Attachment 9.5

Meter Replacement Plan

July 2025

PUBLIC

Australian Gas Networks

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0.1	April 2025	Issued for R Gray Review
0.2	May 2025	Issued for AGN review
0.3	June 2025	Finalise for SA Final Plan

Contents

Executive summary

The Meter Replacement Plan – South Australia (the Plan) outlines the program of work we will undertake to manage the accuracy and integrity of our customers' gas meters on a rolling five-year basis. This plan sets out our metering related regulatory obligations, the current stock and performance of domestic and commercial meters in our network, our meter replacement policy, our performance in the current AA period and our forecast meter replacement program for the next AA period (including our approach to developing this forecast).

Our meter replacement plan for the next access arrangement (AA) period (1 July 2026 to 30 June 2031) will see the following program of meter replacement/installation at cost of [redacted] million:

- Replacing ~102,900 end-of-life meters (non-digital)
- Replacing [redacted] defective meters
- Conducting 205 initial in-service compliance testing of new meter types
- Undertaking ~1,100 field-life extension (FLE) tests
- Installing [redacted] digital meters in locations where physical reads are not practicable
- Installing [redacted] digital meters for commercial customers with capability for hourly data access

The overwhelming majority of our meter replacement program is what's known as periodic meter change (PMC). PMCs are end-of-life replacements of domestic and industrial & commercial (I&C) meters, whereby we test and ultimately replace meters with a modern like-for-like replacement. However, our meter replacement program also includes provision to introduce digital meters to our network where prudent and practicable to do so. These two components of our program are discussed in the following sections.

Periodic meter changes

Our meter replacement work program is guided by strict standards for metering installations relating to accuracy, safety and testing. We are obligated to replace meters when:

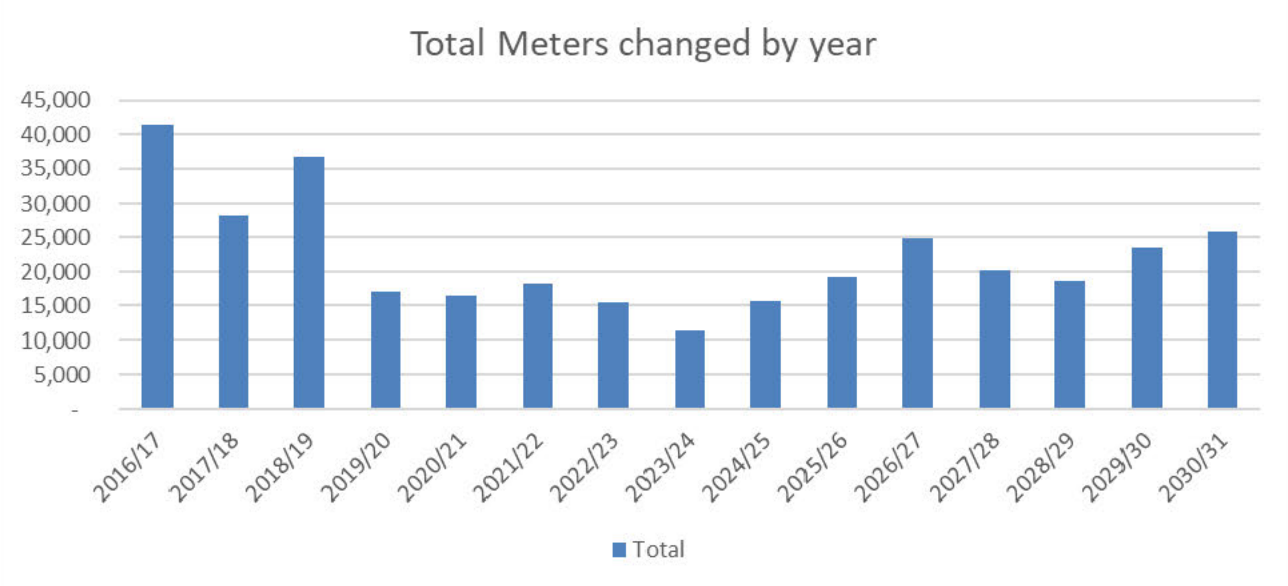
- They have reached the end of their field life (where this cannot be extended);
- When they have failed; or
- If testing shows their accuracy falls outside of the SA Metering Code requirements (± 2%).

