

Attachment 4A

Core Energy – AGN Mt Barker Final Report

June 2018

Page intentionally left blank

AGN Mount Barker | Report

December 2017

FINAL REPORT

CORE
ENERGY
GROUP



Table of Contents

List of Tables and Figures.....	2
1. Introduction.....	3
2. Demand Forecasts	5
References.....	16
A1. Demand Forecast Summary Tables.....	17
Terms of Use	25

List of Tables and Figures

List of Tables

Table 1.1 Customer Segments used for Tariff Classification.....	4
Table 2.1 Penetration rate in new Adelaide subdivisions	7
Table 2.2 Weather Data Comparison	8
Table 2.3 Consumption per Connection by Region GJ.....	8
Table 2.4 Residential vs Commercial Connections	11
Table 2.5 Industrial vs Residential Connections	14

List of Figures

Figure 2.1 Mount Barker Growth Area Dwelling Projections No.	6
Figure 2.2 Residential Customer Connections No.	7
Figure 2.3 Residential Customer Consumption per connection GJ	9
Figure 2.4 Residential Customer Demand GJ	10
Figure 2.5 Commercial Customer Connections No.....	12
Figure 2.6 Commercial Customer Demand GJ	13
Figure 2.7 Industrial Customer Connections No.	14
Figure 2.8 Industrial Customer MDQ GJ.....	15

1. Introduction

Core Energy Group Pty Ltd (“**CE**”) has been engaged by Australian Gas Networks Limited (“**AGN**”) to provide an independent forecast of gas customers and gas demand for an extension of the gas distribution network to Mount Barker. The forecast comprises demand projections in Mount Barker as well as demand projections for commercial and industrial customers along the route of the high pressure extension. The demand forecast will form part of AGN’s submission to the Australian Energy Regulator (“**AER**”) to assess the regulatory case for the extension of AGN’s SA distribution network to the Mount Barker region.

CE has taken all reasonable steps to ensure this report, and the approach to deriving the forecasts referred to within the report, comply with Part 9, Division 2 of the *National Gas Rules* (“**NGR**”).¹ This division outlines ‘access arrangement information relevant to price and revenue regulation’, and two particularly relevant provisions that CE has complied with are sections 74 and 75 of the NGR:

74. Forecasts and estimates

- (1) *Information in the nature of a forecast or estimate must be supported by a statement of the basis of the forecast or estimate.*
- (2) *A forecast or estimate:*
 - (a) *must be arrived at on a reasonable basis; and*
 - (b) *must represent the best forecast or estimate possible in the circumstances.*

75. Inferred or derivative information

Information in the nature of an extrapolation or inference must be supported by the primary information on which the extrapolation or inference is based.

CE has developed demand forecasts for three main customer segments:

- Tariff R Residential (“**Residential**”);
- Tariff C Commercial (“**Commercial**”); and
- Tariff D Industrial (“**Industrial**”).

Table 1.1 below sets out the nature of the forecasts that Core was asked to prepare. These forecasts reflect the manner by which each customer group is billed. For example, forecasts of MDQ are not required for residential customers as residential customers are charged based on the volume of gas used.

¹ *National Gas Rules 2008.*

Table 1.1 Customer Segments used for Tariff Classification

Customer Segment	Description	Customer Numbers	Volume	MDQ
Tariff R (<10TJ)	AGN's residential volume tariff customer group consists of customers who are reasonably expected to consume less than 10 terajoules ("TJ") of natural gas per year, who are billed quarterly and their predominant use of gas is for residential purposes.	✓ sum of components	✓ sum of components	Not required
Tariff C (<10TJ)	AGN's commercial volume tariff customer group consists of customers who are reasonably expected to consume less than 10 TJ of natural gas per year, who are billed quarterly and are not residential customers.	✓ sum of components	✓ sum of components	Not required
Tariff D (>10TJ)	AGN's demand tariff customer group consists of industrial customers that are reasonably expected to consume more than 10 TJ of gas per year.	✓	Not required	✓

2. Demand Forecasts

In this chapter, CE presents the demand forecast for the Mount Barker extension, including the methodology used to derive the forecast and the key assumptions applied. CE sought to apply, wherever possible, the same methodology to determine the demand forecasts for the Mount Barker extension as it does when preparing a demand forecast for an Access Arrangement ('AA') review. Also, consistent with demand forecasts prepared for AA reviews, CE has applied a transparent and straightforward approach which is easily replicable.

Total demand has been forecast by examining the potential number of AGN connections in the Mount Barker growth area and the forecast consumption per connection for both Residential and Commercial customers. This report will also outline the methodology for determining the forecast number of Tariff D connections and their required network capacity. Attachment 1 to this report contains the AGN Mount Barker Model which contains the Residential, Commercial and Industrial forecasts.

2.1. Methodology

The Residential demand forecast was derived by first estimating the number of potential new dwellings in the Mount Barker growth area using Mount Barker District Council's own projections, as prepared by *forecast.id*, over a twenty-year period. CE then estimated a penetration rate based on recent Adelaide subdivisions and consumption per connection based on consumption in areas with similar climate to Mount Barker, thereby deriving a forecast of total Residential demand.

