NATIONAL GAS FORECASTING REPORT

FOR THE EASTERN AND SOUTH-EASTERN AUSTRALIAN GAS REGION

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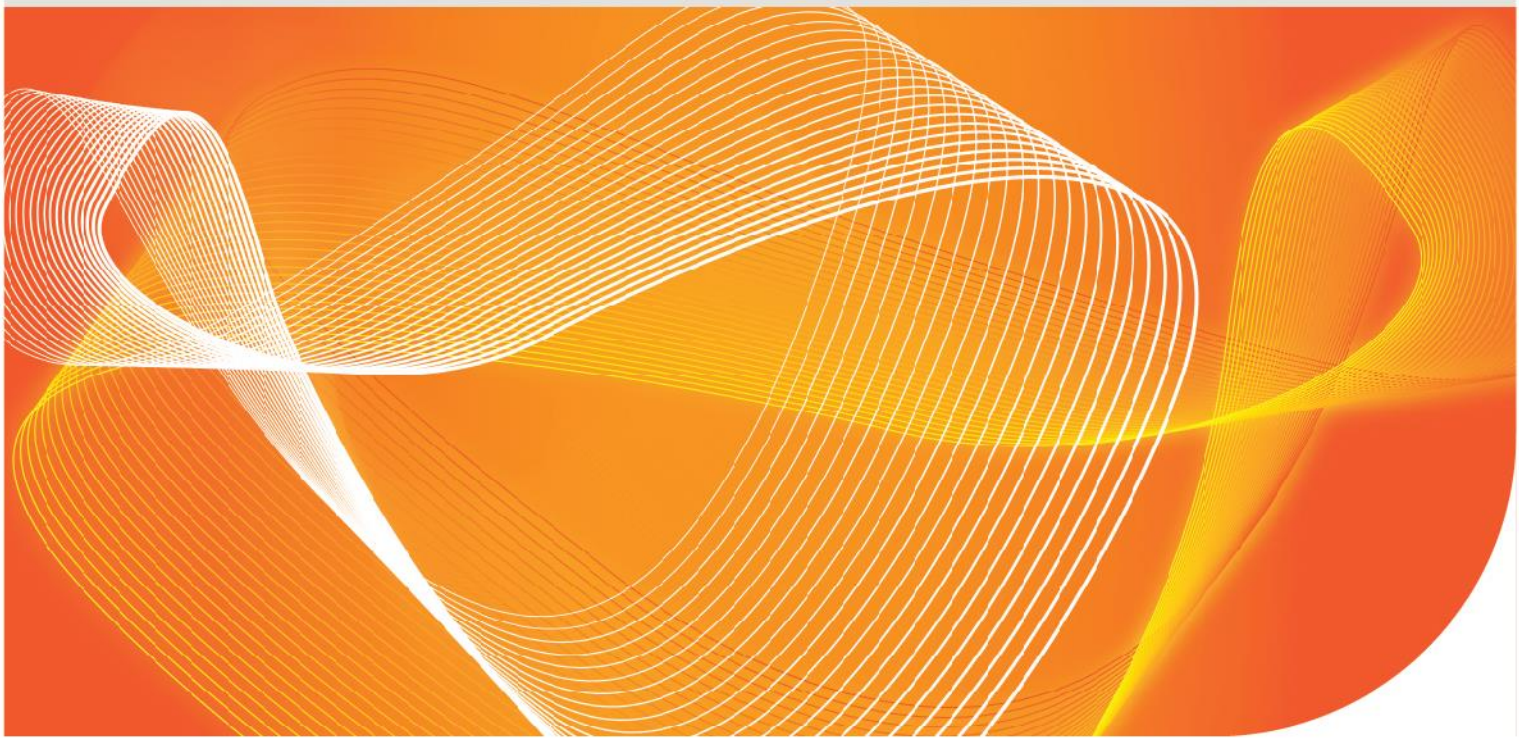

AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

IMPORTANT NOTICE

Purpose

The 2014 National Gas Forecasting Report has been prepared by the Australian Energy Market Operator Limited (AEMO) in connection with its gas planning and operational functions. This report is based on information available as at October 2014, unless otherwise specified.

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EXECUTIVE SUMMARY

The 2014 National Gas Forecasting Report (NGFR) represents AEMO's first gas forecast for eastern and south-eastern Australia's interconnected gas markets. This includes gas used for liquefied natural gas (LNG) processing and exports in Queensland.

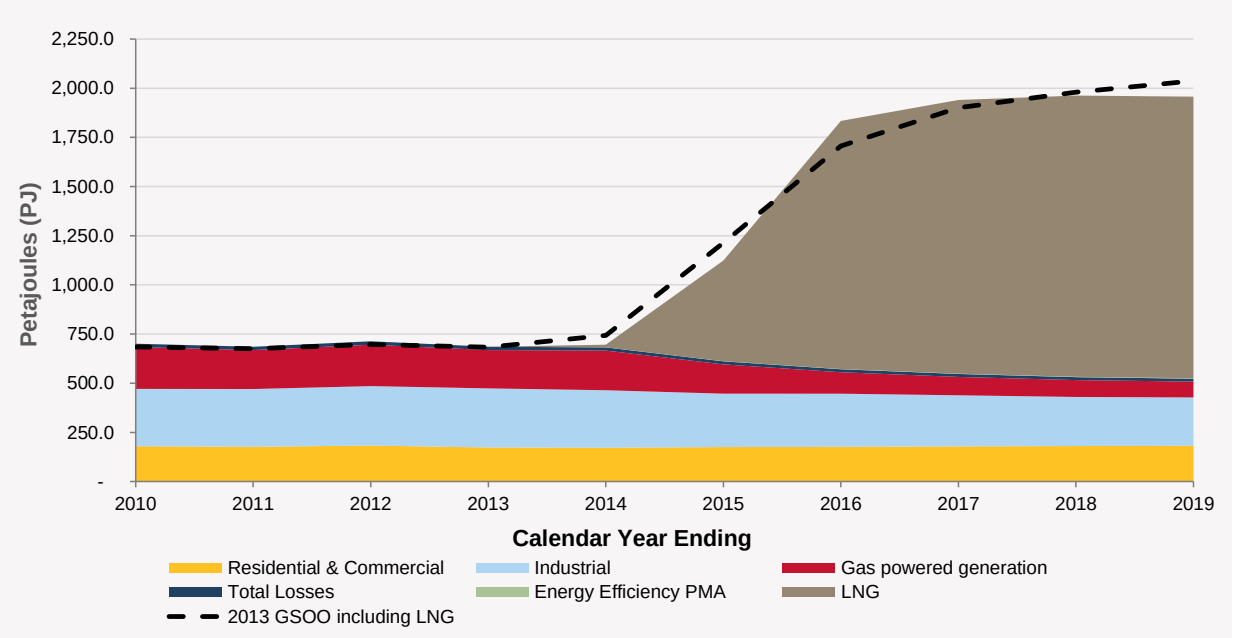
Under a medium energy consumption scenario[1], total consumption (including LNG exports) is projected to increase at an average annual rate of 23.0% in the short-term (2014-19). This compares to a 0.7% decline over the last four years, with the difference primarily driven by the ramp-up of LNG projects reaching 1,432 petajoules (PJ) by 2019.

Key short-term findings are:

- Excluding LNG, annual gas forecasts are projected to decrease at an average annual rate of 5.2%.
- Industrial sector closures—the largest of which include the BP oil refinery in Queensland and the Shell oil refinery in New South Wales—drive an average annual industrial gas consumption decline of 3.4%.
- Gas-powered generation (GPG) gas consumption is forecast to decline at an average annual rate of 16.8% due to minimal growth in electricity consumption and rising gas prices.
- Residential and commercial consumption is projected to increase at an annual average rate of 1.1%. This is due to new connections offset by reductions in average use per connection.

Figure 1 shows the total annual gas consumption forecasts (including LNG exports) under the medium scenario.

Figure 1 Total annual gas consumption (including LNG exports) over the short-term (to 2019)



[1] AEMO. *2014 Planning and Forecasting Scenarios*. Available at: http://www.aemo.com.au/Electricity/Planning/Forecasting. Viewed: 24 Oct 2014.

Regional annual gas outlook from 2014 to 2019

Trends in the gas forecasts differ across gas regions and components, in particular:

- Queensland is the only region to experience overall growth, linked to ramp-up at the Gladstone LNG (GLNG), Queensland Curtis LNG (QCLNG), and Australia Pacific LNG (APLNG) projects until 2019.
- New South Wales, Victorian, and South Australian consumption is forecast to decline, driven by reduced large industrial and GPG consumption.
- Tasmanian consumption is forecast to decline, despite growth in the industrial, and residential and commercial sectors. The overall decline reflects a reduction in GPG forecasts.

Table 1 compares forecast annual growth rates for each gas region by market segment.

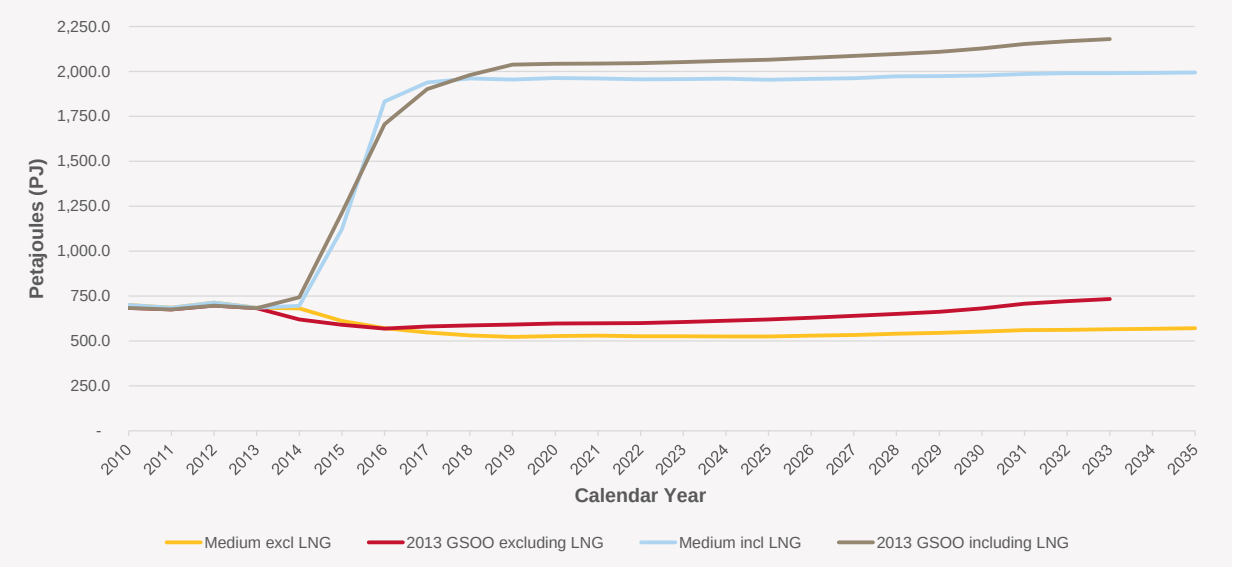
Table 1 Gas consumption annual growth rates (including LNG exports) over the short-term (2014–19)

	Total	Industrial	Residential & commercial	Gas-powered generation	Liquefied natural gas
Queensland (incl. LNG)	44.2%	-5.7%	0.8%	-22.2%	154.7%
Queensland (ex. LNG)	-10.8%	-5.7%	0.8%	-22.2%	-
New South Wales	-1.8%	-2.6%	1.4%	-6.2%	-
Victoria	-1.7%	-1.6%	1.1%	-24.5%	-
South Australia	-5.7%	-0.02%	0.5%	-11.5%	-
Tasmania	-9.3%	0.3%	5.3%	-27.3%	-
Total (inc. LNG)	23.0%	-3.4%	1.1%	-16.8%	154.7%

Annual gas over the total outlook period from 2014 to 2034

Over the long term, the gas forecasts plateau after LNG projects reach full production in 2019. Figure 2 compares the long-term forecasts between the 2013 GSOO and 2014 NGFR, both including and excluding LNG.

Figure 2 Annual gas consumption forecast (incl. LNG exports) for the total outlook period (to 2034)



Maximum demand

The NGFR's maximum demand (MD) commentary focuses on winter, as this is typically higher than the equivalent summer MD values.

Key findings in the short-term to 2019 are:

- South Australian, Victorian, and Queensland (excluding LNG) MD is forecast to decline, driven by increasing fuel costs that reduce reliance on GPG gas consumption.
- Including LNG processing and exports, Queensland MD has the largest average annual growth rate due to the ramp-up of LNG exports.
- Tasmanian MD is forecast to increase due to growth in small industrial, and residential and commercial.
- New South Wales MD is forecast to increase, driven by a shift between coal and GPG.

Table 2 compares average annual growth rates and key drivers for each region.

Table 2 Key findings for 1-in-20 winter MD in the short-term outlook period (2014-2019)

Region	Average annual growth rate	Drivers
Queensland (inc. LNG)	45.7%	Ramp-up of LNG projects.
Queensland (exc. LNG)	-7.4%	Reduced GPG and large industrial consumption driven by increasing fuel costs and closures respectively.
New South Wales	0.7%	Increasing GPG utilisation on peak days, driven by a shift between coal and GPG.
Victoria	-0.7%	Reduced GPG consumption driven by increasing fuel costs.
South Australia	-4.3%	Reduced GPG consumption driven by increasing fuel costs.
Tasmania	1.5%	Increase in residential and commercial consumption.

Key findings in the longer-term to 2034 are:

- Queensland MD has the largest average annual growth rate, due to the initial ramp-up of LNG projects.
- New South Wales and South Australian MD is forecast to increase, driven by increasing GPG utilisation as several existing coal-fired power stations withdraw.
- Victorian and Tasmanian MD is forecast to decline, driven by reductions in large industrial demand, and a greater reliance on renewable resources reducing GPG utilisation.

Table 3 Key findings for 1-in-20 winter MD over total outlook period (2014 - 2034)

Region	Average annual growth rate	Drivers
Queensland (inc. LNG)	9.9%	LNG projects.
Queensland (exc. LNG)	-1.5%	Reduced GPG and large industrial consumption driven by increasing fuel costs and closures respectively.
New South Wales	0.8%	Increasing GPG utilisation driven by retirements of coal-fired power stations.
Victoria	-0.1%	Reduced large industrial and GPG consumption.
South Australia	0.2%	Increasing GPG utilisation driven by retirements of coal-fired power stations.
Tasmania	-0.9%	Reduced large industrial and GPG consumption.

CHAPTER 1. ABOUT THE NGFR

1.1 National gas forecasting

The 2014 National Gas Forecasting Report (NGFR) is AEMO's first gas forecast for eastern and south-eastern Australia's interconnected gas markets. This includes gas used for liquefied natural gas (LNG) processing and exports in Queensland. The NGFR presents annual regional forecasts over a 20-year outlook period (2014-34).

These forecasts are a key input into AEMO's Gas Statement of Opportunities (GSOO), published in March each year. The GSOO uses gas consumption and LNG export forecasts in determining the adequacy of gas supplies and infrastructure in eastern and south-eastern Australia.

As the independent market operator, AEMO is ideally placed to develop these forecasts. In previous years, gas forecasting was outsourced and presented in the GSOO; however, this approach provided limited transparency and control over the assumptions and methodology employed. Bringing these forecasts in-house allows AEMO to deliver more granular datasets, provide more transparent commentary, undertake sensitivity assessments in response to possible future gas market changes, and continuously improve the accuracy of the gas forecasts.

The forecasts explore three distinct scenarios that reflect high, medium, and low gas consumption outlooks. The report focuses on the medium scenario, short-term outlook (2014-19). Drivers are also provided for the high and low scenarios, and across the medium-term (2019-24) and long-term (2024-34) outlook periods.

The full set of data and charts are provided in Excel workbooks accompanying the NGFR, available on AEMO's website. They include a complete set of results for the high, medium, and low scenarios. These workbooks include historical and forecast data, by market segment, for each region, and enable interested parties to undertake their own comparative analysis.

A detailed methodology report will also be available on AEMO's website shortly after publication of this report. The Forecasting Methodology Information Paper will describe and justify AEMO's forecasting assumptions and approach.

1.2 Forecast scenarios

AEMO develops gas forecasts using three scenarios in partnership with market participants, industry groups, and academics. They are reviewed every two years to ensure they remain appropriate in light of any changed policy, regulatory, or economic factors. They were last reviewed in January 2014.

The scenarios represent high, medium and low gas consumption from a centralised source (the national gas transmission pipeline) to reflect the impacts of local energy generation and energy efficiency. The terms high, medium, and low are used throughout the report to identify the scenarios.

The scenarios also reflect differing economic and policy assumptions that affect residential and commercial consumption, large industrial consumption, the magnitude of energy efficiency savings, and use of GPG in the National Electricity Market.

In addition to modelling the scenario assumptions, AEMO seeks guidance about future consumption patterns directly from large industrial customers. Consistent with the National Electricity Forecasting Report (NEFR), the low scenario reflects reduced production from, or closure of, aluminium smelters across eastern and south-eastern Australia. AEMO adopts a probabilistic approach, assuming a 50% reduction in operations between 2015 and 2017 at all aluminium smelters connected to the NEM. This is followed by closures once current agreements with respective state governments or electricity providers expire.

Table 4 shows the correlation between each scenario forecast drivers such as energy consumption, consumer type, and economic activity. Full scenario details are available in AEMO's 2014 Scenario Descriptions.[2]

[2] Available at: http://www.aemo.com.au/Electricity/Planning/~/media/Files/Other/forecasting/2014_Planning_and_Forecasting_Scenarios.ashx. Viewed: 1 December 2014.

Table 4 Comparison of key variables across gas forecasting scenarios

	High gas consumption from centralised sources[a]	Medium energy consumption from centralised sources	Low energy consumption from centralised sources
Energy consumption	High	Medium	Low
Type of consumer[b]	Low engagement	Highly engaged	Highly engaged
Economic activity	High	Medium	Low

a) A centralised source refers to the national gas transmission pipeline for gas.
b) Where the type of consumer engagement refers to consumers more proactively exercising choice of energy sources and usage patterns.

1.3 Definitions

This section provides an overview of commonly used terms in this report.

Annual gas consumption refers to gas consumed over a calendar year, and can include residential and commercial consumption, industrial consumption, GPG consumption, or transmission and distribution losses. Gas used for LNG processing and exports is considered separately.

Maximum demand (MD) refers to gas used at a single point in time, and also refers to the highest level of daily demand occurring during summer or winter each year. This can include residential and commercial demand, industrial demand, GPG demand, or distribution losses. Gas used for LNG processing and exports is considered separately.

Residential and commercial, also known as Tariff V, refers to residential and small-to-medium-sized commercial users consuming less than 10 terajoules (TJ) per year. Unless otherwise specified, historical residential and commercial data is not weather corrected.

Per customer connection refers to the average consumption per residential and commercial gas connection. Expressing consumption on this basis largely removes the impact of population growth, and allows commentary about underlying consumer behaviour patterns.

Industrial, also known as Tariff D, refers to users that consumed more than 10 TJ of gas onsite in 2013. Industrial consumption also includes some GPG that is not connected to the NEM, for example, GPG around Mt Isa.

Transmission losses refer to gas that is unaccounted for and consumed for operational purposes (such as compressor fuel) when transported through high-pressure transmission pipelines to lower-pressure distribution networks. Transmission losses are calculated as a percentage of total residential and commercial consumption, industrial consumption, GPG consumption, and distribution losses.