This means the volume of meter replacement work in each AA period is directly influenced by the age and condition of the current stock of meters in our network at that time. We do, however, attempt to extend meter lives where safe and prudent to do so. We do this by applying field life extension (FLE) strategies that optimise the life of each meter type and family. For example, our technicians conduct ancillary and associated works when attending each meter, with the aim of reducing the frequency of visits and extending the life of the assets where practicable.

Due to the periodic and cyclical nature of the meter replacement program, there is a higher proportion of industrial and commercial (I&C) customer meters for the next 5 years. We are adopting the same replacement policy and FLE strategies as in prior AA periods; there are simply more meters falling due for replacement in this cycle.

Volumes in the current AA period (1 July 2021 to 30 June 2026) are lower than historical volumes due to the change from a 15-year meter life to 18-year meter life that occurred in 2006. While the meter change volumes in the next AA period have increased, the total volume is 26,500 lower than in the 2016-21 AA period, as highlighted in the graph below.

FigureExecSumm 1: Total meters changed per year, 2016 to 2031



The following table provides a summary of the periodic meter change (PMC) activity over the next AA period.

TableExecSumm 1; South Australian Network: Meter replacement volumes cost estimate ($'000 January 2025, direct unescalated costs)

	2026/27	2027/28	2028/29	2029/30	2030/31	Total
Domestic meters						
Number of PMCs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Unit rate ($/meter)			[redacted]			[redacted]
Forecast cost ($'000)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
I&C meters						
Number of PMCs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Unit rate ($/meter)			[redacted]			[redacted]
Forecast cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total PMCs (volume)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total all meters ($'000)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Note: Some totals may not add due to rounding.

For details regarding the meter replacement unit rates, including the rationale for any changes, please refer to the Unit Rates Report.

Digital metering

Digital metering for gas is becoming the industry standard. Traditional analogue meters require manual readings, which can lead to human error. Manual meter reading is also one of most common causes of safety incidents, with our meter readers often suffering slips, trips, and dog attacks when doing their rounds. Older analogue meters are also often located in spaces that are difficult to access, meaning they cannot always be read.

In contrast, digital meters automatically capture and transmit data, ensuring that meters can always be read and those readings are precise and consistent. This accuracy is valued by customers and AGN, as it ensures fair billing. It also means our meter readers do not need always need to access customers' properties, significantly reducing their safety risk.

Digital meters can also track gas usage and relay this information to the customer and AGN. The availability of near real-time data will allow customers to better understand their gas consumption patterns and identify opportunities for energy savings. For AGN, real-time monitoring enables more efficient network design and utilisation.

The growing trend towards digitalisation and smart home technologies has made digital gas metering a natural progression. Customers are increasingly seeking connected and automated solutions for managing their homes, and digital meters fit seamlessly into this ecosystem. The Australian Energy Market Commission (AEMC) recently "*made a final rule requiring universal smart meter deployment across the National Electricity Market by 2030, delivering benefits sooner to consumers while ensuring strong customer protections*". While this ruling is targeted at electricity networks, there is no reason to assume gas network customers would not also benefit from smart metering.

While digital meters are becoming the norm within the gas sector globally, there remains a cost differential between the two technologies. Currently, a digital meter installation costs around $[redacted] more than an analogue meter.[1] We expect prices to converge over time as the technology matures, volumes increase across the industry, and diaphragm meters become harder to source. However, until it becomes cost efficient to install digital meters as part of the standard PMC program, we are taking a more considered and pragmatic approach to digital metering.