We have applied two approaches to forecasting Commercial connections, given the nature of the extension. The first approach was to estimate Commercial connections according to the state-wide ratio of Commercial to Residential connections. This approach reflects the fact that the number of Commercial connections in Mount Barker should reflect the ratio of Commercial to Residential connections elsewhere in South Australia.

The second approach was applied in the relevant area outside of Mount Barker, i.e. in Monarto South Industrial Park and Kanmantoo, and forecasts connections via a survey of existing LPG customers. AGN provided survey information in relation to likely Commercial customers in Monarto South and Kanmantoo, which forms the basis of both the connections and consumption forecast for the larger Commercial customers.

In relation to the smaller Commercial customers in Mount Barker, average consumption was determined according to the state-wide average used in the most recent South Australian AA. The larger consumption of the Commercial customers in Monarto South and Kanmantoo was forecast according to survey data provided by AGN.

The Industrial connections forecast also utilises a combination of the state-wide ratio of Industrial to Residential connections and survey data. The Industrial forecast assumes that all of these connections will require the minimum capacity of 50 GJ MDQ, with the exception of one larger Industrial customer with a capacity of [REDACTED].

2.2. Residential Demand Forecast

2.2.1. Connections

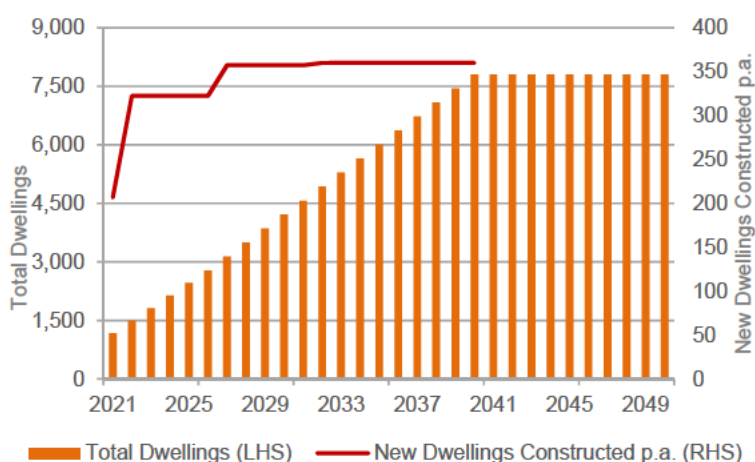
CE has estimated the number of potential Residential connections in Mount Barker area using the following approach:

1. Derive the forecast number of dwellings per annum in Mount Barker Growth Area to 2040 using *forecast.id*;
2. Estimate the penetration of gas connections in the development areas; then
3. Derive the forecast for the number of new connections in the Mount Barker growth area.

2.2.1.1 Dwellings Forecast

Forecast.id provides dwellings forecasts for the Mount Barker Growth Area to 2036, which CE has extrapolated to 2040. *forecast.id* expect dwelling growth of approximately 200 per annum in the first few years, followed by 300 dwellings per annum until 2026, and 350 dwellings per annum until 2036. CE have extrapolated to 2040 using the annual dwelling forecast of 350. CE expects further dwellings growth beyond 2040 however, for the purposes of the dwellings forecast, total dwellings growth ceases beyond 2040. The detailed dwellings forecast can be found in the 'Assumptions' worksheet of the AGN Mount Barker Model and is shown in Figure 2.1 below.

Figure 2.1 Mount Barker Growth Area Dwelling Projections | No.



Source: Forecast.id & Core Energy Group, 2017

2.2.1.2 Penetration Rate

CE considers an appropriate gas penetration rate to apply to the Mount Barker extension is that which is currently evidenced in residential land developments of similar size. AGN has provided CE with the data required to determine the gas penetration rate, which data is presented in Table 2.1 below. The sample contains 10,235 homes and 9,748 connections, resulting in a penetration rate of 95%.

Table 2.1 Penetration rate in new Adelaide subdivisions

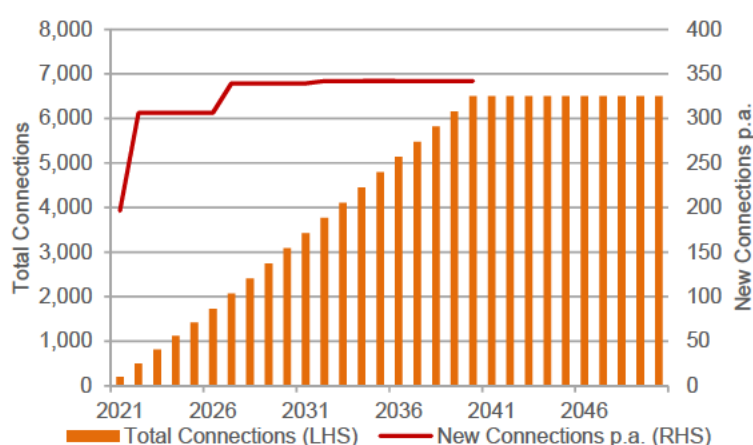
Subdivisions	Total Dwellings	Natural Gas Connections	Penetration
Andrews Farm	2,859	2,775	97%
Craigburn Farm	908	879	97%
Lightsview	1,828	1,767	97%
Northgate	1,154	1,132	98%
Seaford Heights	185	176	95%
Seaford Rise	2,401	2,195	91%
St Clair	900	824	92%
Total	10,235	9,748	95%

Source: Australian Gas Networks, 2017

2.2.1.3 Residential Connections

CE has multiplied the average penetration rate by the number of estimated new connections in the Mount Barker Growth Area to derive the forecast number of new connections as shown in Figure 2.2 below. Residential customer connections are expected to be 196 in 2021, increasing to 6,502 in 2040.

