overrun to be priced at the highest priced MOS price step in the applicable MOS stack under these circumstances. The overrun MOS requirement contributed to $119 726 of the total MOS service payments on the day.

3.2 The 23 January gas day

On the day, 18.7 TJ of MOS was required, which resulted in MOS service payments of $470 935. This is significantly higher than the average cost for MOS services in Sydney of around $28 000 for the 2015–16 financial year to date.[17]

The total MOS quantity was made up of 18.7 TJ of decrease MOS on the EGP.

With only 17 TJ of gas offered in the decrease MOS stack for January on the EGP, the remaining requirement was allocated as overrun MOS. The overrun MOS allocation was priced at the maximum available MOS price in the offer stack ($49.99/GJ), contributing to $84 393 to the total cost for MOS services on the gas day.

17 2015–16 FYTD average calculated at 30 April 2016

The main factors which led to the large MOS service payments were:

- participants over forecasting demand
- the MSP had 0 TJ net flow to the hub which meant only the EGP could provide decrease MOS to offset the demand error within the hub

3.2.1 Participants over forecasting demand

As demand was lower on the day than forecast, the quantities of gas participants instructed the pipelines to deliver were higher than necessary. This resulted in an additional 18.7 TJ of gas being stored on the EGP as decrease MOS.

3.2.2 The EGP provided all of the decrease MOS

On the day, the majority of gas was scheduled by AEMO to be supplied from the EGP. The MSP was scheduled 0 TJ of net flow to the hub.

The main contributors to this scheduling result were:

- the majority of low priced gas offers were for the EGP
- The gas offers scheduled on the MSP were offset by backhaul bids[18]

As noted earlier, a pipeline's net flow to a hub cannot be less than 0 TJ. This means a pipeline's capacity to provide decrease MOS (which is effectively a reduction of supply to the hub) cannot exceed its flow to the hub. If the MSP is already supplying 0 TJ to the Sydney hub, it cannot provide decrease MOS.

Therefore, the decrease MOS requirement could only be supplied by the EGP.

The MOS requirement of 18.7 TJ was well above the normal level of decrease MOS that would usually be provided by the EGP.

However, there was a relatively low quantity of decrease MOS offers on the EGP, and at relatively high prices. This contributed to the overall MOS service payment being comparable to the payment on 13 January, despite the quantity of MOS being much lower.

Figure 7 shows participants have since offered a larger overall quantity of decrease MOS at lower prices on the EGP.

[18] Back haul bids are made by participants to satisfy demand located outside the hub. The scheduling of backhaul on a pipeline reduces the total quantity of flow 'to the hub'.