Our digital metering program has two parts:

- Compliance driven installation
- An expansion of customer service offerings included in the approved AGN Victorian AA for time of use data to I&C customers with digital meters in SA

These are discussed in the following sections.

Digital metering - compliance

AGN has an obligation to send timely and accurate meter data to gas retailers. The *South Australian Gas Metering Code* (administered by the Essential Services Commission of South Australia (ESCOSA)) provides strict guidance on the collection, validation and accuracy of metering data. To ensure customers' gas bills are accurate, the Gas Metering Code requires we must use our *best endeavours*[2]

[1] Discussion on digital metering costs and the cost differential between digital and analogue meters is provided in the Unit Rates Paper.

[2] 'Best endeavours' means to act in good faith and use all reasonable efforts, skill and resources, Section 6, Gas Metering Code, ESCOSA.

to carry out an *actual meter reading*[3] and provide that data to retailers within a reasonable timeframe specified by the retailer. Metering data must also be periodically validated, which also requires an actual meter read rather than an estimated read[4]. Retailers generally require accurate and validated meter data to be provide at least once every 12 months.

There are around [redacted] meters in our network located in dangerous or inaccessible places. Customers at these locations have not received a physical (manual) meter read for at least 12 months, and in some cases their meters have not been read for several years. This means we have to estimate their consumption, resulting in inaccurate billing, customer dissatisfaction and non-compliance with meter data provision obligations at our end.

During the next 5 years we propose to address this issue by installing digital meters at these [redacted] sites. Digital meters can be read remotely via existing cellular 4G/5G networks, and the digital meter data will be integrated into AGN's metering and billing data system. This eliminates the need for meter readers to attend the site or put themselves in harm's way and allows accurate billing information to be provided to retailers as required.

We have developed a system in Victoria as part of the approved Victorian AGN Access Arrangement Digital Meter program. Our Victorian solution has been developed as a scalable application that can be applied to other AGN jurisdictions with minimal additional expenditure, and we intend to use this for the South Australia digital meter deployment.

Digital metering – Commercial customer deployment

Digital meters will eventually become a standard offering across the energy sector, and will replace diaphragm meters in the foreseeable future, as is being the case across Europe and North America.[5] However, we appreciate that the Australian gas market is different and significantly smaller than these colder climates, which is why we are adopting a more pragmatic approach. Before the switch to digital metering we want to understand their technical capabilities and identify the most appropriate and cost-effective digital metering solutions for the various customers on our network.

As a prudent operator AGN is investigating opportunities to understand service offerings and options for customers to utilise digital meters where it is cost beneficial to do so. Currently, small I&C digital meters are available at a cost neutral price point compared to analogue meters for a segment of our South Australian customers (i.e. for customers with an AL-425 diaphragm gas meter). Approximately 2,500 customers in this category are due for an end-of-life meter replacement within the next AA period. Given the unit cost differential between digital/analogue for these customers is negligible, it makes sense to install digital meters at their premises as standard. As per the compliance driven replacements discussed above, we will utilise the Victorian solution for the receipt and processing of the meter indexes.

Installing digital meters for this customer segment will be capex cost neutral comparative to their existing analogue meter, however, we will need to invest approximately [redacted] in our associated IT and meter data management systems, to make sure these systems can receive and store the meter data securely (this cost is included in the Operational Applications business case).

[3] 'Actual meter reading' means the physical collection of metering data by way of a scheduled meter reading or a special meter reading. An actual meter read may be metering data which has been substituted in accordance with clause 4.4. l (b) for an interval meter or clause 4.4.2(b) for a basic meter, but does not include metering data which has been estimated. Ibid.

[4] 'Estimated' read means obtaining an estimated value for the total energy quantity of gas delivered at a delivery point calculated by the distributor in accordance with clause 4.5 of this industry code in lieu of an actual meter reading. Ibid.