Figure 2.2 Residential Customer Connections | No.



2.2.2. Consumption per connection

Gas consumption per dwelling is influenced by the local climate. Relatively cooler climates, such as Melbourne, have a higher consumption per dwelling due to the higher heating requirement, whereas relatively milder climates, such as Adelaide have a lower heating requirement. This difference in heating requirement is observed in the difference between gas consumption per connection: Melbourne averages approximately 49 GJ per annum whilst Adelaide averages approximately 17 GJ per annum. Table 2.2 below presents a comparison of weather in areas served by AGN's gas networks in South Australia and also in Melbourne and Albury.

Table 2.2 Weather Data Comparison

Weather comparison	Mt. Barker	Mt. Gambier	Tanunda	Whyalla	Port Pirie	Berri	Adelaide	Albury	Melbourne*
Mean Maximum Temperature (°C)	20.0	19.0	21.6	23.7	24.5	23.4	22.4	22.1	19.9
Mean Minimum Temperature (°C)	8.1	8.2	9.2	11.5	12.7	10.2	12.3	8.7	10.2
Mean Average Temperature (°C)	14.1	13.6	15.4	17.6	18.6	16.8	17.4	15.4	15.1
Mean Number of Days < 2°C	27.3	19.0	27.9	13.5	1.2	Not Available	1.1	48.8	7.6
Mean Rainfall (mm)	765.1	711.1	481.4	267.2	345.6	263.2	551.0	711.7	648.3
Mean Number of Days of Rain	137.6	184.1	122.6	79.8	78.3	68.1	121.0	115.1	150.6

*Melbourne weather as recorded at the Olympic Park weather station.

Source: Bureau of Meteorology, 2017

Therefore, when assessing the potential consumption of new dwellings connecting to the Mount Barker extension, it is important to consider the gas consumption of new dwellings in regions with similar climate to Mount Barker.

It is interesting to observe that Melbourne, with an average consumption of 49 GJ per annum, has a milder climate than Mount Barker, driven by higher Mean Average Temperature, less days with a mean temperature of less than two degrees celcius and less mean rainfall. Similarly Albury has a higher Mean Average Temperature, less mean rainfall and days of rain than Mount Barker and has an average consumption per connection of 45 GJ per annum. Like Mount Barker, Albury has a high number of days with a minimum of less than 2 degrees celcius.

Comparison of Mount Barker weather to other regions shows that Mount Gambier has the most similar weather to Mount Barker, followed by Tanunda. Adelaide, along with the regional centres, is not considered an appropriate proxy for Mount Barker as their weather is significantly milder.

We therefore determined to use customer information from Mount Gambier to estimate the likely average residential consumption for Mount Barker.

The next step was to identify the gas consumption of new homes constructed from 2011 onwards in Mount Gambier. CE restricted the examination of gas consumption to recently built homes because they provide a reasonable proxy of consumption in the new homes to be constructed in Mount Barker. The gas consumption per new home in Mount Gambier is shown in Table 2.3.

Table 2.3 Consumption per Connection by Region | GJ

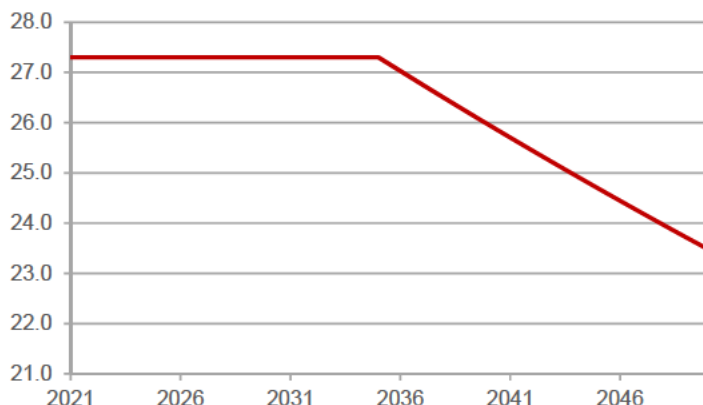
Region	2012	2013	2014	2015	2016	Average Consumption (GJ)
Mt Gambier	30.2	27.3	26.9	26.9	25.3	27.3
Number of MIRNs	109	199	270	377	443	N/A

Source: Australian Gas Networks, 2017

CE consider as a reasonable estimation of consumption per connection in Mount Barker region is 27.3 GJ per connection, which is the average of consumption per connection in the period 2012 to 2016 in Table 2.3. Residential consumption per connection is shown below in Figure 2.3.

The average consumption of 27.3GJ is further supported when comparing the demographics of Mount Barker to Mount Gambier. Mount Barker has a higher average household size (2.6 versus 2.3 persons), much higher median household income (\$1,435 versus \$1,052) and a higher percentage of dwellings with more than four bedrooms (37% versus 21%)².