Distribution losses refer to gas leakage and metering uncertainties in the distribution network. This is calculated as a percentage of total residential and commercial consumption and industrial consumption connected to the distribution networks.

Gas-powered generation (GPG) refers to generation plant producing electricity by using gas as a fuel for turbines, boilers, or engines. The NGFR forecasts only include GPG that is connected to the NEM. The GPG forecasts are based on AEMO's electricity market modelling results.[3]

Liquefied natural gas (LNG) refers to gas used for LNG processing and exports.

Probability of exceedence (POE) refers to the likelihood that an MD forecast will be met or exceeded, reflecting the sensitivity of forecasts to changes in weather patterns in any given year. For example:

- **1-in-2 MD**, also known as a 50% POE, refers to the MD value that, on average, is expected to be met or exceeded one out of every two years (or 50% of the time).
- **1-in-20 MD**, also known as a 5% POE, refers to the MD value that, on average, is expected to be met or exceeded one out of every 20 years (or 5% of the time).

Winter and **summer** are defined using their calendar definitions as June to August, and December to February, respectively.

[3] Available at http://www.aemo.com.au/Electricity/Planning/National-Transmission-Network-Development-Plan. To be published mid December 2014

1.4 Changes since 2013 GSOO forecasts

In previous years, AEMO outsourced gas forecasting and published it as part of the GSOO; however, this approach provided limited transparency and control over the assumptions and methodology employed. Bringing these forecasts in-house allows AEMO to deliver more granular datasets, provide more transparent commentary, undertake sensitivity assessments in response to future gas market changes, and continuously improve forecast accuracy.

Key changes since the 2013 GSOO forecasts are:

- Updated large industrial forecasts using participant surveys and one-on-one interviews with large industrial consumers.
- Updated residential and commercial forecasts, which includes energy efficiency estimates for the first time, and revised gas price trajectories.
- Updated GPG forecasts that better align generator bidding behaviour with observed market behaviour.

1.5 Supporting information

The following supplementary information will be available on AEMO's website:

- Input assumptions, and historical annual gas consumption and MD data from 2010 to 2013. To be published on 17 December 2014.
- Forecast Methodology Information Paper explaining the approach used for the 2014 NGFR forecast. To be published on 19 December 2014.
- A summary of AEMO's independent external peer review, and ACIL Allen's key findings during the peer review process. To be published 19 December 2014.

CHAPTER 2. EASTERN AND SOUTH-EASTERN AUSTRALIA GAS FORECAST

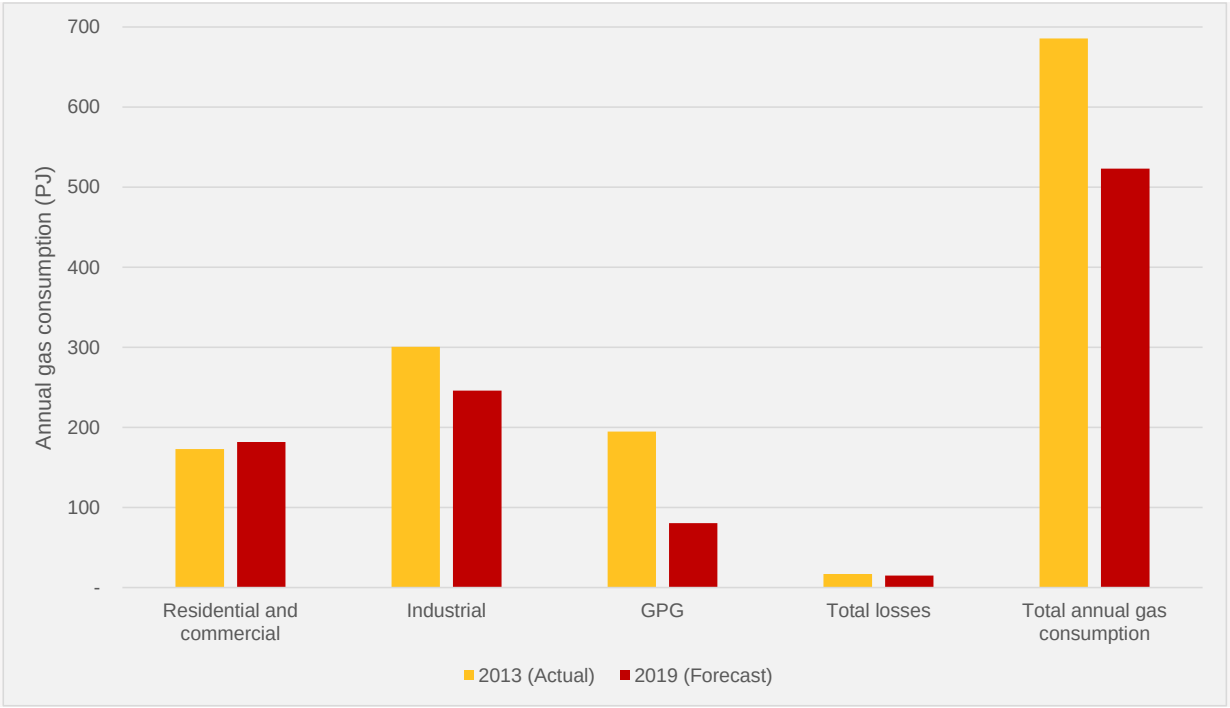
This chapter focuses on the medium scenario short-term forecast. A comparison of the high and low scenario short-term forecast is summarised in Table 10.

2.1 Key findings

Key short-term (2014-19) findings for the eastern and south-eastern Australia gas region overall are:

- Excluding LNG, total gas consumption is forecast to decrease at an average annual rate of 5.2%.
- Including LNG, the forecast increases at an average annual rate of 23.0%.
- Residential and commercial consumption is forecast to increase at an average annual rate of 1.1%, driven by new gas connections despite average use per connection continuing to decline.
- Industrial gas consumption is forecast to decrease at an average annual rate of 3.4%, driven by industrial closures.
- GPG gas consumption is forecast to decline at an average annual rate of 16.8%, driven by rising gas prices and the modelled entry of new renewable generation in the NEM.

Figure 3 Comparison of 2013 (actual) and 2019 (forecast) annual gas consumption, excluding LNG[4]



[4] GPG gas consumption may include some gas used for electricity production that is subsequently used for LNG processing.

2.2 Annual consumption

Historically, from 2010 to 2013, consumption decreased from 700.9 PJ to 685.6 PJ. This average annual decrease of 0.7% was mainly driven by reduced GPG and residential and commercial consumption. The decrease in residential and commercial consumption in 2013 is linked to warmer winters in New South Wales, Victoria, and South Australia.

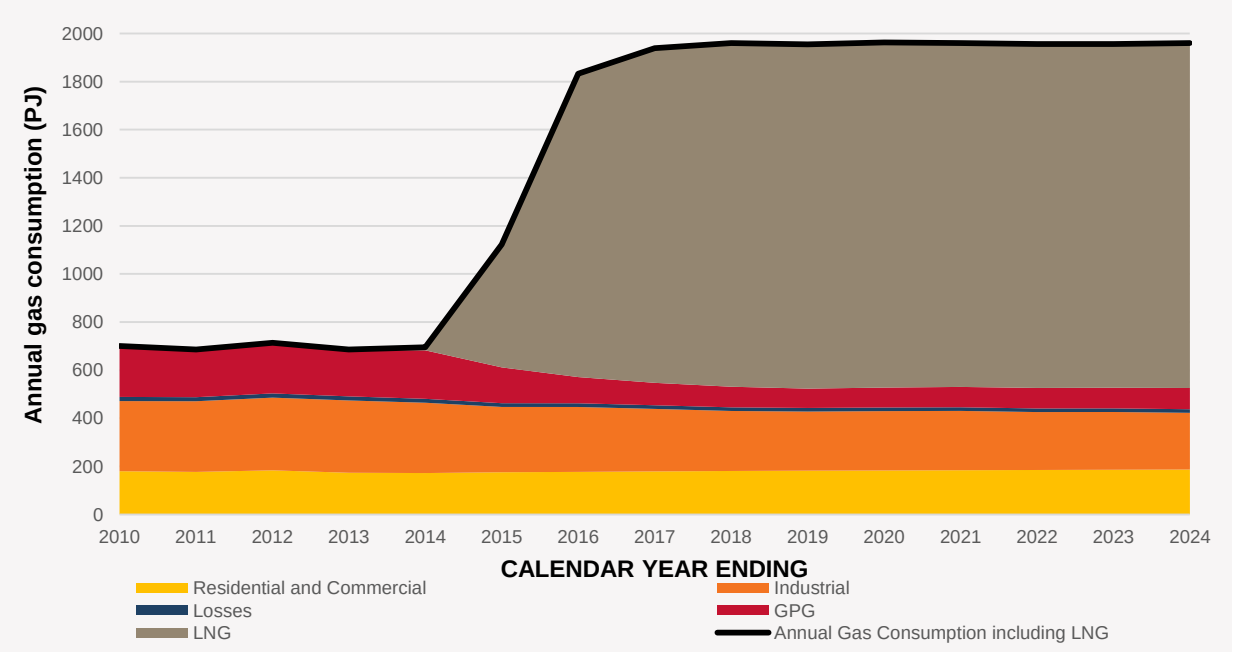
Annual consumption includes total losses from transmission and distribution networks. Refer to Appendix A for further details.

Table 5 and Figure 4 presents the annual consumption trends and drivers.

Table 5 Total annual gas consumption over the short, medium, and long term (excluding LNG)

Timeframe	Forecast (PJ)	Average annual growth	Drivers
Short term (2014-19)	682.2 to 523.3	5.2% decrease	Decline in industrial forecasts driven by rising gas prices, plant closures, improved plant efficiencies, and fuel substitution. Decline in GPG gas consumption driven by increasing gas prices and assumed new renewable generation that reduce reliance on modelled GPG plants in the NEM.
Medium term (2019-24)	523.3 to 525.7	0.1% increase	Increase in residential and commercial consumption reflecting growth in customer connections outpacing the reduction in average use per connection. Increase in GPG gas consumption linked to modelled coal-fired power stations retirements and increasing GPG competitiveness in the NEM.
Long term (2024-34)	525.7 to 567.5	0.8% increase	Increase in residential and commercial consumption.

Figure 4 Annual gas consumption (including LNG exports) for eastern and south-eastern Australia



Differences between high, medium, and low scenario short-term forecasts, 2014-19

Excluding LNG exports, the high, medium, and low scenario short-term forecasts decline at annual average rates of 3.4%, 5.2%, and 7.8% respectively.

Including LNG exports, the high, medium, and low scenario short-term forecasts increase at annual average rates of 24.7%, 23.0%, and 20.2% respectively. Key differentiating factors are outlined in the individual component forecast sections.

Figure 5 Comparison of high, medium, and low scenario forecasts, including LNG

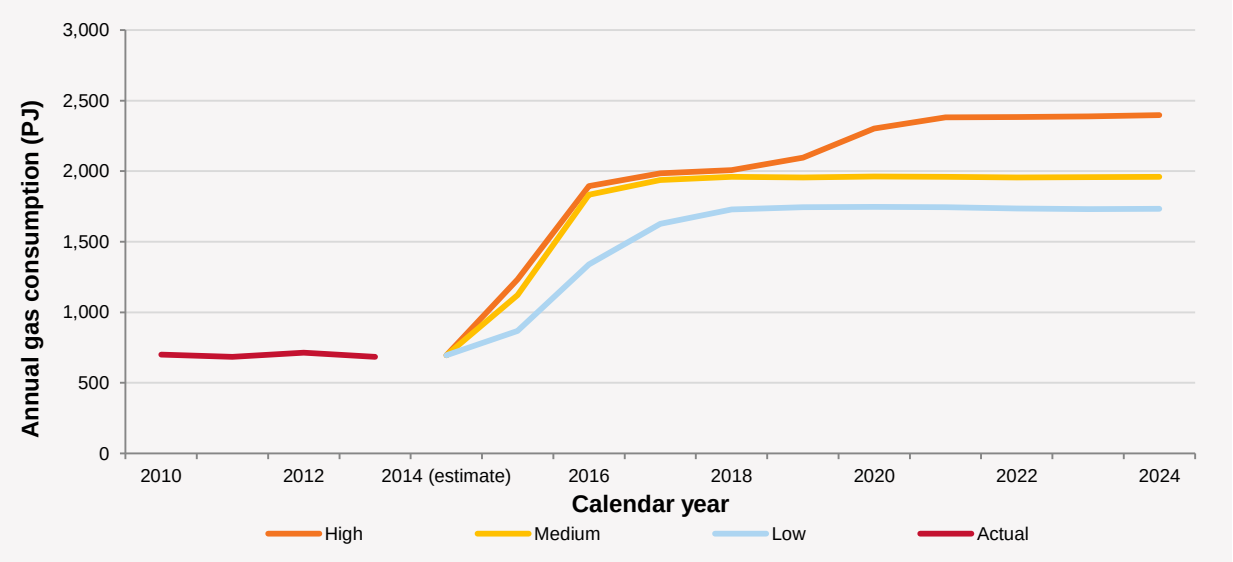


Table 6 Annual gas consumption for the eastern and south-eastern Australia gas region (PJ)

	Excluding LNG exports				Including LNG exports			
	Actual	High	Medium	Low	Actual	High	Medium	Low
2014 estimate	682.2				718.4			
2015		631.2	611.3	556.0		1,263.9	1,127.1	845.5
2016		596.4	571.1	503.4		1,892.8	1,832.5	1,319.2
2017		581.7	547.2	468.7		1,981.4	1,938.6	1,612.0
2018		575.1	530.9	449.2		2,003.3	1,960.8	1,717.9
2019		573.4	523.2	444.6		2,091.1	1,954.9	1,734.5
2020		583.3	527.4	445.0		2,297.1	1,963.1	1,738.4
2021		590.1	530.2	447.1		2,375.5	1,960.6	1,735.7
2022		591.0	526.0	438.6		2,375.9	1,956.4	1,727.2
2023		596.1	526.8	434.9		2,380.1	1,957.0	1,723.2
2024		601.9	525.7	434.6		2,390.4	1,959.8	1,726.5

2.2.1 Residential and commercial consumption (Tariff V)

Historically, from 2010 to 2013, residential and commercial consumption decreased from 179.7 PJ to 173.2 PJ. This average annual decrease of 1.2% was due to warm weather during the 2013 winter. On a weather-corrected basis, residential and commercial consumption increased at an annual average rate of 0.8%.[5] This reflects the increase in connections to the gas network (due to a combination of new housing growth and fuel substitution from existing non-gas homes). Average use per connection declined over the period, linked to rising retail gas prices and federal energy efficiency savings.

Table 7 demonstrates the continued growth of and drivers for residential and commercial consumption.

Table 7 Residential and commercial consumption over the short, medium, and long term

Timeframe	Forecast (PJ)	Average annual growth	Drivers
Short term (2014-19)	171.9 to 181.9	1.1% increase	Increase in connections to the gas network, outpacing reductions in average use per connection.
Medium term (2019-24)	181.9 to 186.6	0.5% increase	
Long term (2024-34)	186.6 to 199.7	0.7% increase	

Refer to Appendix B for further details on savings from federal energy efficiency programs.

2.2.2 Industrial consumption (Tariff D)

Historically, from 2010 to 2013, industrial consumption increased from 291.6 PJ to 300.7 PJ. This average annual increase of 1.0% is mainly driven by expansion of existing facilities and new gas connections.

Table 8 demonstrates the industrial consumption trends and drivers.

Table 8 Industrial consumption over the short, medium, and long term

Timeframe	Forecast (PJ)	Average annual growth	Drivers
Short term (2014-19)	292.5 to 245.8	3.4% decrease	Industrial closures including BP oil refinery[6] in Qld, and the Caltex oil refinery[7] in NSW.
Medium term (2019-24)	245.8 to 235.9	0.8% decrease	Less favourable economic conditions, including increasing gas price, which result in closures or reduced operation from industrial customers.
Long term (2024-34)	235.9 to 225.7	0.4% decrease	

2.2.3 Gas-powered generation

Historically, from 2010 to 2013, GPG gas consumption decreased from 212.3 PJ to 194.8 PJ. This average annual decline of 2.8% is linked to declining electricity consumption that reduces reliance on GPG plants.

Table 9 demonstrates the GPG gas consumption trends and drivers.

Table 9 GPG gas consumption over the short, medium, and long term

Timeframe	Forecast (PJ)	Average annual growth	Drivers
Short term (2014-19)	201.5 to 80.5	16.8% decrease	Rising gas prices and modelled new renewable generation which reduces the competitiveness of GPG plant in the NEM.
Medium term (2019-24)	80.5 to 88.3	1.9% increase	Increasing electricity consumption, and the modelled retirement of several coal-fired power stations.
Long term (2024-34)	88.3 to 126.5	3.7% increase	

[5] Based on weather corrected data for NSW, SA, Victoria and Queensland. Data for Tasmania is included but not weather corrected.
[6] Source: http://www.bp.com/en_au/australia/media/media-releases/bulwer-island-refinery-processing-halt.html. Accessed: 14 November 2014.
[7] Source: http://www.caltex.com.au/CommunityAndEnvironment/KurnellSiteConversion/Pages/Home.aspx. Accessed: 13 November 2014.

2.2.4 Summary of high, medium, and low scenario trends and drivers in the short-term (2014-19)

Table 10 High, medium, and low drivers for eastern and south-eastern Australia gas region (PJ)

Forecast component	Scenario	Forecast (PJ)	Average annual growth	Key drivers
Residential and commercial	Medium	171.9 to 181.9	1.1% increase	Growth in new connections outpacing reductions in average use per connection.
	High	171.9 to 186.4	1.6% increase	Lower gas prices, a higher rate of new connections (due to higher population growth) and no additional federal energy efficiency savings beyond current programs.
	Low	171.9 to 172.3	<0.1% increase	Higher gas prices, fewer new customers (due to lower population growth) and more federal energy efficiency savings.
Industrial	Medium	292.5 to 245.8	3.4% decrease	Closures in several regions. The largest of which include BP oil refinery[8] in Qld, and the Caltex oil refinery[9] in NSW.
	High	292.5 to 285.0	0.5% decrease	More optimistic operating forecasts due to favourable economic conditions, higher gross domestic product (GDP) growth, higher commodity prices, lower gas prices, lower exchange rates and modest plant expansion.
	Low	292.5 to 198.0	7.5% decrease	Reduced production forecast due to less favourable economic conditions, lower GDP growth, lower commodity prices, higher gas prices and higher exchange rates. AEMO adopted a probabilistic approach to reflect the reduced production or closure of aluminium smelters in response to less favourable economic conditions.
Gas-powered generation	Medium	201.5 to 80.5	16.8% decrease	Rising forecast gas prices which reduces the competitiveness of GPG plant in the NEM.
	High	201.5 to 85.9	15.7% decrease	Lower gas prices and faster growth in electricity consumption result in higher utilisation of GPG plant in the NEM, and therefore slower decline in GPG gas consumption.
	Low	201.5 to 71.0	18.8% decrease	Higher gas prices and slower growth in electricity consumption result in lower utilisation of GPG plant in the NEM, and therefore faster decline in GPG gas consumption.

[8] Source: http://www.bp.com/en_au/australia/media/media-releases/bulwer-island-refinery-processing-halt.html. Accessed: 14 November 2014.
[9] Source: http://www.caltex.com.au/CommunityAndEnvironment/KurnellSiteConversion/Pages/Home.aspx. Accessed: 13 November 2014.

