Attachment 13.1

Core Energy Forecasting Report

July 2025

PUBLIC

Australian Gas Networks

Australian Gas Networks (SA) Gas Access Arrangement July 2026 to 30 June 2031

Gas Demand and Connections Forecast

25 June 2025

Table of Contents

Annexures:

1. Glossary

AA or GAA	Access Arrangement; Gas Access Arrangement
ABS	Australian Bureau of Statistics
ACQ	Annual Consumption Quantity
ADQ	Average Daily Quantity (ACQ/365)
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AGN	Australian Gas Networks (SA)
CORE	Core Energy and Resources Pty. Limited
D/C	Demand per connection
EDD	Effective Degree Day
FY	Financial Year
GJ	Gigajoule
GSP	Gross State Product
MDQ	Maximum Daily Quantity
MIRN	Meter Installation Registration Number
NCC	National Construction Code
NGR	National Gas Rules
PJ	Petajoule
R-C; RC	Reverse Cycle (Air-conditioning)
R&C	Residential and Commercial
Review Period	The Access Arrangement Period: 1st July 2026 to 30 June 2031
SA	South Australia
Tariff V	If Tariff V is referred to it is to be interpreted as R&C for South Australia.
TJ	Terajoule

2. Executive Summary

2.1. Introduction

This report has been prepared by Core Energy and Resources Pty. Ltd. (CORE) for the purpose of providing Australian Gas Networks (SA) (AGN) with an independent forecast of gas customers and gas demand for the company's natural gas distribution network in South Australia (SA), for the five-year Access Arrangement (AA) Review Period from 1 July 2026 to 30 June 2031 (Review Period).

2.2. Methodology

CORE has used a methodology which is consistent with the 1 July 2021 to 30 June 2026 AA, with adjustments to reflect AER comments on the demand forecast relating to the AA, changes in market, economic and other circumstances since that AA, including:

- the impact of COVID,
- Government policy relating to greenhouse gas (GHG) emissions including
  - those emissions generated by future gas use, and
  - the impact of electrification; particularly as it relates to Residential and Commercial customers who utilise Tariffs R and C respectively in South Australia.

Although the methodology is consistent with the current AA, the development of AGN's gas demand forecasts for the Review Period has required a far greater degree of research, analysis, and modelling of expected changes in circumstances which are expected to take place during the Review Period.

CORE considers that the evolving trend in electrification will have a material impact on future gas demand. CORE has reviewed and relied upon projections by the Australian Energy Market Operator (AEMO) of the expected reduction in Tariffs R and C demand due to electrification/fuel switching as detailed within this report. CORE notes that the AER placed significant emphasis on the AEMO forecasts in the last Victorian Access Arrangements, including AGN Victoria and Albury and Multinet, and CORE considers that such an emphasis should extend to this South Australian AA.

CORE's methodology has considered AA Proposals and Decisions by the AER, and forecasting techniques and methodologies adopted by leading energy forecasting organisations, both throughout Australia and internationally. This ensures that CORE's approach meets the specific requirements of the NGR.

2.3. Demand Forecast

CORE's demand forecast for AGN over the 1 July 2026 to 30 June 2031 period is summarised as follows:

Table 2.0 CORE AGN Demand Forecast – Initial Proposal (Financial Year ended 30 June)

Forecast Element	2027	2028	2029	2030	2031	Average % Change 2027-2031[1]
Residential Demand | GJ	5,885,280	5,632,531	5,309,084	4,992,987	4,689,273	-5.26
Commercial Demand | GJ	3,132,053	3,104,469	3,073,424	3,031,820	2,980,819	-1.1
Industrial ACQ Demand | GJ	9,663,417	9,592,974	9,497,026	9,350,407	9,158,376	-1.16
Industrial MDQ Demand | GJ	50,106	49,706	49,155	48,303	47,182	-1.30

Source: CORE AGN Demand Forecast Model

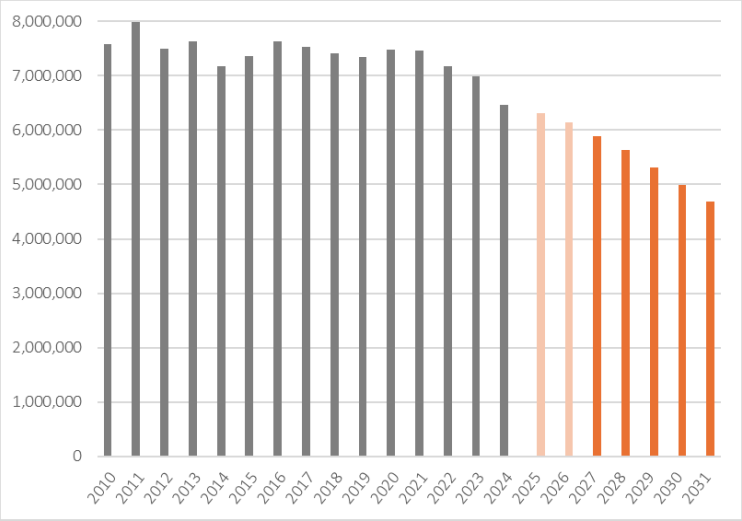
The following paragraphs provide an overview of CORE's demand forecast for each customer segment.

2.3.1. Residential

2.3.1.1 Demand

Residential demand is forecast to fall by an average annual rate of-5.26% between FY 2027 and FY 2031 due to a low rate of growth in net connections and a reduction in average demand per connected customer, which continues a downward trend observable over the longer term and in a more pronounced way from 2021.

Figure 2.1 Residential Demand – history and forecast (normalised GJ)



Source: CORE AGN Demand Forecast Model

2.3.1.2 Connections

Residential connections are forecast to increase by an average annual rate of 0.30% during the Review Period which is influenced by a lower level of completions than observed in historical periods and a lower rate of the AGN penetration

[1] The change is an average annual change based on the % movement between the closing value from the end of FY 2026 to FY 2031

rate (% of new customers connecting to the AGN network). A broader summary of factors contributing to these trends are summarised below:

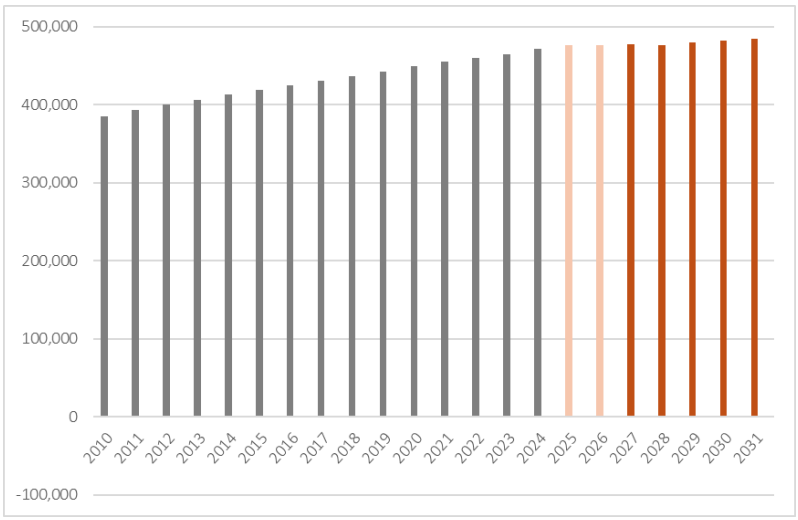
New Customers:

- lower levels of new dwelling construction activity in SA, in part due to lower forecast population growth.
- significant SA dwelling growth outside the AGN network area (e.g. Mt Barker with >44,000 population in 2024).
- increase in all electric dwellings within the AGN network area, leveraging solar and electric heat pump technologies and influenced by new National Construction Code (NCC) standards and government policy which is focused on leveraging renewable energy to meet emission reduction targets and energy efficiency (e.g. the 800 lot Villawood development at Aldinga - a partnership between Villawood Properties and Renewal SA. This development includes features like gas-free construction, solar panels, heat pumps, batteries, and microgrids. Additionally, the Energy Masters project is testing the benefits of energy-smart homes in 500 South Australian households, focusing on optimizing energy use and offering subsidies for energy-efficient appliances.
- South Australia has a growing network of homes with solar and battery systems that participate in virtual power plants. The SA VPP initiative, for example, helps reduce energy costs for participating households and supports the grid.
- The NCC 2022 provisions, which came into effect in October 2024, focus on improving energy efficiency in new homes. They include higher thermal performance requirements (7-star equivalent) and a whole-of-home energy budget to guide the selection of efficient building systems.

Existing Customers/AGN network area developments:

- increased trend toward electrification – particularly when appliances require replacement or during renovation.
- increased awareness of the cost effectiveness and sustainability of renewable sourced electricity and energy efficiency of heat pump technology – water and space heating.
- higher level of disconnections – particularly when household gas appliances require replacement at end of effective life or are replaced during renovation and result in all electric energy sourcing.

Figure 2.2 Residential closing connections – history and forecast (No. of connections).



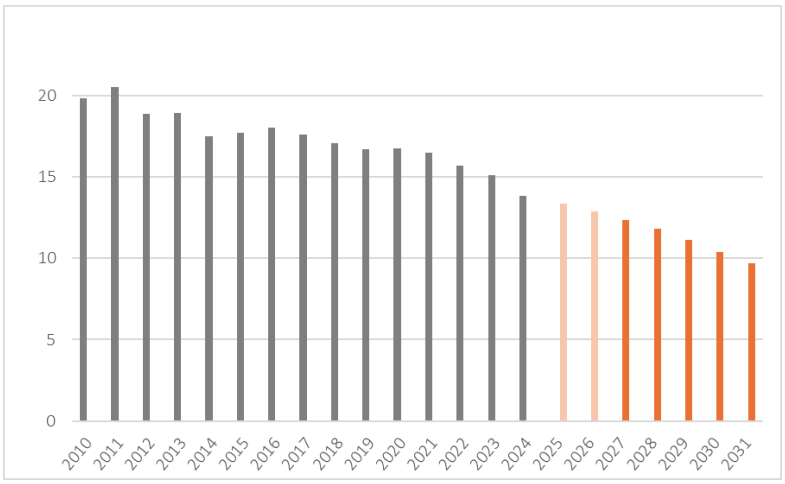
Source: CORE AGN Demand Forecast Model

2.3.1.3 Demand per Connection

Residential demand per connection is expected to fall at a rate of -5.50% during the Review Period for the following primary reasons:

- base level of decline which has been observable over the longer term, which has accelerated since 2016, with an average annual decline rate of -5.8% between 2022-2024.
- growing trend toward replacement of gas heating with electric Reverse-Cycle air-conditioning when appliances are due to be replaced or during renovation.
- growing trend in use of alternative water heating technologies, including solar and electric heat pumps.
- advances in dwelling construction standards which favour alternative energy sources, including 7 star standards introduced by updates to the NCC in 2022, which favour solar and electric appliances which were mandatory from 2024.
- increased level of new higher density dwellings with lower levels of gas connection over time and those connected to gas using lower levels of gas due to advances in building and appliance efficiency and lower levels of appliance penetration (lower space heating and water heating penetration).
- increasing solar and battery storage penetration within the ”Existing customer” grouping, which substitutes gas use.

Figure 2.3 Residential Demand per Connection – history and forecast. (normalised GJ)



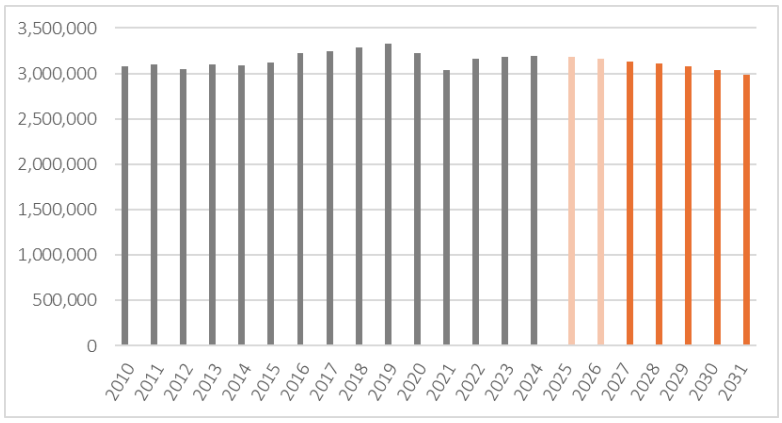
Source: CORE AGN Demand Forecast Model

2.3.2. Commercial Connections and Demand

2.3.2.1 Demand

Commercial demand is forecast to fall at an average annual rate of -1.1% during the Review Period due to a fall in both connections and average demand per connected customer.

Figure 2.4 Commercial Demand – history and forecast (normalised GJ).



Source: CORE AGN Demand Forecast Model

2.3.2.2 Connections

Commercial connection growth is forecast to decline moderately, extending trends emerging over recent years, due to:

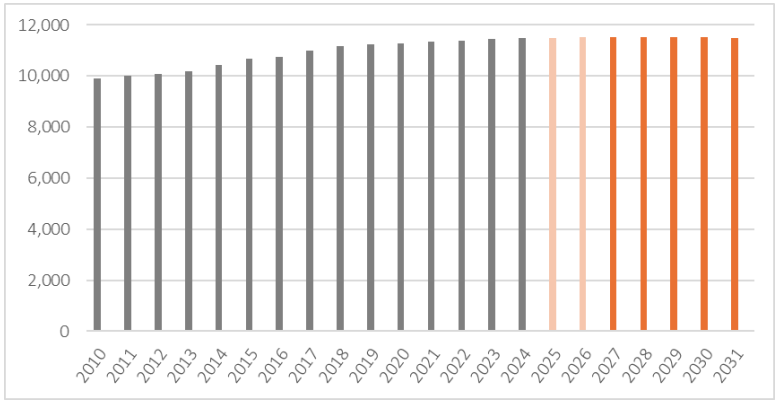
New Customers:

- lower level of forecast new gas-intensive Commercial development activity
- increase in all electric businesses and Commercial properties, leveraging solar and electric heat pump technologies (one example is the all-electric building at 83 Pirie Street which reached practical completion at end 2022).