Figure 2.3 Residential Customer Consumption per connection | GJ



Consumption per connection, estimated at an average of 27.3 GJ per annum is expected to decline after 2035 at a rate of 1% per annum due to efficiency gains in appliances, which is consistent with AEMO's 2016 NGFR estimate of consumption per connection decline³. The lifecycle of appliances is assumed to be 15 years on average, after which time appliances are most likely replaced with more efficient new appliances, contributing to a lower demand on average per household.

CE's assumption is that from after year 15 onwards the connections on the network have reached a level of maturity that is representative of the overall SA network and therefore the weighting of new and old appliances will be similar to that in the rest of the state. As such, the forecast decline in consumption per connection of 1% is also representative of a small proportion of appliances being replaced with more efficient new appliances as part of a larger state-wide pool of appliances.

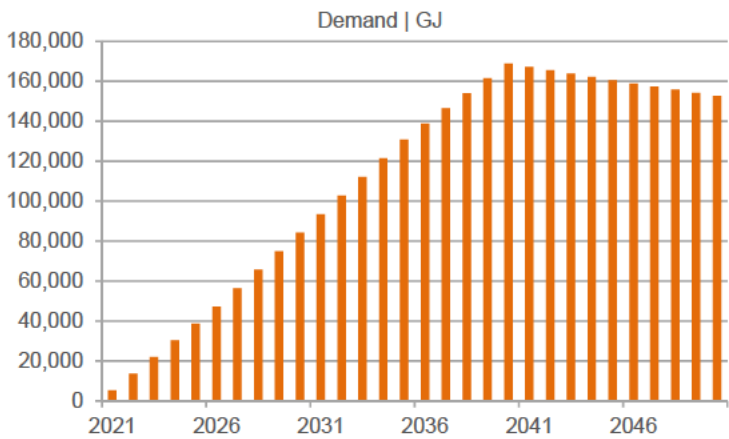
2.2.3. Total Residential Demand

The total Residential demand is a product of forecast connections and consumption per connection described above. Mount Barker Residential customer demand grows from approximately 5,360 GJ in 2021 and peaks at almost 169,000 GJ in 2040. The forecast of Residential customer demand is presented in Figure 2.4 below.

² Australian Bureau of Statistics 2017

³ AEMO, *National Gas Forecasting Report for Eastern and South-Eastern Australia*, December 2016, page 35 Table 20

Figure 2.4 Residential Customer Demand | GJ



2.3. Tariff C Commercial

2.3.1. Connections

The Commercial connections forecast can be broadly categorised into two geographic segments – the first relates to commercial connections within the Mount Barker township (Commercial Mount Barker) and those expected to connect from laterals to the transmission pipeline at Monarto South and Kanmantoo (Commercial Monarto South and Commercial Kanmantoo).

Commercial Mount Barker connections were estimated using the following approach:

1. Estimate the ratio between Residential and Commercial customers using AGN SA historical data from 2014/15 to 2016/17; then
2. Estimate the number of new Commercial customers based on the ratio.

It should also be noted that AGN has surveyed commercial LPG customers in Mt Barker, Monarto South and Kanmantoo, and have provided CE with some guidance on the customers that will potentially connect to the gas network.

2.3.1.1 Commercial Mount Barker

The extension to Mount Barker will also include the connection of the town's central business district, with the intention of serving local commercial business customers. The commercial customers in the town centre represent a wide range of small to medium to large businesses such as cafes, restaurants, schools, offices and large supermarkets.

To estimate the number of commercial connections for the next 20 years in Mount Barker, CE has applied the state-wide ratio of commercial customers to residential customers of 2.54% (see Table 2.4 below). The ratio is based on the average of the 2014/15 to 2016/17 commercial to residential ratios. The ratio is then applied to the forecast of Residential customers to derive the Commercial connections.

Table 2.4 Residential vs Commercial Connections

	2014/15	2015/16	2016/17	Average
Number of Tariff R connections	419,410	425,056	430,776	
Number of Tariff C connections	10,684	10,735	10,996	
% of Tariff C connections to Tariff R connections	2.55%	2.53%	2.55%	2.54%

Source: Australian Gas Networks, 2017

The profile of the connections forecast reflects the Residential connections forecast, with the addition of 5 connections per year initially, growing to 8 and then 9 per year by 2040.

2.3.1.2 Commercial Monarto South and Commercial Kanmantoo

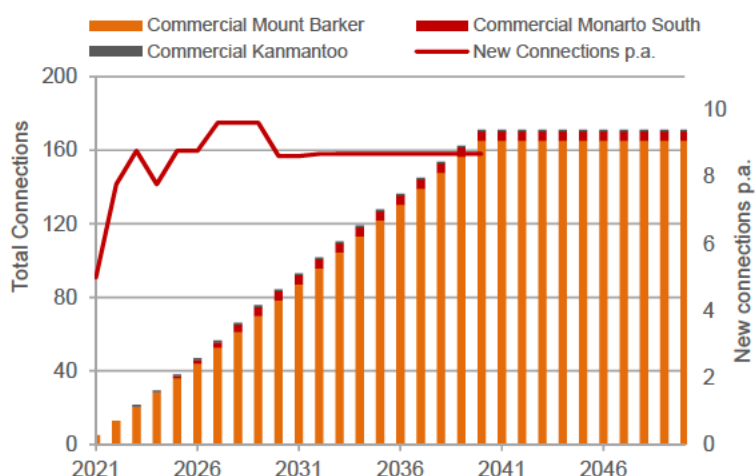
The route of the proposed pipeline connecting Mount Barker to the existing distribution network passes two load centres at Monarto South (Commercial Monarto South connections) and Kanmantoo (Commercial Kanmantoo connections), located approximately 40km and 20km away from Mount Barker respectively. Monarto South has been earmarked by the State Government, the Mount Barker District Council and the Murray Bridge Rural City Council for further development and expansion as an industrial park. It has also been identified as an employment centre for the region.