[5] For example, the UK government has mandated the installation of smart meters, including digital gas meters, for households and small businesses. Energy suppliers are required to offer smart meters to their customers, with the goal of completing the rollout by the end of 2025. https://www.gov.uk/government/publications/energy-security-bill-factsheets/energy-security-bill-factsheet-smart-metering

TableExecSumm 2: South Australia: Digital meter replacement capex ,inaccessible meters ($'000 January 2025, direct unescalated costs)

	2026/27	2027/28	2028/29	2029/30	2030/31	Total
Remote digital meter reading						
Inaccessible meters (volumes)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Inaccessible meters ($'000)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total capex ($'000)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

TableExecSumm 3: South Australia: Digital meter replacement capex, I&C ($'000 January 2025, direct unescalated costs)

	2026/27	2027/28	2028/29	2029/30	2030/31	Total
Remote digital meter reading						
I&C customers with AL-425 diaphragm gas meter (volumes)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total cost to replace EOL AL-425 meters ($'000)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Incremental capex for digital vs analogue solution	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total capex ($'000)**	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

*indicative forecast based on the I&C unit rate of [redacted]
**the forecast costs are captured in the overall I&C end of life program, and therefore digital metering solutions for I&C have no incremental increase impact on the overall capex requirement.

TableExecSumm 4: South Australia: Digital meter replacement associated opex ($'000 January 2025)

	2026/27	2027/28	2028/29	2029/30	2030/31	Total
Number of digital meters installed	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Digital meter hosted service charge ($,000)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Meter read savings ($,000)*	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total opex	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

* Based on 4 meter reads pa per customer, and one special read pa for inaccessible sites.

Addressing a known compliance and customer satisfaction issue is a prudent activity, consistent with good practice and justified under clause 79 the National Gas Rules (NGR). Further, we consider the incremental costs to install digital meters at commercial properties is a high value and low-cost exercise, which will enable us to achieve the lowest sustainable costs of providing metering services over the long term, ultimately benefitting all network users.

1. Introduction

1.1. Purpose

Australian Gas Networks Limited (AGN) reticulates gas to over 485,000 customers in the South Australian natural gas distribution networks (the networks). The volume of gas delivered to a customer is measured through a meter, with meter measurements being a key input into customer bills.

Under the *National Measurement Act 1960* (Commonwealth) (National Measurement Act) and the South Australian Gas Metering Code (South Australian Code), we have a regulatory obligation to manage the integrity of these meters and ensure they operate within a prescribed tolerance band for metering accuracy (i.e. currently +2% to -2% of the volume of gas delivered at the site). Periodic meter changes (PMCs) must therefore be carried out to:

- Test the accuracy of meters currently installed
- Replace meters when the accuracy of their measurements falls outside the prescribed band

Failure to maintain the accuracy of meters to the required standards increases the likelihood of customers being charged the incorrect amount for gas usage. For meters servicing larger customers, meter inaccuracy can have a significant effect on the level of unaccounted for gas. It can also result in a breach of our licence obligations, penalties, and other compliance actions.

This Plan provides an overview of the current stock of domestic and commercial meters in our networks, the standards for metering installations and the obligations we have to test and replace these meters. The Plan also outlines the ongoing processes and continuous improvements we apply to ensure we deliver value to our customers and comply with our regulatory obligations in relation to these meters.

The Plan sets out the forecast capital expenditure (capex) for the next AA period (2026-31) on PMCs for domestic and commercial meters[6], as well as bespoke digital metering projects.

In developing this Plan, we have had regard to:

- The metering standards and other regulatory obligations set out in the National Measurement Act, the South Australian Code, Australian Standard (AS) 4944 (Gas Meters – In-Service Compliance Testing); and
- Rule 79/91 of the National Gas Rules (NGR), which requires our expenditure to be:
    - Such as would be incurred by a prudent service provider, acting efficiently, in accordance with accepted good industry practice to achieve the lowest sustainable cost of providing this service; and
    - Justifiable on one of the grounds set out in rule 79(2), and particularly in the case of periodic meter replacement activities, to comply with a regulatory obligation or requirement

This Plan has been developed and reviewed as part of our asset management planning processes and is an input into the Asset Management Plan (AMP).