CHAPTER 3. QUEENSLAND FORECASTS

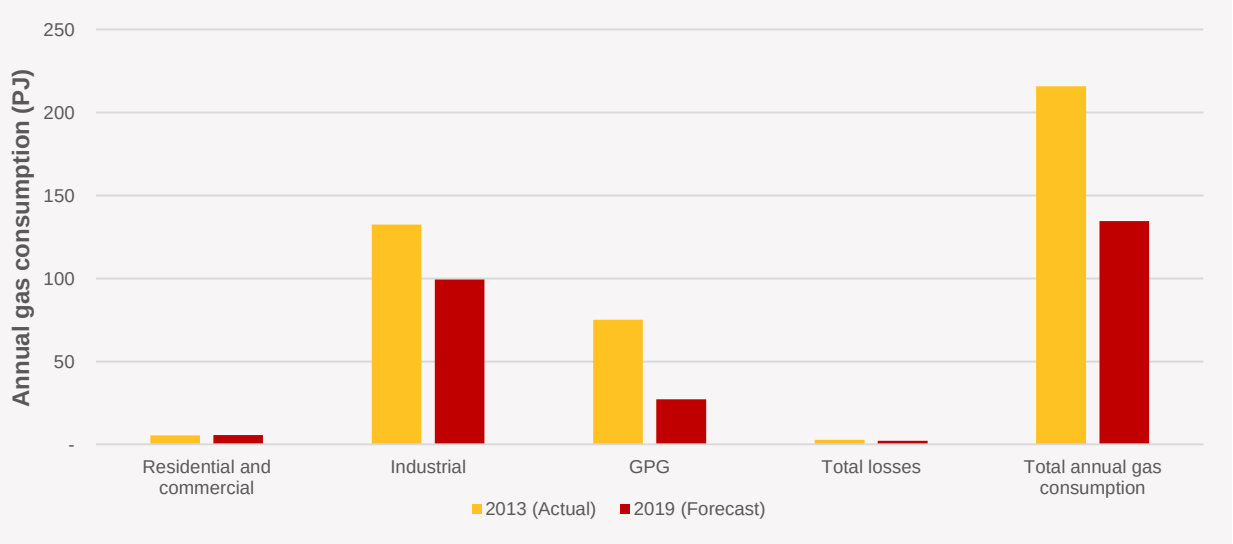
This chapter focuses on the medium scenario short-term forecast. A comparison of the high and low scenario short-term forecast is summarised in Table 16.

3.1 Key findings

Excluding LNG, key short-term (2014-19) findings for Queensland are:

- Total gas consumption is forecast to decrease at an average annual rate of 10.8%.
- Residential and commercial consumption is forecast to increase at an average annual rate of 0.8%, driven by new gas connections despite average use per connection continuing to decline.
- Industrial gas consumption is forecast to decrease at an average annual rate of 5.7%, driven by industrial closures.
- GPG gas consumption is forecast to decrease at an average annual rate of 22.2%, driven by rising gas prices that reduce the competitiveness of GPG plant in the NEM.

Figure 6 Comparison of 2013 (actual) and 2019 (forecast) annual gas consumption, excluding LNG[10]



[10] GPG gas consumption may include some gas used for electricity production that is subsequently used for LNG processing.

3.2 Annual consumption[11]

Historically, from 2010 to 2013, annual gas consumption increased from 212.8 PJ to 215.9 PJ. This average annual increase of 0.5% is mainly driven by plant expansion and new gas connections for industrial customers.

Annual consumption includes total losses from transmission and distribution networks. Refer to Appendix A for further details.

Table 11 presents the annual consumption trends and drivers over the short, medium, and long term.

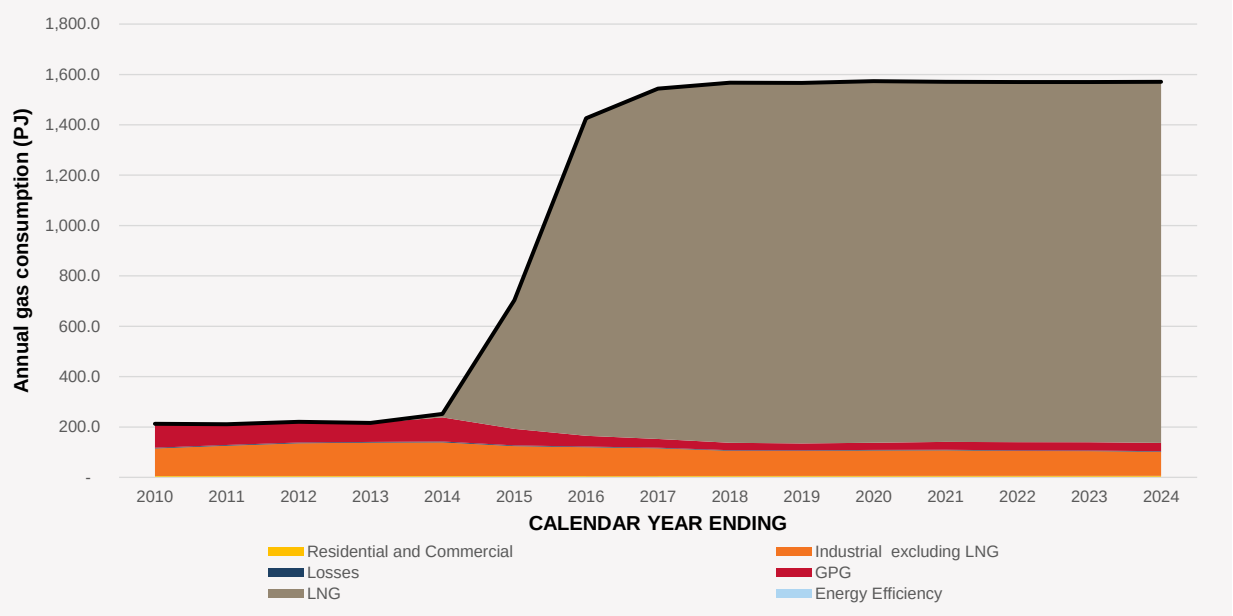
Table 11 Total annual gas consumption over the short, medium, and long term (excluding LNG)

Timeframe	Forecast (PJ)	Average annual growth	Drivers
Short term (2014-19)	238.3 to 134.7	10.8% decrease	Industrial closures by large customers such as BP Bulwer Island refinery[12] and reduced industrial consumption by other industrial consumers. Higher gas prices resulting in lower usage of GPG plants.
Medium term (2019-24)	134.7 to 136.9	0.3% increase	Increased GPG gas consumption driven by modelled retirement of existing coal-fired power stations, and increasing electricity consumption.
Long term (2024-34)	136.9 to 147.0	0.7% increase	

Figure 7 shows the annual forecast for Queensland by segment. This includes the impact of LNG, which is forecast to grow strongly once the LNG projects (QCLNG, APLNG, GLNG) begin to export gas from Curtis Island.

Six committed LNG trains are under construction, with the first delivery of LNG (from the QCLNG project) scheduled for 20 December 2014.[13] LNG forecasts were prepared by Jacobs and are available on AEMO's website.[14]

Figure 7 Annual consumption forecast segments (including LNG) for Queensland



[11] Consumption in Queensland excludes usage at the Daandine Power Station which is supplied directly from a gas field.
[12] http://www.bp.com/en_au/australia/media/media-releases/bulwer-island-refinery-processing-halt.html. Accessed: 14 November 2014.
[13] Available at http://aemo.com.au/Gas/Planning/Forecasting/National-Gas-Forecasting-Report. To be published 17 December 2014
[14] Available at http://aemo.com.au/Gas/Planning/Forecasting/National-Gas-Forecasting-Report. To be published 17 December 2014

Differences between high, medium, and low scenario short-term forecasts, 2014-19

Excluding LNG, the high, medium and low scenario short-term forecast average annual decreases are 7.3%, 10.8%, and 13.7% respectively. Including LNG exports, these increase to 46.3%, 44.2%, and 41.0% respectively. Key differentiating factors are outlined in the individual component forecast sections.

Figure 8 Comparison of high, medium, low scenario forecasts, including LNG

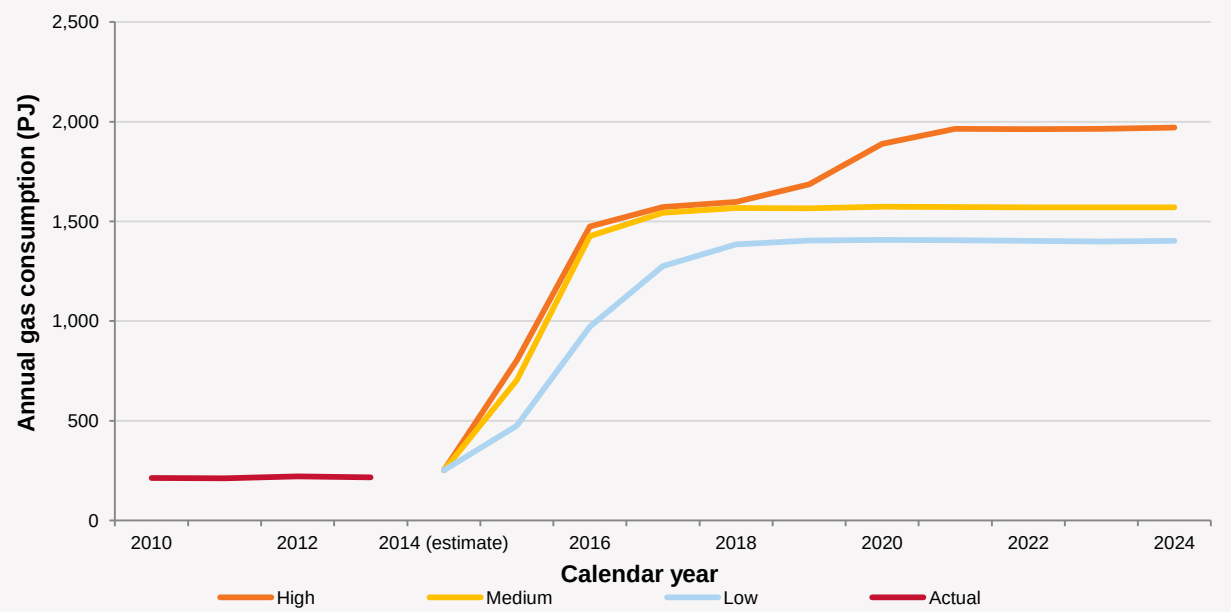


Table 12 Annual gas forecast for Queensland (PJ)

	Annual gas consumption, excluding LNG				Annual gas consumption, including LNG exports			
		High	Medium	Low		High	Medium	Low
2014 estimated	238.3				251.6			
2015		202.3	192.6	186.7		802.9	703.9	476.2
2016		176.2	165.1	155.8		1,475.1	1,426.5	971.7
2017		169.2	152.5	132.9		1,572.5	1,543.9	1,276.3
2018		164.9	137.3	116.8		1,597.7	1,567.1	1,385.5
2019		163.3	134.7	113.8		1,686.3	1,566.4	1,403.6
2020		169.5	137.5	113.4		1,889.3	1,573.1	1,406.8
2021		172.1	140.9	117.2		1,964.2	1,571.3	1,405.8
2022		170.9	139.8	114.4		1,962.9	1,570.2	1,403.0
2023		172.1	139.5	111.0		1,963.9	1,569.7	1,399.4
2024		174.4	136.9	111.2		1,971.1	1,571.0	1,403.1

3.2.1 Residential and commercial consumption (Tariff V)

Historically, from 2010 to 2013, residential and commercial consumption increased from 5.37 PJ to 5.44 PJ. This average annual increase of 0.4% reflects an increase in connections to the gas network due to new housing growth and fuel substitution from existing non-gas homes. This is offset by declines in average use per connection linked to rising retail gas prices and federal energy efficiency savings.

Table 13 demonstrates the residential and commercial consumption trends and drivers.

Table 13 Residential and commercial consumption over the short, medium, and long term

Timeframe	Forecast (PJ)	Average annual growth	Drivers
Short term (2014-19)	5.4 to 5.7	0.8% increase	Growth in new connections outpacing reductions in average use per connection, due to increasing retail gas prices, increased savings from federal energy efficiency programs.
Medium term (2019-24)	5.7 to 6.0	1.2% increase	
Long term (2024-34)	6.0 to 6.6	1.0% increase	

Refer to Appendix B for further details on savings from federal energy efficiency programs.

3.2.2 Industrial consumption (Tariff D)[15]

Historically, from 2010 to 2013, industrial consumption increased from 109.3 PJ to 132.5 PJ. This average annual increase of 6.6% is mainly driven by plant expansion and new industrial load.

Table 14 demonstrates the industrial consumption trends and drivers.

Table 14 Industrial consumption over the short, medium, and long term

Timeframe	Forecast (PJ)	Average annual growth	Drivers
Short term (2014-19)	133.6 to 99.5	5.7% decrease	Closures such as BP at Bulwer Island Refinery[16] in 2015, and industrial customers reducing their consumption because of improved plant efficiencies and increasing gas prices.
Medium term (2019-24)	99.5 to 95.4	0.8% decrease	Industrial customers reducing their consumption due to less favourable economic conditions linked to increasing gas prices.
Long term (2024-34)	95.4 to 92.6	0.3% decrease	Industrial customers continuing to reduce their consumption, driven by increasing gas prices.

3.2.3 Gas-powered generation

Historically, from 2010 to 2013, GPG consumption decreased from 95.1 PJ to 75.1 PJ. This average annual decline of 7.6% was driven by decreasing electricity consumption. Table 15 demonstrates the GPG consumption trends and drivers.

Table 15 Gas-powered generation over the short, medium, and long term

Timeframe	Forecast (PJ)	Average annual growth	Drivers
Short term (2014-19)	95.8 to 27.3	22.2% decrease	Increasing gas prices which reduces the competitiveness of GPG plant in the NEM.
Medium term (2019-24)	27.3 to 33.1	4.0% increase	The modelled retirement of several coal–fired power stations, resulting in a greater electricity market share for GPG plant.
Long term (2024-34)	33.1 to 45.4	3.2% increase	

[15] Excludes LNG usage.
[16] Source: http://www.bp.com/en_au/australia/media/media-releases/bulwer-island-refinery-processing-halt.html. Accessed: 14 November 2014.

3.2.4 Summary of high, medium and low scenario trends and drivers in the short-term (2014-19)

Table 16 High, medium and low drivers for Queensland (PJ)

Forecast component	Scenario	Forecast (PJ)	Average annual growth	Key drivers
Residential and commercial	Medium	5.4 to 5.7	0.8% increase	Growth in new connections, outpacing reductions in average use per connection.
	High	5.4 to 6.0	1.8% increase	Lower retail gas prices, a higher rate of new connections (due to higher population growth) and no additional federal energy efficiency savings beyond current programs.
	Low	5.4 to 5.3	0.6% decrease	Higher retail gas prices, fewer new customers (due to lower population growth) and more federal energy efficiency savings.
Industrial	Medium	133.6 to 99.5	5.7% decrease	Closures such as BP at Bulwer Island Refinery in 2015, and industrial customers reducing their consumption because of improved plant efficiencies and increasing gas prices.
	High	133.6 to 120.0	2.1% decrease	More optimistic operating forecasts due to favourable economic conditions, higher GDP growth and higher commodity prices, lower gas prices, and lower exchange rates.
	Low	133.6 to 81.2	9.5% decrease	Reduced production forecast due to less favourable economic conditions, lower GDP growth, lower commodity prices, higher gas prices and higher exchange rates. AEMO adopted a probabilistic approach to reflect the reduced production or closure of aluminium smelters in response to less favourable economic conditions.
Gas-powered generation	Medium	95.8 to 27.3	22.2% decrease	Rising gas prices which reduces the competitiveness of GPG plant in the NEM.
	High	95.8 to 34.7	18.4% decrease	Gas prices increase more slowly than in the medium scenario, leading to a slower decline in GPG consumption.
	Low	95.8 to 25.4	23.3% decrease	Gas prices increase more quickly than in the medium scenario, leading to a faster decline in GPG consumption.
Liquefied Natural gas	Medium	13.3 to 1,432	154.7% increase	The three LNG projects (QCLNG, APLNG, GLNG) begin to export gas from Curtis Island, with the very first delivery of LNG scheduled for 20 December 2014.
	High	13.3 to 1,523	157.9% increase	All six committed LNG projects operate above contract, and a seventh train from 2020.
	Low	13.3 to 1,290	149.5% increase	All six committed LNG projects operate at 10% below contract.

3.3 Summer MD

Queensland is the only region where, historically, MD occurs in summer and is driven by GPG. The 2013 summer MD was 603.7 TJ on 30 January 2013.

Winter MD forecasts and growth rates are published in the 2014 NGFR datasheets.[17]

Table 17 Summer MD, excluding LNG, 1-in-20 forecast

Timeframe	Forecast (TJ/d)	Average annual growth	Drivers
Short term (2014-19)	700.3 to 473.5	7.5% decrease	Rising gas prices which reduce reliance on GPG plant in the NEM, and result in reduced operation or closure of large industrial customers.
Medium term (2019-24)	473.5 to 563.4	3.5% increase	Driven by GPG demand as electricity consumption increases and existing coal-fired power stations are retired.
Long term (2024-34)	563.4 to 552.8	0.2% decrease	Linked to rising gas prices which result in reduced operation of industrial customers and existing gas-powered stations withdrawing.

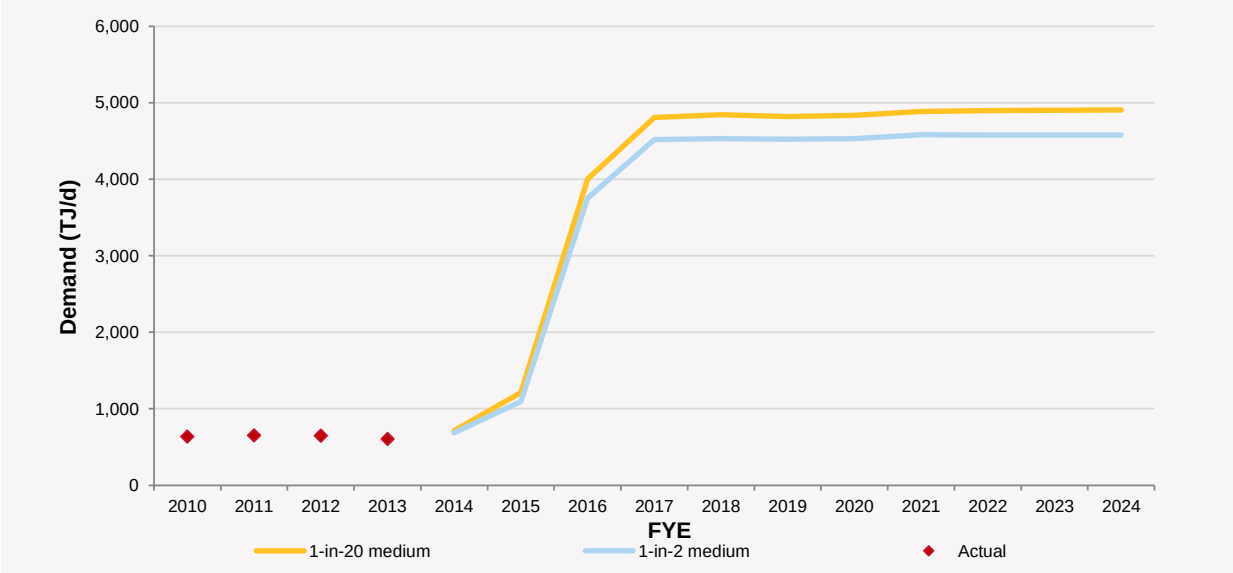
Differences between high, medium, and low scenario short-term forecasts, 2014-19

Excluding LNG, the high, medium and low short-term forecasts decrease at annual average rates of 3.3%, 7.5%, and 12.9% respectively. This decrease is primarily due to reduced large industrial and GPG demand. Including LNG, the high, medium and low short-term forecasts increase at average annual rates of 49.0%, 46.6%, and 43.0% respectively.