AGN surveyed existing businesses in Monarto South and Kanmantoo, and identified six commercial-size businesses that would likely connect to the pipeline. Five of these businesses have been categorised as Commercial Monarto South and one as Commercial Kanmantoo.

2.3.1.3 Total Commercial Connections

The forecast of the number of Commercial connections only consists of areas that AGN currently plans to access. There is further potential for connections growth in the commercial customer segment if the AGN network reaches other business centres in the Mount Barker region. As presented in Figure 2.5 below, there are 5 Commercial customer connections forecast in 2021, increasing to 165 in 2040.

Figure 2.5 Commercial Customer Connections | No.



2.3.2. Consumption per Connection

CE has categorised the Tariff C Commercial consumption forecast into three Commercial consumption categories:

- Commercial Mount Barker – 273 GJ per annum
- Commercial Monarto South – [REDACTED] per annum
- Commercial Kanmantoo – [REDACTED] per annum

The consumption for the Commercial Mount Barker category reflects the state-wide average of 273 GJ per annum as approved in the most recent South Australian AA. The consumption of Commercial Monarto South and Commercial Kanmantoo categories were determined according to AGN's estimate and AGN survey information respectively.

2.3.2.1 Commercial Mount Barker

Given the mix and size of commercial businesses, CE have used the forecast state-wide average commercial consumption per connection of 273 GJ per annum used in the latest AGN SA Access Arrangement as an estimate of expected consumption in Mount Barker. CE also consider this to be a relatively conservative estimate as the consumption has not been increased to take account of the cooler weather in Mount Barker. Although not as sensitive as residential customers, commercial customers also exhibit a requirement for heating load as evidenced by the fact consumption varies with climate.

Consumption per connection for Commercial Mount Barker customers, estimated at an average of 273GJ per annum, is expected to decline after 2035 at a rate of 1% per annum due to efficiency gains in appliances, which is consistent with AEMO's 2016 NGFR estimate of consumption per connection decline⁴.

2.3.2.2 Commercial Monarto South and Commercial Kanmantoo

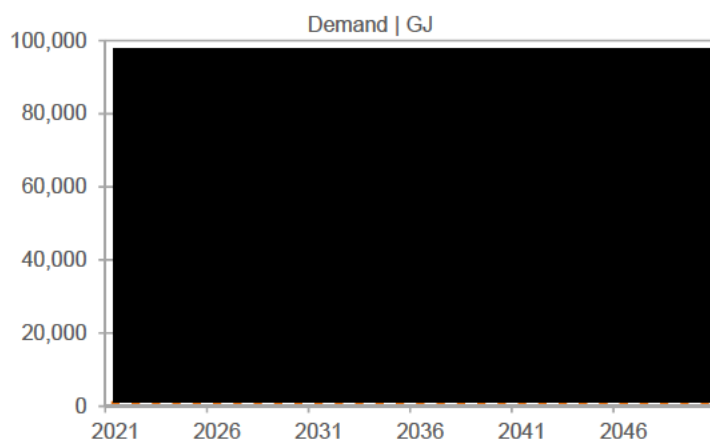
In respect of Commercial Monarto South, AGN estimated the gas consumption of the businesses to be [REDACTED] per annum consistent with the consumption of existing customers of a similar size.

In respect of Commercial Kanmantoo, AGN surveyed existing businesses in Kanmantoo and identified an existing customer that could connect to the network. AGN estimates the customer's gas consumption to be [REDACTED] on the basis of its current LPG consumption.

2.3.1. Total Commercial Demand

Figure 2.6 below presents the Commercial customer demand by customer type. The Commercial customer demand forecast increases from 1,360 GJ in 2021 to peak at over 81,000 GJ in 2040. By 2040, Commercial demand is expected to be 42,879 GJ in Mount Barker, [REDACTED] in Monarto South and [REDACTED] in Kanmantoo. Total Commercial demand is driven by growth in connections.

