

GAS STATEMENT OF OPPORTUNITIES

FOR EASTERN AND SOUTH-EASTERN AUSTRALIA

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IMPORTANT NOTICE

Purpose

AEMO has prepared this document to provide information about the natural gas industry in eastern and south-eastern Australia, in accordance with the National Gas Law and Part 15D of the National Gas Rules.

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EXECUTIVE SUMMARY

The 2015 Gas Statement of Opportunities (GSOO) reports on the adequacy of eastern and south-eastern Australian gas markets to supply maximum demand and annual consumption as forecast in the 2014 National Gas Forecasting Report (NGFR) published in December 2014.¹

The NGFR expected combined industrial, residential and commercial gas consumption to fall from 447 petajoules (PJ) in 2015 to 425 PJ in 2034. This is a sharper decline than AEMO reported in the May 2014 GSOO Update, and as a result forecast gaps in gas supply are lower in the 2015 GSOO than they were in the 2014 GSOO Update.

Dynamic changes in the gas markets make data quality and transparency a critical issue. AEMO has confirmed data with participants before publishing this GSOO, and will continue to work with industry to improve data quality and transparency and, therefore, the credibility of modelled outcomes. This report is based on data provided by industry participants up to 20 March 2015.

Supply adequacy outlook

Short-term supply adequacy outlook (2015 to 2019)

- In line with lower forecast gas consumption, no regions should expect gas supply gaps.
- In New South Wales, where a gas supply gap had previously been forecast, no gap is now expected. This is due to a 17% decline in the 2019 forecast for industrial, residential and commercial gas consumption. In addition, upgrades to gas market infrastructure, the commissioning of the 1.5 PJ Newcastle LNG storage facility and an increase in the capacity of the Victoria – New South Wales Interconnect have all alleviated gas supply gaps.

Medium and long-term supply adequacy outlook (2020 to 2034)

- The only forecast medium and long-term supply gaps are in Queensland.
- Forecast gas supply gaps to 2034 in Queensland are 214 PJ, consisting predominantly of gas-powered generation (GPG) supply. There are no forecast supply gaps for liquefied natural gas export.
- These forecast supply gaps are down from the 1,000 PJ anticipated in the 2013 GSOO, largely due to lower gas consumption and maximum daily demand forecasts following the reduction in industrial consumption across eastern and south-eastern gas markets.
- To meet current medium-term and long-term forecast gas consumption, it may be necessary to extract approximately 5,000 PJ from undeveloped reserves found mainly in the Cooper, Otway and Gippsland Basins.

Victorian Gas Planning Review (VGPR)

The 2015 GSOO also includes key information on the Victorian Declared Transmission System (DTS) including an overview of system and pipeline capacities, demand and supply forecast, and adequacy assessment. This information is published as Attachment B.

The VGPR confirms that the Victorian DTS can supply the maximum forecast 1-in-20-year system demand of 1,257 TJ per day for the period 2015-2019.

¹ AEMO 2014 National Gas Forecasting Report. Available at: <http://www.aemo.com.au/Gas/Planning/Forecasting/>. Viewed: 23 January 2015.



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CHAPTER 1. WHAT'S NEW IN THE GSOO

In December 2014, AEMO published the first National Gas Forecasting Report (NGFR) for eastern and south-eastern Australia. The forecasts in the NGFR form the basis of the outlooks for annual consumption and maximum demand for the 2015 GSOO.

The 2015 GSOO signals ongoing shifts in consumption and supply positions in the dynamic eastern and south-eastern Australian gas markets. It details changes in supply adequacy over the short-term and further revises the 2013 GSOO's medium-term and long-term supply assessments.

AEMO expects that changes to infrastructure capacity and lower forecast consumption will result in short-term gas supply needs being met and potential medium and long-term gaps reduced.

A GSOO update published in May 2014 focused on the short-term effects of changes in forecast liquefied natural gas (LNG) exports and the withdrawal of the Swanbank E gas power station.

Detail on AEMO's supply adequacy results for the 2015 GSOO can be found in Attachment A. Attachment B contains the 2015 VGPR.

1.1 Gas consumption forecasts are lower

Forecast domestic gas consumption is lower than reported in the 2013 GSOO, which forecast industrial, residential and commercial gas consumption would rise to 615 PJ by 2033.

By contrast, the 2014 NGFR showed gas consumption for industrial, residential and commercial gas falling from 447 PJ in 2015 to 425 PJ in 2033.

Most of the change is due to a fall in industrial consumption across eastern and south-eastern Australian gas markets. This is particularly the case in NSW and Queensland, where a number of large gas industrial consumers are closing. The NGFR anticipates further declines in industrial consumption due to expected rises in domestic gas prices.