Key drivers behind the differences from the medium scenario are:

- In the high scenario, gas prices increase more slowly and electricity MD increases more quickly in the short term. These factors together lead to a slower decline in GPG MD. The high scenario also assumes an additional (seventh) LNG project and LNG operation above contract.
- In the low scenario, gas prices increase more quickly and electricity MD decreases in the short term. These factors together lead to a faster decline in GPG MD. The low scenario also assumes all six LNG projects operate at 10% below contract.

Figure 9 Summer 1-in-2 and 1-in-20 year event MD forecasts for Queensland



[17] Available at http://aemo.com.au/Gas/Planning/Forecasting/National-Gas-Forecasting-Report. To be published 17 December 2014

Table 18 Summer 1-in-2 and 1-in-20 year event MD for Queensland (TJ/d)

		High		Medium		Low	
	Actual	1-in-2	1-in-20	1-in-2	1-in-20	1-in-2	1-in-20
2013	603.7						
2014		684.9	713.0	684.9	713.0	684.9	713.0
2015		1,192.2	1,325.0	1,093.4	1,211.3	892.6	978.9
2016		4,048.2	4,320.7	3,754.9	4,003.8	2,297.7	2,434.4
2017		4,592.7	4,919.6	4,519.9	4,810.0	3,393.9	3,588.5
2018		4,625.0	4,958.0	4,529.0	4,843.3	4,017.4	4,258.9
2019		4,894.2	5,234.7	4,521.8	4,819.8	4,023.6	4,266.1
2020		5,612.8	6,008.6	4,531.7	4,836.0	4,013.8	4,254.0
2021		5,734.5	6,110.4	4,582.3	4,885.9	4,115.3	4,377.0
2022		5,734.4	6,111.8	4,577.3	4,896.9	4,085.5	4,353.0
2023		5,737.2	6,124.7	4,576.8	4,903.0	4,071.4	4,347.7
2024		5,766.0	6,149.4	4,577.5	4,905.1	4,069.9	4,351.0

CHAPTER 4. NEW SOUTH WALES FORECASTS

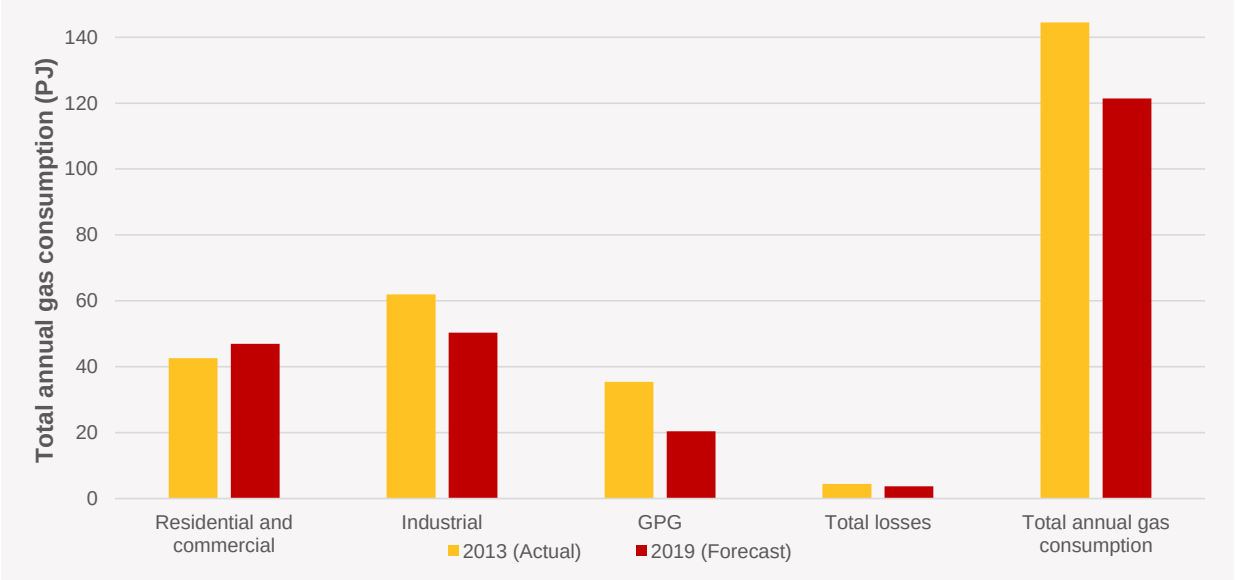
This chapter focuses on the medium scenario short-term forecast. A comparison of the high and low scenario short-term forecast is summarised in Table 24.

4.1 Key findings

Key short-term (2014-19) findings for New South Wales are:

- Total gas consumption is forecast to decrease at an average annual rate of 1.8%.
- Residential and commercial consumption is forecast to increase at an average annual rate of 1.4%, driven by new gas connections despite average use per connection continuing to decline.
- Industrial gas consumption is forecast to decrease at an average annual rate of 2.6%, driven by industrial closures.
- GPG consumption is forecast to decline at an average annual rate of 6.2%, driven by rising gas prices that reduce competitiveness of GPG plant in the NEM.

Figure 10 Comparison of 2013 (actual) and 2019 (forecast) annual gas consumption



4.2 Annual consumption

Historically, from 2010 to 2013, gas consumption declined from 147.0 PJ to 144.5 PJ. This average annual decline of 0.6% is mainly driven by closures of industrial customers.

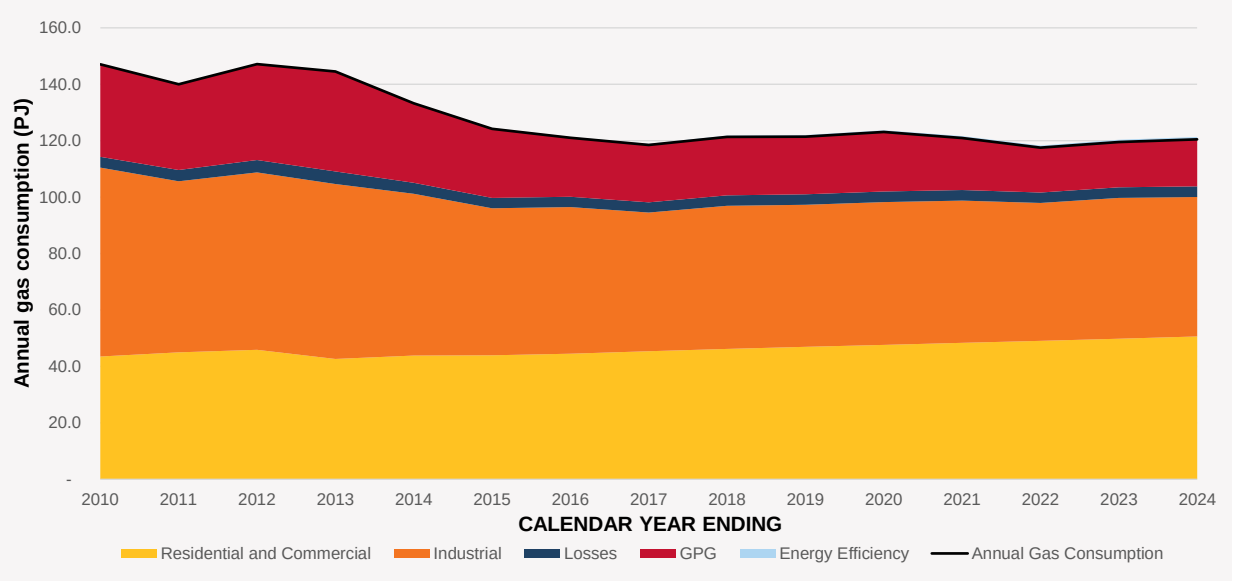
Annual consumption includes total losses from transmission and distribution networks. Refer to Appendix A for further details.

Table 19 presents the annual consumption trends and drivers over the short, medium, and long term.

Table 19 Total annual gas consumption over the short, medium, and long term

Timeframe	Forecast (PJ)	Average annual growth	Drivers
Short term (2014-19)	133.2 to 121.4	1.8% decrease	Decline in industrial consumption linked to the closure of several large industrial consumers, including the Caltex Kurnell[18] refinery and Alcoa Yennora[19] rolling mills. Decline in GPG consumption corresponds with increasing gas prices, and the modelled entry of new renewable wind generation in the NEM.
Medium term (2019-24)	121.4 to 120.4	0.2% decrease	Decline in GPG consumption reflecting the modelled retirement of existing GPG plants.
Long term (2024-34)	120.4 to 133.3	1.0% increase	Increase in GPG and residential and commercial consumption.

Figure 11 Annual consumption forecast segments for New South Wales



[18] Source: http://www.caltex.com.au/CommunityAndEnvironment/KurnellSiteConversion/Pages/Home.aspx. Accessed: 13 November 2014.
[19] Source: http://www.getsydney.com.au/business-and-employment-in-sydney/item/3010-alcoa-to-close-yennora-aluminum-mill-and-point-henry-smelter. Accessed: 13 November 2014.

Differences between high, medium, and low scenario short-term forecasts, 2014-19

In the short term, the high, medium and low scenario forecasts decline at annual average rates of 0.8%, 1.8%, and 3.8% respectively. Key differentiating factors are outlined in the individual component forecast sections below.

Figure 12 Comparison of high, medium, low scenario forecasts, including LNG

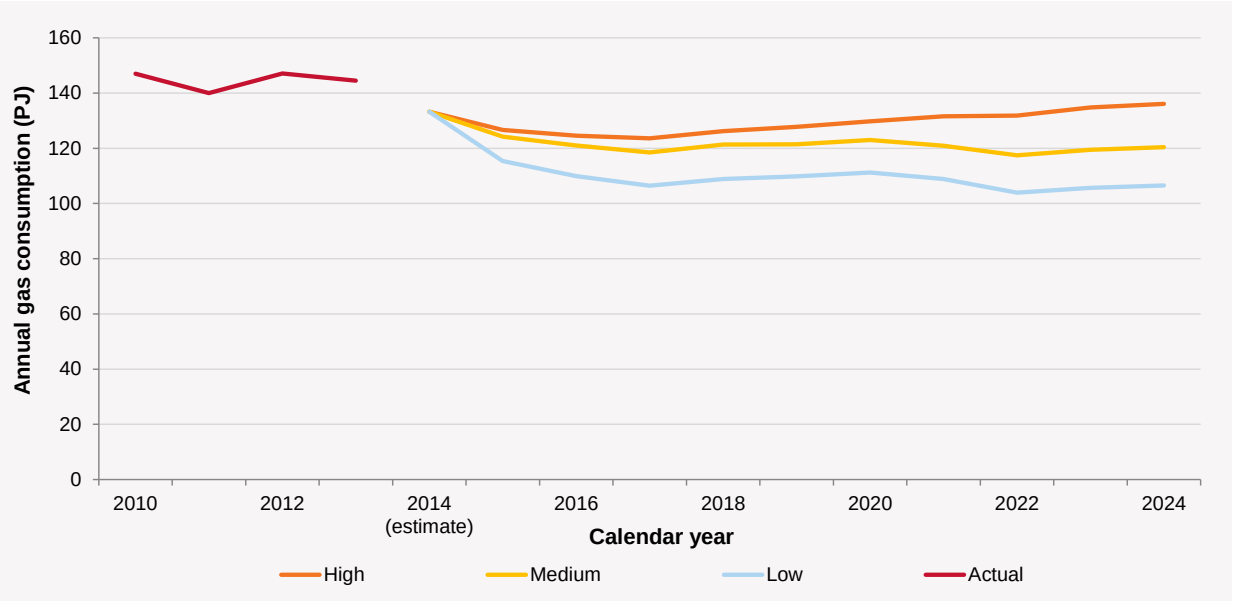


Table 20 Annual gas consumption for New South Wales (PJ)

	Actual	High	Medium	Low
2014 estimated	133.2			
2015		126.6	124.2	115.4
2016		124.5	121.0	109.9
2017		123.6	118.5	106.5
2018		126.2	121.3	108.8
2019		127.8	121.4	109.8
2020		129.8	123.0	111.3
2021		131.6	120.9	108.9
2022		131.9	117.5	103.9
2023		134.8	119.5	105.7
2024		136.1	120.4	106.5

4.2.1 Residential and commercial consumption (Tariff V)

Historically, from 2010 to 2013, New South Wales residential and commercial consumption decreased from 43.5 PJ to 42.6 PJ. This average annual decrease of 0.7% was due to weather where the 2013 winter was very warm. On a weather-corrected basis[20], residential and commercial consumption increased at an annual average of 1.1%. This reflects an increase in connections to the gas network. Average use per connection declined over the period, linked to rising retail gas prices and savings from federal energy efficiency programs.

Table 21 demonstrates the residential and commercial consumption trends and drivers.

[20] Weather correction methodology published in NGFR methodology paper.

Table 21 Residential and commercial consumption over the short, medium, and long term

Timeframe	Forecast (PJ)	Average annual growth	Drivers
Short term (2014-19)	43.8 to 46.9	1.4% increase	Growth in connections to the gas network due to new housing growth outpacing the decline in average use per connection. This is a result of increasing gas prices, increased savings from federal energy efficiency programs, and an expected warmer trend, which is significant as gas consumption is sensitive to annual weather patterns.
Medium term (2019-24)	46.9 to 50.6	1.5% increase	
Long term (2024-34)	50.6 to 57.2	1.2% increase	

Refer to Appendix B for further details on savings from federal energy efficiency programs.

4.2.2 Industrial consumption (Tariff D)

Historically, from 2010 to 2013, industrial consumption decreased from 66.9 PJ to 62.0 PJ. This average annual decrease of 2.5% is mainly driven by closures of Shell Australia's Clyde Refinery[21] in 2012, and Viridian's glass plant at Ingleburn in 2013.[22] Table 22 demonstrates the industrial consumption trends and drivers.

Table 22 Industrial consumption over the short, medium, and long term

Timeframe	Forecast (PJ)	Average annual growth	Drivers
Short term (2014-19)	57.3 to 50.3	2.6% decrease	Industrial closures including Caltex Kurnell[23] refinery and Alcoa Yennora[24] rolling mills.
Medium term (2019-24)	50.3 to 49.4	0.4% decrease	Increasing gas prices are forecast to reduce gas consumption by small-to-medium industrial customers.
Long term (2024-34)	49.4 to 47.4	0.4% decrease	

4.2.3 Gas-powered generation

Historically, from 2010 to 2013, GPG gas consumption increased from 32.8 PJ to 35.4 PJ; an average annual increase of 2.6%. Table 23 demonstrates the trend and drivers in GPG gas consumption.

Table 23 GPG gas consumption over the short, medium, and long term

Timeframe	Forecast (PJ)	Average annual growth	Drivers
Short term (2014-19)	28.2 to 20.4	6.2% decrease	Rising forecast gas prices reducing the competitiveness of GPG plant in the NEM.
Medium term (2019-24)	20.4 to 16.6	4.1% decrease	Rising forecast gas prices, combined with the modelled retirement of some GPG plants.
Long term (2024-34)	16.6 to 24.7	4.0% increase	Long-term growth in electricity consumption.

[21] Source: http://www.abc.net.au/news/2012-06-07/shell-to-close-clyde-oil-refinery/4058560. Accessed: 13 November 2014.
[22] Source: http://www.dailytelegraph.com.au/newslocal/macarthur/viridian-glass-factory-closure-at-ingleburn-to-cost-150-jobs/story-fngr8h70-1226602604827. Accessed: 13 November 2014.
[23] Source: http://www.caltex.com.au/CommunityAndEnvironment/KurnellSiteConversion/Pages/Home.aspx. Accessed: 13 November 2014
[24] Source: http://www.getsydney.com.au/business-and-employment-in-sydney/item/3010-alcoa-to-close-yennora-aluminum-mill-and-point-henry-smelter. Accessed: 13 November 2014.

4.2.4 Summary of high, medium, and low scenario trends and drivers in the short-term (2014-19)

Table 24 High, medium, and low drivers for New South Wales (PJ)

Forecast component	Scenario	Forecast (PJ)	Average annual growth	Key drivers
Residential and commercial	Medium	43.8 to 46.9	1.4% increase	Growth in new connections, outpacing reductions in average use per connection.
	High	43.8 to 48.2	1.9% increase	Lower retail gas prices, a higher rate of new connections (due to higher population growth) and no additional federal energy efficiency savings beyond current programs.
	Low	43.8 to 44.6	0.4% increase	Higher retail gas prices, fewer new customers (due to lower population growth) and more federal energy efficiency savings.
Industrial	Medium	57.3 to 50.3	2.6% decrease	Industrial closures including the Caltex Kurnell refinery and Alcoa Yennora rolling mills in 2014.
	High	57.3 to 55.4	0.7% decrease	More optimistic operating forecasts due to favourable economic conditions such as higher GDP growth and higher commodity prices, lower gas prices and lower exchange rates.
	Low	57.3 to 43.5	5.4% decrease	Reduced production forecasts due to less favourable economic conditions, lower GDP growth, lower commodity prices, higher gas prices and higher exchange rates. AEMO adopted a probabilistic approach to reflect the reduced production or closure of aluminium smelters in response to less favourable economic conditions.
Gas-powered generation	Medium	28.2 to 20.4	6.2% decrease	Rising forecast gas prices reducing the competitiveness of GPG plant in the NEM.
	High	28.2 to 20.2	6.4% decrease	Higher electricity consumption and lower gas prices resulting in higher GPG gas consumption.
	Low	28.2 to 18.3	8.3% decrease	Reduced electricity consumption and higher gas prices resulting in lower GPG gas consumption.

4.3 Winter MD

MD in New South Wales occurs in winter and is primarily driven by residential and commercial demand. The 2013 winter MD was 579.7 TJ on 20 August 2013. Summer MD forecasts and growth rates are published in the 2014 NGFR datasheets.[25]

Table 25 presents the drivers for the summer MD over the short, medium, and long term.