Figure 2.6 Commercial Customer Demand | GJ



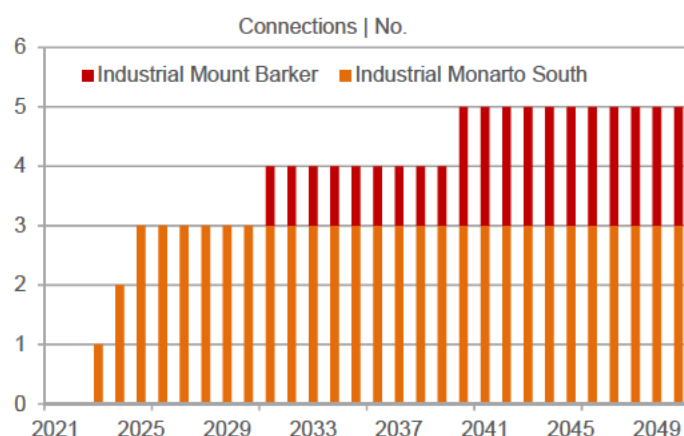
⁴ AEMO, *National Gas Forecasting Report for Eastern and South-Eastern Australia*, December 2016, page 35 Table 20

2.4. Tariff D Industrial

2.4.1. Connections

The Industrial connections forecast can be broadly categorised into two geographic segments – the first relates to industrial connections within the Mount Barker township (Industrial Mount Barker) and those expected to connect to the transmission pipeline at Monarto South (Industrial Monarto South).

Figure 2.7 Industrial Customer Connections | No.



2.4.1.2 Industrial Mount Barker

Industrial Mount Barker connections were estimated using the following approach:

3. Estimate the ratio between Residential and Industrial customers using AGN SA historical data from 2014/15 to 2016/17; then
4. Estimate the number of new Industrial customers based on the ratio.

The state-wide ratio is estimated to be 0.03% as shown in Table 2.5 below.

Table 2.5 Industrial vs Residential Connections

	2014/15	2015/16	2016/17	Average
Number of Residential connections	419,410	425,056	430,776	
Number of Industrial connections	127	121	116	
% of Industrial to Residential connections	0.03%	0.03%	0.03%	0.03%

Source: Australian Gas Networks, 2017

The ratio results in two Industrial Mount Barker connections. These two Mount Barker Industrial connections are assumed to have a capacity requirement of 50 GJ MDQ.

2.4.1.3 Industrial Monarto South

As with the Commercial forecast, the Industrial connections forecast was completed using both the state-wide ratio of Industrial to Residential connections and the results of AGN survey data. AGN conducted a survey of existing LPG customers which resulted in an assumption of three Monarto South connections (Industrial Monarto South). Of the three Industrial customers based on AGN's survey in Monarto South, two are assumed to require a capacity of 50GJ MDQ and one is assumed to require a capacity of [REDACTED] MDQ [REDACTED]

2.4.2. Capacity per connection

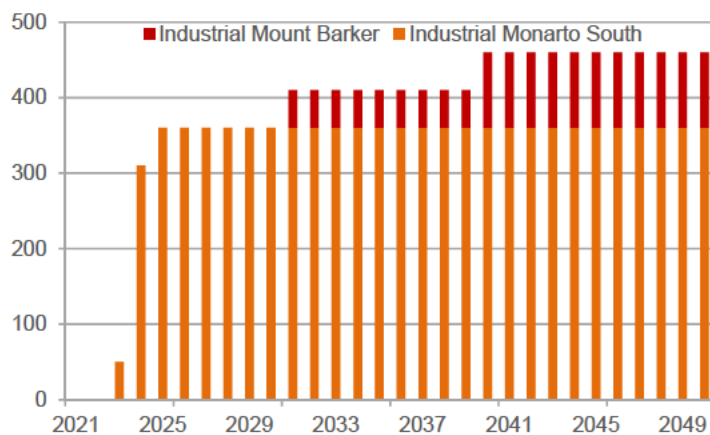
Four of the five Industrial customers are forecast to have a capacity requirement of 50GJ MDQ per day and the remaining Industrial customer has a capacity requirement of [REDACTED] per day. 50GJ MDQ is the minimum capacity charge for an Industrial customer and the [REDACTED] is based on surveys. We are of the view that this capacity mix reflects the future Industrial demand profile of Mount Barker and Monarto South.

2.4.3. Total Industrial Demand

By 2040 the final 50GJ MDQ capacity customer is forecast to require access to the network based on the ratio. This brings the total capacity by 2040 to [REDACTED] comprising four Industrial businesses requiring 50GJ MDQ and one Industrial business with a requirement of [REDACTED]

The forecast Industrial capacity requirement in Mount Barker and Monarto South is represented in Figure 2.8 below.

Figure 2.8 Industrial Customer MDQ | GJ



References

- ACIL Allen Consulting, *Report to Australian Energy Market Operator, 'Gas Consumption Forecasting: A Methodology,'* June 2014
- AEMO, *National Gas Forecasting Report*, December 2016
- AER, *Australian Gas Networks (SA) Access Arrangement 2016-21*, May 2016
- Bureau of Meteorology, *South Australian Weather Stations Data*, 2017
- ESCOSA, *Request for approval of new distribution system – Australian Gas Networks Ltd*, Feb 2017
- Forecast.ID, <http://forecast.id.com.au/mount-barker/residential-development?WebID=170>, accessed September 2017
- Government of South Australia, *Development Plan: Mount Barker District Council*, 16 May 2017

A1. Demand Forecast Summary Tables

Tariff R

Table A1.1 Tariff R Demand

Demand	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Demand	GJ	5,358	13,720	22,081	30,443	38,804	47,165	56,429	65,693	74,957	84,221
Growth	%		156%	61%	38%	27%	22%	20%	16%	14%	12%