[6] Note that this Plan does not include Tariff D interval meters because the cost of these meters is recovered directly from the Tariff D customers.

1.2. Stakeholder engagement

We are committed to operating our networks in a manner consistent with the long-term interests of our customers. To facilitate this, we conduct regular stakeholder engagement to understand and respond to the priorities of our customers and stakeholders. Feedback from stakeholders is built into our asset management considerations, and is an important input when developing and reviewing our expenditure programs.

Our customers have told us their top three priorities are price/affordability, reliability of supply, and maintaining public safety.[7] They also told us they expect us to deliver a high level of public safety and are satisfied that this is current practice. Customers are also sensitive to price increases and are aware that accurate billing allows them to manage their usage and budget accordingly. Customers have told us during our recent engagement program that they are interested in having access to real-time gas usage.

This Plan, and the proposed meter testing and replacement activities outlined in it, are designed to ensure meters remain consistent with technical specifications, safety standards and compliance requirements, thereby helping maintain a safe and reliable service to customers. These activities are consistent with stakeholder expectations of our network and the levels of service our customers' value.

We will endeavour to deliver the meter testing and replacement programs outlined by this plan for the lowest sustainable cost, thereby minimising impact on distribution network tariffs.

Further information on our customer and stakeholder engagement program is available in Chapter 5 of our Final Plan.

1.3. Document scope and structure

1.3.1. Scope

This Plan applies to meters used by domestic and I&C customers only. It does not apply to meters used at Tariff D customer sites (i.e. customers consuming more than 10 TJ per annum). Costs associated with domestic and I&C meters are recovered from the regulated gas distribution network tariffs. The cost of replacing Tariff D meters are recovered directly from Tariff D customers.

This Plan applies to meters only. It does not cover the replacement and/or maintenance of meter sets and associated metering facility assets.

1.3.2. Structure

This document is structured as follows:

- Metering related regulatory obligations – this section outlines AGN's metering related obligations under the National Measurement Act, the South Australian Code, and Australian Standard AS 4944
- Meters in the South Australian networks – this section sets out the types of meters currently in operation in our networks that are subject to the National Gas Law (NGL) and National Gas Rules (NGR)[8]

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7 See feedback at: https://gasmatters.agig.com.au/SA

8 These meters are located in the Adelaide Metropolitan Area and regional towns serviced by the Moomba to Adelaide Pipeline System (MAPS) – Whyalla, Pt Pirie, Peterborough, Barossa Valley towns, Riverland towns, and small townships just north of Adelaide, as well as Mt Gambier in the south-east of the state.

- Meter replacement policy – this section outlines the meter replacement policy, which governs our approach to meter replacement
- Current performance – this section summarises meter replacement volumes and expenditure during the current AA period
- Forecast meter replacement program – this section describes the forecasting methodology we use to determine the amount we expect to spend on PMCs subject to the NGL and NGR in the next AA period, as well as the results of this forecasting methodology
- Digital metering transition – this section discusses how we are addressing our current non-compliance issue with meter reads, and our approach to making a pragmatic and considered transition towards digital metering as a standard service