Table 25 Summer MD, 1-in-20 forecast

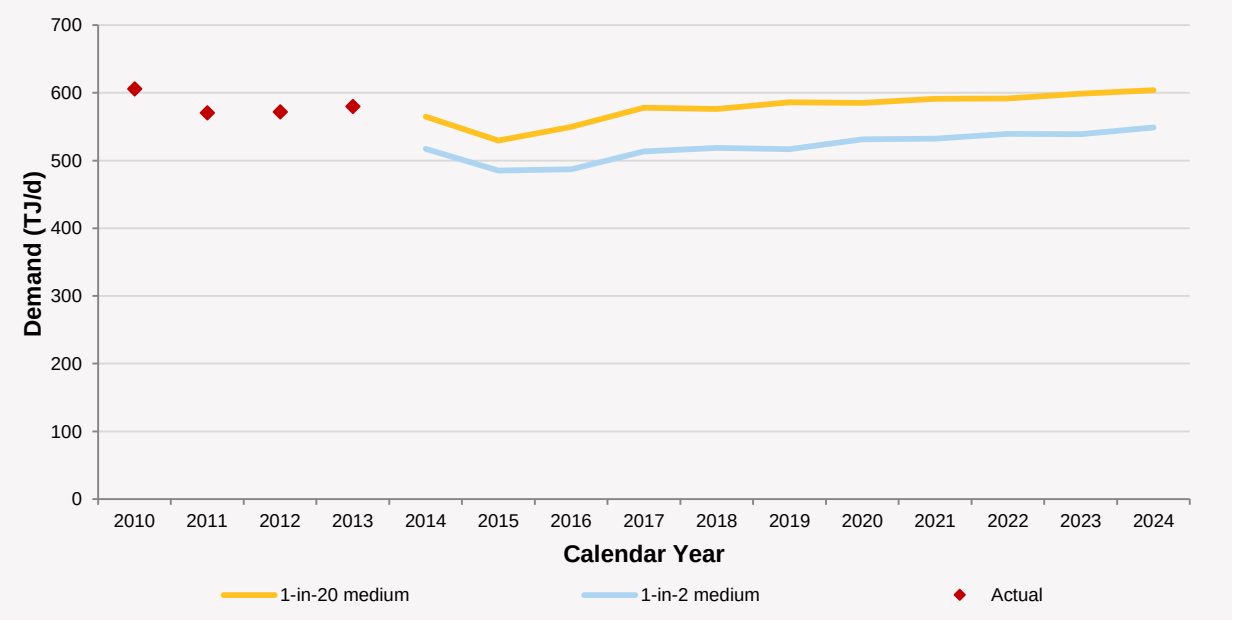
Timeframe	Forecast (TJ/d)	Average annual growth	Drivers
Short term (2014-19)	565.0 to 585.9	0.7% increase	Increase in GPG MD due to higher reliance on GPG plants in the NEM as NSW electricity winter MD grows during this period.
Medium term (2019-24)	585.9 to 603.9	0.6% increase	
Long term (2024-34)	603.9 to 668.7	1.0% increase	

Differences between high, medium, and low scenario short-term forecasts, 2014-19

The high and medium short-term forecasts increase by annual average rates of 0.8% and 0.7% respectively, while the low short-term forecast decreases by an annual average rate of 0.1%. Key drivers behind the differences from the medium scenario are:

- In the high scenario, faster growth in electricity MD results in greater reliance on GPG plant in the NEM. This is in conjunction with a more optimistic industrial forecasts in response to favourable economic conditions.
- In the low scenario, GPG MD is increasing, but at a slower rate due to reduced reliance on GPG plant in the NEM. This growth is offset by reduced industrial production in response to less favourable economic conditions, and gas and commodity price assumptions.

Figure 13 Winter 1-in-2 and 1-in-20 year event MD forecasts for New South Wales



[25] Available at http://aemo.com.au/Gas/Planning/Forecasting/National-Gas-Forecasting-Report. To be published 17 December 2014

Table 26 Winter 1-in-2 and 1-in-20 year event MD for New South Wales (TJ/d)

		High		Medium		Low	
	Actual	1-in-2	1-in-20	1-in-2	1-in-20	1-in-2	1-in-20
2013	579.7						
2014		517.3	565.0	517.3	565.0	517.3	565.0
2015		498.9	543.6	485.0	529.6	452.4	495.0
2016		515.8	565.7	487.2	549.8	439.9	475.4
2017		525.2	580.2	513.6	577.9	466.2	518.0
2018		526.9	587.7	518.8	576.2	489.1	553.5
2019		528.0	587.0	516.9	585.9	503.0	562.9
2020		554.9	606.3	531.2	585.1	530.0	585.4
2021		565.2	619.9	532.3	591.0	519.5	574.7
2022		582.1	625.4	539.3	591.7	508.6	578.2
2023		584.5	639.4	539.1	598.8	514.9	582.3
2024		591.1	643.4	548.6	603.9	520.5	586.4

CHAPTER 5. SOUTH AUSTRALIAN FORECASTS

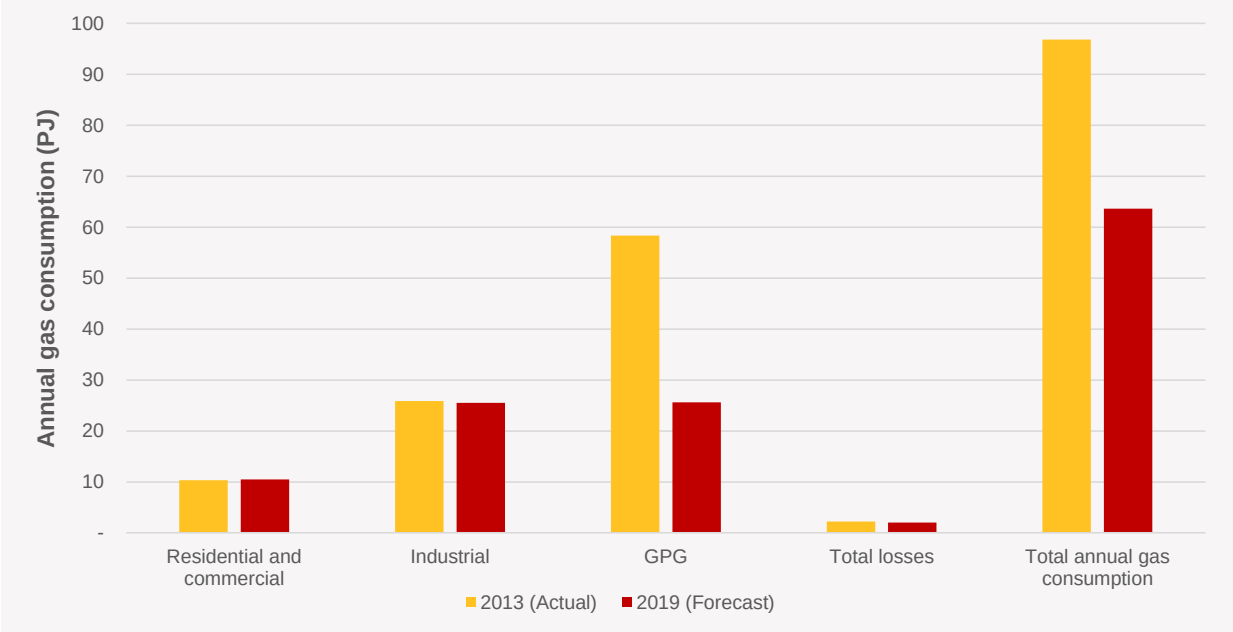
This chapter focuses on the medium scenario short-term forecast. A comparison of the high and low scenario short-term forecast is summarised in Table 32.

5.1 Key findings

Key short-term (2014-19) findings for South Australia are:

- Total gas consumption is forecast to decrease at an average annual rate of 5.7%.
- Residential and commercial consumption is forecast to increase at an average annual rate of 0.5%, driven by new connections despite average use per connection continuing to decline.
- Industrial gas consumption is forecast to decrease at an average annual rate of less than 0.1%, driven by manufacturing closures, despite modest plant expansions.
- GPG is forecast to decrease at an average annual rate of 11.5%, driven by rising gas prices that reduce GPG competitiveness in the NEM.

Figure 14 Comparison of 2013 (actual) and 2019 (forecast) annual gas consumption



5.2 Annual consumption

Historically, from 2010 to 2013, gas consumption declined from 107.7 PJ to 96.8 PJ. This average annual decline of 3.5% is mainly driven by reduced GPG gas consumption.

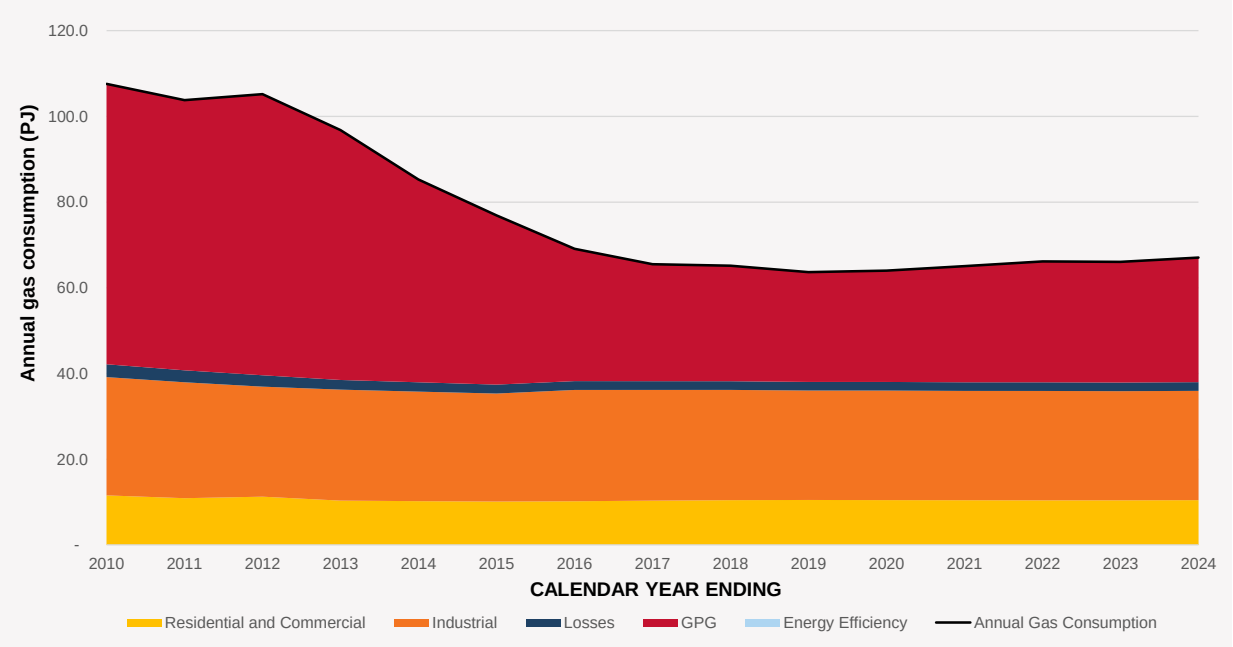
Annual consumption includes total losses from transmission and distribution networks. Refer to Appendix A for further details.

Table 27 presents the annual consumption trends and drivers over the short, medium, and long term.

Table 27 Total annual gas consumption over the short, medium, and long term

Timeframe	Forecast (PJ)	Average annual growth	Drivers
Short term (2014-19)	85.2 to 63.7	5.7% decrease	Reduced GPG consumption in the NEM due to rising gas prices.
Medium term (2019-24)	63.7 to 67.0	1.0% increase	Increased GPG consumption due to the modelled retirement of existing coal-fired power stations, making GPG more competitive in the NEM.
Long term (2024-34)	67.0 to 82.5	2.1% increase	Increased GPG due to retirement of existing coal-fired power stations and modelled new GPG plants in 2030. Increase in residential and commercial consumption also contributes.

Figure 15 Annual consumption forecast segments for South Australia



Differences between high, medium, and low scenario short-term forecasts, 2014-19

The high, medium, and low short-term forecasts decline at average annual rates of 5.6%, 5.7%, and 8.6% respectively. The reversed order between the high and medium scenarios is primarily driven by competing scenario drivers for GPG consumption. Key differentiating factors are outlined in the individual component forecast sections.

Figure 16 High, medium, low comparison

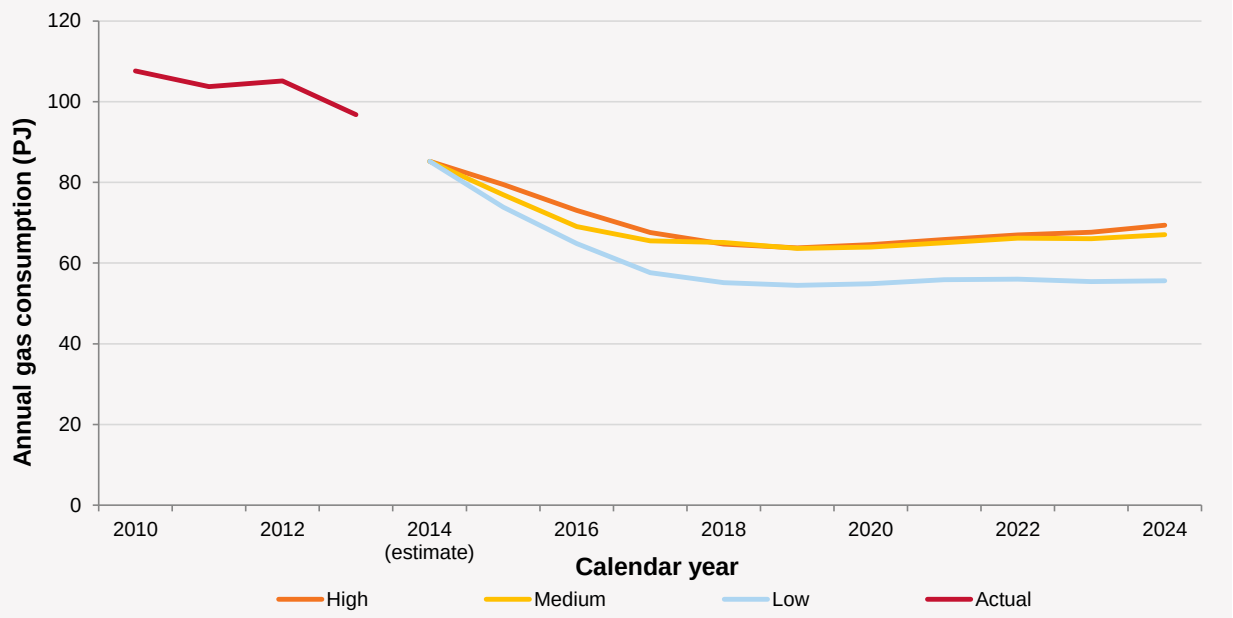


Table 28 Annual gas consumption for South Australia (PJ)

	Actual	High	Medium	Low
2014 estimate	85.2			
2015		79.5	76.9	73.9
2016		73.1	69.1	64.8
2017		67.6	65.5	57.6
2018		64.7	65.1	55.2
2019		63.7	63.7	54.5
2020		64.6	64.0	54.9
2021		65.8	65.1	55.9
2022		67.0	66.2	56.0
2023		67.7	66.0	55.4
2024		69.4	67.0	55.6

5.2.1 Residential and commercial consumption (Tariff V)

Historically, from 2010 to 2013, residential and commercial consumption decreased from 11.6 PJ to 10.3 PJ. This average annual decrease of 3.7% is primarily due to weather; the 2013 winter was very warm (15% below the 10-year average heating degree days) and 2010 was colder than average. On a weather-corrected basis, the average annual decrease becomes 0.4%. This decrease is due to declining average use per connection, attributable largely to rising gas prices and federal energy efficiency savings.

Table 29 demonstrates the residential and commercial consumption trends and drivers over the short, medium, and long term.

Table 29 Residential and commercial consumption over the short, medium, and long term

Timeframe	Forecast (PJ)	Average annual growth	Drivers
Short term (2014-19)	10.2 to 10.5	0.5% increase	Growth in customer connections, outpacing a decline in average use per customer. This decline is due to a combination of increasing gas price and federal energy efficiency savings.
Medium term (2019-24)	10.5 to 10.46	0.1% decrease	Faster decline in average use per customer becomes the dominant driver, as forecast gas prices rise. Increased savings from federal energy efficiency programs also contributes to declining average usage.
Long term (2024-34)	10.5 to 11.1	0.6% increase	Growth in customer connections, outpacing the decline in average use per customer.

Refer to Appendix B for further details on savings from federal energy efficiency programs.

5.2.2 Industrial consumption (Tariff D)

Historically, from 2010 to 2013, industrial consumption decreased from 27.6 PJ to 25.9 PJ. This average annual decrease of 2.1% was mainly driven by reduced production by large industrial customers due to economic conditions such as increasing competition.

Table 30 demonstrates the industrial consumption drivers over the short, medium, and long term.

Table 30 Industrial consumption over the short, medium, and long term

Timeframe	Forecast (PJ)	Average annual growth	Drivers
Short term (2014-19)	25.6 to 25.5	<0.1% decrease	Driven by closure of manufacturing plant, despite modest industrial plant expansion.
Medium term (2019-24)	25.53 to 25.50	<0.1% decrease	Small-to-medium industrial load customers reducing their consumption due to higher gas prices. This is offset by some increases in plant inefficiencies.
Long term (2024-34)	25.5 to 25.3	<0.1% decrease	Continued decline in gas consumption from the small to medium industrial customers due to gas price increases as well as plant efficiency improvements in the large industrial customers.

5.2.3 Gas-powered generation

Historically, from 2010 to 2013, GPG gas consumption decreased from 65.4 PJ to 58.3 PJ. This average annual decrease of 3.8% was driven by increased rooftop PV uptake, and commissioning of new wind farms which have reduced the dispatch of GPG plant in the NEM.

Table 31 demonstrates the GPG gas consumption trends and drivers.

Table 31 GPG consumption over the short, medium, and long term

Timeframe	Forecast (PJ)	Average annual growth	Drivers
Short term (2014-19)	47.3 to 25.6	11.5% decrease	Rising forecast gas prices which reduces the competitiveness of GPG plant in the NEM. This includes the withdrawal of a Torrens island GPG plant from 2017.
Medium term (2019-24)	25.6 to 29.1	2.5% increase	Increased GPG gas consumption due to electricity consumption growth in Victoria and modelled retirement of coal-fired power stations.
Long term (2024-34)	29.1 to 43.8	4.2% increase	Modelled retirement of existing coal-fired power stations, and modelled new GPG plant in 2030.[26]

[26] Available at http://www.aemo.com.au/Electricity/Planning/National-Transmission-Network-Development-Plan. To be published mid-December 2014.

5.2.4 Summary of high, medium and low scenario trends and drivers in the short-term (2014-19)

Table 32 High, medium and low drivers for South Australia (PJ)

Forecast component	Scenario	Forecast (PJ)	Average annual growth	Key drivers
Residential and commercial	Medium	10.2 to 10.5	0.5% increase	Growth in new connections, outpacing a decline in average use per connection due to combination of price increase and federal energy efficiency savings.
	High	10.2 to 10.9	1.2% increase	Lower gas prices, a higher rate of new connections (due to higher population growth) and no additional federal energy efficiency savings beyond current programs.
	Low	10.2 to 9.8	0.8% decrease	Higher gas prices causing faster decline in average use per customer, fewer new customers (due to lower population growth) and more federal energy efficiency savings.
Industrial	Medium	25.6 to 25.5	<0.1% decrease	Driven by closures of manufacturing plant, despite modest plant expansion.
	High	25.6 to 27.2	1.3% increase	More optimistic operating forecasts due to favourable economic conditions, higher GDP growth and higher commodity prices, lower gas prices and lower exchange rates, and modest plant growth.
	Low	25.6 to 22.3	2.7% decrease	Reduced production forecast due to less favourable economic conditions, such as lower GDP growth and commodity prices, and higher gas prices and higher exchange rates.
Gas-powered generation	Medium	47.3 to 25.6	11.5% decrease	Rising forecast gas prices reduces the competitiveness of GPG plant in the NEM. This decrease is offset by modelled coal-fired power station retirements.
	High	47.3 to 23.5	13.0% decrease	Higher electricity consumption, which results in less retirement of existing coal-fired power stations and additional renewable generation. This results in a faster decrease in GPG gas consumption compared to the medium scenario.
	Low	47.3 to 20.6	15.3% decrease	Higher gas prices and lower electricity consumption, offset by additional retirement of coal-fired power stations, results in a decrease in the market share of GPG plant. This leads to a faster decrease in GPG gas consumption than in the medium scenario.