For LNG consumption, the 2013 GSOO forecast 1,446 PJ by 2033. The 2014 NGFR forecast LNG consumption of 1,425 PJ by 2033, further reducing gas consumption. This reduction is largely due to lower forecast gas required to power LNG export facilities.

1.2 System capability - pipeline capacity and storage have increased

The following infrastructure improvements will increase capacity for gas to flow to demand areas.

1.2.1 Victoria – New South Wales Interconnect upgrade

Upgrades to the Victoria – New South Wales Interconnect through Culcairn will be completed during 2015, providing increased flows to New South Wales by raising capacity from 57 TJ to 118 TJ per day. This reduces forecast gas supply gaps in NSW. More information is provided in Attachment B.

1.2.2 Moomba–Sydney Pipeline

Currently gas flow on the Moomba–Sydney Pipeline (MSP) is one-directional from Moomba to New South Wales. An upgrade of the MSP, due for completion during 2015, will allow gas to flow from New South Wales to Moomba, so gas produced in Southern Australia can be exported to Queensland.



1.2.3 Connection of South East Australia Gas pipeline and Moomba–Adelaide Pipeline System upgrade

The South East Australia Gas (SEA Gas) pipeline connects the Port Campbell production zone in Victoria with Adelaide, allowing bi-directional gas flow. The Moomba–Adelaide Pipeline System (MAPS) connects Adelaide with the Moomba Gas Plant, with one-directional flow from Moomba to Adelaide. These pipelines are expected to be directly connected later this year. Work is also underway to allow MAPS to flow in both directions, allowing for gas exports from Southern Australia to Queensland.

1.2.4 Tasmanian Gas Pipeline high priority storage

The Tasmanian Gas Pipeline (TGP) offers surplus linepack capacity as storage to the Victorian DTS. Phase 1 of the TGP storage project, available since winter 2014, provides for 150 TJ to be stored and accessed when required at a withdrawal rate of up to 15 TJ per day, with potential for 50 TJ per day (and an additional 85 TJ per day as available).

Phase 2 will be available in early 2016, and should provide withdrawal rates of up to 120 TJ per day firm at an injection rate of 5 TJ per hour into the Victorian DTS, via a new connection to the Longford to Melbourne Pipeline.

1.2.5 Roma–Brisbane Pipeline

The Roma–Brisbane Pipeline (RBP) is one-directional from Roma to Brisbane. An upgrade of the RBP, due for completion during 2015, will allow gas to flow towards Roma. This will allow gas produced near the eastern end of the RBP to be sent through Wallumbilla.

1.3 Greater availability of gas market data for modelling

Data quality and transparency is a significant issue in the dynamic, changing east coast gas market, and is critical to credible forecast modelling. Acknowledging this issue, AEMO worked with participants to complete additional data review and confirmation in preparing the 2015 GSOO. Going forward, AEMO will continue to work with industry to improve data quality and transparency, and therefore improve the credibility of modelled outcomes.

1.3.1 Moomba storage facility

The Moomba storage facility is a large underground storage facility for processed gas. Until recently, AEMO did not have enough reliable information about operating conditions, flow rates, and costs to include this facility in its modelling. AEMO now has enough data to model the Moomba gas storage facility for the 2015 GSOO.

1.3.2 Linepack²

Though gaps in each region could potentially be reduced through linepack, AEMO had not previously incorporated detailed linepack information because little information was available on exact linepack capability. Participants have now provided detailed information to AEMO and AEMO has used updated modelling software to incorporate linepack in the 2015 GSOO models.

1.3.3 Updated facility and cost data

AEMO has incorporated comprehensive feedback from gas market participants on data relating to pipelines, production facilities, storage facilities, gas reserves, and production costs into this GSOO. Using this feedback, AEMO has made important updates to the GSOO gas model, including revising downward the capacity of production facilities in South Queensland by about 150 TJ per day.

² Linepack temporarily stores gas in pipelines by increasing pipeline pressure, gas can then be withdrawn by reducing pipeline pressure.



AEMO also revised production cost assumptions based on feedback from some participants. As most revised production costs were up, AEMO also ran a sensitivity study to the base analysis modelling to examine the effect of higher gas production costs across all facilities on gas supply adequacy. The study found no material effect on forecast supply gaps.

At 1 March 2015, the Narrabri processing facility and Gloucester production facilities, which would have added to gas market capacity, were not considered committed projects, so are excluded from the modelling used in the base analysis.