Existing Customers:

- increased awareness of cost effectiveness and sustainability of renewable sourced electricity and energy efficiency of heat pump technology – water and space heating.
- Government influences on fuel switching – e.g. business subsidies
- higher level of disconnection – particularly when appliances require replacement and result in all electric energy sourcing.

Figure 2.5 Commercial Connections – history and forecast (Number of closing connections).



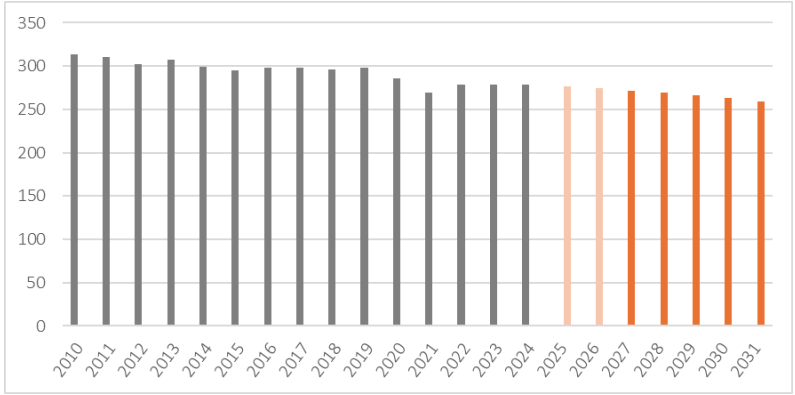
Source: CORE AGN Demand Forecast Model

2.3.2.3 Demand per Connection

Commercial demand per connection is expected to fall by -1.12%, extending a long term trend, for the following primary reasons:

- advances in construction standards which favour other energy sources.
- changing mix/type of small business
- increasing solar and battery storage penetration within Existing customer category, which substitute gas – although to a lower extent than residential.
- continuing advances in energy efficiency.
- increased number of shared central low emission energy facilities used by multiple small businesses
- growing trend in the use of alternative water heating technologies.

Figure 2.6 Commercial Demand per Connection – history and forecast (normalised GJ).



Source: CORE AGN Demand Forecast Model

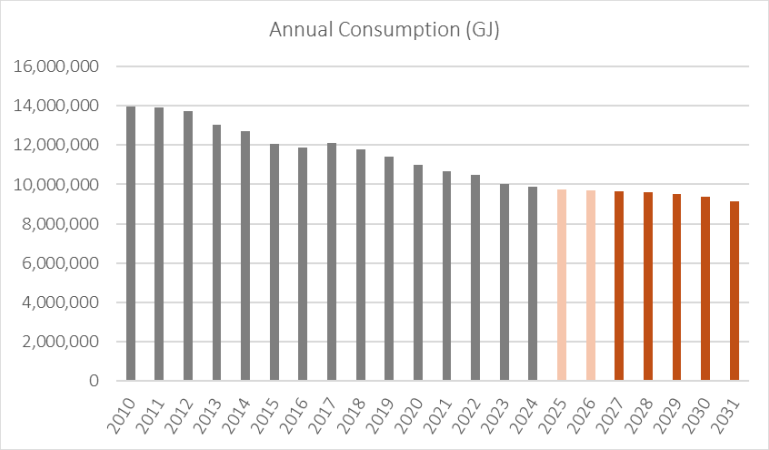
2.3.4. Industrial

Industrial demand is forecast to fall during the Review Period by an average annual rate of:

- -1.16% for ACQ
- -1.39% for MDQ

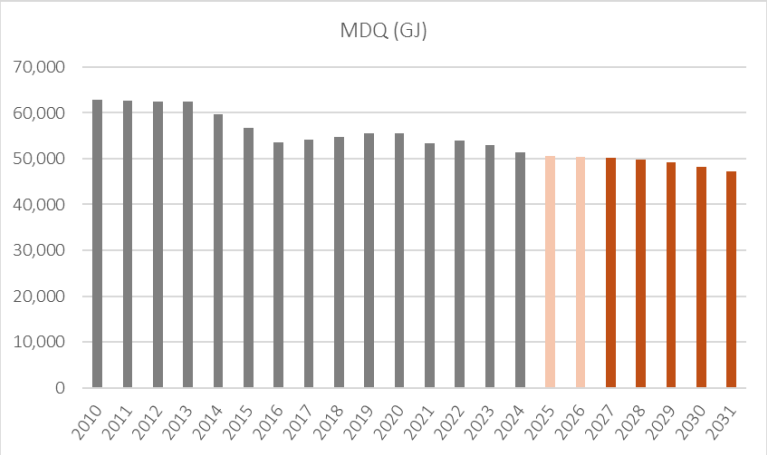
These reductions are due to the expected changes in the ways industrial customers source and use energy, to enhance profitability and meet sustainability standards, as observed over the longer term presented in the following figures.

Figure 2.7 Industrial ACQ Demand – history and forecast. (GJ)



Source: CORE AGN Demand Model

Figure 2.8 Industrial MDQ Demand – history and forecast (TJ)



Source: CORE AGN Demand Model

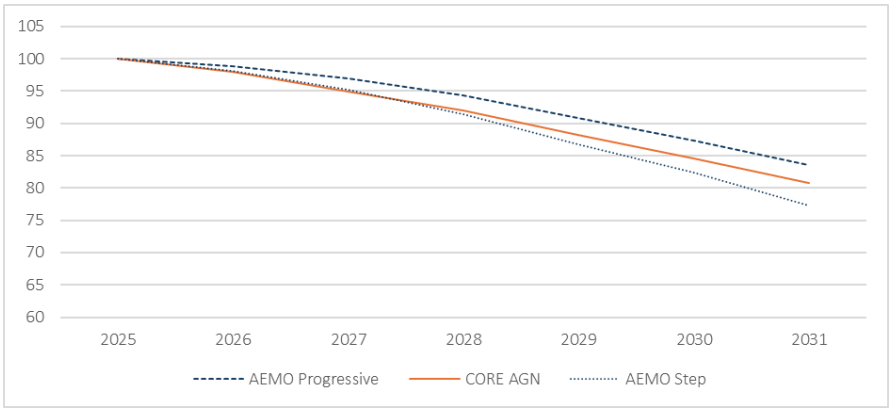
Major changes which are forecast to impact industrial demand include:

- Structural changes across certain sectors (such as health) and specific large customer operations.
- use of new, more energy efficient heating and processing technologies.
- greater use of alternative energy sources including solar and waste resources and other 'behind the meter' solutions.
- changes in national and international market competitiveness across certain sectors.

2.4. Validation

As the most significant element of a validation or cross check process, CORE has compared its demand forecast for Residential and Commercial customers (combined) against the Progressive and Step Change scenario forecasts presented by AEMO within its 2025 Gas Statement of Opportunities (GSOO) and related online forecasting portal[2], as summarised in the following figure.

Figure 2.9 AGN R&C forecast and AEMO 2025 GSOO scenarios on an index basis with 2025=100



Source: CORE based on AEMO data and AGN Demand Model; R&C – Residential and Commercial

Figure 2.9 compares Residential and Commercial (R&C) customers together as AEMO does not present a separate forecast for each segment. The figure shows that the AGN forecast is broadly consistent with the AEMO Step change scenario to 2027 and from 2028 trends closer to the Progressive scenario, finishing approximately at the midpoint between the two AEMO scenarios by end 2031.

CORE notes that the 2025 base demand is materially different between AGN and the two AEMO scenarios which impact the index analysis. Based on actual data to end April 2025 (10 of the 12 months of FY 2025), CORE has assessed that the AGN 2025 forecast is reasonable.

[2] https://aemo.com.au/energy-systems/gas/gas-forecasting-and-planning/gas-forecasting-data-portal

3. Introduction

3.1. Report Scope

This report has been prepared by Core Energy and Resources Pty. Ltd. (CORE) for the purpose of providing Australian Gas Networks (SA) (AGN) with an independent forecast of gas customers and gas demand for the company's natural gas distribution network in South Australia (SA), for the five-year Review Period from 1 July 2026 to 30 June 2031 (Review Period).

This report and related forecast models will form part of AGN's Revised Access Arrangement (AA) submission to the Australian Energy Regulator (AER).

CORE has taken all reasonable steps to ensure this report, and the approach to deriving the forecasts referred to within the report, complies with Part 9, Division 2 of the National Gas Rules (NGR). This division outlines "access arrangement information relevant to price and revenue regulation", including ss 74; 75:

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.

In addition to this report, CORE attaches the following confidential models to this report:

- AGN EDD Model
- AGN Weather Normalised Demand Model
- AGN Demand Forecast Model

3.2. Report Structure

All years refer to financial years (**FY**) unless stated otherwise.
The report comprises the following main elements, supported by certain Annexures:

- Executive Summary
- Introduction
- Methodology
- Weather Normalisation
- Residential Demand and Connection - History and Forecast
- Commercial Demand and Connections – History and Forecast
- Industrial Demand and Connections – History and Forecast
- Validation
- Conclusion

3.3. Overview of AGN Network

The SA gas distribution network is owned by Australian Gas Networks which outsources the operation of the network to the APA Group.

The SA gas distribution network covers Adelaide and its surrounds, and the regional centres of Mount Gambier, Whyalla, Port Pirie, Barossa Valley, Murray Bridge and Berri. It consists of approximately 8,322 km of pipeline delivering gas to around 483,000 customers (2024).

The SA distribution gas network is connected to the MAPS, SEA Gas, Southeast and Riverland transmission pipelines.

The following list shows the two types of services that AGN SA has proposed for the 1 July 2026–30 June 2031 access arrangement period.

- Haulage reference services:
    - Domestic Haulage Service
    - Commercial Haulage Service
    - Demand Haulage Service
- Ancillary non-reference services:
    - Special Meter Read
    - Disconnection
    - Reconnection
    - Meter Gas and Installation Test
    - Meter Removal
    - Meter Reinstallation

4. Methodology

4.1. Introduction

The overarching approach adopted by CORE to derive the demand and connections forecast for the AGN, involves four primary elements – each consistent with the approach adopted for the 1 July 2021 to 30 June 2026 AA.

1. An approach to normalisation of historical demand to remove the impact of abnormal weather (4.2)
2. An approach to deriving a forecast of Residential demand (4.3)
3. An approach to deriving a forecast of Commercial demand (4.4)
4. An approach to deriving a forecast of Industrial demand (4.5)

The methodology adopted by CORE takes into consideration prior AER draft and final decisions relating to recent AA demand forecast proposals, which together with consideration of approaches adopted by leading national and international organisations engaged in energy forecasting, including AEMO, results in a best-practice approach to gas connection and demand forecasting.

The methodology incorporates a highly transparent approach, including a demand forecast model that examines material factors that are considered likely to, or have the potential to, impact normalised demand and future connections. This report sets out material underlying facts and assumptions relied upon to develop forecast gas demand, including actual connections and demand data provided by AGN for the period 30 June 2010 to 30 June 2024.

CORE considers this process to be compliant with s 74(2) of the NGR - Forecasts are constructed on a reasonable basis whilst representing the best forecasts possible in the circumstances.

Further details relating to major elements of CORE's approach are set out below.

4.2. Weather Normalised Demand

Gas consumption by Residential and Commercial customers is materially influenced by weather, including during seasonal winter heating season. Accordingly, the weather impact on historical Residential and Commercial consumption is analysed and modelled to remove the impact of abnormal weather conditions, to provide an appropriate, normalised historical trend in demand per connection, for consideration for demand forecasting purposes.

Whilst there is some evidence of certain industrial sectors being influenced by weather, CORE considers it is not statistically significant to separate weather from the many other influences on demand across the wide range of ANZSIC industrial classes which are represented within the AGN. Further, the impact of COVID on demand during the FY2020-2021 period and customer recovery phase response in 2022 makes this data unsuitable as an indicator of long-term demand trends. Therefore, Industrial forecasts are based on analysis of historical actual demand, specific customer input and factors which are considered to impact future demand which were not necessarily observable in the historic trend.

This approach is consistent with the approach adopted by energy market operator AEMO who excluded price impact from its forecast of gas demand for the Industrial customer class – as observable from AEMOs Electricity and Gas Forecast portal.

Consistent with the 2020-2025 AA, CORE's weather normalisation methodology for Residential and Commercial customers is based on AEMO's EDD forecasting guidelines, as the EDD methodology, based on these guidelines has been demonstrated to provide a more rigorous and accurate approach to normalisation. This approach involves the derivation of an EDD Index and the application of that index to historical actual demand per connection to arrive at normalised historical demand per connection.

To enable weather normalisation analysis, CORE has developed a model which has been used for Residential and Commercial segments. The model is materially consistent with the one used for AGN's 2021 to 2026 AA. This modelling and related analysis is addressed in further detail in Section 5.

CORE considers this process to be compliant with s 74(2) of the NGR. Forecasts are constructed on a reasonable basis whilst representing the best forecasts possible in the circumstances.

4.3. Residential Customer segment

CORE's forecast for Residential demand is the product of residential connections and demand per connection. Further CORE analyses address Existing and New connections and related demand per connection separately due to material difference between these segments.

4.3.1. Connections

A combination of inhouse data and third-party independent inputs is an important element in this approach. This includes:

- analysis of historical trends based on AGN data.
- HIA residential commencement forecasts as a basis for forecasting SA completions.
- ABS data to support analysis of energy and gas use trends and economic factors.