2. Metering related regulatory obligations

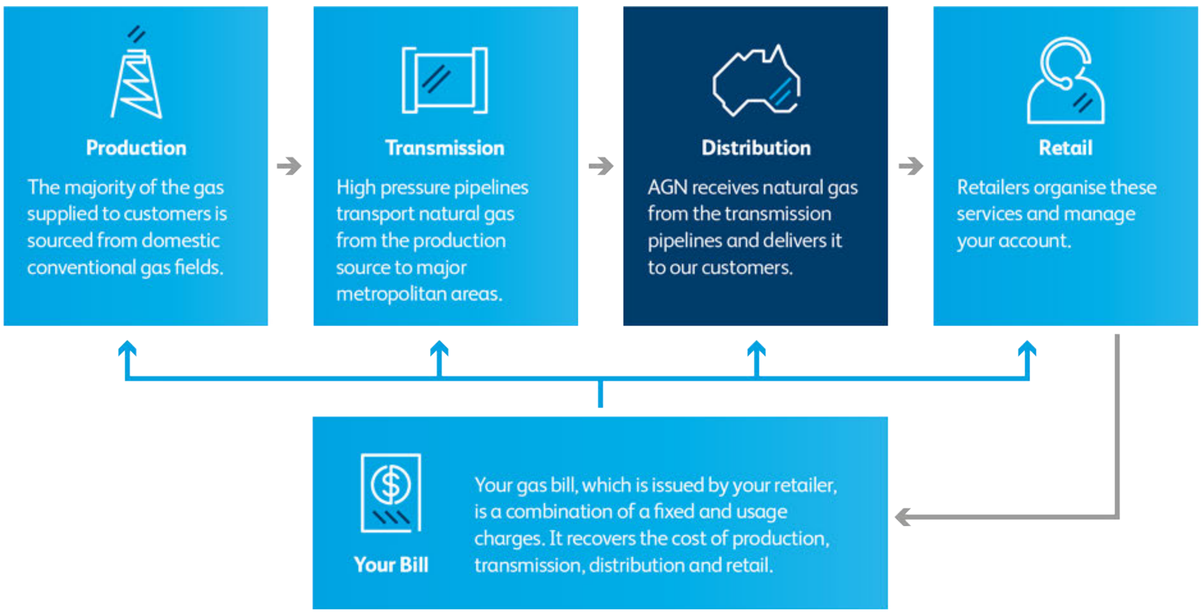
2.1. Role of AGN in customer metering

Our role in supplying energy to customers is illustrated in Figure 2.1. We own the distribution networks that transport gas directly to the customer. We also own, maintain and read the meters at each customer site.

The majority[9] of customers connected to our distribution networks have their gas transported to them by retailers. Retailers are responsible for purchasing natural gas from producers, transporting the gas through the transmission and distribution networks, and billing customers for all of the services required to supply natural gas to their site. This includes billing for use of the distribution network. Therefore, the metering information we collect is a key input into a retailer's billing process.

The costs of using the distribution network are recovered from customers through a network tariff that comprises a fixed supply charge and a volumetric (consumption) charge. The volumetric charge is directly related to the amount of gas supplied to each customer site, which is measured by our meters.

Figure 2.1: Our role in the South Australian gas supply chain



AGN is the asset owner and is ultimately responsible for investment decisions in the network, and that day-to-day operations, maintenance and construction in our network is in alignment with Australian Standards and good industry practice. We are responsible for installing meters in our networks and managing the PMCs. PMC activities include:

- Testing the accuracy of the meters

9 While there are a small number of large industrial customers that enter into their own gas supply and transportation arrangements, the majority of customers rely on a retailer for that service.

- Replacing meters when their accuracy falls outside the prescribed tolerance band

Meter testing is conducted by a National Association of Testing Authorities (NATA) accredited facility, while the meter replacement activities are carried out by a combination of APA staff and contractors.

2.2. Meter concepts

2.2.1. Meter types

There are currently three main types of meter design used in the South Australian networks:

- Diaphragm meters
- Rotary meters
- Turbine meters

Note digital meters are an emerging opportunity for AGN, with installation of digital meters recently commencing in AGIG's Victorian networks. Our plan is to introduce digital meters into the AGN SA networks on a limited basis over the next five years, leveraging the work conducted in Victoria.

Our meters are grouped according to their service category. The groups are:

- *Domestic meters* – typically diaphragm meters with a capacity up to 8m^3 per hour that are used to supply both residential and some small commercial customers
- *I&C meters* – these can be any of the above type of meters, with a capacity greater than 8m^3 per hour and used to supply medium-to-large scale commercial facilities and small-to-large size industrial customers

Larger capacity I&C meters are used at Tariff D customer sites; however Tariff D meters are outside the scope of this Plan. Any reference made in the Plan to meters of size >25m^3 per hour is referring to medium to large I&C meters (i.e. non-Tariff D customers).