5.3 Summer MD

Historically, MD in South Australia was driven by GPG demand. The 2013 summer MD was 401.6 TJ on 7 January 2013.

Despite the 2013 MD occurring in winter, MD is forecast to occur in summer in the NGFR forecasts, primarily due to reduced GPG demand in winter. The 2013 winter MD was 425.0 TJ on 18 June 2013.

Winter MD forecasts and growth rates are published in the 2014 NGFR datasheets.[27]

Table 33 presents the summer MD drivers over the short, medium, and long term.

Table 33 Summer MD over the short, medium, and long term

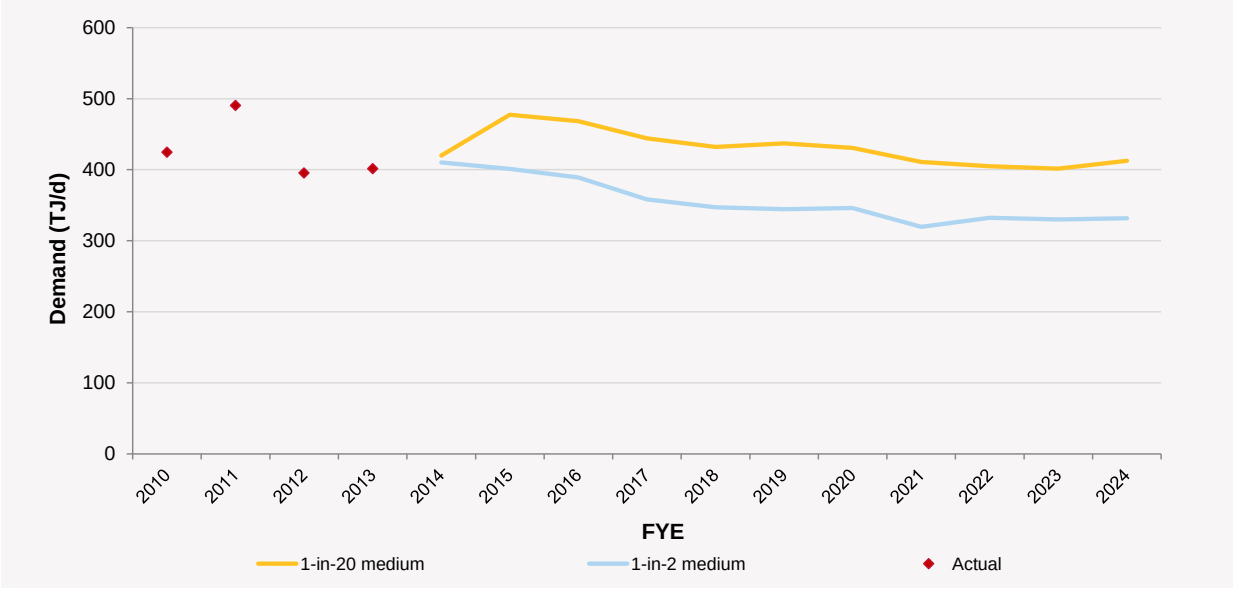
Timeframe	Forecast (TJ/d)	Average annual growth	Drivers
Short term (2014-19)	420.0 to 437.2	0.8% increase	Increasing reliance on GPG during times of electricity peak.
Medium term (2019-24)	437.2 to 412.5	1.2% decrease	Decline in electricity MD.
Long term (2024-34)	412.5 to 463.8	1.2% increase	Modelled retirements of existing brown coal, and new GPG plant are added to meet demand growth.

Differences between high, medium, and low scenario short-term forecasts, 2014-19

The high and medium short-term forecasts increase at annual average rates of 0.7% and 0.8% respectively. The low short-term forecast decreases at an annual average rate of 2.3%. The reversed order across the high and medium scenarios is primarily driven by competing drivers affecting GPG behaviour in the NEM. In particular:

- In the high scenario, higher electricity consumption leads to reduced coal-fired power station retirement and more investment in renewable generation. This reduces South Australia's reliance on GPG plants during periods of high electricity demand, and results in a slower increase in GPG summer MD than in the medium scenario.
- In the low scenario, while electricity consumption is lower, it is not sufficiently low to drive more coal-fired power station retirement than the medium scenario. Instead, the combination of higher gas prices and lower electricity MD result in declining GPG summer MD.

Figure 17 Summer 1-in-2 and 1-in-20 year event MD forecasts for South Australia



[27] Available at http://aemo.com.au/Gas/Planning/Forecasting/National-Gas-Forecasting-Report. To be published 17 December 2014

Table 34 Summer 1-in-2 and 1-in-20 year event MD for South Australia (TJ/d)

		High		Medium		Low	
	Actual	1-in-2	1-in-20	1-in-2	1-in-20	1-in-2	1-in-20
2013	401.6						
2014		410.1	420.0	410.1	420.0	410.1	420.0
2015		415.1	485.9	401.0	477.3	377.5	476.7
2016		408.5	478.3	388.9	468.3	358.6	458.2
2017		389.0	468.6	358.1	444.1	308.3	426.0
2018		336.4	421.5	347.2	431.9	293.9	376.9
2019		345.1	435.9	344.5	437.2	296.6	374.8
2020		351.3	416.4	346.0	430.8	291.1	353.5
2021		338.6	398.9	319.6	410.8	277.1	350.2
2022		338.3	399.5	332.4	405.0	273.5	344.1
2023		343.5	413.9	329.9	401.6	257.1	345.5
2024		349.0	426.8	331.6	412.5	254.1	347.2

CHAPTER 6. VICTORIAN FORECASTS

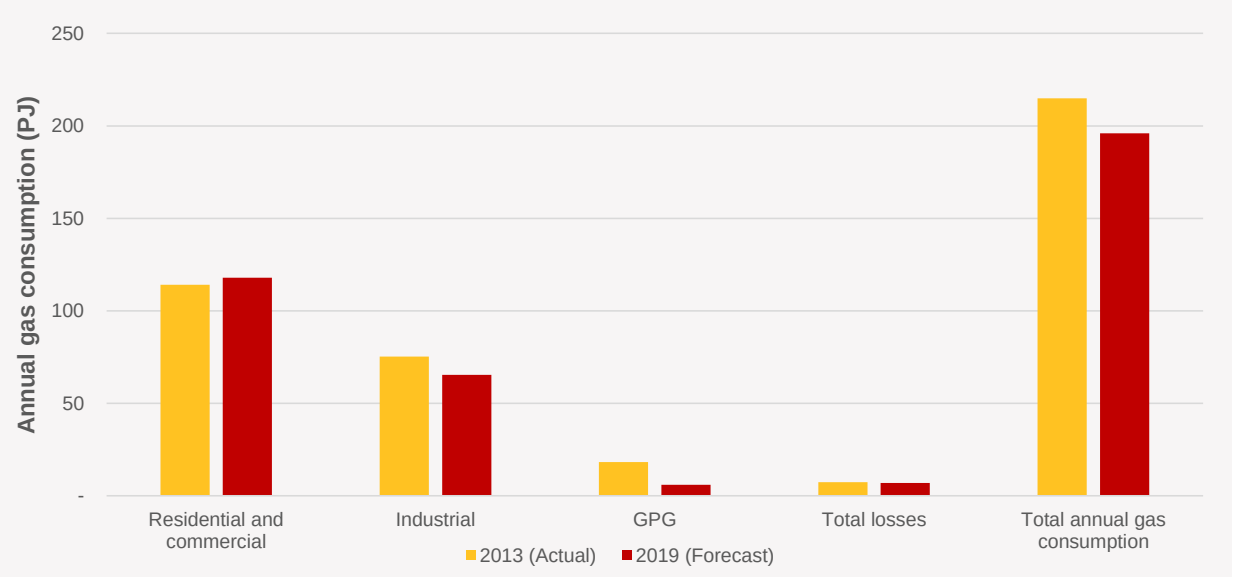
This chapter focuses on the medium scenario short-term forecast. A comparison of the high and low scenario short-term forecast is summarised in Table 40.

6.1 Key findings

Key short-term (2014-19) findings for Victoria are:

- Total gas consumption is forecast to decrease at an average annual rate of 1.7%.
- Residential and commercial consumption is forecast to increase at an average annual rate of 1.1%, driven by new gas connections.
- Industrial gas consumption is forecast to decrease at an average annual rate of 1.6%, driven by industrial closures.
- GPG gas consumption is forecast to decline at an average annual rate of 24.5%, driven by rising gas prices that reduce GPG competitiveness in the NEM.

Figure 18 Comparison of 2013 (actual) and 2019 (forecast) annual gas consumption



6.2 Annual consumption

Historically, from 2010 to 2013, Victorian gas consumption declined from 217.8 PJ to 214.9 PJ. This average annual decline of 0.4% is driven by declining residential and commercial, and industrial consumption. The decline in residential and commercial consumption is linked to weather, with 2013 having a warm winter. The industrial decline is driven by closures over the period.

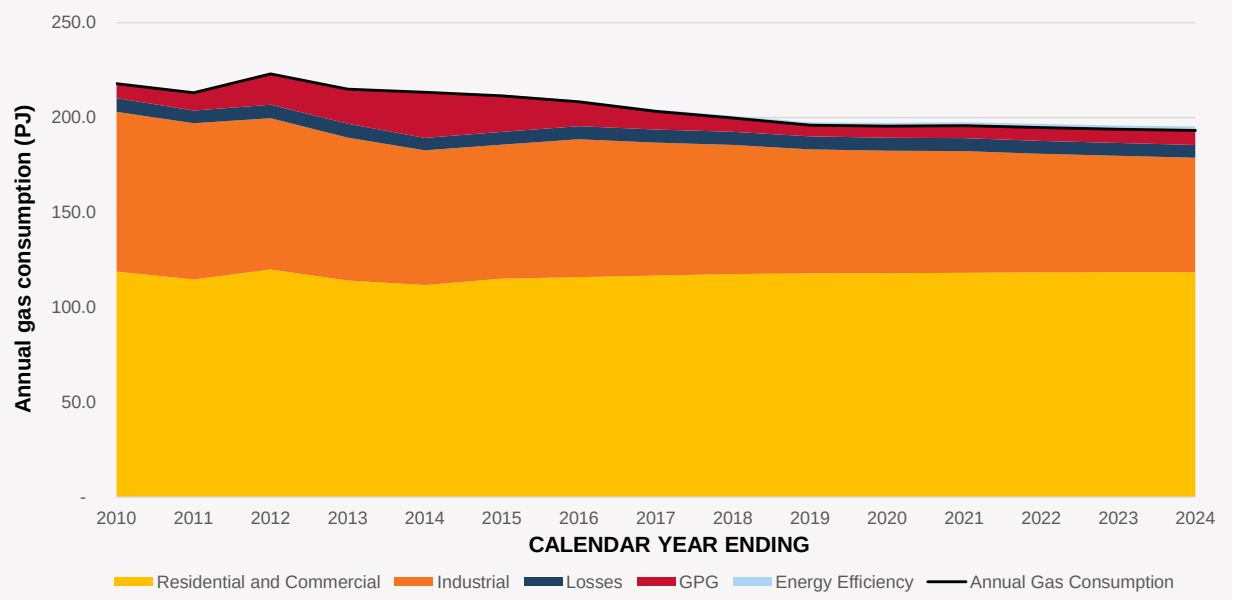
The annual consumption includes total losses from transmission and distribution networks. Refer to Appendix A for further details.

Table 35 demonstrates the annual consumption trends and drivers over the short, medium, and long term.

Table 35 Total annual gas consumption over the short, medium, and long term

Timeframe	Forecast (PJ)	Average annual growth	Drivers
Short term (2014-19)	213.3 to 196.0	1.7% decrease	Decrease in industrial driven by closure of car manufacturing plants[28,29,30] and Alcoa Point Henry aluminium smelter[31]. Decrease in GPG consumption driven by reduced dispatch in electricity market due to rising gas prices.
Medium term (2019-24)	196.0 to 193.2	0.3% decrease	Industrial consumption decline due to higher gas prices, offset by increase in residential and commercial and GPG consumption.
Long term (2024-34)	193.2 to 198.9	0.3% increase	Continued growth in residential and commercial.

Figure 19 Annual consumption forecast segments for Victoria



[28] Source: http://www.theaustralian.com.au/business/news/toyota-to-stop-making-cars-in-australia-follows-ford-and-holden/story-e6frg906-1226822823246. Accessed: 13 November 2014.
[29] Source: http://www.heraldsun.com.au/news/holden-to-cease-making-cars-in-australia-in-2017-while-toyota-considers-if-it-can-go-it-alone/story-fni0fiyv-1226780690797. Accessed: 13 November 2014.
[30] Source: http://www.abc.net.au/news/2013-05-23/ford-to-close-geelong-and-broadmeadows-plants/4707960. Accessed: 13 November 2014.
[31] Source: http://www.alcoa.com/australia/en/alcoa_australia/location_overview/point_henry.asp. Accessed: 13 November 2014.

Differences between high, medium, and low scenario short-term forecasts, 2014-19

The high, medium, and low scenario short-term forecasts decline at annual average rates of 0.3%, 1.7%,and 4.1% respectively. Key differentiating factors are outlined in the individual component forecast sections below.

Figure 20 Comparison of high, medium, low scenario forecasts, including LNG

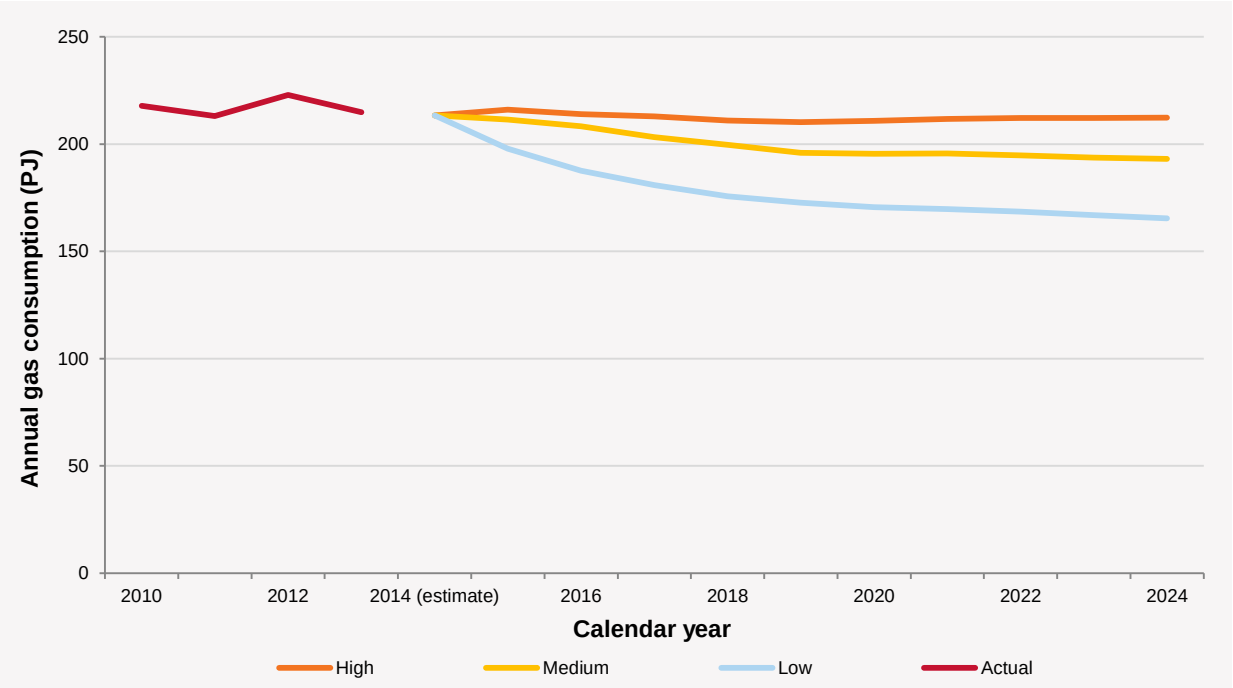


Table 36 Annual gas consumption for Victoria (PJ)

	Actual	High	Medium	Low
2014 estimate	213.3			
2015		216.0	211.5	197.8
2016		214.0	208.3	187.6
2017		213.0	203.3	180.9
2018		211.0	199.7	175.7
2019		210.2	196.0	172.7
2020		210.8	195.5	170.6
2021		211.7	195.7	169.8
2022		212.2	194.7	168.5
2023		212.2	193.8	166.9
2024		212.4	193.2	165.4

6.2.1 Residential and commercial consumption (Tariff V)

Historically, from 2010 to 2013, residential and commercial consumption decreased from 118.8 PJ to 114.1 PJ. This average annual decrease of 1.3% was due to warm weather during the 2013 winter. On a weather-corrected basis[32], residential and commercial consumption increased at an annual average of 0.8%. This reflects an increase in connections to the gas network (due to a combination of new housing growth and all-electric homes connecting to gas). Average use per connection declined over the period, linked to rising gas prices and savings from federal energy efficiency programs.

Table 37 demonstrates the residential and commercial consumption trends and drivers over the short, medium and long term.

Table 37 Residential and commercial gas consumption over the short, medium, and long term

Timeframe	Forecast (PJ)	Average annual growth	Drivers
Short term (2014-19)	111.7 to 117.9	1.1% increase	Increase in connections to the gas network due to new housing growth and fuel substitution from existing non-gas homes. This is offset by a decline in average use per connection linked to rising retail gas prices and federal energy efficiency savings.
Medium term (2019-24)	117.9 to 118.5	0.1% increase	
Long term (2024-34)	118.5 to 123.6	0.4% increase	

Refer to Appendix B for further details on savings from federal energy efficiency programs.

6.2.2 Industrial consumption (Tariff D)

Historically, from 2010 to 2013, industrial consumption decreased from 84.2 PJ to 75.3 PJ. This average annual decrease of 3.7% is linked to closures of large industrial plants including Amcor's Fairfield plant[33] and Bluescope Steel's Western Port hot strip mill[34] which closed in 2011, as well as reduced consumption at other plants. Table 38 demonstrates the continued decline and drivers in industrial consumption over the short, medium, and long term.

Table 38 Industrial consumption over the short, medium, and long term

Timeframe	Forecast (PJ)	Average annual growth	Drivers
Short term (2014-19)	71.0 to 65.3	1.6% decrease	Industrial closures including car manufacturing plants[35,36,37], Alcoa's Point Henry aluminium smelter[38], and other large customers reducing their gas consumption in response to higher gas prices, and less favourable economic conditions.
Medium term (2019-24)	65.3 to 60.3	1.6% decrease	Increasing gas prices are forecast to reduce small-to-medium industrial customer gas consumption.
Long term (2024-34)	60.3 to 56.9	0.6% decrease	Further reductions in consumption from small-to-medium industrial customers.

6.2.3 Gas-powered generation

Historically (2010-13): GPG gas consumption increased from 7.6 PJ to 18.2 PJ. This average annual increase of 33.9% was driven by the commissioning of Mortlake Power Station in 2012. Table 39 demonstrates the trend and drivers in GPG gas consumption over the short, medium, and long term.