4.3.1.1 Existing Connections

- residential connection numbers for 2010 to 2024 were compiled by CORE based on data provided by AGN.
- disconnection data was compiled by CORE based on data sourced from AGN.
- the closing 2024 connections are defined as existing connections for this forecast. The forecast for existing connections for a given year is derived by removing forecast disconnections from forecast opening connections. Forecast disconnections are based on the historical average of disconnections as a percentage of the year-opening number of connections and adjusting for any factors which vary between the forecast and historical periods.

4.3.1.2 New Connections

CORE has derived an estimate of new dwelling connections in the 2024 to 2030 period via a four-step process:

- estimate new dwellings in SA: CORE has undertaken an extensive literature search and statistical analysis to derive a forecast of SA dwelling completions. CORE has relied upon independent studies completed by HIA. .
- estimate number of new dwellings in SA that will be developed within the AGN area: CORE has analysed dwelling completions within the postcode area served by the AGN network relative to all SA, having regard to third party population and dwelling forecasts, including SA Government and ABS.
- forecast the number of dwellings expected to be connected to the AGN network annually. CORE analysed the historical AGN network penetration rate and determined adjustments based on forecast demographic, appliance mix and other trends.
- determine the apportionment of forecast connections between dwelling types: to enable analysis of the difference in demand per connection between the dwelling types. CORE analysed the historical average increase of houses vs medium and higher density dwellings, based on third party analysis including the SA Government, and forecast dwelling commencements by dwelling type which is sourced from HIA.

4.3.2. Demand per Connection

CORE has considered alternative methodologies that could reasonably be used to forecast residential demand per connection. CORE considers that the most accurate estimate involves analysis of the historical annual average growth and then adjusting for the impact of each material factor influencing that growth. Regression analysis was completed for a range of other macroeconomic variables such as GSP. Ultimately, no statistical trend fitted to the data set was significant, meaning that weather and price-normalised historical average growth rates were a more reliable alternative.

In carrying out this approach, CORE ensured that all analysis was rigorous, data of a suitable quality was utilised, the forecast was set out in a transparent fashion and any assumptions, inputs, calculations, and results were displayed.

Therefore, the steps taken to arrive at a forecast of demand per connection were as follows:

- normalise demand per connection for the effects of weather using the process outlined in Section 4.
- derive the historical annual average growth in demand per connection based on normalised demand per connection between FY 2010 and 2024 using data provided by AGN.

- derive a forecast of demand per connection, having regard to major factors which are expected to influence demand per connection including economic activity, government policy, appliance switching (including electrification trends) and building and appliance efficiency trends. AEMO data was used in this process.

CORE also analysed own and cross price elasticity but assessed the impact to be negligible. This analysis relied on the price elasticity analysis undertaken by AEMO for the 2025 GSOO, which showed that the net impact would be close to zero across both Residential and Commercial segments.

4.4. Commercial Segment

The methodology adopted to derive a forecast of Commercial demand is similar to the approach used for Residential demand, although different drivers of demand are considered. The paragraphs below provide relevant details of the approach to deriving both Commercial Connections and Demand per Connection which form the basis of the Commercial Demand forecast.

4.4.2. Connections

The following steps were taken to derive a forecast of Commercial connections.

- collate connections data from the FY 2010 to 2024 period based on inputs provided by AGN, which is used to derive annual growth rates for the 2010 to 2024 period.
- undertake analysis to arrive at the most appropriate drivers to use as a basis for forecasting future connections.
- use the selected driver/s to forecast connections for the 'bridging years' of 1 July 2024 to 30 June 2026 and the forecast for the Review Period.

4.4.3. Demand per Connection

The approach used in the residential demand forecast was also adopted for the Commercial sector.

- normalise historical demand per connection for the effects of weather using the process outlined in Section 5.
- determine the historical annual average growth in demand per connection based on demand per connection between 2010 (based on 2009-2010 movement) and 2024, for both existing and new connections based on inputs provided by AGN.
- determine the forecast of demand per connection, having regard to the normalised historical annual average growth and the movement in factors that are expected to impact future demand per connection. These factors include policy change, efficiency, decarbonisation and appliance mix trends.

CORE also analysed own and cross price elasticity but assessed the impact to be negligible. This analysis relied on the price elasticity analysis undertaken by AEMO for the 2025 GSOO, which showed that the net impact would be close to zero across both Residential and Commercial segments.

4.5. Industrial Segment

Industrial demand (ACQ and MDQ) has been forecast via the following steps:

- analysis of individual customer data, and customer sector data based on ANZSIC classes, including historical demand trends, using data provided by AGN.
- analysis of customer feedback from AGN discussions and surveys.

- consideration of any known closures and load changes advised by AGN or identified via CORE research.
- research and analysis of third-party data to assess factors that are expected to impact ACQ demand of individual customers and customer clusters data based on ANZSIC classes.
- analysis of the historical relationships between MDQ with ACQ.

5. Weather Normalised Historical Demand

5.1. Introduction

CORE's analysis of historical demand is based on weather normalised data to remove the influence of abnormal weather fluctuations on historical demand across the Residential and Commercial customer segments, utilising proprietary EDD Index and Weather Normalisation models.

CORE's proprietary EDD index model and weather normalised demand model should be referred to in conjunction with this report. These models have been submitted to AGN to form a confidential attachment to AGN's Access Arrangement Information.

5.2. EDD Index and Weather Normalisation Modelling

The EDD Index model is used to analyse relationships between movement in historical weather factors and movement in demand per connection, using widely accepted statistical regression techniques. The result is a series of coefficients which are used as inputs to the weather normalisation model.

The EDD Index model aims to solve for the best-fit EDD coefficients by minimising the Sum of Squared Residuals ("SSresid") according to the following demand model specification:

Demand = a + b1*EDD + b2*Friday + b3*Saturday + b4*Sunday
where Effective Degree Days ("EDD") =

Temperature (DD):		MAX (Threshold - Temperature, 0)
plus,	Wind Chill	Wind Chill Coefficient * MAX (Threshold - Temperature, 0) * Wind
plus,	Insolation	Insolation Coefficient * Sunshine Hours
plus,	Seasonality	MAX (Seasonality Coefficient * 2*Cosine (2π (Day - Seasonality Factor)/365),0)

This methodology is consistent with the AEMO "EDD 312" specification in its 2012 'Weather Standards for Gas Forecasting' Report
The EDD Index coefficients presented below have been used to normalise Residential and Commercial demand following extensive scenario analysis and reference to factors used by AEMO, including the temperature assumption. As part of this process, both EDD and a linearised trend in historical EDD (due to warming trends) are calculated. Actual EDD greater than the EDD linearised trend, implies that the weather in the year was colder than normal (and vice versa). Colder weather induces higher demand per connection, as more gas is required for heating (and vice versa).

Table 5.1 EDD Index Coefficients

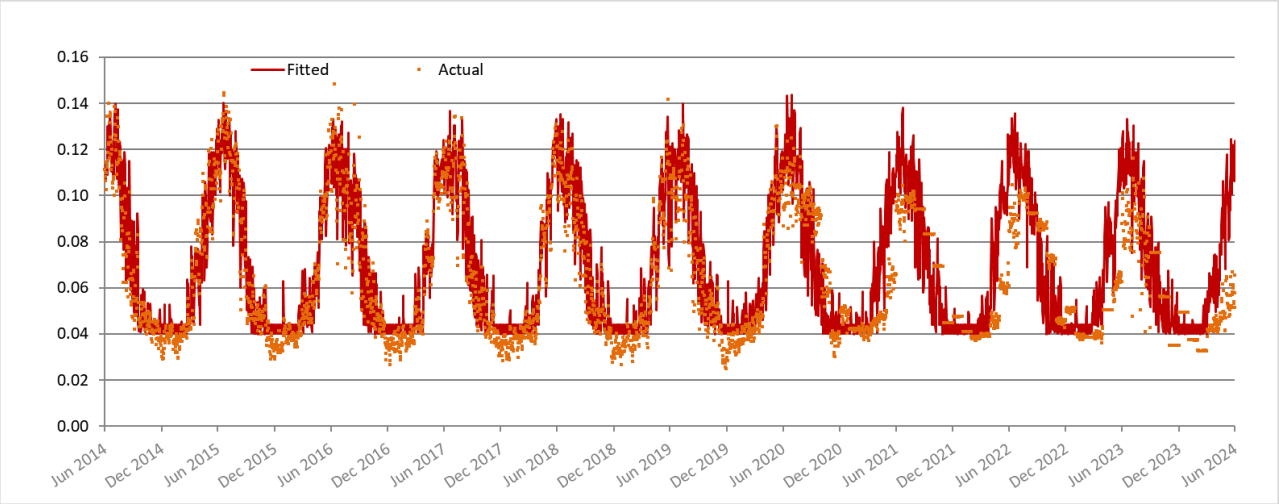
Degree Day Threshold	°C	18.5
Wind Chill Coefficient	No.	0.0273

Insolation Coefficient	No.	-0.1000
Seasonality Factor	No.	200.9037
Seasonality Coefficient	No.	3.6950

Source: CORE based on EDD model

The following figures and table summarise the results of the EDD and weather normalisation modelling – a comparison of actual demand per connection and statistically fitted demand per connection.

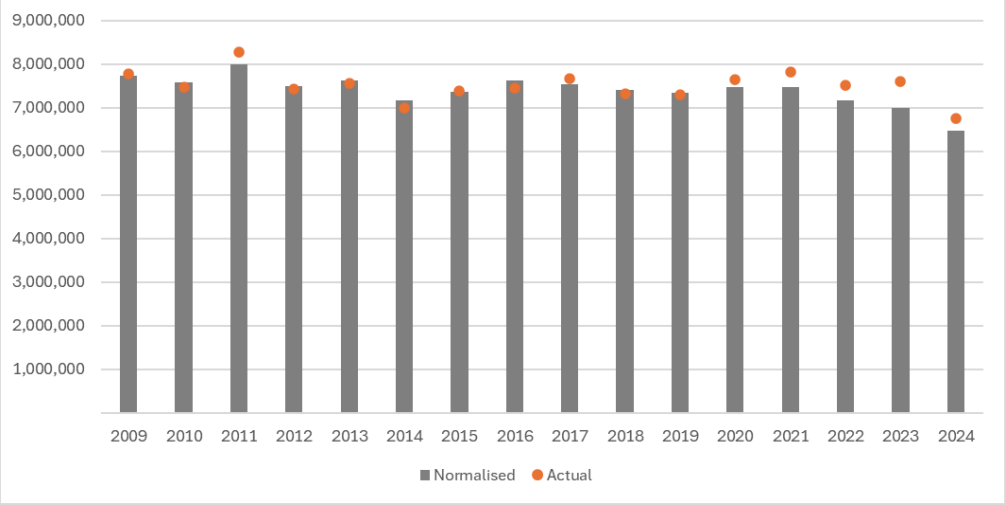
Figure 5.1 Actual vs Fitted demand based on EDD index model.



Source: CORE based on EDD model

Residential demand

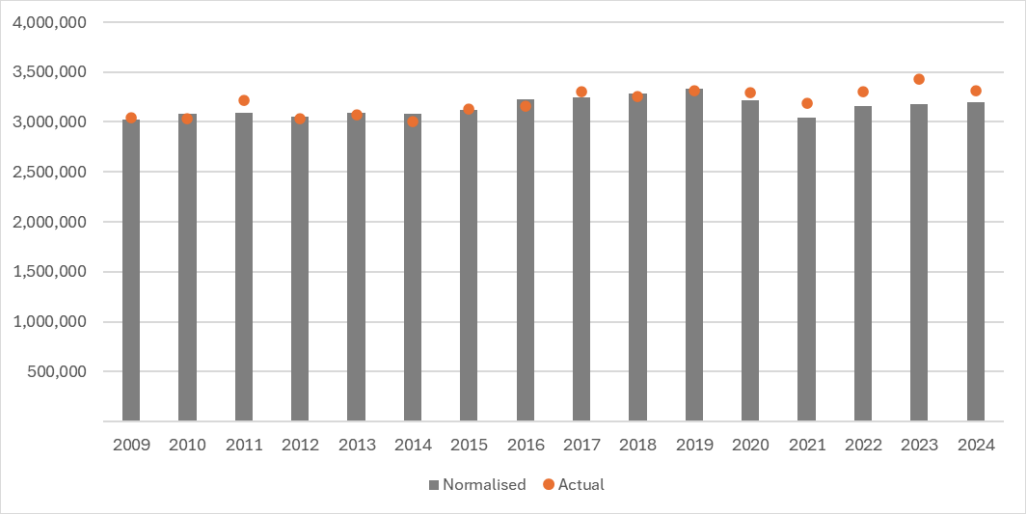
Figure 5.2 Actual vs Fitted demand – Residential demand



Source: CORE based on EDD model

Commercial demand

Figure 5.3 Actual vs Fitted demand – Commercial demand



Source: CORE based on EDD model

Figure 5.4 Summary of historical, actual and normalised demand - Residential and Commercial