Demand	Unit	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Demand	GJ	93,485	102,822	112,159	121,495	130,832	138,767	146,530	154,124	161,551	168,815
Growth	%	11%	10%	9%	8%	8%	6%	6%	5%	5%	4%

Demand	Unit	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Demand	GJ	167,127	165,455	163,801	162,163	160,541	158,936	157,346	155,773	154,215	152,673
Growth	%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%

Source: Core Energy Group, 2017

Table A1.2 Tariff R Connections

Connections	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
New Connections p.a.	no.	196	306	306	306	306	306	339	339	339	339
Total Connections	no.	196	503	809	1,115	1,421	1,728	2,067	2,406	2,746	3,085
Growth rate	%		156%	61%	38%	27%	22%	20%	16%	14%	12%

Connections	Unit	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
New Connections p.a.	no.	339	342	342	342	342	342	342	342	342	342
Total Connections	no.	3,424	3,766	4,108	4,450	4,792	5,134	5,476	5,818	6,160	6,502
Growth rate	%	11%	10%	9%	8%	8%	7%	7%	6%	6%	6%

Source: Core Energy Group, 2017

Table A1.3 Tariff R | Consumption per connection

Consumption per connection	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Demand	GJ	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3
Growth	%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Consumption per connection	Unit	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Demand	GJ	27.3	27.3	27.3	27.3	27.3	27.0	26.8	26.5	26.2	26.0
Growth	%	0.0%	0.0%	0.0%	0.0%	0.0%	-1.0%	-1.0%	-1.0%	-1.0%	-1.0%

Consumption per connection	Unit	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Demand	GJ	25.7	25.4	25.2	24.9	24.7	24.4	24.2	24.0	23.7	23.5
Growth	%	-1.0%	-1.0%	-1.0%	-1.0%	-1.0%	-1.0%	-1.0%	-1.0%	-1.0%	-1.0%

Source: Core Energy Group, 2017

Tariff C

Table A1.4 Tariff C | Demand

Demand	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Commercial Mount Barker	GJ	1,361	3,485	5,609	7,732	9,856	11,980	14,333	16,686	19,039	21,392
Commercial Monarto South	GJ	0	0	0	0						
Commercial Kanmantoo	GJ	0	0								
Total	GJ	1,361	3,485			24,356	32,480	40,833	49,186	57,539	59,892
Growth rate	%		156%				33%	26%	20%	17%	4%

Demand	Unit	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Commercial Mount Barker	GJ	23,745	26,117	28,488	30,860	33,231	35,247	37,219	39,147	41,034	42,879
Commercial Monarto South	GJ										
Commercial Kanmantoo	GJ										
Total	GJ	62,245	64,617	66,988	69,360	71,731	73,747	75,719	77,647	79,534	81,379
Growth rate	%	4%	4%	4%	4%	3%	3%	3%	3%	2%	2%

Demand	Unit	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Commercial Mount Barker	GJ	42,450	42,026	41,605	41,189	40,777	40,370	39,966	39,566	39,171	38,779
Commercial Monarto South	GJ										
Commercial Kanmantoo	GJ										
Total	GJ	80,950	80,526	80,105	79,689	79,277	78,870	78,466	78,066	77,671	77,279
Growth rate	%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%

Source: Core Energy Group, 2017

Table A1.5 Connections

New Connections pa.	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Commercial Mount Barker	no.	5	8	8	8	8	8	9	9	9	9
Commercial Monarto South	no.	0	0	0	0	1	1	1	1	1	0
Commercial Kanmantoo	no.	0	0	1	0	0	0	0	0	0	0
Total	no.	5	8	9	8	9	9	10	10	10	9

New Connections pa.	Unit	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Commercial Mount Barker	no.	9	9	9	9	9	9	9	9	9	9
Commercial Monarto South	no.	0	0	0	0	0	0	0	0	0	0
Commercial Kanmantoo	no.	0	0	0	0	0	0	0	0	0	0
Total	no.	9	9	9	9	9	9	9	9	9	9

Cumulative connections	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Commercial Mount Barker	no.	5	13	21	28	36	44	53	61	70	78
Commercial Monarto South	no.	0	0	0	0	1	2	3	4	5	5
Commercial Kanmantoo	no.	0	0	1	1	1	1	1	1	1	1
Total	no.	5	13	22	29	38	47	57	66	76	84
Growth rate	%		156%	69%	36%	30%	23%	21%	17%	15%	11%

Cumulative connections	Unit	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Commercial Mount Barker	no.	87	96	104	113	122	130	139	148	156	165
Commercial Monarto South	no.	5	5	5	5	5	5	5	5	5	5
Commercial Kanmantoo	no.	1	1	1	1	1	1	1	1	1	1
Total	no.	93	102	110	119	128	136	145	154	162	171
Growth rate	%	10%	9%	9%	8%	7%	7%	6%	6%	6%	5%

Table A1.6 Tariff C | Consumption per connection

Consumption per connection	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Commercial Mount Barker	GJ	273	273	273	273	273	273	273	273	273	273
Commercial Monarto South	GJ	■	■	■	■	■	■	■	■	■	■
Commercial Kanmantoo	GJ	■	■	■	■	■	■	■	■	■	■