[32] Weather correction methodology published in NGFR methodology paper.
[33] Source: http://www.abc.net.au/news/2008-02-20/amcor-jobs-under-threat/1048252. Accessed: 26 November 2014.
[34] Source: http://www.theaustralian.com.au/business/news/bluescope-to-shut-furnace-mill-and-cut-1000-jobs/story-e6frg906-1226119226393. Accessed: 26 November 2014.
[35] Source: http://www.theaustralian.com.au/business/news/toyota-to-stop-making-cars-in-australia-follows-ford-and-holden/story-e6frg906-1226822823246. Accessed: 13 November 2014.
[36] Source: http://www.heraldsun.com.au/news/holden-to-cease-making-cars-in-australia-in-2017-while-toyota-considers-if-it-can-go-it-alone/story-fni0fiyv-1226780690797. Accessed: 13 November 2014.
[37] Source: http://www.abc.net.au/news/2013-05-23/ford-to-close-geelong-and-broadmeadows-plants/4707960. Accessed: 13 November 2014.
[38] Source: http://www.alcoa.com/australia/en/alcoa_australia/location_overview/point_henry.asp. Accessed: 13 November 2014.

Table 39 GPG gas consumption over the short, medium, and long term

Timeframe	Forecast (PJ)	Average annual growth	Drivers
Short term (2014-19)	24.1 to 5.9	24.5% decrease	Increasing gas prices reduce the competitiveness of GPG plant in the NEM.
Medium term (2019-24)	5.9 to 7.6	5.3% increase	Increasing electricity consumption leads to a greater reliance on GPG plants in the NEM
Long term (2024-34)	7.6 to 11.6	4.2% increase	

6.2.4 Summary of high, medium, and low scenario trends and drivers in the short-term (2014-19)

Table 40 High, medium and low drivers for Victoria (PJ)

Forecast component	Scenario	Forecast (PJ)	Average annual growth	Key drivers
Residential and commercial	Medium	111.7 to 117.9	1.1% increase	Growth in new connections, outpacing reductions in average use per connection.
	High	111.7 to 120.4	1.5% increase	Lower gas prices, a higher rate of new connections (due to higher population growth) and no additional federal energy efficiency savings beyond current programs.
	Low	111.7 to 111.7	<0.1% decrease	Higher gas prices, fewer new customers (due to lower population growth) and more federal energy efficiency savings.
Industrial	Medium	71.0 to 65.3	1.6% decrease	Industrial closures including car manufacturing plants, Alcoa's Point Henry aluminium smelter, and other large customers reducing their gas consumption due to high gas prices, and less favourable economic conditions.
	High	71.0 to 76.8	1.6% increase	More optimistic operating forecasts due to favourable economic conditions, higher GDP growth, higher commodity prices, lower gas prices, lower exchange rates, and modest plant growth.
	Low	71.0 to 48.2	7.4% decrease	Reduced production forecast due to less favourable economic conditions, lower GDP growth, lower commodity prices, higher gas prices and higher exchange rates. AEMO adopted a probabilistic approach to reflect the reduced production or closure of aluminium smelters in response to less favourable economic conditions.
Gas-powered generation	Medium	24.1 to 5.9	24.5% decrease	Rising forecast gas prices which reduces the competitiveness of GPG plant in the NEM.
	High	24.1 to 5.8	24.7% decrease	Higher electricity consumption results in fewer modelled retirements of existing brown coal fired power stations. Despite lower gas prices in this scenario, the higher availability of coal-fired power reduces GPG gas consumption below both the medium and low scenario forecasts.
	Low	24.1 to 6.8	22.4% decrease	Lower electricity consumption results in substantially more modelled retirement from existing brown coal fired power stations (2500 MW compared to 300 MW in the medium). Despite higher gas prices in this scenario, the reduced availability of coal-fired power increased GPG consumption above both the medium and high scenario.

6.3 Winter MD

MD in Victoria occurs in winter and is primarily driven by residential and commercial demand. The 2014 winter MD was 1,286.7 TJ on 1 August 2014. Summer MD forecasts and growth rates are published in the 2014 NGFR datasheets.[39]

Table 41 demonstrates the growth and drivers of MD over the short, medium, and long term.

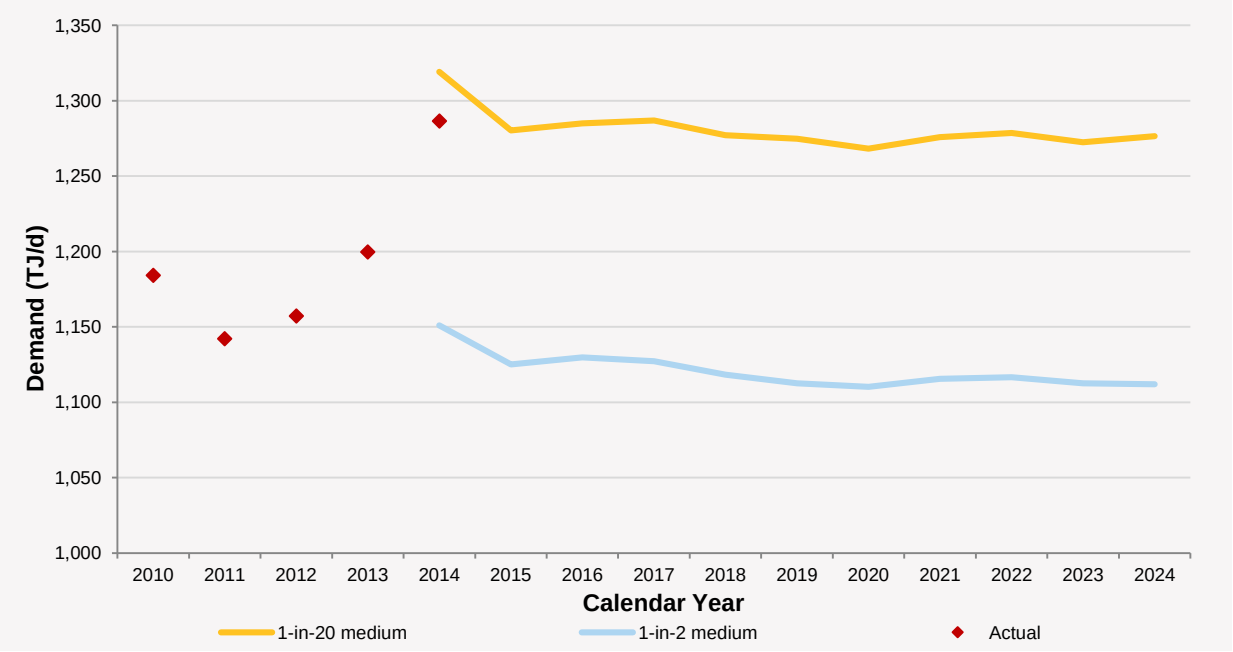
Table 41 Winter MD over the short, medium, and long term

Timeframe	Forecast (TJ/d)	Average annual growth	Drivers
Short term (2014-19)	1,319.2 to 1,274.8	0.7% decrease	Closures in large industrials and reduced GPG leads to declining MD.
Medium term (2019-24)	1,274.8 to 1,276.5	<0.1% increase	Linked to growth in GPG MD as electricity winter MD grows in the medium term. This growth is offset by a decrease in industrial.
Long term (2024-34)	1,276.5 to 1,295.8	0.2% increase	Linked to GPG MD growth, offset by annual average decreases of in industrial MD. This growth is offset by a decrease in industrial.

The high, medium, and low short-term forecasts decrease at annual averages of 0.1%, 0.7%, and 2.0% respectively. Consistent with consumption forecasts, key drivers for the differences from the medium scenario are:

- In the high scenario, higher customer connection growth and lower gas prices lead to higher residential, commercial and industrial demand. This is partially offset by fewer modelled retirements of coal-fired plants that reduce reliance on GPG plants in the NEM.
- In the low scenario, lower customer connection growth and higher gas prices lead to lower residential, commercial, and industrial demand. This is partially offset by additional modelled retirements of coal-fired plants that increase reliance on GPG plants in the NEM.

Figure 21 Winter 1-in-2 and 1-in-20 year event MD forecasts for Victoria



[39] Available at http://aemo.com.au/Gas/Planning/Forecasting/National-Gas-Forecasting-Report. To be published 17 December 2014

Table 42 Winter 1-in-2 and 1-in-20 year event MD for Victoria (TJ/d)

		High		Medium		Low	
	Actual	1-in-2	1-in-20	1-in-2	1-in-20	1-in-2	1-in-20
2013	1,199.6						
2014[a]	1,286.7	1,151.1	1,319.2	1,151.1	1,319.2	1,151.1	1,319.2
2015		1,141.7	1,296.5	1,125.1	1,280.4	1,076.8	1,228.2
2016		1,150.0	1,306.0	1,129.8	1,285.0	1,059.1	1,208.9
2017		1,158.6	1,315.0	1,127.3	1,286.8	1,046.0	1,196.1
2018		1,152.3	1,308.5	1,118.2	1,277.0	1,036.8	1,195.5
2019		1,155.1	1,315.1	1,112.5	1,274.8	1,030.5	1,189.9
2020		1,154.1	1,315.3	1,110.2	1,268.1	1,025.9	1,176.3
2021		1,165.7	1,323.2	1,115.4	1,276.0	1,038.4	1,194.7
2022		1,170.6	1,331.1	1,116.7	1,278.6	1,030.0	1,191.3
2023		1,169.4	1,331.6	1,112.7	1,272.4	1,024.7	1,188.7
2024		1,174.4	1,341.9	1,111.8	1,276.5	1,018.2	1,181.6

a) Post-winter data up to 30 September 2014 is available for Victoria.

CHAPTER 7. TASMANIA FORECASTS

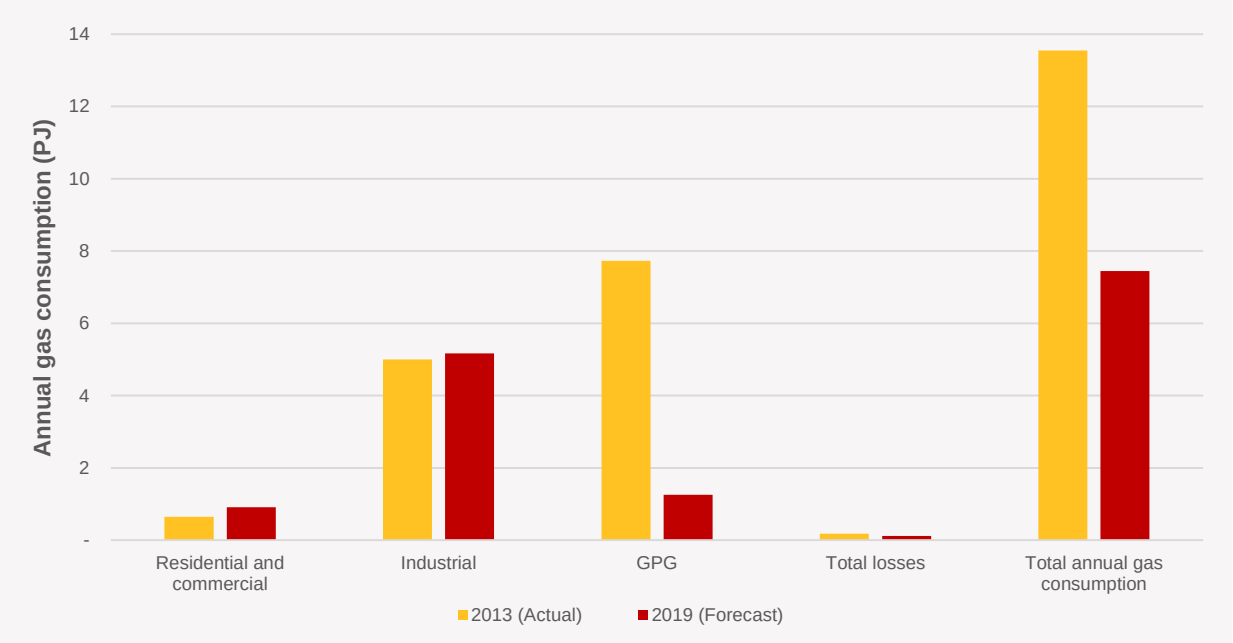
This chapter focuses on the medium scenario short-term forecast. A comparison of the high and low scenario short-term forecast is summarised in Table 48.

7.1 Key findings

Key short-term (2014-19) findings for Tasmania are:

- Total gas consumption is forecast to decrease at an average annual rate of 9.3%.
- Residential and commercial consumption is forecast to increase at an average annual rate of 5.3%, driven by new gas connections.
- Industrial gas consumption is forecast to increase at an average annual rate of 0.3%, driven by increasing consumption for small-to-medium industrial customers.
- GPG gas consumption is forecast to decline at an average annual rate of 27.3%, driven by declining electricity consumption and the temporary closure of Tamar Valley Power Station.[40]

Figure 22 Comparison of 2013 (actual) and 2019 (forecast) annual gas consumption



[40] Refer to http://www.aemo.com.au/Electricity/Planning/Related-Information/Generation-Information. Viewed 1 Dec 2014.

7.2 Annual consumption

Historically, from 2010 to 2013, gas consumption declined from 15.7 PJ to 13.6 PJ. This average annual decline of 4.8% was mainly driven by a 12.2% decline in GPG, a flow-on effect of declining electricity consumption. Other sectors continued to grow, having started from a zero base in 2004[41] when the Tasmanian gas network commenced operation.

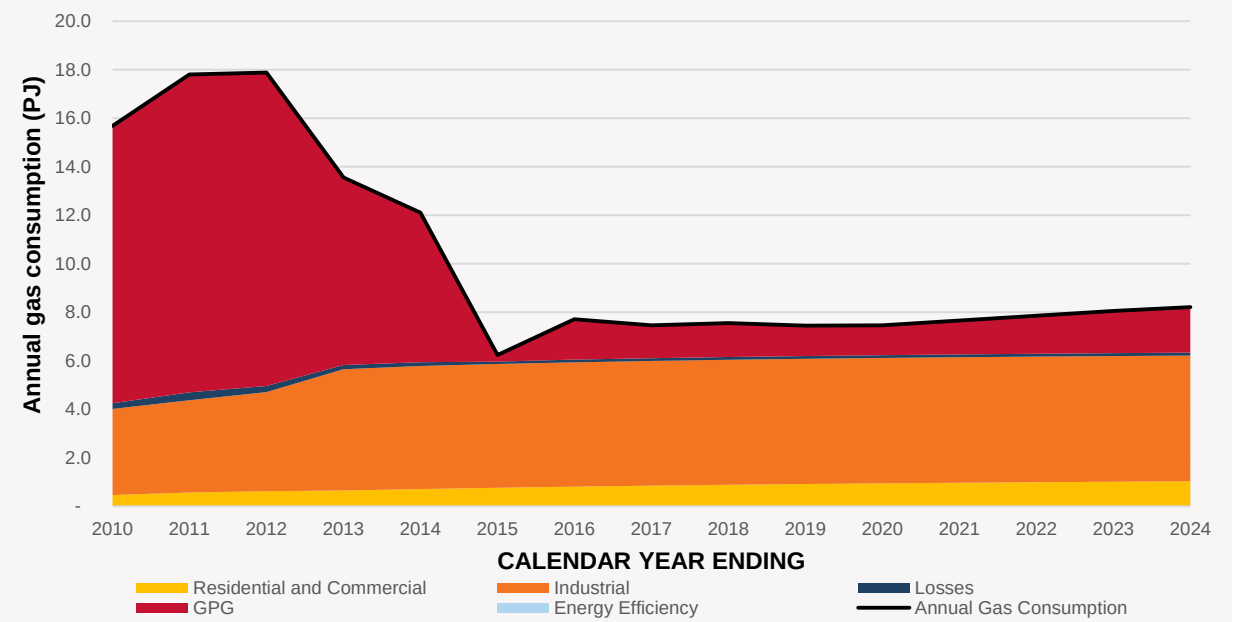
Annual consumption includes total losses from transmission and distribution networks. Refer to Appendix A for further details.

Table 43 demonstrates the annual consumption trends and drivers over the short, medium, and long term.

Table 43 Annual gas consumption

Timeframe	Forecast (PJ)	Average annual growth	Drivers
Short term (2014-19)	12.1 to 7.4	9.3% decrease	Decrease in GPG gas consumption reflecting the temporary withdrawal of Tamar Valley Power Station in 2015.
Medium term (2019-24)	7.4 to 8.2	2.0% increase	Reflects growth in all sectors over the period, including the modelled return of Tamar Valley Power Station.
Long term (2024-34)	8.2 to 5.8	3.5% decrease	Decline in industrial consumption reflecting reduced operation. GPG gas consumption also declines due to long term reductions in electricity consumption.

Figure 23 Annual consumption forecast segments for Tasmania



[41] Source: http://www.dpac.tas.gov.au/__data/assets/pdf_file/0017/141803/Tasmania_s_Energy_Sector_-_an_Overview.PDF.

Differences between high, medium, and low scenario short-term forecasts, 2014-19

The high, medium, and low scenario short-term forecasts decline at average annual rates of 7.2%, 9.3%, and 20.7% respectively. Key differentiating factors are outlined in the individual component forecast sections below.

Figure 24 Comparison of high, medium, low scenario forecasts, including LNG

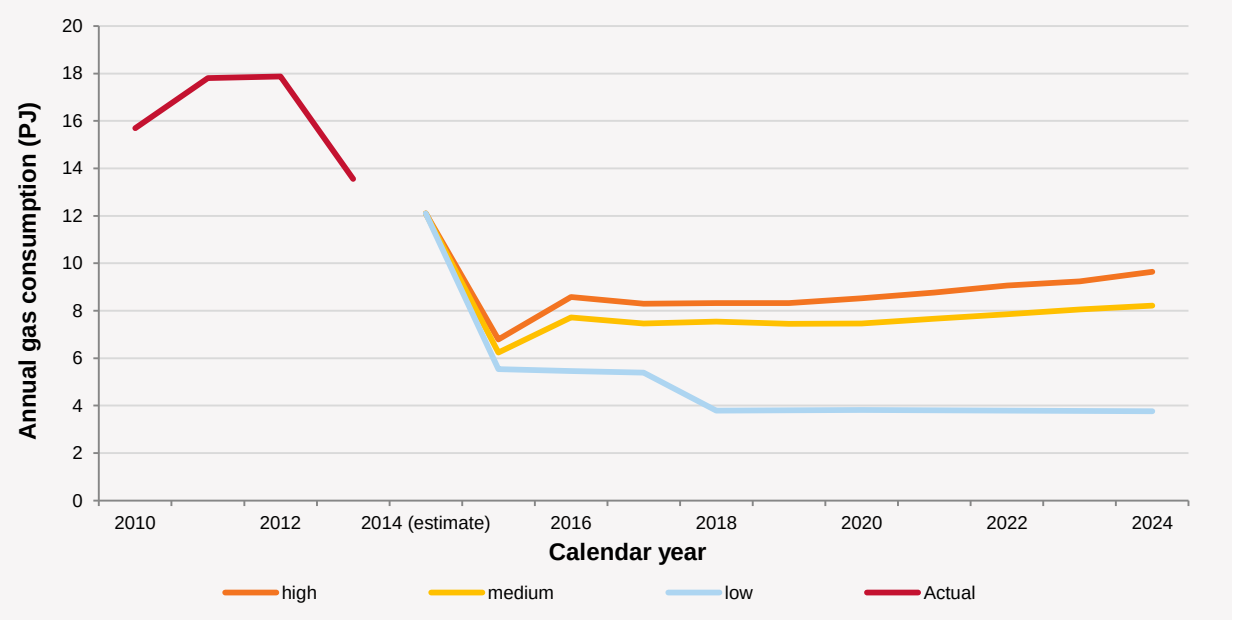


Table 44 Annual gas consumption for Tasmania (PJ)

	Actual	High	Medium	Low
2013	13.6			
2014		12.1	12.1	12.1
2015		6.8	6.2	5.5
2016		8.6	7.7	5.5
2017		8.3	7.5	5.4
2018		8.3	7.5	3.8
2019		8.3	7.4	3.8
2020		8.5	7.5	3.8
2021		8.8	7.7	3.8
2022		9.1	7.9	3.8
2023		9.2	8.1	3.8
2024		9.6	8.2	3.8

7.2.1 Residential and commercial consumption (Tariff V)

Historically, from 2010 to 2013, residential and commercial consumption increased from 0.5 PJ to 0.6 PJ. This average annual increase of 12.1% was driven by the progressive connection of new customers throughout the period. Table 435 demonstrates the trend and drivers in residential and commercial consumption.