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
EDD | Linearisation																
Linearised EDD	2,093	2,088	2,082	2,082	2,070	2,064	2,059	2,058	2,047	2,041	2,035	2,035	2,024	2,018	2,012	2,012
EDD	2,131	2,014	2,285	2,050	2,029	1,943	2,071	1,954	2,145	1,988	2,004	2,144	2,245	2,231	2,375	2,179
Difference	37	(73)	203	(31)	(41)	(121)	13	(104)	98	(53)	(31)	109	221	213	363	167
Residential | Normalisation																
Tariff Residential normalised demand	7,731,902	7,577,824	7,987,798	7,486,732	7,636,711	7,179,728	7,366,533	7,624,650	7,529,508	7,417,920	7,344,971	7,472,509	7,464,241	7,176,170	6,995,219	6,465,478
Tariff Residential actual demand	7,777,427	7,471,069	8,269,742	7,437,268	7,570,581	6,994,308	7,381,386	7,459,090	7,677,762	7,330,141	7,290,725	7,645,764	7,825,245	7,526,384	7,603,599	6,747,412
Difference	45,525	(106,755)	281,944	(49,463)	(66,130)	(185,421)	14,852	(165,560)	148,254	(87,779)	(54,246)	173,255	361,005	350,213	608,381	281,935
Tariff Residential normalised demand per connection	20.61	19.83	20.49	18.84	18.90	17.50	17.69	18.04	17.59	17.08	16.69	16.73	16.49	15.67	15.12	13.80
Tariff Residential actual demand per connection	20.73	19.55	21.21	18.71	18.74	17.05	17.72	17.64	17.93	16.88	16.56	17.12	17.29	16.43	16.43	14.40
Difference	.1	(.3)	.7	(.1)	(.2)	(.5)	.0	(.4)	.3	(.2)	(.1)	.4	.8	.8	1.3	.6
Commercial | Normalisation																
Tariff Commercial normalised demand	3,027,469	3,077,907	3,095,489	3,050,008	3,095,509	3,085,977	3,119,904	3,226,883	3,243,719	3,289,332	3,330,837	3,219,348	3,038,998	3,161,833	3,178,170	3,194,972
Tariff Commercial actual demand	3,046,571	3,033,097	3,215,869	3,028,984	3,068,923	3,007,967	3,125,723	3,155,929	3,304,370	3,251,587	3,310,273	3,291,674	3,188,281	3,305,301	3,427,175	3,309,639
Difference	19,102	(44,810)	120,380	(21,024)	(26,585)	(78,010)	5,819	(70,954)	60,651	(37,746)	(20,563)	72,327	149,283	143,467	249,005	114,667
Tariff Commercial normalised demand per connection	312	313	311	302	307	299	295	299	298	296	298	285	270	279	278	279
Tariff Commercial actual demand per connection	314	308	323	300	304	291	296	292	304	293	296	292	283	291	300	289
Difference	2.0	(4.6)	12.1	(2.1)	(2.6)	(7.6)	.6	(6.6)	5.6	(3.4)	(1.8)	6.4	13.2	12.6	21.8	10.0

Source: CORE based on weather normalisation model

6. Residential Demand and Connections – History and Forecast

6.1. Introduction

This section of the report presents details of CORE's approach to derivation of the Residential demand forecast, on a weather normalised basis, together with a forecast of connections.

Residential demand is derived using a bottom-up approach: the product of forecast connections and demand per connection.

CORE's approach takes into consideration historical trends as well as expectations of future drivers of demand which are not present in the historic data/trends – both macro and micro in nature, utilising a proprietary demand forecasting model. This report should be read in conjunction with the relevant tabs of CORE's AGN Demand model, which is a confidential attachment to AGN's Access Arrangement Information.

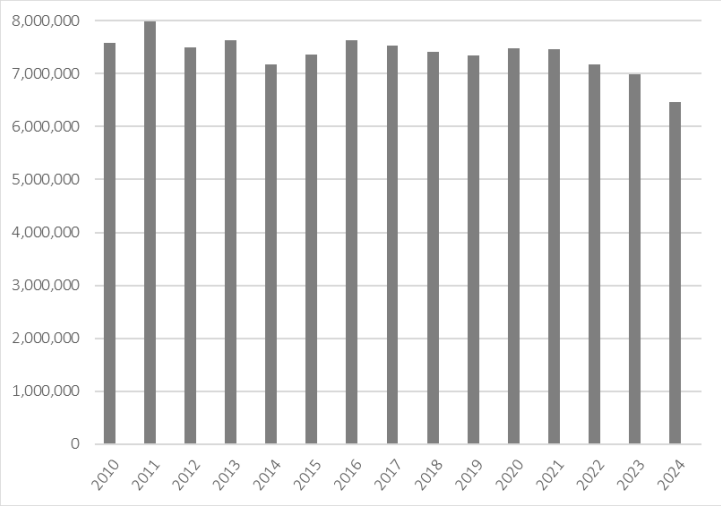
6.2. Historical Trend Overview

The approach to deriving a forecast of Residential demand commences with analysis of historical weather normalised movements in demand and underlying movements in connections and demand per connection.

6.2.1. Historical Residential Demand Analysis

Residential normalised demand increased by an average annual rate of approximately -1.12% between 1 July 2010 and 30 June 2024, as summarised below. This was attributable to growth in connections (approx. 1.48%), offset partially by a fall in average consumption per connection (-2.60%)

Figure 6.1 Residential weather normalised demand | GJ



Source: CORE based on weather normalisation model

CORE notes the following in relation to this demand trend:

- Demand has trended downward since 2016 – except for the COVID influenced period. From FY 2017 the average annual rate of decline was -3.34%
- The rate of decline in demand has increased materially since 2020 – closer to 4% if adjusted for COVID impact.
- Forecast levels of electrification are estimated to be materially above historical levels, placing further downward pressure on future demand.

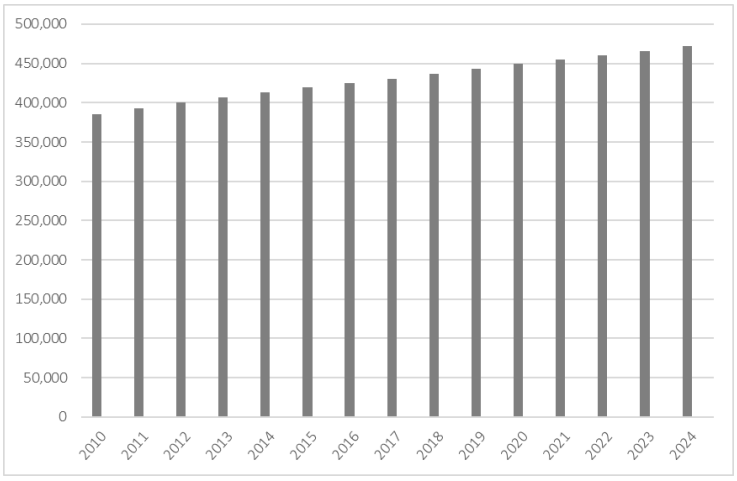
6.2.2. Historical Residential Connection Analysis

Residential closing connections increased by an average annual rate of 1.48% between 1 July 2009 and 30 June 2024.

The net growth includes several elements which are addressed in further detail in later paragraphs:

- "Gross connections" - the growth in residential dwelling completions in SA which connect to the AGN, before disconnections
- "Penetration rate" – the % of SA new dwellings which connect to the AGN based on gas appliance installation.
- "Disconnections" – the % of AGN connected customers which subsequently disconnect during the period.

Figure 6.2 Residential Connections | No.



Source: CORE demand model

CORE notes the following declining trend:

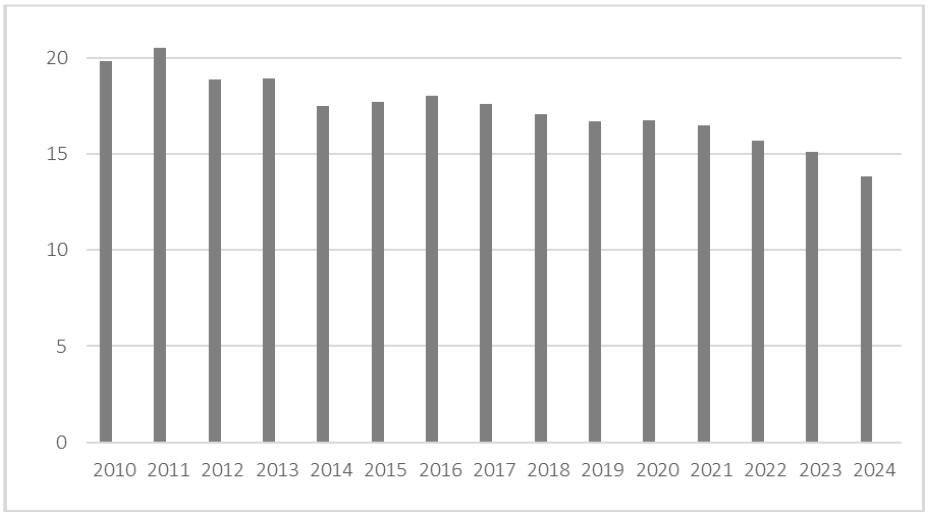
- During the 2011-2013 period average growth was close to 1.9%
- During the 2014-2020 period average growth was close to 1.43%
- During the 2020-2024 period average growth was close to 1.18%

6.2.3. Historical Residential Demand/Connection Analysis

The following figure highlights a consistent decline in demand per connection since 2016 and a broader declining trend prior thereto, and an accelerating rate of reduction from 2022.

Between 2022 and 2024 there was a 17.25% cumulative reduction. representing an average annual reduction of -5.75%, with a peak reduction of -8.7% in 2024.

Figure 6.3 Residential Demand/Connections| GJ.



Source: CORE demand model

6.3 Forecast Residential Demand and Connections

The methodology adopted by CORE to derive a forecast of AGN Residential demand, and connections, is outlined in Sections 4 and 5. CORE considers that this methodology delivers outcomes which are consistent with the NGR – the best forecast or estimate possible in the circumstances.

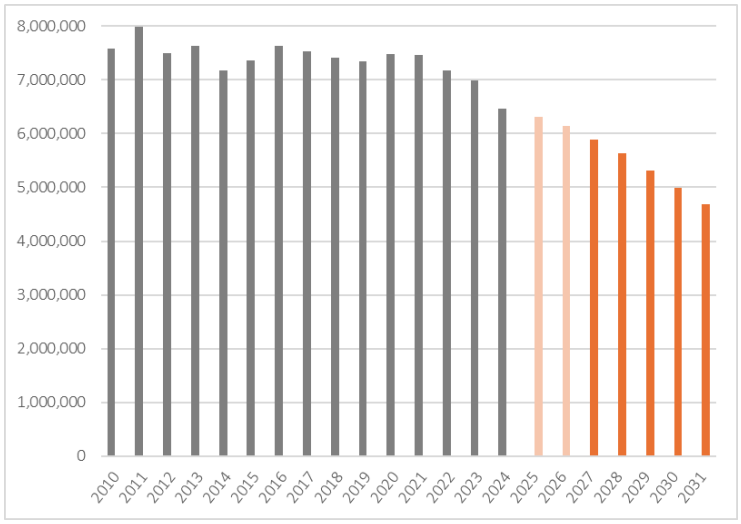
CORE's approach commences with a forecast of connections, followed by demand per connection, with the product of these elements being forecast demand.

CORE's demand forecast is summarised below and is followed by an analysis of underlying drivers.

6.3.1 Forecast Residential Demand

CORE forecasts a continuing decline in demand during the bridging years of FY 2025 and 2026 and the five year Review Period. The forecast average annual decline during the Review Period is -5.8%, due to a combination of forecast decline in the rate of connections and continuing fall in annual average demand/connection as addressed below.

Figure 6.4 Residential Demand | GJ.



Source: CORE based on AGN Demand Model

6.3.2 Forecast Residential Connections

CORE's forecast of connections involves three primary elements:

- SA dwelling completions - the growth in residential dwelling completions in SA based on HIA data
- AGN Penetration rate – the % of SA new dwellings which are forecast to connect to the AGN network having regard to historical actual experience and emerging influences.
- Disconnections – the % of AGN connected customers which are forecast to disconnect during the period based on historical actual data and emerging influences.

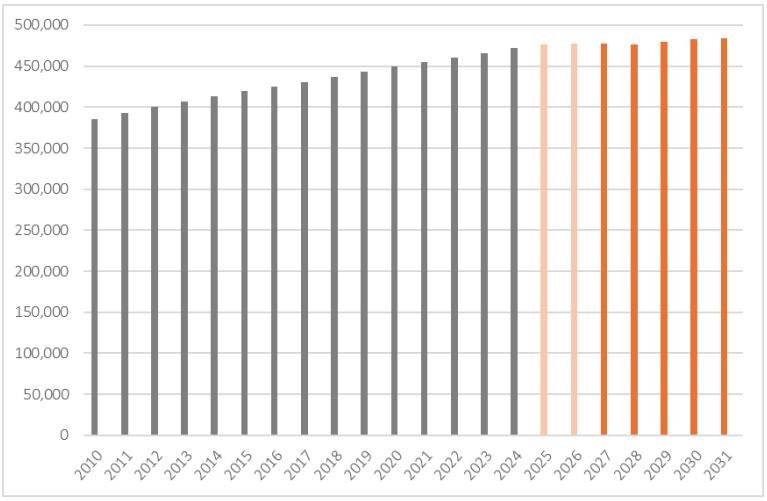
6.3.2.1 Overview

The following summarises historical actual connections and CORE's forecast of connections for the two bridging years of FY 2025-2026 and the five-year Review Period ending in FY 2031.

The figure is characterised by three historical periods with material differences in the rate of connection growth, with a cumulative reduction in the rate of average annual growth of 38%:

- 2010-2014 – 1.83%
- 2015-2020 – 1.38% (25% reduction)
- 2021-2024 – 1.20% (incremental 13% reduction)

Figure 6.5 Historical and Forecast Residential connections | No.



Source: CORE based on AGN Gas Demand Model

CORE's forecast is based on the modelling of the most likely trend in future connections, which gives rise to an average annual growth in connections of 0.3%. The major factors which are forecast to influence the connection rate include:
Reduction in the Penetration Rate – the % of SA new houses connecting to the AGN network on an annual basis

- Continuing high levels of multi dwelling developments which have far lower gas connection rates than houses
- Moderate increase in disconnections as existing customers move to all electric use of houses or existing houses are replaced by new multi dwelling developments.