Figure 7: Recent change to the quantity of MOS offers on the EGP

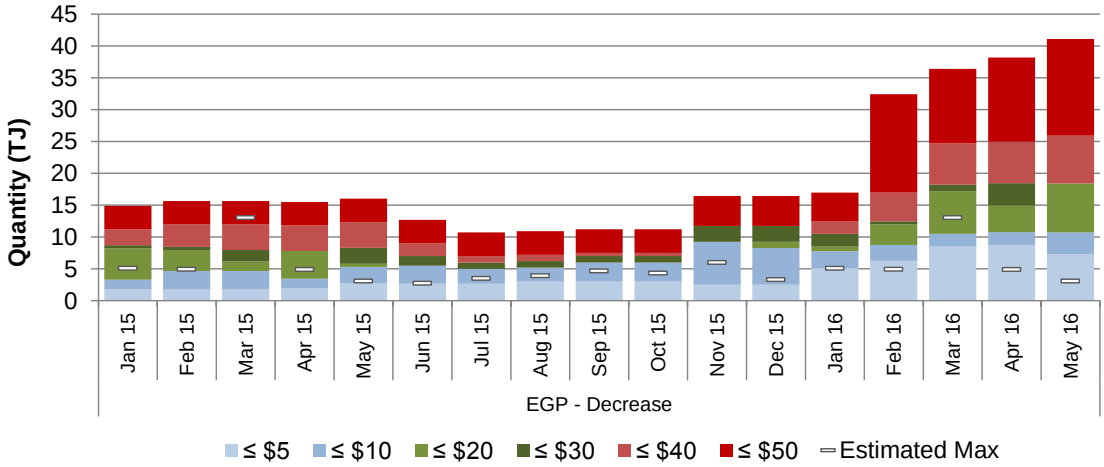


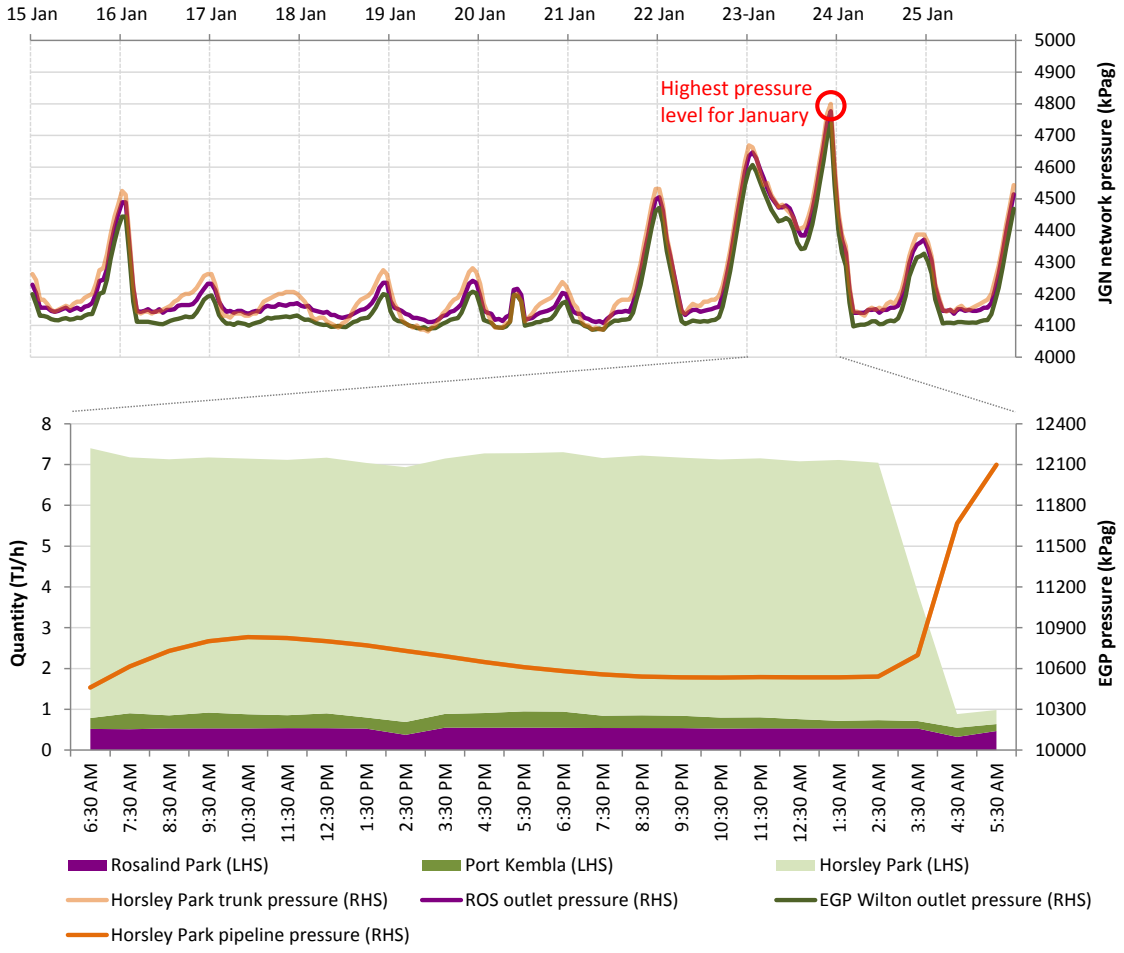
Figure 8 below shows pressure levels along the trunk line that delivers gas to the main section of Sydney's distribution network at the Horsley Park, Rosalind Park and Wilton custody transfer points on the 15 to 25 January gas days (inclusive).[19]

It also shows the hourly flows into the Sydney hub on the 23 January gas day. On the day, the Sydney hub was supplied by the Horsley Park, Rosalind Park, and Port Kembla points.