Consumption per connection	Unit	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Commercial Mount Barker	GJ	273	273	273	273	273	270	268	265	262	260
Commercial Monarto South	GJ	■	■	■	■	■	■	■	■	■	■
Commercial Kanmantoo	GJ	■	■	■	■	■	■	■	■	■	■

Consumption per connection	Unit	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Commercial Mount Barker	GJ	257	254	252	249	247	244	242	240	237	235
Commercial Monarto South	GJ	■	■	■	■	■	■	■	■	■	■
Commercial Kanmantoo	GJ	■	■	■	■	■	■	■	■	■	■

Source: Core Energy Group, 2017

Tariff D

Table A1.7 Tariff D | MDQ

MDQ	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Industrial - 50 GJ	GJ	0	0	50	50	100	100	100	100	100	100
Industrial - 260 GJ	GJ	0	0	0	■	■	■	■	■	■	■
Total	GJ	0	0	50	■	■	■	■	■	■	■
Growth rate	%				520%	16%	0%	0%	0%	0%	0%

MDQ	Unit	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Industrial - 50 GJ	GJ	150	150	150	150	150	150	150	150	150	200
Industrial - 260 GJ	GJ	■	■	■	■	■	■	■	■	■	■
Total	GJ	■	■	■	■	■	■	■	■	■	■
Growth rate	%	14%	0%	0%	0%	0%	0%	0%	0%	0%	12%

MDQ	Unit	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Industrial - 50 GJ	GJ	200	200	200	200	200	200	200	200	200	200
Industrial - 260 GJ	GJ	■	■	■	■	■	■	■	■	■	■
Total	GJ	■	■	■	■	■	■	■	■	■	■
Growth rate	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Tariff D | Connections

New Connections pa.	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Industrial - 50 GJ	no.	0	0	1	0	1	0	0	0	0	0
Industrial - 260 GJ	no.	0	0	0	1	0	0	0	0	0	0
Total	no.	0	0	1	1	1	0	0	0	0	0

New Connections pa.	Unit	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Industrial - 50 GJ	no.	1	0	0	0	0	0	0	0	0	1
Industrial - 260 GJ	no.	0	0	0	0	0	0	0	0	0	0
Total	no.	1	0	0	0	0	0	0	0	0	1

Cumulative connections	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Industrial - 50 GJ	no.	0	0	1	1	2	2	2	2	2	2
Industrial - 260 GJ	no.	0	0	0	1	1	1	1	1	1	1
Total	no.	0	0	1	2	3	3	3	3	3	3
Growth rate	%				100%	50%	0%	0%	0%	0%	0%

Cumulative connections	Unit	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Industrial - 50 GJ	no.	3	3	3	3	3	3	3	3	3	4
Industrial - 260 GJ	no.	1	1	1	1	1	1	1	1	1	1
Total	no.	4	4	4	4	4	4	4	4	4	5
Growth rate	%	33%	0%	0%	0%	0%	0%	0%	0%	0%	25%

Cumulative Connections	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Mount Barker Industrial	0	0	0	0	0	0	0	0	0	0
Monarto South Industrial	0	0	1	2	3	3	3	3	3	3

Cumulative Connections	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Mount Barker Industrial	1	1	1	1	1	1	1	1	1	2
Monarto South Industrial	3	3	3	3	3	3	3	3	3	3

Cumulative Connections	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Mount Barker Industrial	2	2	2	2	2	2	2	2	2	2
Monarto South Industrial	3	3	3	3	3	3	3	3	3	3

MDQ	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Mount Barker Industrial	0	0	0	0	0	0	0	0	0	0
Monarto South Industrial	0	0	50	■	■	■	■	■	■	■

MDQ	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Mount Barker Industrial	50	50	50	50	50	50	50	50	50	100
Monarto South Industrial	■	■	■	■	■	■	■	■	■	■

MDQ	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Mount Barker Industrial	100	100	100	100	100	100	100	100	100	100
Monarto South Industrial	■	■	■	■	■	■	■	■	■	■

Terms of Use

This Report has been prepared by Core Energy Group Pty Limited, A.C.N. 110 347 085, for the sole purpose of providing Client, in accordance with the strict terms of an agreed Engagement Letter.

This document has been prepared on the basis of a specific scope and does not purport to contain all the information that a particular party may require. The information contained in this document may not be appropriate for all persons and it is not possible for Core to have regard to the objectives, financial and other circumstances and particular needs of each party who reads or uses this document.

Core believes that the information contained in this document has been obtained from sources that are accurate at the time of issue, but makes no representation or warranty as to the accuracy, reliability, completeness or suitability of the information contained within this document. To the extent permitted by law, Core, its employees, agents and consultants accept no liability (including liability to any person by reason of negligence or negligent misstatement) for any statements, opinions, information or matter (expressed or implied) arising out of the information contained within this document.

© Core Energy Group – All material in this document is subject to copyright under the Copyright Act 1968 (Commonwealth) and international law and permission to use the information must be obtained in advance and in writing from Core.

Core Energy Group

Level 1, 276 Flinders St

Adelaide SA 5000

T: +61 8 8470 0050 | w: coreenergy.com.au

Paul Taliangis

Chief Executive Officer

T: +61 8 8470 0050

E: pt@coreenergy.com.au