Further details of this analysis are addressed in the following paragraphs.

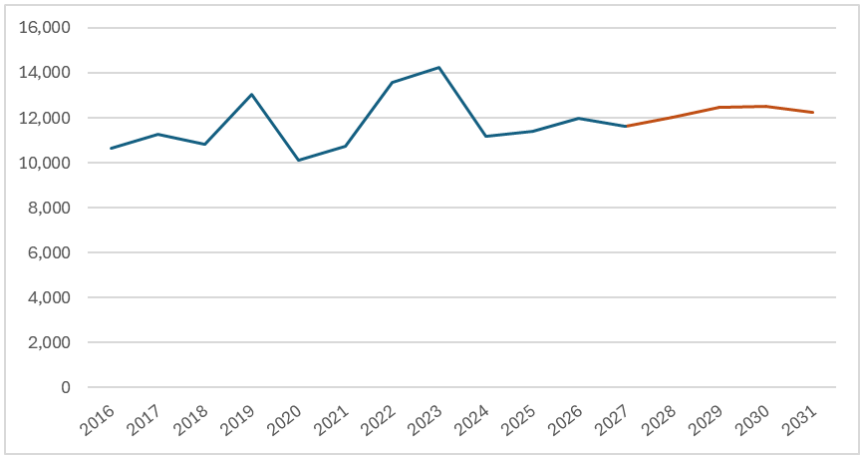
6.3.2.2 Analysis of factors Influencing CORE's Connections Forecast

Forecast SA dwelling growth

CORE has relied upon the latest HIA SA dwelling forecast as a basis for forecasting the expected rate of connections to the AGN network.

The HIA dwelling commencement forecasts are lagged by one year to represent expected timing of dwelling completions. The blue line below shows historical actuals and forecasts for 2025-2026 and the orange line shows the HIA forecast for the Review Period.

Figure 6.6 Dwelling completions based on HIA data (No. dwellings)

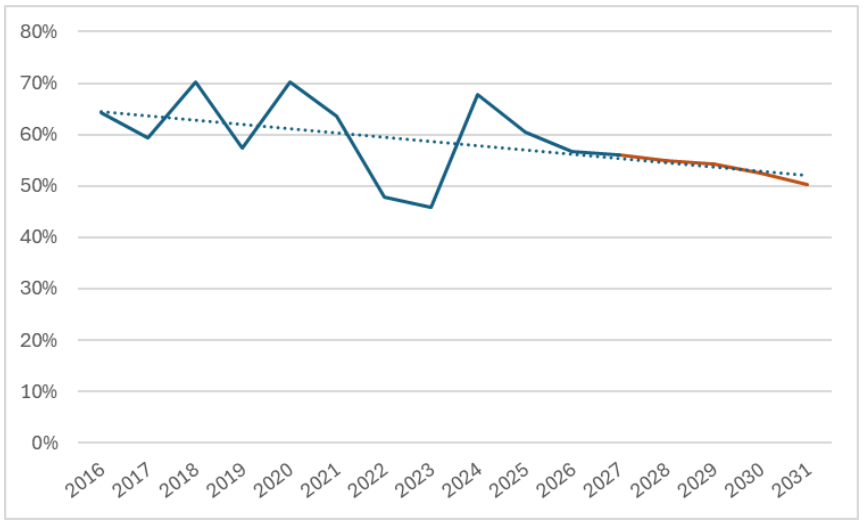


Source: CORE based on AGN Gas Demand Model, including HIA data

AGN Penetration Rate

CORE's demand model presents detailed analysis of the actual forecast decline in AGN's Penetration Rate over time. The analysis compares total SA dwelling completions (per HIA data) to actual AGN connections in the comparable year. The results are presented for the historical period 2016 through to the forecast for Review Period.

Figure 6.7 Historical and forecast AGN network Penetration Rate (% connections/SA completions)



Source: CORE based on AGN Gas Demand Model

This analysis results in the following penetration rates between the defined time intervals:

- 2010-2014 – 65%
- 2015-2019- 63%
- 2020-2024 – 59%
- 2022-2024- 54%

Based on the above analysis, the aggregate reduction in Penetration Rate is 11% absolute reduction which is equivalent to a 17% fall (11/65), of which the vast majority is attributable to the period from 2020.

CORE has run a range of scenarios of forecast connections, having regard to a range of factors including the following:

- the forecast level of dwelling developments within the AGN network vs SA as a whole
- forecast level of multi dwelling developments
- potential for policy supporting alternative energy sources relative to gas.
- expected level all electric dwelling developments.

As a result of this analysis, CORE has forecast that the average Penetration Rate will fall from an average rate of 59% during the 2020-2024 period to an annual average of 55% during the Review Period. As top down support for these percentages CORE notes that the ABS reported a total number of 808,366 SA dwellings in its 2021 Census report. In 2021 AGN had average connections of 452,317, which represents a 55.95% Penetration Rate. CORE estimates this rate to be closer to 55% in 2024 utilising ABS, HIA and AGN data. Therefore, CORE considers that its forecast is strongly supported by the historical trend, increasing penetration of all electric dwellings, and growth in areas outside the AGN network area.

CORE notes that close to 10% of SA dwellings sit outside the AGN network area, with a number of these areas experiencing growth faster than the AGN network area. One example is Mount Barker which has close to 20,000 dwellings, the majority of which have been completed within the past five years and continues to experience a rate of growth above the AGN network area – see Annexure 2.

Moderate increase in disconnections

As part of a broader analysis of forecast electrification, CORE has forecast an increase in houses moving from part gas to all electric energy supply (except for some LPG). This expected trend has been combined with analysis of historical trends in AGN disconnections to arrive at an overall forecast of annual connections which are forecast to disconnect during the Review Period.

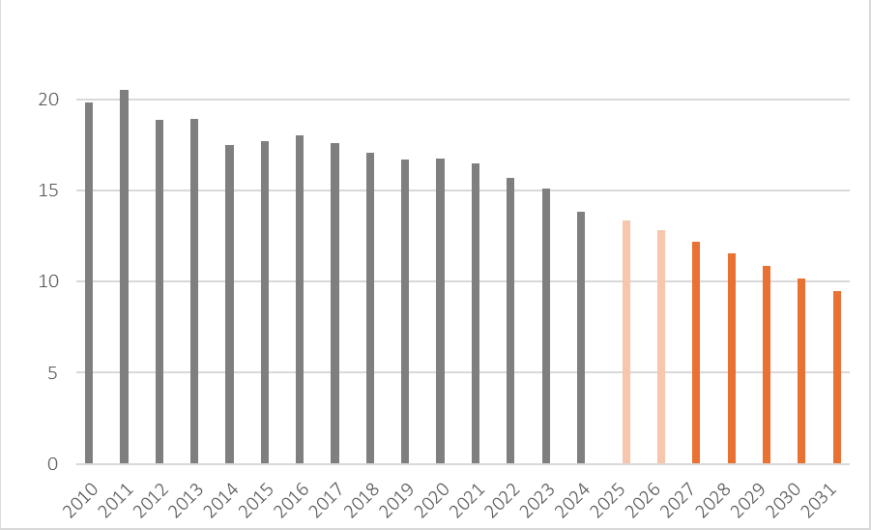
CORE forecasts that the annual rate of disconnections will increase from an average of 0.47% between 2018-2024 to 0.80% during the Review Period. In number of dwelling terms this equates to an increase in forecast disconnections from 3,101 in 2027 to 4,438 in 2031. This movement is primarily attributable to the forecast impact of electrification. In situations where customer dwellings move to 100% electric dwellings, CORE considers it reasonable to assume that a percentage of these customers will disconnect rather than continue to pay a standing charge. The increase in disconnections of approximately 1,300 per annum by 2031, assuming demand per connection of 14 GJ equates to a reduction of 18,000 GJ which is a very small percentage of the impact forecast by CORE and AEMO – closer to 2,000,000 GJ.

5.3.3 Forecast Demand per Connection

CORE has forecast that demand per connection will fall by an average annual rate of -5.5% over the Review Period, as summarised in the figure below.

CORE notes, as set out above, that the average actual rate of reduction during 2022-2025 was -5.75%. CORE has forecast that this rate of reduction will continue during the Review Period, which is supported by YTD actual results for the 2025 financial year.

Figure 6.8 Demand per Connection (GJ)



SOURCE: CORE AGN Demand model

CORE has utilised in house historical research, undertaken new online research and held discussion with AGN management to determine the most likely factors contributing to this trend. These factors are summarised below:

- the ongoing impact of energy efficiency initiatives – both dwelling and appliances. For example, a 6-star home is likely to use 24% less energy for heating and cooling than a 5-star rated home. Further, the latest 2022 NCC revision requires new homes to achieve a 7 star rating (mandatory from May 2024) which is expected to progressively accelerate all electric home developments as gas cannot be used unless combined with solar developments which often do not meet homeowner's economic criteria and thus favour electric heat pump technologies.

- a growing number of multi-dwelling developments which have a lower level of gas usage than houses (lower gas space/room heating and water heating). Based on HIA data the share of multi development dwellings: total dwellings will increase from 22% in 2023-24 to 30% in 2030-31

- an emerging trend of all electric developments – such as:
  - The 800 lot Villawood housing development at Aldinga which features all electric energy supply.
  - Up to 3,500 social housing properties in South Australia (SA) will receive energy efficiency upgrades. This partnership between the Australian and South Australian governments is to reduce power bills for SA Housing Trust households across the state. The $35.8 million package includes energy performance improvements such as replacing gas appliances with electric.

  - An “Australian first” Energy Masters Project - demonstration of aggregated flexible demand in residential settings will be rolled out in South Australia, with SAPN to deliver smart energy upgrades for 500 households as part of a pilot program to coordinate power usage and support the grid.
  - smaller recently completed apartment developments on East Terrace on the Adelaide city fringe.

- Research by the SA Government indicates that annual savings of all electric homes are $1,457 p.a. This saving plus Government incentives encourages a significant number of homeowners to move to or toward all electric use.

- The compounding impact of appliance switching from gas appliances to renewable/electric alternatives, with the most pronounced impact being in the room heating area where reverse cycle air-conditioning is increasingly replacing gas space heating when appliances require replacement, or major renovations give rise to appliance replacement. This trend is influenced by the far higher efficiency of reverse cycle heating, the convenience of one unit for heating and cooling vs separate gas heating and electric cooling, the view that gas prices will rise above electricity, and the impact of Government incentives.

- CORE has considered the impact of price elasticity on forecast demand/connection and has concluded that the impact (both own price and cross price elasticity) is likely to be immaterial. This is supported by AEMO analysis undertaken for the 2025 GSOO which presented zero impact for the Progressive Scenario and a modest 0.01PJ change for the Step Change scenario for the 2030-31 years only.

CORE considers that these factors adequately account for the forecast reduction from -5.75% historically to -5.8% average per annum during the Review Period.

7. Commercial Demand & Connections – History and Forecast

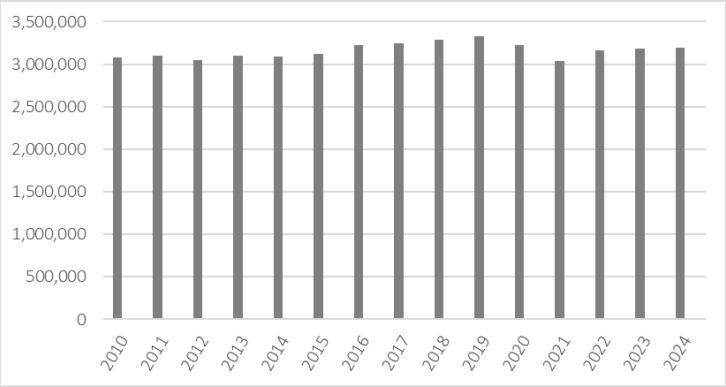
7.1. Historical Overview

7.1.1. Commercial Demand

SA Commercial demand has followed a three stage trend between 2009-10 and 2023-24. During the period to 2014, annual average growth was 0.4%, increasing to 1.5% between 2015 and 2019. Since 2019 Commercial demand has been materially below 2019 and prior year levels. Whilst the 2020 and 2021 year declines were likely impacted by COVID restrictions and associated customer and tenant behaviour, CORE notes that the combined annual reduction during these years of -8.9% has not recovered to end 2024, which indicates that there was an underlying demand impact during 2020 and 2021 which was independent of COVID.

The average annual rate of decline in demand between 2019 and 2024 was -0.8%.

Figure 7.1 Historical Commercial demand (GJ)



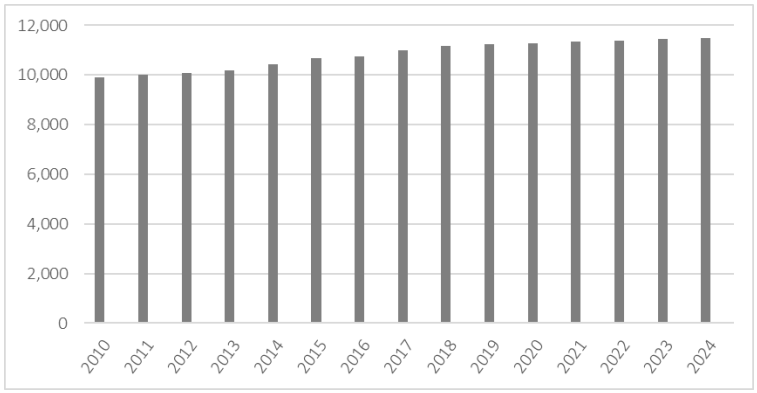
Source: CORE based on AGN Gas Demand Model

The average annual decline in demand in recent historical years is attributable to a decline in consumption per connection, offset partially by net growth in Commercial connections as addressed below.