The figure shows a significant increase in pressure within the distribution network towards the end of the gas day and the resulting reduction in supply from the Horsley Park point.

19 Figure 1 on page 5 sets out the Sydney hub, including the trunk line and the main section of the distribution network (the top circle containing the Horsley Park, Rosalind Park and Wilton custody transfer points).

Figure 8: Hourly pressure and flow levels along sections of the main trunk line in the Sydney gas network on 23 January*



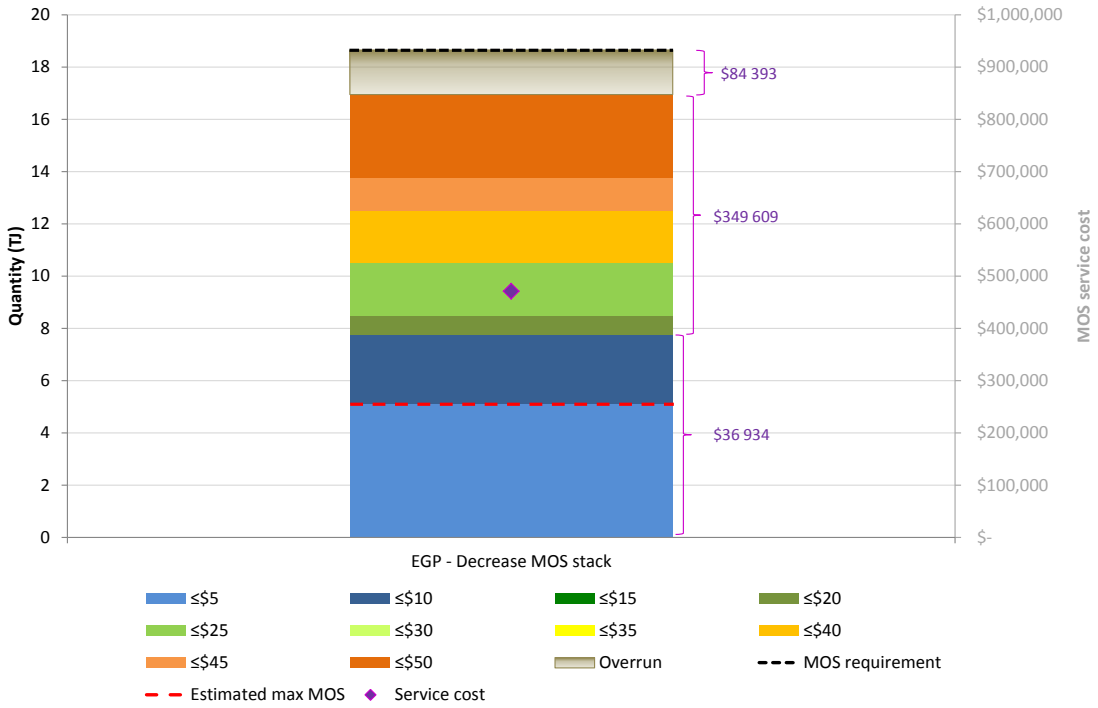
* Pressure levels at points along the trunk line in the main section of the Sydney distribution network are displayed at the top of the figure, while the pressure on the EGP is displayed alongside flows at Horsley Park at the bottom.

Nominations to provide most of the supply to the hub via the EGP, combined with over forecast demand inside the hub, led to the pressure within the distribution system increasing to its highest level for the month of January (at those sections of the trunk line). This resulted in flows on the pipeline being backed-off towards the end of the gas day and led to the higher than normal quantity of decrease MOS being allocated on the EGP.

3.2.3 Market Operator Service (MOS)

Figure 9 shows, for the month of January, the decrease MOS stack on the EGP. The dotted black lines show the MOS requirement on the day. The dotted red lines show AEMO's estimated maximum quantity of MOS on 23 January 2016.