CHAPTER 2. SUPPLY ADEQUACY

2.1 Overview

AEMO completed its analysis for high, medium and low gas consumption scenarios from a centralised source to reflect local energy generation and energy efficiency impacts.

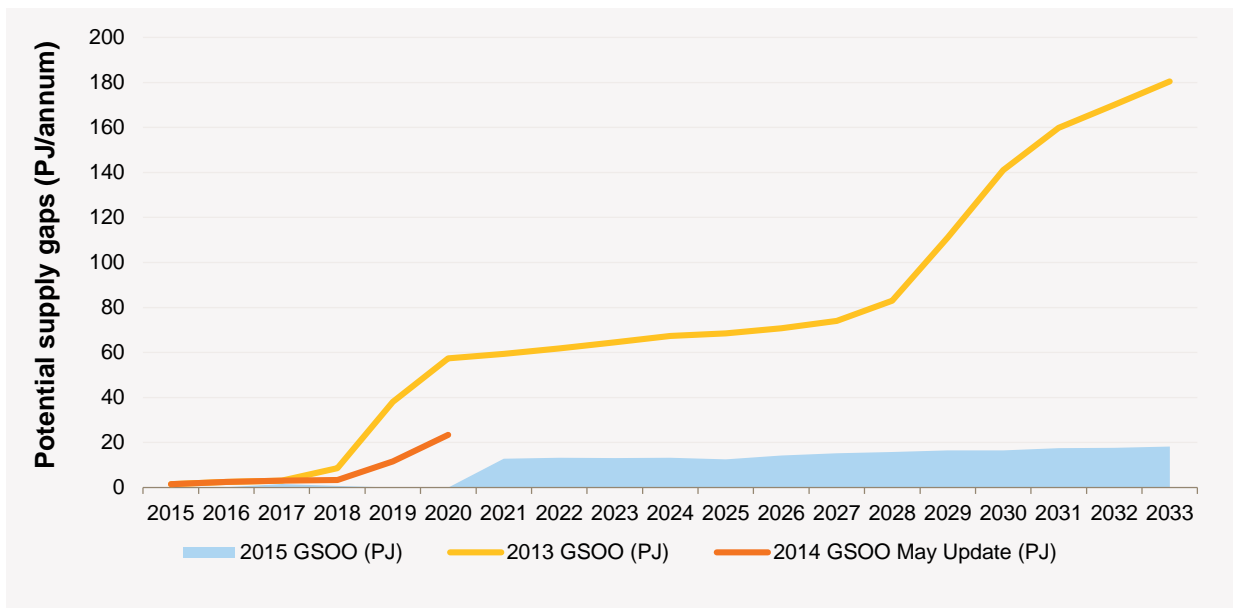
These scenarios relate to the scenarios used to generate the 2014 NGFR gas consumption forecasts. For each scenario and sensitivity study, both 1-in-2³ year and 1-in-20⁴ year maximum demand conditions are studied.

All results detailed in the 2015 GSOO relate to the medium scenario and 1-in-20 year maximum demand conditions. Results for the other scenarios and selected sensitivity analysis are available in Attachment A: Detailed Adequacy Results and on the AEMO website.

Throughout this section, where modelling indicates that supply is unlikely to meet annual consumption and peak demand, the potential shortfall is referred to as a “forecast supply gap” in production, pipeline, processing, or storage facilities. Additional capacity might be needed to bridge that gap.

Figure 1 shows forecast supply gaps over the 20-year GSOO outlook period, compared to those forecast in the 2013 GSOO and 2014 GSOO May Update.

Figure 1 Total forecast supply gaps



Substitution of gas powered generation

Excess capacity in the National Electricity Market (NEM) makes fuel switching – substitution of gas-powered generation (GPG) with other forms of generation – an option. This reduces the potential for short-term gaps in GPG supply. However, if there is large-scale retirement of non-gas powered generation in the medium to long term, fuel switching might not be feasible and supply gaps may arise.

³ 1-in-2 maximum demand, also known as a 50% probability of exceedance (POE), refers to the maximum demand value that, on average, is expected to be met or exceeded one out of every 2 years (or 50% of the time).

⁴ 1-in-20 maximum demand, also known as a 5% POE, refers to the maximum demand value that, on average, is expected to be met or exceeded one out of every 20 years (or 5% of the time).



2.1.1 Short term outlook (2015 to 2019)

- A short-term supply gap of 2.3 PJ is forecast in Queensland, of which 11 TJ is industrial, residential and commercial gas supply, with gas-powered generation (GPG) making up the rest. Electricity generation fuel switching would be likely to eliminate these supply gaps. There are no forecast supply gaps for LNG export.
- No supply gaps are forecast in other eastern and south-eastern gas markets by the end of 2019.