7.1.2. Commercial Connections

The average rate of growth in connections between 2010 and 2018 was 1.5%, and this rate fell considerably between 2019 and 2024, to an average annual rate of 0.4% - a 73% reduction in growth rate.

Figure 7.2 Historical Connections (No.)



Source: CORE based on AGN Gas Demand Model

The reduction in connections is primarily due to a fall in new/gross connections, from a recent peak of 243 in 2019 to a low of 171 in 2024 – a fall of approximately 30%.

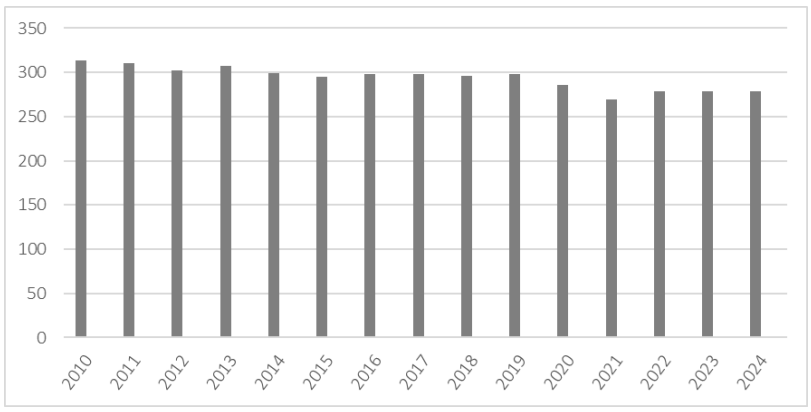
Whilst there has been some movement in disconnections over time – the recent year average (2019 onward) has been 153 disconnections per annum.

7.1.3. Commercial Demand/Connection

Commercial demand per connection has been relatively flat to falling since 2010, however a more pronounced reduction is observable from 2019, including some impact of COVID in 2020 and 2021.

By 2024 demand per connection was an annual average of 279 GJ p.a., falling from a peak of 310 GJ p.a. in 2010.

Figure 7.3 Historical Demand/Connections (GJ.)



Source: CORE based on AGN Gas Demand Model

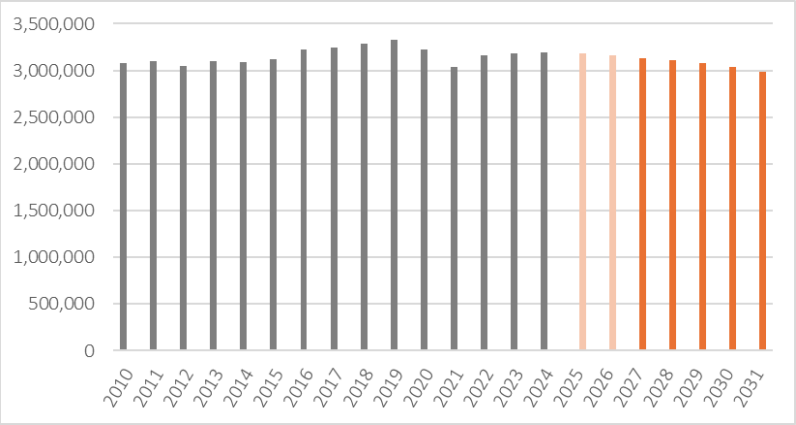
7.2. Forecast Connections and Demand

7.2.1. Forecast Demand

CORE has forecast a reduction in Commercial demand due to a reduced level of forecast connection growth and reduction in consumption per connection as addressed below. The annual average rate of demand growth is forecast to be -1.1% during the Review Period.

CORE notes that the impact of COVID contributed to a fall in demand in 2020 and 2021 as observable in the following figure. The post COVID demand has fallen below levels observed in 2016-2020. CORE has taken this fall into consideration in developing the forecast.

Figure 7.4 Historical and forecast Commercial demand (GJ)



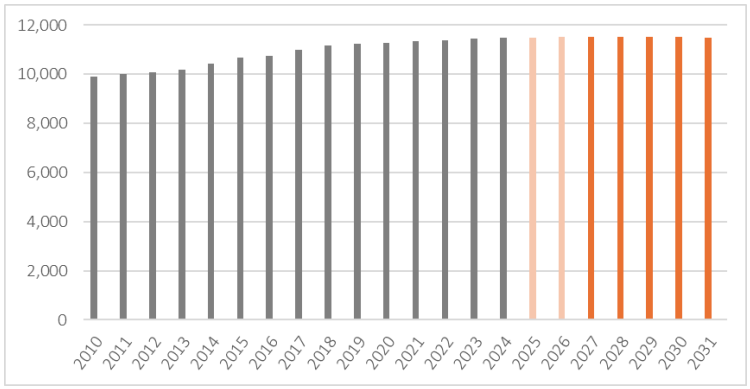
Source: CORE based on AGN Gas Demand Model

7.2.2. Forecast Connections

CORE forecasts an average fall in Commercial connections during the Review Period at an average annual rate of -0.02%. This compares with an average annual rate of growth of 0.36% over the last three years ending 30 June 2024. This 0.38% movement is attributable to:

- An extension of the historical trend which is observable through analysis of the FY2025 actual results to end May 2025
- A peak level of activity in certain sectors such as restaurants and cafes which is expected to plateau/fall during the Review Period.
- a high level of State/national/global uncertainty making new investment decisions more difficult
- the impact of the cost of living challenge facing consumers
- an expected increase in disconnections to levels experienced historically
- modest impact of electrification as part of Tariff V forecast by AEMO

Figure 7.5 Historical and forecast Commercial connections (GJ)



Source: CORE based on AGN Gas Demand Model

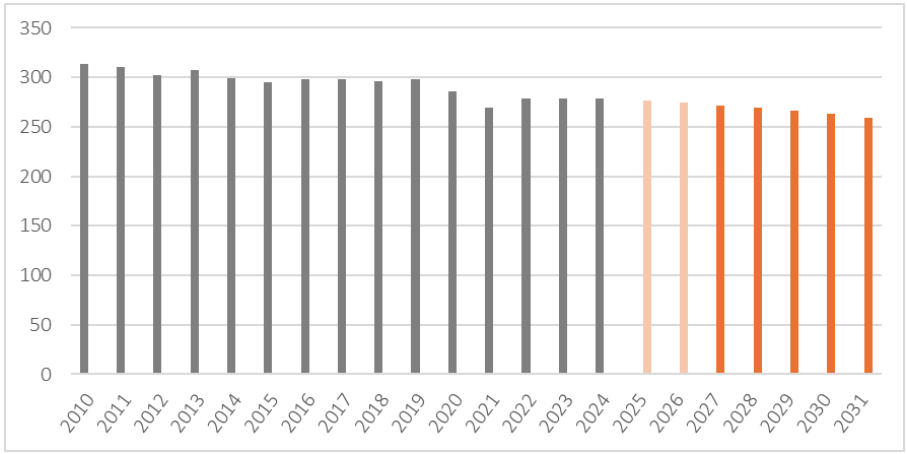
7.2.3. Forecast demand per connection

Demand per connection fell by an average annual rate of -0.45% between FY 2010 and 2019, and by -0.72% between 2010 and 2024, including some impact of COVID during 2020-2021.

CORE notes that the fall in demand/connection between 2020 and 2021 has not recovered to end June 2024 and therefore CORE considers it reasonable to assume that the fall included structural influences beyond COVID.

CORE has used a base rate decline of -1.03% for the 2025-2031 period, which extends the historical rate of decline due to factors which include a forecast electrification impact (partial move toward electricity vs all electric – particularly room heating).

Figure 7.6 Historical and forecast Commercial demand per connection (GJ)



Source: CORE based on AGN Gas Demand Model

8. Industrial Connections and Demand

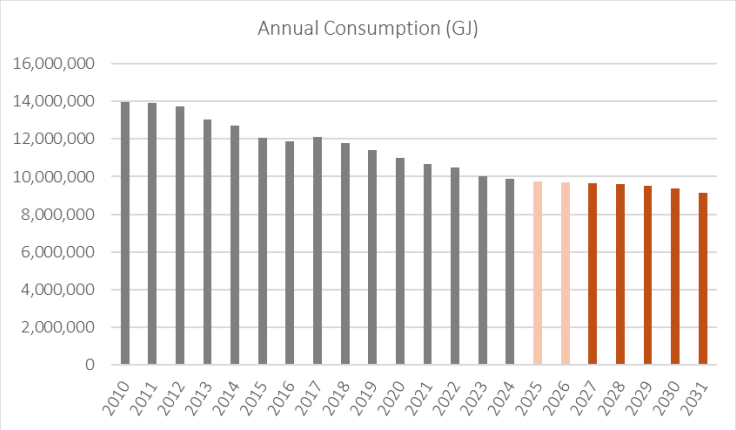
8.1. ACQ demand

CORE has developed a forecast for Industrial ACQ based on the following:

- for each MIRN an assessment was made by CORE of the 2024 closing ACQ and recent years historical trend, and to derive a base level ACQ which was relied upon as the 2025 opening value.
- a forecast growth factor was determined for each MIRN, having regard to the historical trend, response from survey (30% of ACQ volume), and an analysis of sectors and individual companies expected to change gas demand during the Review Period. This included a modest degree of electrification in line with AEMO forecasting:
  - Progressive Scenario - 0.05 PJ in 2031
  - Step Change Scenario (PJ) – 0.02 in 2028; 0.09 2029; 0.019 2030; 0.26 2031.
- CORE determined a most likely rate of decline for each of the Review Period of -1.16%, based on analysis of the outlook for major industrial segments and larger individual customers. This analysis included direct feedback from AGN discussions with customers and CORE desktop analysis which included analysis of public releases by customers.

The result of the above analysis is summarised in the following figure. CORE notes that the major influence on post 2017 demand was industrial capacity reduction and fuel switching for customers with realistic switching flexibility and supporting economic feasibility.

Figure 8.1 ACQ history and forecast (GJ)



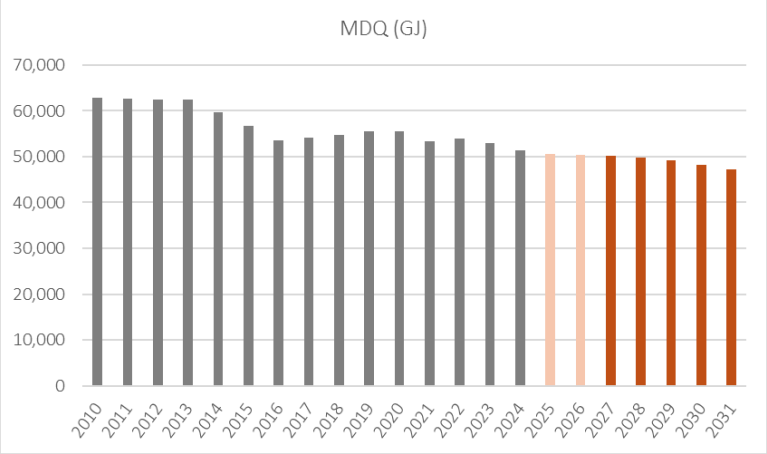
Source: CORE based on AGN Gas Demand Model

8.2. MDQ demand

CORE has developed a forecast for Industrial MDQ based on the following:

- the annual relationship between ACQ and MDQ was determined for each MIRN for the 2024 year and this value was applied against the forecast ACQ for FY 2025-2031 to derive a forecast of MDQ for the Review Period.

Figure 8.2 MDQ history and forecast (GJ)



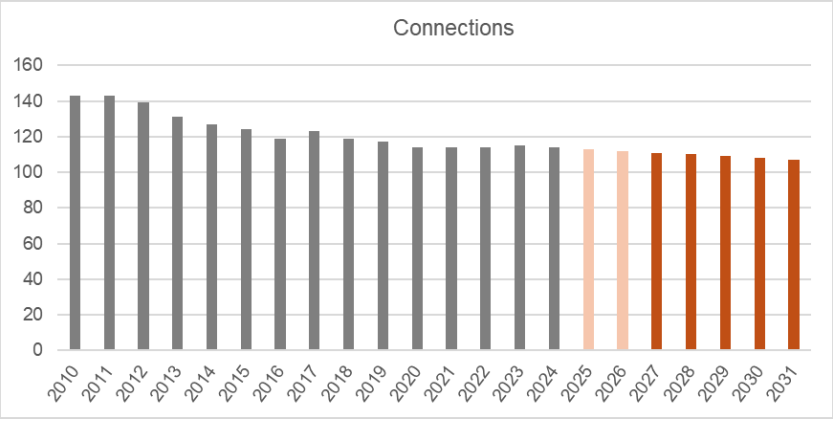
Source: CORE based on AGN Gas Demand Model

The above figure illustrates a long term downward trend with a steeper decline from 2022.

8.3. Connections

CORE has derived a forecast of Industrial Connections based on historical trends. CORE notes that the long term trend from 2010 to 2024 is a reduction in average connections per annum of 2 connections. However, since 2019 the average reductio was 1 per annum. CORE has considered likely movements during the Review Period to be more in line with recent trends and has therefore assumed a reduction in connections of 1 for each year during the Review Period.

Figure 8.3 Industrial connections – history and forecast (No.)