Figure 9: MOS stack and allocation requirements for 23 January



On the day, the decrease MOS requirement of 18.7 TJ was provided by the EGP.

Compared to the decrease MOS offers available on the MSP (shown in Figure 6), there was a relatively low quantity of decrease MOS offers on the EGP, which resulted in high priced MOS offers being used.

There was less than 8 TJ being offered at or below $10/GJ. Prices rose sharply above this quantity, with less than 5 TJ offered between $10/GJ and $40/GJ.

The total quantity of decrease MOS required on the EGP exceeded the amount of offers (17 TJ) and AEMO's estimated maximum requirement (5 TJ). Therefore, the difference of 1.7 TJ was allocated as overrun MOS. As noted earlier, the NGR requires overrun to be priced at the highest priced MOS price step in the applicable MOS stack under these circumstances. The overrun MOS requirement contributed to $84 393 of the total MOS service payments on the day.

Appendix: Primary markets, MOS markets & Contingency Gas

On 13 and 23 January 2016, MOS service payments exceeded $250 000. MOS service payments are made to participants who offer MOS. Participants are not obligated to offer MOS. When MOS is required, MOS offers are allocated in merit order (i.e. from lowest to highest price). This occurs separately to the scheduling of bids and offers by AEMO, and therefore can be characterised as an ancillary market. The number of participants offering MOS is lower than the number of participants in the STTM (or primary market).

Figure 10 below shows Sydney hub participants and whether they were active in the primary market and MOS market on the 13 and 23 January gas days. It shows that, of the 13 participants in the primary market, only three of them submitted MOS offers.

Figure 10: STTM Sydney hub participation on 13 and 23 January 2016

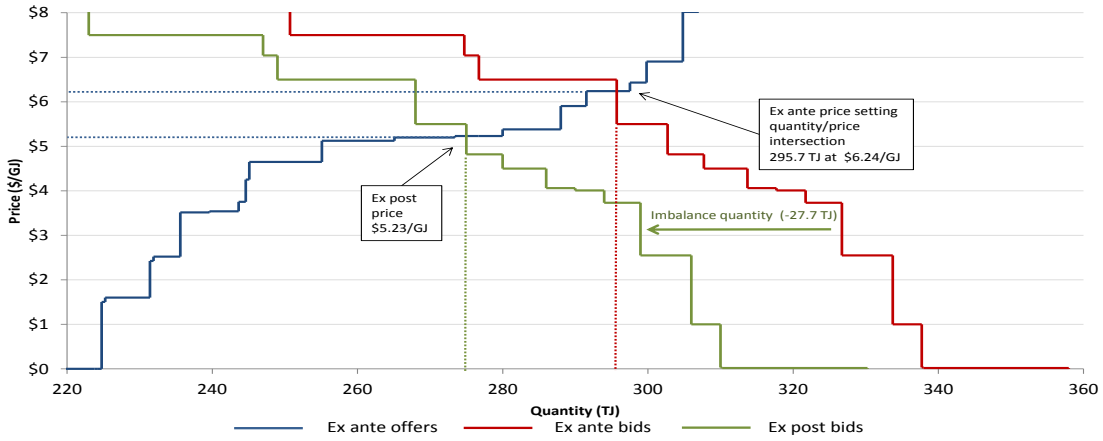
Participant (underlined also submitted MOS offers)	Pipeline Supply (Offers)		Pipeline Demand (Bids)		Hub Demand	
	MSP	EGP	MSP	EGP	Price taker bids (uncontrollable demand)	Withdrawal bids/ non price taker bids
AGL	Y	Y	N	N	Y	N
BlueScope	N	Y	N	N	Y	N
CovaU	N	N	N(13)/ Y(23)	N	Y	N
EnergyAustralia	Y(13)/ N(23)	Y	N(13)/ Y(23)	Y(13)/ N(23)	Y	N
GoEnergy	N	N	Y	N	N	Y
Lumo	N	N	N	N	Y	N
M2Energy	N	N	N	N	Y	N
Origin	N	Y	Y	N	Y	N
OneSteel	N	Y	N	N	Y	Y(13)/ N(23)
Qenos	Y	N	N	N	Y	N
Red Energy	N	N	N	N	Y	N
Snowy Hydro	N	N	N	N	N	Y(13)/ N(23)
Visy Paper	N	N	N	N	Y	N