Meters are also usually grouped into meter types and families, with the term *family* being used to refer to *a quantity of meters that is considered uniform*. Consistent with AS 4944 and with the National Measurement Institute's document NITP 14, a meter family (also known as meter population) has the following details in common:

- Manufacturer
- Country of manufacture
- Type or model of the meter
- Year of manufacture (within the same 12-month period)
- Year of initial verification in the country of manufacture (within the same 12-month period)
- Accuracy class
- Certificate of approval

For example, the Email 602 meter type, which was installed each year between 2000 and 2023, consists of 24 meter families (populations).

2.3. Meter testing and replacement obligations

2.3.1. Regulatory requirements

This Plan relates to domestic and I&C customer meters installed in our South Australian networks, which are subject to the following regulatory obligations:

- *National Measurement Act 1960 (Commonwealth)* – gas measurement laws are governed through the National Measurement Institute by the Chief Metrologist, who is empowered to oversee and administer the National Measurement Act. This Act sets out the requirements that apply to utility meters used for trade, their verification and the penalties for failure to comply with certain provisions in the Act[10]
- *South Australian Network* – as a condition of our South Australian Gas Distribution Licence, we are required to comply with the metering related provisions set out in the South Australian Code. Amongst other things, the South Australian Code:[11]
  - Requires us to provide metering installations and sets out our obligations in relation to the standard of those installations, meter testing and replacements, and the collection and provision of metering data to retailers;[12] and
  - Requires us to comply with AS 4944 when determining the initial and ongoing life of a meter family defined in this standard and when testing these meters[13]

Failure to maintain the accuracy of meters to the required standards increases the likelihood of customers being charged the incorrect amount for gas usage which, on larger meters, can have a significant effect on the level of unaccounted for gas. Failure to comply with the obligations outlined above can also result in:

- A breach of our licence conditions and authorisation in South Australia
- Enforcement actions as set out in the *Gas Act*[14]
- Penalties being applied under the *National Measurement Act*

2.3.2. Meter capacities

AS 4944 (Gas meters – In-Service Compliance Testing) applies to diaphragm meter families with a capacity of 25m^3 per hour or less.[15] A distinction can therefore be drawn between meter families with a capacity:

- *Up to and including 25m^3 per hour* (i.e. domestic and smaller/medium I&C meters), which are subject to AS 4944, the South Australian Code and the National Measurement Act; and

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10 Under this Act, a person may be required to pay a penalty if they supply a utility meter for trade that gives an inaccurate measurement. The maximum penalty for such an offence is 200 penalty units, with each penalty unit worth $330. The maximum penalty that could be payable if a single meter was found to give an inaccurate measurement (i.e. running fast) is therefore $66,000.

11 The South Australian Code has been developed by the Essential Services Commission of South Australia (ESCOSA) and applies to all distributors that hold a gas distribution licence. The Code sets out the minimum standards for metering installations. Clause 4 of AGN's Gas Distribution Licence requires compliance with this Code.

12 These provisions can be found in sections 2-4 of the South Australian Code.

13 This provision can be found in section 3.4 of the South Australian Code.

14 Gas Act Section 27

15 AS 4944:2006 section 1 Scope and section 4.1.2 Maximum flow rate.

- *Greater than 25m^{3}per hour* (i.e. medium to large I&C meters), which are subject to the South Australian Code and the National Measurement Act

Our meter testing and replacement obligations under AS 4944 and the South Australian Code are outlined in sections 2.3.3 and 2.3.4 respectively.