Source: CORE based on AGN Gas Demand Model

9. Validation

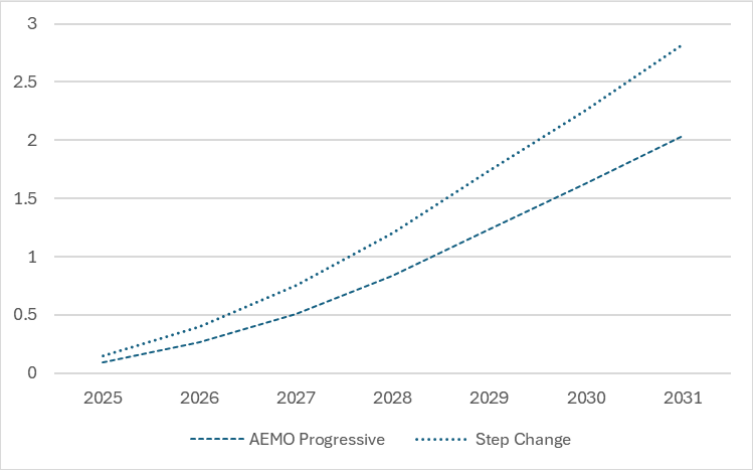
An essential element of CORE's approach to demand forecasting is to seek cross checks from appropriate sources to or support/ validate CORE's approach and results. CORE highlights two important areas of validation below.

9.1. Electrification

For this AA, CORE has undertaken extensive research to derive a rigorous forecast of the impact of future electrification on South Australia/AGN demand. This research has determined that the impact is expected to be modest for the Industrial segment within the Review Period. Therefore, CORE's focus has been directed to the Residential and Commercial segments.

CORE has determined that the most rigorous analysis in this area has been undertaken by AEMO for the 2025 Gas Statement of Opportunities (GSOO). The AEMO online gas portal presents data relating to the forecast scenarios developed by AEMO. For this purpose, AEMO groups Residential and Commercial together as a Tariff V classification. Therefore, CORE has extracted the AEMO forecast impact of electrification on gas demand for Tariff V for the 2025 to 2031 period for the Step Change and Progressive scenarios, as summarised below. This figure highlights that AEMO forecasts electrification to reduce gas demand by between 2 and 2.8 PJ between 2025 and 2031.

Figure 9.1 AEMO forecast negative impact of electrification on gas demand – Step Change and Progressive Scenarios (PJ)



Source: CORE using AEMO gas forecasting portal data

CORE's forecast attributes that majority of the impact of electrification to a reduction in Residential demand per connection on the basis that CORE analysis indicates that most electrification within the Review Period will give rise to partial appliance replacement rather than full household electrification (particularly for existing vs new connections). The full electrification impact is, however, recognized, albeit to a lesser extent, in CORE's assumption of reducing Penetration Rate and increasing disconnections which have a downward influence on connections.

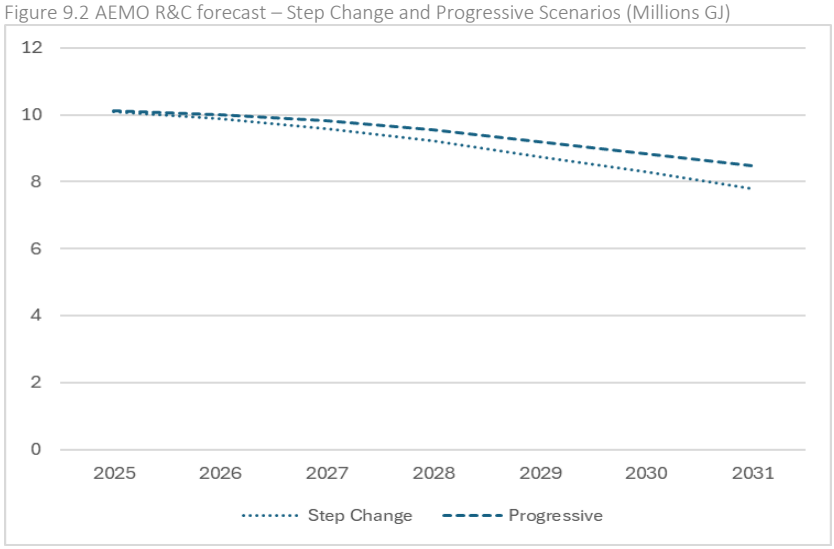
9.2. Residential and Commercial Forecast

As noted above, AEMO combines Residential and Commercial customer segments to create a single Tariff V class (R&C).

CORE has undertaken analysis of the AEMO R&C forecast scenarios and compared the scenarios against the CORE AGN forecast for the 2025 - 2031 period. CORE has selected the 2025 year as a base year as the level of actual AGN demand for FY 2025 will become available during the AA process. CORE notes that the AEMO forecast is for calendar years, however the actual results to June 2025 will cover half the calendar year and provide an important insight to the calendar year progress/trend.

CORE's analysis initially focused on the AEMO projections alone – for both the Progressive and Step Change Scenarios. A summary of the projections for the 2025 to 20231 period is shown below.

Figure 9.2 AEMO R&C forecast – Step Change and Progressive Scenarios (Millions GJ)

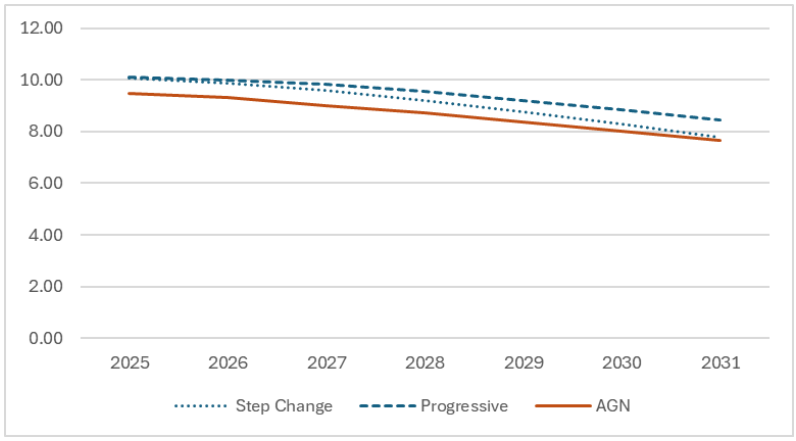


Source: CORE using AEMO gas forecasting portal data

The above figure highlights that AEMO is forecasting a material fall in R&C demand under both scenarios – a range of close to 1.7 million GJ under the Progressive Scenario and 2.3 million GJ under the Step Change scenario.

Whist the is some difference between the CORE/AGN forecast for 2025 and the two AEMO scenarios, the following figure presents a comparison of the forecast demand for the 2025 to 2031 period. The CORE forecast reduction in combined R&C demand during the 2025 to 2031 period is 1.86 million GJ, which is toward the lower end of the AEMO range referred to above.

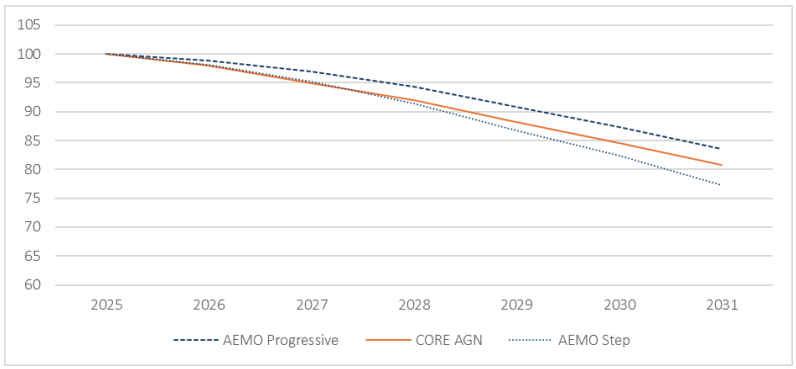
Figure 9.3 AEMO and CORE AGN demand forecasts for the 2025 to 2031 period (Million GJ)



Source: CORE using AEMO gas forecasting portal data and CORE AGN Demand model

Having regard to the differences in 2025 forecast, CORE considers that it is appropriate to consider a comparison between the three data series as an Index with 2025=100. The result is summarised in the following figure, which highlights that the CORE AGN forecasts trends between the two AEMO scenarios.

Figure 9.4 AEMO and CORE AGN demand forecasts for the 2025 to 2031 period - Index basis 2025=100 (Million GJ)



Source: CORE using AEMO gas forecasting portal data and CORE AGN Demand model

9.3. Conclusion

CORE considers that the analysis summarised above provides strong support/validation of the CORE AGN R&C forecast for both the impact of electrification in reducing demand and the overall demand forecast.

Furthermore, CORE notes the AER's position in the last Victorian (e.g. Multinet AA p12 Final Decision) – "Our final decision is to not accept MGN's proposed demand forecast for the 2023–28 period, and substitute with a demand forecast based on the Australian Energy Market Operator's (AEMO) 2023 Gas Statement of Opportunities (GSOO). We are satisfied this approach is consistent with rule 74 of the National Gas Rules (NGR).2 Tables 12.1 and 12.2 set out our final decision for MGN's forecast demand".

CORE considers that the AER has supported the quality of AEMO analysis and the GSOO process. For Rule 74 purposes. Therefore, CORE considers that it is reasonable to place an appropriate degree of reliance on the GSOO 2025 analysis presented above.

10. Conclusion

CORE considers that the forecasts presented in this report and the accompanying models comply with the NGR requirements in full, as it relates to the development of forecasts for AA purposes - both connections and demand, for each tariff class.

The following is a summary of the actions taken by CORE to ensure that the above referenced requirements were met.

10.1. Overarching approach

CORE has adopted an overarching approach which has been accepted by the AER in prior AGN SA AA's, and in AA's across other jurisdictions, including NSW and Victoria, which includes the following features:

- Consistent methodology which has been supported by the AER in prior AGN AA and AA's in other jurisdictions
- Appropriate transparency – report and models.
- An extensive data time series which provides insight relating to historical trends and a basis for analysis for forecast trends
- Use of statistical techniques which consider cause and effect.
- Use of EDD and weather normalised historical demand models and data.
- Balanced use of historical trend data and data which addresses new trends which impact the Review Period.
- Balanced use of top down and bottom-up analysis.
- Consideration of both macro and micro drivers of forecast connections and demand.
- A detailed cross check/validation process, based on market Operator (AEMO) inputs.

10.2. Approach to forecasting connections and demand for each customer segment

10.2.1. Residential

Connections

CORE'S forecast for residential connections combines the following elements to ensure complete compliance with the NGR as it relates to forecasting:

- reliance on independent HIA data as a basis to forecast future SA dwelling completions
- use of firm historical data and logical analysis to forecast the AGN Penetration Rate across the Review Period and a logical basis for movement away from this trend.
- use of historical disconnection data as a basis to forecast disconnections throughout the Review Period, augmented by analysis of the expected impact of electrification on future disconnections.

Demand per Connection

CORE'S forecast for residential demand/connection combines the following elements to ensure complete compliance with the NGR as it relates to forecasting:

- reliance on independent analysis by AEMO as it relates to the forecast impact of electrification on gas demand in SA
- use of firm historical data and logical analysis to forecast the average annual decline rate across the Review Period and a logical basis for movement away from this trend.

10.2.2. Commercial

Connections

CORE'S forecast for Commercial connections combines the following elements to ensure complete compliance with the NGR as it relates to forecasting:

- use of firm historical data and logical analysis to forecast the AGN gross connections across the Review Period and a logical basis for movement away from this trend.
- use of historical disconnection data as a basis to forecast disconnections throughout the Review Period.

Demand per Connection

CORE'S forecast for Commercial demand/connection combines the following elements to ensure complete compliance with the NGR as it relates to forecasting:

- reliance on independent analysis by AEMO as it relates to the forecast impact of electrification on gas demand in SA – Tariff V (R&C)
- use of firm historical data and logical analysis to forecast the average annual decline across the Review Period.

10.2.3. Industrial

ACQ

- analysis of historical trends by sectors and individual customers.
- research relating to outlook for major sectors and customers
- direct feedback from customers via AGN discussion and survey for a series of large customers (approx. 30% of ACQ)
- use of firm historical data and logical analysis to forecast the average annual decline across the Review Period for each MIRN.

MDQ

- detailed analysis of historical relationship between MDQ and ACQ
- feedback via AGN discussion with a series of large customers and surveys (approx. 30% of MDQ)
- use of historical data and logical analysis to forecast the average annual decline across the Review Period for each MIRN.

A1 SA Economic Performance, GSP Outlook

This Annexure addresses the historical and forecast performance of the SA economy and presents a conclusion that it is not a suitable metric to be used for gas demand forecasting purposes – particularly in a period of structural change.

Recent Historical Performance

The following table presents a summary of SA economic performance between FY 2023 and FY 2024. This table highlights that SA's GSP was below that Australian average and that its GSP per capita was marginally below the national average – both negative.

Table A2.1 | Key aggregates, FY 2023-24 % change

	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	Australia
Chain volume measures (a)									
GSP	1.2	1.5	2.1	1.2	0.5	1.4	4.6	4.0	1.4
GSP per capita (b)	-1.0	-1.2	-0.5	-0.4	-2.7	1.0	3.6	1.9	-1.0
Real Gross State Income	0.3	1.3	-3.5	1.1	-0.7	1.4	-5.0	4.2	-0.3
Current price values									
GSP	5.3	5.9	1.1	5.9	2.2	5.0	0.2	8.2	4.1

a. Reference year for chain volume measures is 2022-23.

b. Population estimates are as published in National, state and territory population and ABS projections.

Source: https://www.abs.gov.au/statistics/economy/national-accounts/australian-national-accounts-state-accounts/latest-release#south-australia

Projected Performance

The following table presents the SA Government's (State Budget) estimates of Key Economic Indicators through to FY 2028.

This table presents an estimated upward trend relative to 2023-24. CORE notes that much of the growth is attributable to population growth.