Primary market outcomes – 13 and 23 January

Figure 11 below shows the ex ante offers and the ex post price for Friday 13 January. The supply curve for offers (the blue line) is made up of offers to supply gas from six participants and the demand curve (the red line) is made up of bids to withdraw gas

from 13 participants.[20] The figure shows the relatively flat supply curve from about 255 TJ was influential in before the day (ex ante) and after the day (ex post) prices being similar. Total demand was over forecast (295.7 TJ) such that the ex ante price was relatively high at $6.24/GJ. However, once the large imbalance (over forecast) was revealed from actual metered demand after the day, the ex post price was set on the basis of what the price would have been without this imbalance (27.7 TJ) leading to a recalculated ex post price of $5.23/GJ.[21] The purpose of this report is not to explain every aspect of the STTM, however it is noted that ex post pricing and payments in particular contribute in part to funding MOS payments. That is, participants who deviate between ex ante schedules and ex post schedules (for example under or over forecast demand) may make deviation payments which fund the need for MOS balancing gas (see MOS section below).

Figure 11: Ex ante offers and the ex post price for 13 January

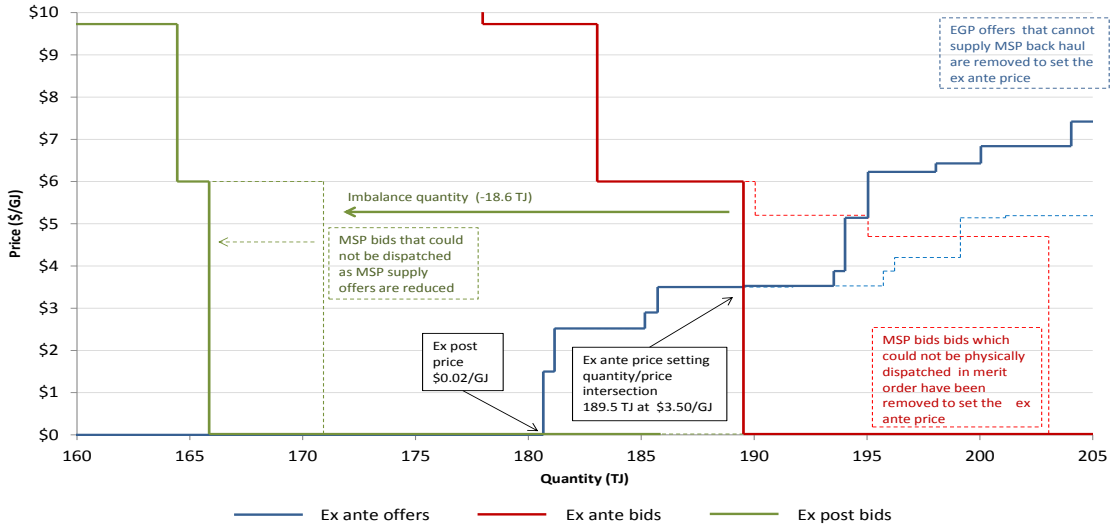


On Saturday 23 January 2016, the supply curve for offers consisted of the same six participants as for 13 January however demand (bids) was significantly lower given it was a Saturday. Figure 12 shows the supply and demand curves for the ex ante and ex post schedules.

20 The blue line takes into account the offers shown in Figure 10 in the column 'pipeline supply (offers)' and the red line takes into account the bids shown in Figure 10 in the columns 'pipeline demand (bids)' and 'hub demand'.

21 These prices do not constitute significant price events as ex ante and ex post prices as one part of the threshold set out in the AER guideline must be greater than $15/GJ http://www.aer.gov.au/wholesale-markets/market-guidelines/significant-price-variations-in-the-sttm-reporting-triggers

Figure 12: Ex ante offers and the ex post price for 23 January



As noted above the purpose of this report is not to explain every aspect of the STTM. However, it is noted that the ex ante schedule on 23 January had lower volumes and lower prices than would have been the case if further backhaul bids were scheduled on the MSP (the dotted red line) and offset by further offers from the EGP being scheduled. However, as the MSP already had 0 TJ net flow to the hub, it was unable to provide any additional backhaul. As noted earlier, a pipeline's net flow to a hub cannot be less than 0 TJ.