2.1.2 Medium and long-term supply outlook (2020-2034)

- Forecast supply gaps in Queensland to 2034 are about 214 PJ, of which 17 TJ is industrial, residential and commercial gas supply, with GPG making up the rest. There are no forecast supply gaps for LNG export.
- No medium or long-term supply gaps are forecast in other eastern and south-eastern gas markets.

2.2 No supply gaps expected in NSW

The 2015 GSOO does not forecast a supply gap in NSW. The 2013 GSOO forecast supply gaps of 3,500 TJ between 2019 and 2020, and the May 2014 GSOO Update forecast supply gaps of 47 TJ between 2019 and 2020.

The main reasons these supply gaps are no longer forecast are:

- A reduction in forecast consumption and maximum daily demand for NSW. From the 2013 GSOO to the 2015 GSOO, the 2019 forecast consumption for NSW has reduced by 21 PJ.
- Augmentation of the Victoria – New South Wales Interconnect pipeline, to increase northward flow from 57 TJ per day to 118 TJ per day.
- The MSP pipeline upgrade that allows gas to be exported to Queensland and injected into the Moomba storage facility. Gas from the Moomba storage facility can then be extracted at times of high New South Wales demand and imported back through the MSP.
- Better available gas market data and improved modelling software has allowed more detailed modelling of storage and linepack.

2.3 Queensland gas supply gaps possible over the long term

Total supply gaps for Queensland are expected to be 15 PJ per year on average from 2020. For the long term, analysis shows that there may be supply gaps in GPG and industrial, residential and commercial consumption. A total of 28 TJ of industrial, residential and commercial supply gaps are forecast for Gladstone across the 20-year forecast period.

The analysis assumes LNG consumption will be met ahead of all other forms of consumption. AEMO understands that LNG developers will be able to redirect some of their forecast consumption to domestic users. If that happens, supply gaps might not occur in Queensland. More information about LNG facility operation will be required to model any available flexibility.



2.4 Infrastructure Adequacy

2.4.1 Addressing Forecast Supply Gaps

Forecast supply gaps in Queensland can be eliminated if gas production capacity in South Queensland is increased by 100 TJ per day.

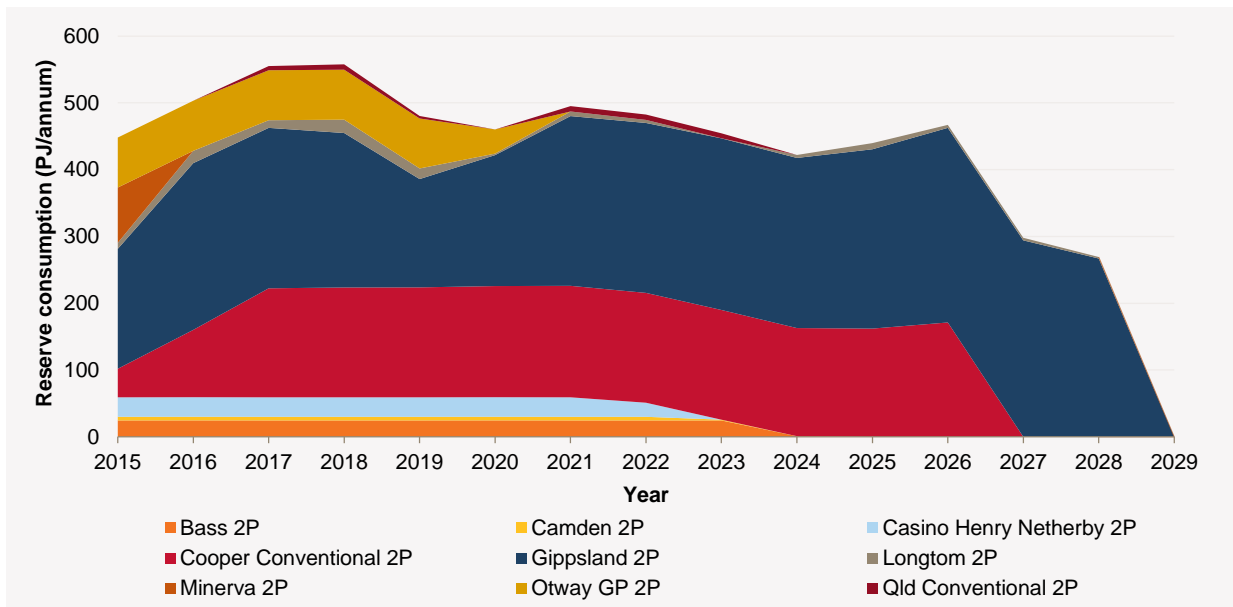
AEMO’s analysis, based on current information, shows that flows on the South West Queensland Pipeline (SWQP) between Ballera and Wallumbilla will operate at maximum capacity almost continually from 2018 to meet forecast LNG export demand. All forecast supply gaps in Queensland occur at, or east of, Wallumbilla. Matching these potential gaps requires increasing production capacity from the South Queensland gas fields located at, or east of, Wallumbilla by at least 100 TJ per day or increasing SWQP pipeline capacity by 100 TJ per day.