	2023-24 Estimate	2024-25 Forecast	2025-26 Projection	2026-27 Projection	2027-28 Projection
Gross State Product - real growth (%)	1¼	1½	1¾	2	2
State Final Demand - real growth (%)	1¾	1½	1¾	2	2
Employment - growth (%)	2	½	¾	1	1
CPI (%)	4¾	3½	2¾	2½	2½

Source: https://www.statebudget.sa.gov.au/our-budget/economic-overview

Relationship between GSP and SA gas use

CORE has undertaken analysis of the relationship between gas consumption and economic performance, using GSP as the key indicator.

Table A2.3 | SA GSP history compared to gas segment consumption growth

	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
GSP % Growth	2.0%[3]	1.4%[4]	-1.4%[5]	3.9%[6]	5.1%[7]	3.8%[8]	1.25%[9]
Population Growth[10]	1.22%	1.43%	1.52%	0.59%	1.24%	1.50%	1.30%
Gas consumption growth Residential[11]	-1.48%	-0.98%	1.74%	-0.11%	-3.86%	-2.52%	-7.57%
Gas consumption growth Commercial	2.07%	1.07%	0.45%	0.38%	0.40%	0.49%	0.47%
Gas consumption growth Industrial (ACQ)[12]	-2.64%	-3.43%	-3.73%	-2.93%	-1.41%	-4.41%	-1.74%

Findings and Conclusion

The above table and additional analysis undertaken by CORE (correlation, trend analysis), shows that there is not a statistically significant relationship between GSP and gas use in South Australia.

CORE offers the following observations in support of this analysis:

- the price of gas has not moved in line with GSP and price elasticity response by customers are not correlated to GSP in a statistically significant way.
- trends in energy efficiency across sectors are not correlated to GSP in a statistically significant way.
- energy use substitution by customer segments is influenced by Government intervention which is influenced by legislated GHG emission reduction targets which are not correlated to GSP in a statistically significant way.

Having regard to this analysis, CORE considers that it is not appropriate to rely upon GSP forecasts as a basis for forecasts of gas use by customer segments within the AGN network.

[3] https://www.abs.gov.au/ausstats/abs@.nsf/Previousproducts/5220.0Main%20Features22017-18?opendocument&tabname=Summary&prodno=5220.0&issue=2017-18&num=&view=#:~:text=South%20Australia%20(SA)%20GSP%20grew,12.0%25)%20detracted%20from%20growth.

[4] https://www.treasury.sa.gov.au/__data/assets/pdf_file/0020/517511/GSP-GDP_2018-19.pdf

[5] https://www.treasury.sa.gov.au/__data/assets/pdf_file/0006/518676/GSP-GDP,-2019-20.pdf

[6] https://www.treasury.sa.gov.au/economy,-taxes-and-rebates/economic-briefs/gross-state-product/GSP-GDP-2020-21.pdf

[7] https://www.treasury.sa.gov.au/economy,-taxes-and-rebates/economic-briefs/gross-state-product/GSP-GDP,-2021-22.pdf

[8] https://www.treasury.sa.gov.au/__data/assets/pdf_file/0006/960738/GSP-GDP,-2022-23.pdf

[9] Source: https://www.statebudget.sa.gov.au/our-budget/economic-overview

[10] https://plan.sa.gov.au/state_snapshot/population/population-projections#:~:text=In%202021%2C%20South%20Australia's%20population,annual%20growth%20rate%20of%201.4%25.

[11] CORE Demand Forecast Model

[12] CORE Demand Forecast Model

A2. Penetration Rate Analysis

The forecast Penetration Rates included within the CORE Demand Forecast Model and addressed in this report are impacted by the following trends:

Growth in number of dwellings in areas outside the AGN network area

- Growth in multi dwelling developments inside AGN network area
- Growth in all electric dwellings (see Validation section for AEMO forecast).

Growth in areas outside the AGN network area

CORE's analysis (part but not all of areas outside AGN network due to lack of complete data), based on independent data sourced primarily from ABS, and .idcommunity), shows that more than 10% of SA dwellings are located outside of the AGN network area. Therefore, absent significant delays in completion from a prior year, which roll over into a forward year, AGN's annual Penetration Rate will not exceed 90%. (occupied dwellings estimated to be 745,000 based on 2021 Census and growth rate of 1% p.a 2021-2024).

Figure 10.1 Estimated dwellings – residential areas outside AGN network

Area	Estimated dwellings 2024
Yorke Peninsula	19,750
Mount Barker	17,909
Victor Harbour	10,350
Goolwa	6,350
Strathalbyn	4,450
Millicent, Beachport	3,980
Kangaroo Island	3,100
Waikerie	1,750
Pt Elliot	1,650
Miland, Clayton Bay	1,500
Hindmarsh Island	1,400
Middleton	1,295
Wellington, Tailem Bend	675
Total	74,159

SOURCE: ABS census and .idcommunity web site

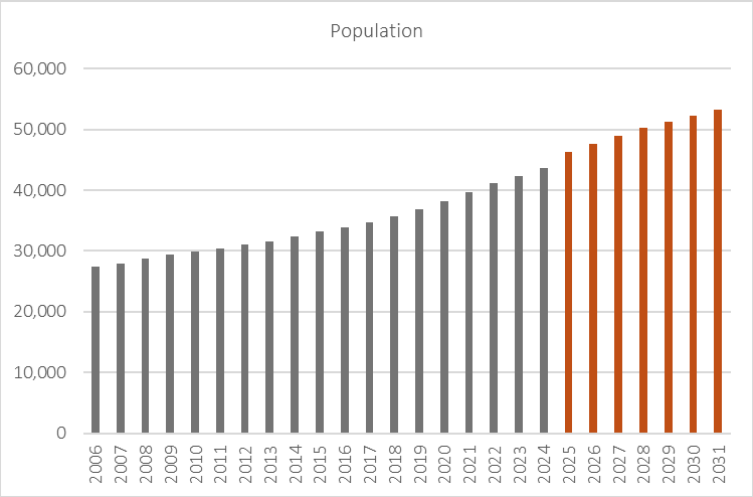
Further, a number of the areas outside the AGN network area are experiencing growth rates above that relating to areas within the AGN network. One such area is Mount Barker, for which a concise analysis is provided below.

Mount Barker Case Study

The District Council of Mount Barker area is located between 20 and 45 kilometers south-east of Adelaide, generally on the eastern side of the Mount Lofty Ranges. The District Council of Mount Barker area is bounded by the Adelaide Hills and Mid Murray Council areas in the north, the Rural City of Murray Bridge in the east, the Alexandrina Council area in the south, and the City of Onkaparinga in the west.

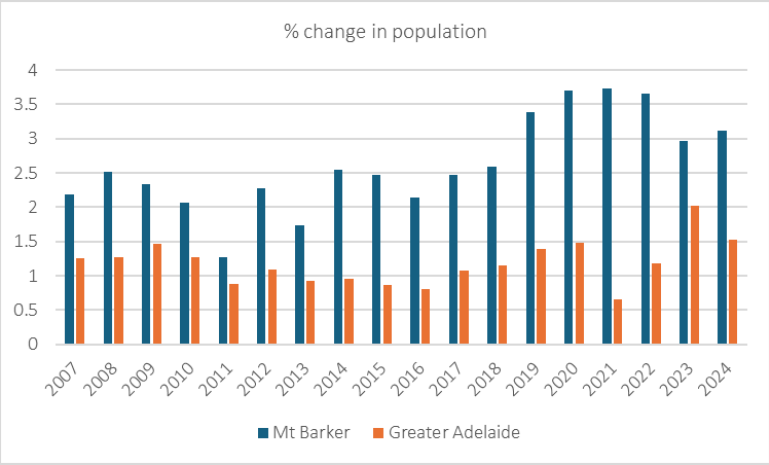
In 2025 Mt Barker is estimated to have a population of approximately 46,000, with the rate of growth shown in the following figures.

Figure A2.1 Population – history and forecast to 2031.



Source: https://forecast.id.com.au/mount-barker/population-households-dwellings

Figure A2.2 Annual % change in population – Mt Barker and Greater Adelaide area



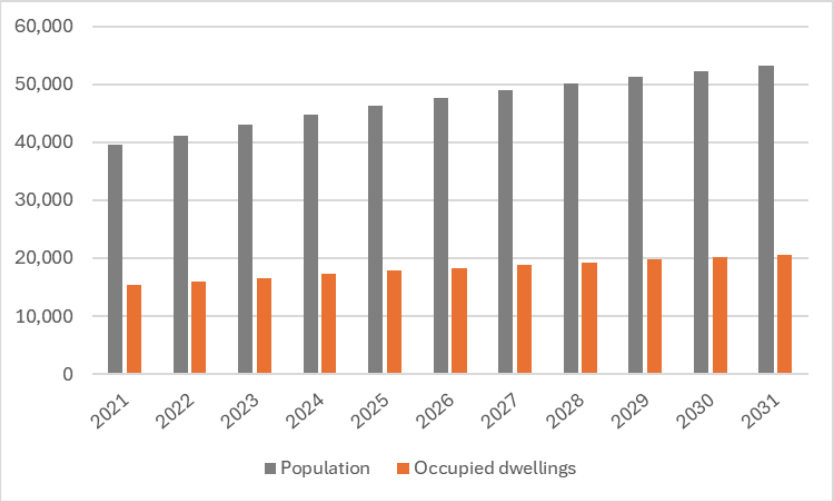
Source: https://forecast.id.com.au/mount-barker/population-households-dwellings

Figure A2.2 above highlights the higher rate of growth which consistently took place in Mount Barker relative to the Greater Adelaide area between 2007 and 2024.

Figure A2.3 shows that a high rate of population and dwellings growth is forecast throughout the Review Period. In 2025 dwellings are estimated at approximately 18,000 and are forecast to reach approximately 20,500 by 2031.

Mt Barker is characterised by house dwelling and few muti dwellings, therefore CORE has undertaken an analysis of the % of forecast houses to be completed between 2026 and 2031 – being 2,500 in Mt Barker compared to 53,000 for South Australia as a whole, which equates to 4.72% of new SA dwellings to be completed which are outside the AGN network area during the Review Period.

Figure A2.3 Comparison of Mt Barker historical and forecast population and occupied private dwellings



Source: https://forecast.id.com.au/mount-barker/population-households-dwellings

Other areas which are forecast to have high growth rates include York Peninsula, Millicent and Strathalbyn.

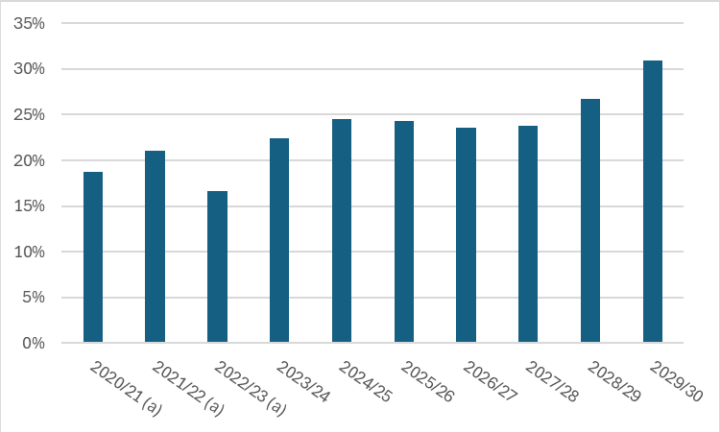
CORE considers that areas outside the AGN network could account for up to 12.5% of dwellings in SA by the end of the Review Period – accounting for a material reduction in forecast Penetration Rate relative to SA as a whole.

Growth in Multi dwelling developments 2025-2031

CORE has reviewed AGN data (as summarised in the Historical data tab within the CORE AGN Demand model) to determine the historical Penetration Rate for Multi dwelling developments. This analysis shows that Multi dwelling developments account for a 26% Penetration Rate between 2010 and 2019 and closer to 21% in more recent years which CORE considers to be more relevant for forecasting purposes.

HIA independent forecasts show that multi dwelling developments are forecast to increase above recent historical years as summarised in the following figure. Forecast increases are up to 10% absolute percentage points above historical levels and up to 50% higher in relative terms.

Figure A2.4 Comparison of Mt Barker historical and forecast population and occupied private dwellings



Source: CORE based on HIA data.

CORE considers that this trend will have a material downward impact on AGN's future Penetration Rate.

A3 Reference Documents

CORE has referred to an extensive list of documents, including the following, for the purpose of:

- refining CORE's forecasting methodology.
- identifying issues of significance addressed in recent gas access arrangements addressed by the AER.
- accessing specific data used as a modelling input for forecasting purposes, including historical trend analysis.
- accessing evidence to support derivation of forecasts presented within this report.
- validation/cross-check.

Document
Australian Bureau of Statistics:
4602.0.55.001 – Environmental Issues: Energy Use and Conservation, 2011, 2014
5220.0 Australian National Accounts; State Accounts.
5609.0 Housing Finance.
3218.0 Regional Population Growth.
8731.0 Building Approvals.
AEMO:
Forecasting Methodology Information Paper.
Gas Statement of Opportunities 2025
Integrated System Plans (ISPs).
Forecasting portal.
AEMC Residential Electricity Price Trends – 2024 edition
AER Access Arrangements – all gas network access arrangements.
AGL Public statement on 6-star energy rating impact.
Arena The Incredible ULCS: ultra-low cost solar.
Bureau of Meteorology Weather Station Data – Adelaide Airport.
Clean Energy Council – various disclosures
COAG Energy Council, National Energy Productivity Plan 2015-2030.
HIA Housing Forecasts
NABERS, NABERS for Apartment Buildings.
NatHERS, Nationwide House Energy Rating Scheme (NatHERS).
NCC National Construction Code – 2022