The large negative imbalance quantity on the gas day (-18.6 TJ) resulted in the ex post price decreasing significantly, to just $0.02/GJ (compared to the $3.50/GJ ex ante price). This sharp decrease was due to the steep supply curve on the day, which was not the case on 13 January.

Market Operator Service (MOS)

MOS, also known as balancing gas, is required to manage everyday pipeline deviations. A pipeline deviation occurs when there is a difference between the total quantity of gas nominated by the pipeline's shippers (typically gas retailers) and the quantity of gas physically delivered. There are two kinds of pipeline deviations; positive (when more gas is delivered) and negative (when less gas is delivered).

When actual gas flows are higher than final nominations, the difference is supplied by increase MOS. When actual gas flows are lower than final nominations, the difference is supplied by decrease MOS.

MOS is a balancing service separate from the offers and bids which are scheduled to supply hub or pipeline demand.

MOS costs

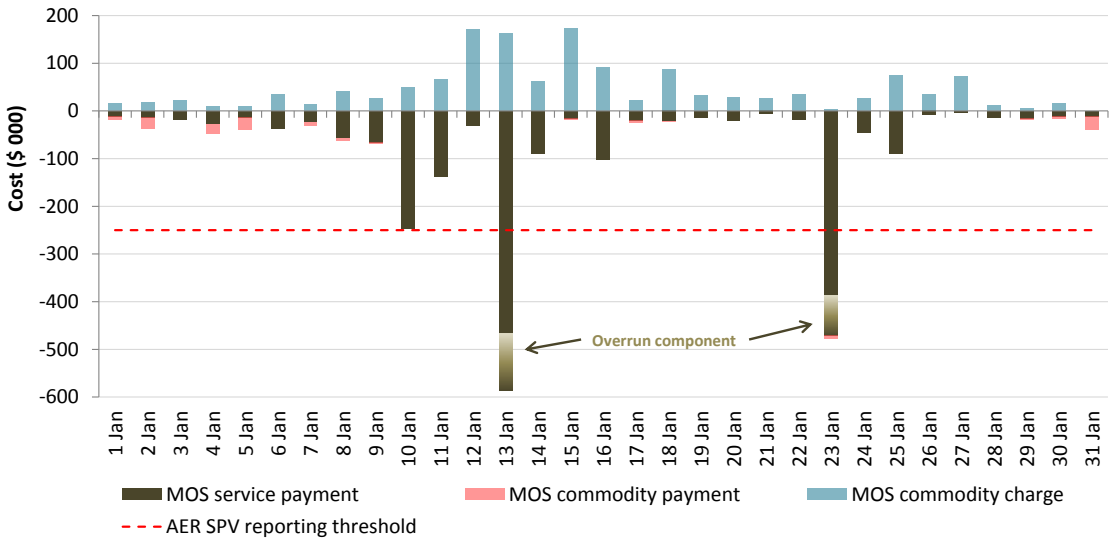
The price paid for MOS consists of two separate components, the service cost and the commodity cost. This SPV report relates to the service cost, or service payments, exceeding $250 000.

The MOS service cost is determined by the price offered and reflects the cost of providing the service. This may include contractual or non-contractual components of providing MOS offers, such as park and loan services, storage costs, opportunity costs and risk abatement. If a participant's increase or decrease MOS offer is used on a gas day, they will receive a payment equal to the price of the relevant MOS offer multiplied by the quantity used. Throughout this report this will be referred to as the MOS service payment, as it is the amount paid to participants for the service provided.

The cost of the actual gas supplied (increase) or absorbed (decrease) is paid (in the case of increase MOS) or charged (in the case of decrease MOS) at the ex ante price two days after the gas day when the MOS was needed (the D+2 price). This allows for MOS providers to place bids and offers on the following gas day (D+1) to restore MOS gas on the D+2 gas day in order to manage risks associated with price uncertainty. In the case of increase MOS, participants will receive a payment for the physical quantity of gas supplied, referred to as the commodity payment. In the case of decrease MOS, they will receive a charge for the gas they have procured from the market, referred to as the commodity charge.