Table 45 Residential and commercial consumption over the short, medium, and long term

Timeframe	Forecast (PJ)	Average annual growth	Drivers
Short term (2014-19)	0.7 to 0.9	5.3% increase	Growth in connections as new customers choose to connect to gas when replacing appliances.
Medium term (2019-24)	0.9 to 1.0	2.3% increase	Continued growth in new connections, though moderating as gas prices rise.
Long term (2024-34)	1.0 to 1.1	1.1% increase	Continued growth in new connections, although the rate of new connections reduces as the network matures.

Refer to Appendix B for further details on savings from federal energy efficiency programs.

7.2.2 Industrial consumption (Tariff D)

Historically, from 2010 to 2013, industrial consumption increased from 3.6 PJ to 5.0 PJ. This average annual increase of 12.1% is mainly driven by the progressive connection of small to medium industrial customers. Table 46 demonstrates the industrial consumption trends and drivers.

Table 46 Industrial consumption over the short, medium, and long term

Timeframe	Forecast (PJ)	Average annual growth	Drivers
Short term (2014-19)	5.1 to 5.2	0.3% increase	Growth in small-to-medium customer consumption, though at a slower rate than historically as saturation occurs.
Medium term (2019-24)	5.16 to 5.18	0.1% increase	Continued (though slowing) growth in small-to-medium customer consumption.
Long term (2024-34)	5.2 to 3.5	3.9% decrease	Reduced operation by industrial customers driven by higher gas prices.

7.2.3 Gas-powered generation

Historically, from 2010 to 2013, Tasmanian GPG gas consumption decreased from 11.4 PJ to 7.7 PJ. This average annual decline of 12.2% was driven by declining electricity consumption in this period. Table 47 demonstrates the GPG gas consumption growth and drivers over the short, medium, and long term.

Table 47 GPG gas consumption over the short, medium, and long term

Timeframe	Forecast (PJ)	Average annual growth	Drivers
Short term (2014-19)	6.2 to 1.3	27.3% decrease	Temporary shutdown of the Tamar Valley Power Station over winter 2015.[42]
Medium term (2019-24)	1.3 to 1.9	8.4% increase	Modelled return of Tamar Valley Power Station to operation.
Long term (2024-34)	1.9 to 1.0	5.7% decrease	Long-term forecast decline in Tasmanian electricity consumption.

[42] Source: Generation Information Page: http://www.aemo.com.au/Electricity/Planning/Related-Information/Generation-Information. Viewed 1 October 2014

7.2.4 Summary of high, medium, and low scenario trends and drivers in the short-term (2014-19)

Table 48 High, medium and low drivers for Tasmania (PJ)

Forecast component	Scenario	Forecast (PJ)	Average annual growth	Key drivers
Residential and commercial	Medium	0.7 to 0.91	5.3% increase	Growth in connections as new customers choose to connect to gas when replacing appliances.
	High	0.7 to 0.94	5.9% increase	Lower gas prices and an assumed faster rate of new connections.
	Low	0.7 to 0.85	3.8% increase	Higher gas prices and an assumed slower rate of new connections.
Industrial	Medium	5.1 to 5.2	0.3% increase	Growth in small-to-medium customer consumption.
	High	5.1 to 5.6	2.1% increase	More optimistic operating forecasts due to favourable economic conditions, higher GDP growth, higher commodity prices, lower gas prices and lower exchange rates.
	Low	5.1 to 2.8	11% decrease	Reduced production forecast due to less favourable economic conditions, lower GDP growth, lower commodity prices, higher gas prices and higher exchange rates. AEMO adopted a probabilistic approach to reflect the reduced production or closure of aluminium smelters in response to less favourable economic conditions.
Gas-powered generation	Medium	6.2 to 1.3	27.3% decrease	Temporary shutdown of the Tamar Valley Power Station over winter 2015.
	High	6.2 to 1.6	23.3% decrease	Lower forecast gas prices and higher electricity consumption result in higher GPG gas consumption.
	Low	6.2 to 0.04	63.2% decrease	Higher gas prices and lower electricity consumption result in negligible GPG gas consumption outside of peak electricity demand periods.

7.3 Winter MD

Historically, MD in Tasmania occurs in winter and is driven by both GPG and residential and commercial demand. The 2013 winter MD was 59.4 TJ on 24 June 2013.

Summer MD forecasts and growth rates are published in the 2014 NGFR datasheets.[43] Table 49 demonstrates the growth and drivers of MD over the short, medium, and long term.

Table 49 Winter MD for Tasmania in the short, medium, and long term.

Timeframe	Forecast (TJ/d)	Average annual growth	Drivers
Short term (2014-19)	59.3 to 63.7	1.5% increase	Driven by both GPG and residential and commercial MD, which grow at annual average rates of 1.5% and 5.3% respectively.
Medium term (2019-24)	63.7 to 70.6	2.1% increase	Residential and commercial MD grows consistent with the consumption forecasts, and is linked to continued growth in new connections. While Tamar Valley Power Station is withdrawn in winter 2015, it returns from winter 2016 and GPG MD increases as the electricity supply-demand balance tightens.
Long term (2024-34)	70.6 to 49.7	3.4% decrease	Reduction in industrial MD due to reduced operation, and a decline in GPG MD linked to long-term decline in Tasmanian electricity MD.

The high and medium short-term forecasts increase at annual average rates of 1.6% and 1.5% respectively. The low short-term forecast decreases at an annual average rate of 13.9%. The key drivers for differences from the medium scenario are:

- In the high scenario, faster rate of new residential, commercial and industrial connections, and more optimistic operating forecasts due to favourable economic conditions, higher commodity prices, lower gas prices, and lower exchange rates.
- In the low scenario, less favourable economic conditions, lower commodity prices, higher gas prices and higher exchange rates result in reduced operation or closures from existing large industrial customers. This is coupled with lower electricity MD, and subsequently reduced GPG MD values.

[43] Available at http://aemo.com.au/Gas/Planning/Forecasting/National-Gas-Forecasting-Report. To be published 17 December 2014

Figure 25 Winter 1-in-2 and 1-in-20 year event MD forecasts for Tasmania

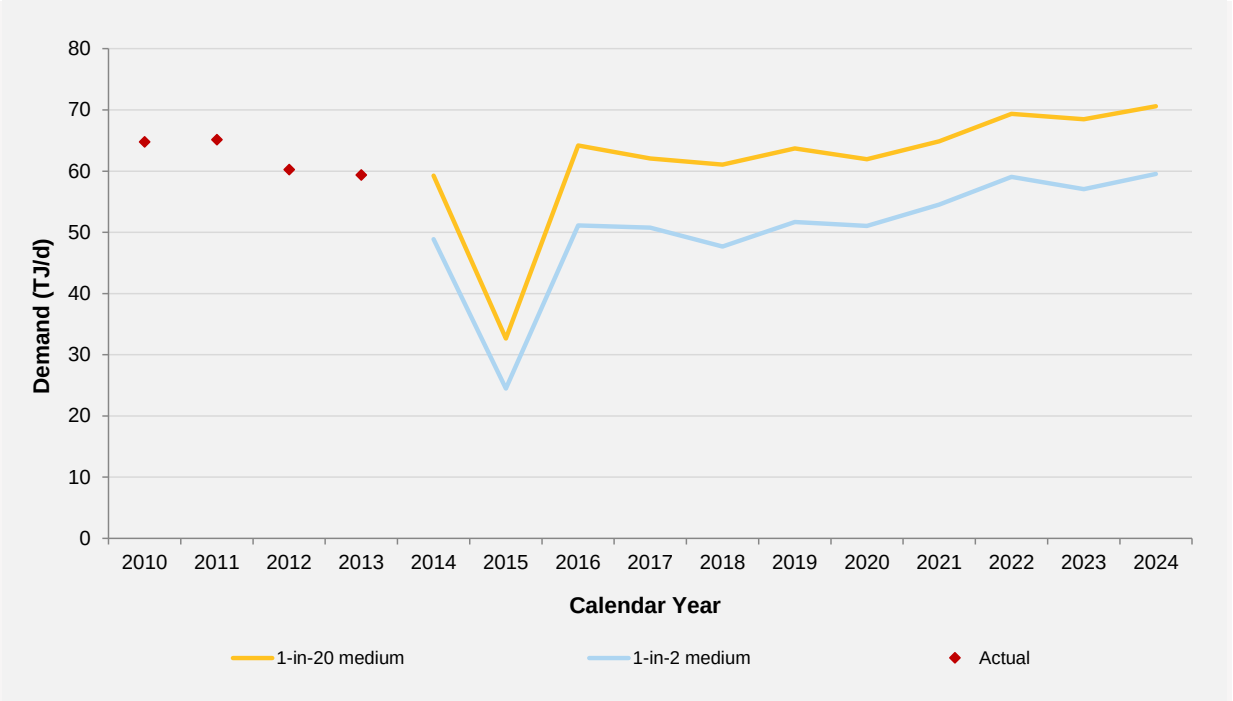


Table 50 Winter 1-in-2 and 1-in-20 year event MD for Tasmania (TJ/d)

		High		Medium		Low	
	Actual	1-in-2	1-in-20	1-in-2	1-in-20	1-in-2	1-in-20
2013	59.4						
2014		48.9	59.3	48.9	59.3	48.9	59.3
2015		27.5	35.6	24.5	32.7	19.9	26.0
2016		55.0	66.5	51.1	64.2	19.5	24.0
2017		54.4	67.1	50.8	62.1	20.9	28.9
2018		54.9	64.3	47.7	61.1	20.1	27.4
2019		53.4	64.0	51.7	63.7	20.2	28.0
2020		56.5	68.1	51.1	62.0	21.6	28.1
2021		59.7	71.0	54.5	64.9	20.3	26.7
2022		62.5	75.5	59.1	69.3	19.3	26.4
2023		64.3	74.3	57.1	68.5	19.3	26.1
2024		66.5	78.6	59.5	70.6	19.3	26.1

APPENDIX A. TOTAL LOSSES

This section provides an overview of the total losses[44] forecast for each region.

Gas is transported through high-pressure transmission pipelines to lower-pressure distribution networks before it is consumed by end users.[45] During this process, some gas is unaccounted for and some is consumed for operational purposes. This gas is collectively referred to as "total losses" in this document.

In the distribution networks, losses are typically a result of gas leaks and metering uncertainties. These losses are also known as unaccounted for gas (UAFG).

Losses that occur in the transmission pipelines are mostly operational losses i.e., gas consumed by compressors and heaters to support normal pipeline operations. UAFG also occurs along the high-pressure pipelines, but in smaller quantities.

Table 51 History and forecasts for total transmission and distribution losses in the 2014 NGFR

Region	Estimated total losses for calendar year ending 2014 (PJ)	Historical (2010-13) growth rate	Short-term (2014-19) growth rate
NSW	3.9	5.3%	-0.9%
Qld	3.5	-1.9%	-7.9%
SA	2.2	-9.0%	-1.7%
Tas	0.2	-9.5%	-6.2%
Vic	6.6	0.3%	1.0%

[44] Maximum demand losses include distribution losses only and are available at : http://aemo.com.au/Gas/Planning/Forecasting/National-Gas-Forecasting-Report

[45] Many commercial and industrial gas consumers also take gas directly from high-pressure pipelines.

APPENDIX B. SAVINGS FROM FEDERAL ENERGY EFFICIENCY PROGRAMS

This section provides an overview of estimated energy efficiency (EE) savings from federal EE programs[46] for each region.

The Tasmanian gas network, where residential and commercial customer connections commenced in 2004, is still developing. As a result, the Tasmanian residential and commercial forecast grows from a very low base and AEMO assumes the impact of building and appliance EE improvements to be negligible.

Table 52 Estimated savings from federal EE programs for each gas region

Timeframe	Forecast (PJ)	Average annual growth rate increase	Region
Short term (2014-19)	0.8 to 1.2	9.3%	Qld
Medium term (2019-24)	1.2 to 1.6	6.4%	
Long term (2024-34)	1.6 to 2.5	4.4%	
Short term (2014-19)	1.1 to 1.6	8.7%	SA
Medium term (2019-24)	1.6 to 2.1	5.6%	
Long term (2024-34)	2.1 to 3.1	3.9%	
Short term (2014-19)	3.3 to 5.1	9.6%	NSW
Medium term (2019-24)	5.1 to 7.0	6.3%	
Long term (2024-34)	7.0 to 10.6	4.2%	
Short term (2014-19)	9.4 to 14.3	8.8%	Vic
Medium term (2019-24)	14.3 to 18.8	5.6%	
Long term (2024-34)	18.8 to 27.5	3.8%	

The EE increases are driven by both appliance and building EE programs.

Key drivers for the differences from the medium scenario are:

- In the high gas consumption scenario (low EE savings), existing programs (buildings and appliances) are included and EE savings (buildings and appliances) are assumed to continue at the same rate as recent history.
- In the medium gas consumption scenario (medium EE savings), existing programs (buildings and appliances) are included and EE savings (buildings and appliances) are assumed to continue at a higher rate than recent history.
- In the low gas consumption scenario (high EE savings), existing programs (buildings and appliances) and in train appliance programs are included and EE savings (buildings and appliances) are assumed to continue at a higher rate than the medium scenario.

[46] Only Federal Government programs are included in this analysis. For more details of the programs refer to the Forecasting Methodology Information Paper, published mid December 2014.

MEASURES AND ABBREVIATIONS

Units of measure

Abbreviation	Unit of measure
DD	Degree day
EDD	Effective degree days
GJ	Gigajoules
HDD	Heating degree days
PJ	Petajoule
PJ/y	Petajoules per year
TJ	Terajoule
TJ/d	Terajoules per day
$	Australian dollars

Abbreviations

Abbreviation	Expanded name
ACT	Australian Capital Territory
AEMO	Australian Energy Market Operator
APLNG	Australia Pacific Liquefied Natural Gas
CCGT	Combined cycle gas turbine (a type of GPG)
CSG	Coal seam gas
DTS	Declared Transmission System
EE	Energy Efficiency
GBB	Gas Bulletin Board
GDP	Gross Domestic Product
GLNG	Gladstone LNG
GPG	Gas-powered generation
GSOO	Gas Statement of Opportunities
GSP	Gross State Product
LNG	Liquefied Natural Gas
MD	Maximum Demand
MEPS	Minimum Energy Performance Standards
NEFR	National Electricity Forecasting Report
NEM	National Electricity Market
NIEIR	National Institute of Economic and Industry Research
NSW	New South Wales
NTNDP	National Transmission Network Development Plan
OCGT	Open cycle gas turbine (a type of GPG)
POE	Probability of exceedence
QCLNG	Queenstown Curtis Liquefied Natural Gas
QLD	Queensland
SA	South Australia
TAS	Tasmania
VGPR	Victorian Gas Planning Report
VIC	Victoria

GLOSSARY

Term	Definition
1-in-2 MD	The 1-in-2 MD forecasts has a 50% probability of exceedence (POE). This projected level of demand is expected, on average, to be exceeded once in two years. Also known as the 50% POE.
1-in-20 MD	The 1-in-20 MD forecasts (for severe weather conditions) has a 5% probability of exceedence (POE). This is expected, on average, to be exceeded once in 20 years. Also known as the 5% POE.
annual average (growth rate)	The compound average growth rate, which is the year-over-year growth rate over a specified number of years.
annual consumption	Gas consumption reported for a given year.
combined-cycle gas turbine (CCGT)	A device utilising a gas turbine and heat recovery/steam generation to efficiently generate electricity. More capital intensive than open-cycle gas turbines and therefore expected to be highly utilised. See also open-cycle gas turbine.
conventional gas	Gas that is produced using conventional or traditional oil and gas industry practices.
Declared Transmission System (DTS)	The gas Declared Transmission System (gas DTS) refers to aspects of the Victorian gas system that are a part of the declared network. According to the National Gas Law (NGL), the DTS of an adoptive jurisdiction has the meaning given by the application Act of that jurisdiction and includes any augmentation of the defined declared transmission system.
domestic gas	Gas that is used within Australia for residences, businesses, power generators, etc. This excludes gas demand for LNG export
Gas Bulletin Board (GBB)	A website (www.gasbb.com.au) managed by AEMO that provides information on major interconnected gas processing facilities, gas transmission pipelines, gas storage facilities, and demand centres in Eastern and South-eastern Australia. Also known as the National Gas Market Bulletin Board or simply the Bulletin Board.
gas-powered generation	Where electricity is generated from gas turbines (combined-cycle gas turbine (CCGT) or open-cycle gas turbine (OCGT)).
large industrial	A segment of the Eastern and South-eastern gas market defined to include businesses that consume more than 10 TJ/yr. See also mass market.
liquefied natural gas (LNG)	Natural gas that has been converted into liquid form for ease of storage or transport.
LNG train	A unit of gas purification and liquefaction facilities found in a liquefied natural gas plant.
mass market	A segment of the Eastern and South-eastern Australian gas market defined to include residential users and businesses that consume less than 10 TJ/yr. See also large industrial.
market segments	For purposes of developing gas demand projections, gas consumers are grouped into domestic market segments (the mass market, large industrial, and gas demand for GPG), and gas demand for LNG export.
National Electricity Law	The National Electricity Law set out in the schedule to the National Electricity (South Australia) Act 1996 (SA) and applied in each of the participating jurisdictions.
National Electricity Market	The wholesale market for electricity supply in Queensland, New South Wales, the Australian Capital Territory, Victoria, Tasmania, and South Australia.
National Electricity Rules	The National Electricity Rules govern the operation of the National Electricity Market. The Rules have the force of law, and are made under the National Electricity Law.
open-cycle gas turbine (OCGT)	A device utilising a gas turbine to generate electricity. Less efficient and less capital intensive than combined-cycle gas turbine (CCGT) and therefore often used only to satisfy peak electricity demand.
peak day	Over the course of a season (winter or summer), the day on which maximum gas demand occurs.
probability of exceedence (POE)	Refers to the probability that a forecast electricity MD figure will be exceeded. For example, a forecast 10% probability of exceedence (POE) MD will, on average, be exceeded only 1 year in every 10.
ramp gas	Coal seam gas produced during the early stages of an LNG export project.
scenario analysis	Identifying and projecting internally consistent political, economic, social, and technological trends into the future and exploring the implications.
Short-Term Trading Market	The Short-Term Trading Market (STTM) is a market-based wholesale gas balancing mechanism established at defined gas hubs. The market uses bids, offers and forecasts to determine schedules for deliveries from pipelines to transmission users and the hubs.

LIST OF COMPANY NAMES

The following table lists the full name and Australian Business Number (ABN) of companies that may be referred to in this document.

Company	Full company name	ABN/CAN
ACIL Allen	ACIL Allen Consulting	68 102 652 148
Jacobs	Jacobs Group Australia Pty Ltd	37 001 024 095