2.4.2 Development of required new gas reserves and resources

Analysis indicates that sufficient commercially viable reserves and resources are available to satisfy projected gas demand for at least the next 20 years. To ensure that gas consumption can be met, however, new gas reserves need to be developed.

Figure 2 illustrates the finding that fields supplying conventional gas from the Otway, Gippsland, and Cooper Basin proven plus probable reserves will be depleted by the end of 2028.

Figure 2 Depletion of proven and probable conventional gas reserves



To make up for the loss of these reserves, a number of new reserves must be developed. GSOO analysis indicates that conventional gas reserves could be developed in the Gippsland, Otway, and Cooper basins, along with shale gas reserves in the Cooper basin, to make up for depleted reserves.

The CSG and unconventional gas reserves supplying Queensland demand, including LNG export, are not expected to deplete over the 20-year GSOO analysis timeframe.



CHAPTER 3. VICTORIAN DECLARED TRANSMISSION SYSTEM ADEQUACY

Key information in the 2015 VGPR for the DTS is included in Attachment B, which provides demand forecast, supply forecast, system and pipeline capacity and adequacy assessment of the DTS for the period of 2015 to 2019. In short, the key messages are:

- The Longford and Iona gas processing facilities are still the two major sources of gas supply to the DTS.
- The 1-in-20 DTS system demand forecasts for 2015 and 2019 have been decreased to 1,248 TJ per day and 1,238 TJ per day respectively, from the forecasts of 1,282 TJ per day and 1,337 TJ per day published in the 2013 VGPR.
- The DTS can supply the maximum forecast 1-in-20 gas demand day of 1,257 TJ per day for the period between 2015 and 2019.
- The new Winchelsea compressor station will boost the South West Pipeline (SWP) capacity from 367 to 429 TJ per day, while stage 2 of the Victorian Northern Interconnect Expansion (VNIE) project currently under construction will increase export capacity to NSW from 57 TJ per day to 118 TJ per day for the next five years.
- SWP capacity for withdrawal at Iona is decreased from 108 TJ per day to 92 TJ per day, mainly due to increased demand on the SWP.



SUPPORTING DOCUMENTS

Table 1 provides links to additional information provided either as part of the 2015 GSOO accompanying information suite, or other related AEMO planning information.

Table 1 Links to supporting information

Supporting Information	Website address
2015 GSOO – Attachment A Detailed Supply Adequacy Results	http://www.aemo.com.au/Gas/Planning/Gas-Statement-of-Opportunities
2015 GSOO – Attachment B Victorian Gas Planning Review	http://www.aemo.com.au/Gas/Planning/Gas-Statement-of-Opportunities
2015 GSOO Methodology Document	http://www.aemo.com.au/Gas/Planning/Gas-Statement-of-Opportunities
Gas Demand Forecasts for the 2015 GSOO	http://www.aemo.com.au/Gas/Planning/Forecasting/National-Gas-Forecasting-Report
Gas facility information	http://www.aemo.com.au/Gas/Planning/Gas-Statement-of-Opportunities/GSOO-2015-Supporting-Information
Gas production costs and transmission costs	http://www.aemo.com.au/Gas/Planning/Gas-Statement-of-Opportunities/GSOO-2015-Supporting-Information
Gas Reserves Update	http://www.aemo.com.au/Gas/Planning/Gas-Statement-of-Opportunities/GSOO-2015-Supporting-Information
LNG export demand projections	http://www.aemo.com.au/Gas/Planning/Forecasting/National-Gas-Forecasting-Report/NGFR-Supplementary-Information
Maps and diagrams	http://www.aemo.com.au/Electricity/Planning/Related-Information/Maps-and-Diagrams
Planning Assumptions	http://www.aemo.com.au/Electricity/Planning/Related-Information/Planning-Assumptions
Supply–demand analysis data files	http://www.aemo.com.au/Gas/Planning/Gas-Statement-of-Opportunities/2015-GSOO-Supply-Demand-Modelling-Data-Files