Figure 13 shows the cost of MOS delivered across the month of January 2016. Commodity payments and charges for each gas day reflect the value of MOS delivered (2 days prior) at the D+2 ex ante price.[22] Payments made to participants for the MOS service or physical gas supplied (commodity) are shown as negative numbers, while charges to participants for the physical gas they have received (parked outside the hub) are shown as positive values.

Figure 13: Sydney MOS payments and charges for January 2016[23]



The average daily cost for MOS services in Sydney over 2015 was $21 965 compared to the average cost over January 2016 of $72 343.

22 For example, the service payment for the MOS requirement on the 13 January gas day is shown for 13 January in the chart, whereas the commodity payment for decrease MOS (on the MSP) and charge for increase MOS (on the EGP) are displayed on the 15 January gas day in the chart (when the D+2 price is calculated).

23 Payments are payable to participants by AEMO (negative numbers), charges are payable to AEMO (positive numbers).

Contingency Gas (CG)

Contingency Gas (CG) is a market mechanism for balancing supply and demand within the STTM when pipeline flows are deemed to be undeliverable to meet forecast or actual demand on a given gas day. The mechanism provides pipeline and distribution network operators with the opportunity to consult with industry participants in order to avoid or minimise the requirement to involuntarily curtail shippers supplying gas to users either within or upstream of the STTM hub.

On the 13 January gas day, a compressor issue on the EGP at Horsley Park[24] resulted in Jemena (the operator of the EGP) declaring a CG trigger event had occurred at 5.30 pm. This resulted in AEMO[25] notifying market participants that a CG event had been declared[26], before a conference was convened[27] to allow market participants to discuss options around the need to schedule CG.

Information regarding the issues affecting deliveries on the EGP was also provided via updates to the Line pack Capacity Adequacy (LCA) flags published on the Bulletin Board.[28]

The potential supply shortfall to the Sydney STTM hub was predicted to have an effect on gas deliveries for the 13 and 14 January gas days. To avert the requirement for CG, participants agreed to renominate supply into the Sydney hub and reduce deliveries on the EGP. Participants arranged for the provision additional supply to the Sydney STTM hub via deliveries on the MSP[29], offsetting the potential shortfall on the EGP.

The outcome of conferences to deal with the potential supply shortfalls resulted in the expected requirement for CG being averted. Participant actions and the subsequent resolution of the compressor issues[30] on the following gas day led to AEMO closing off the CG event at 3.38 pm on 14 January.[31]

Despite actions taken by participants to avert the requirement for CG on the 13 January gas day, a mismatch between renominations on the EGP and MSP led to an oversupply of 15 TJ of gas on the EGP which had a direct impact on the requirements for decrease MOS. Based on the findings in AEMO's report, if matching renominations to switch supply from the EGP to the MSP had been submitted, total MOS requirements due to the demand error in the hub would have resulted in an estimated cost of $160 361 in service payments.

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24 Refer to the Background section of the report for information about the Horsley Park Custody Transfer Point (CTP) in the Sydney STTM hub.

25 AEMO coordinates activities within the STTM via information submitted by market participants.

26 As required under provisions set out under rule 441 of the National Gas Rules (NGR).

27 As required under provisions set out under rule 442 of the National Gas Rules (NGR).

28 Red and amber LCA flags were updated to indicate the likely or expected curtailment of gas deliveries on the pipeline, indicating the cause of the problem and the expected timeframe of the events affecting deliveries.

29 Low nominations to supply the Sydney hub on the MSP and adequate line pack allowed for additional supply to the hub to be provided by the pipeline.

30 Jemena activated alternative compressors to assist in the delivery of nominated gas flows on the EGP.

31 Participants were subsequently notified of the closure of the CG event following the confirmation that the Bulletin Board LCA flag had been updated to green (indicating adequate line pack / pipeline capacity available to meet demand).