2.3.3. Meter testing

2.3.3.1. Meters ≤10 m^3/hr

We are required by the South Australian Code to carry out, or cause to be carried out the following tests on meters:

- Acceptance tests before a new meter is placed into service, before a meter that has been removed from service is placed back into service and after any repairs, maintenance or recalibration is performed on a meter[16]
- Initial in-service compliance testing on any new meter types, which must be carried out in accordance with the requirements set out in AS 4944[17]
- Field life extension (FLE) testing (also referred to as ongoing in-service compliance testing), which must be carried out in accordance with the requirements set out in AS 4944 [18]

We are also required to carry out testing if a customer requests such a test.[19]

The criteria for these tests are set out in Clauses 2.6, 3.4 and 3.7.2 of the South Australian Code and summarised below:

> 2.6.1 The ***minimum standards*** of accuracy for ***metering installations*** are within a margin of accuracy of plus or minus 2% of the net volume of ***gas*** delivered to that ***delivery point***.
>
> 3.2.1 The ***distributor*** must conduct, or cause to be conducted, ***acceptance tests*** on ***meters***, ***correctors*** and ***data loggers*** that are components of ***metering installations*** in the following circumstances:
>
> (a) before a new ***meter***, ***corrector*** or ***data logger*** is placed in service;
>
> (b) before a ***meter***, ***corrector*** or ***data logger*** that has been removed from service is placed back into service; and
>
> (c) after any repairs, maintenance or recalibration performed on a ***meter***, ***corrector*** or ***data logger*** have been completed.
>
> 3.2.2 The ***distributor*** must only adopt a new type of ***metering installation*** if that ***metering installation*** has been ***type tested***.

16 South Australian Code, section 3.2.1.

17 South Australian Code, section 3.4.

18 South Australian Code, section 3.4.

19 South Australian Code, section 3.3. This section of the Code requires AGN to:

- give a retailer at least five business days' notice (or agree such other mutually convenient time) of when the requested test is proposed to be performed; and
- test a metering installation within 15 business days of a request from retailer to ascertain whether or not the installation is defective.

This section also allows AGN to seek payment from the affected party of the costs of testing the metering installation and associated costs if the installation is not defective and meets the accuracy standards set out in the Code.

3.4.3 The testing and sampling plan must provide that ***meters*** be tested at both 20% and 100% of the badge capacity of the ***meters***.

3.4.6 If the test results do not satisfy:

(a) the maximum allowable error limits for badge capacity of the ***meter***s at 20% and at 100% as set out in clause 2.6, with an ***uncertainty limit*** of no more than 1%; and

(b) such other requirements of the testing and sampling plan approved by the ***Commission***, then the ***distributor*** must replace or recalibrate all ***metering installations*** in that ***meter class***.

3.7.2 A ***distributor*** can only make an adjustment for ***meter*** error using a ***corrector*** or a ***correction factor*** when:

(a) the ***corrector*** and ***meter*** for the specified correction is uniquely identified;

(b) the accuracy of the ***meter*** and/or ***corrector*** is within the ***minimum standards***;

(c) the method of adjustment by the ***corrector*** can be varied;

Our meter testing program is therefore carried out to ensure:

- The net volume of gas delivered to each delivery point falls within the prescribed tolerance band of metering accuracy
- Metering installations do not show any systematic bias within the allowable margin of accuracy and meters are not tampered with, or calibrated with the intent of causing bias in the meter
- The tolerances of the individual components (meters, correcting instruments, pressure and temperature transmitters) used to measure gas supplied to a customer are such that the gas measured is within a margin of accuracy of ±1% of the net volume of gas supplied for new meters leaving the manufacturer

The remainder of this section provides further detail on the acceptance testing, initial in-service compliance testing and FLE testing requirements.

Acceptance testing

We are required to carry out, or cause to be carried out, acceptance tests on new meters to be placed back into service. The term *acceptance testing* is defined in the South Australian Code as the *testing and setting by a manufacturer or installer on a meter, corrector or metering installation to establish the initial calibration of the meter, corrector or metering installation.*

To comply with this obligation, we require domestic meters (up to 8 m^3/hr capacity) and small I&C meters (up to 10 m^3/hr capacity) to be tested prior to delivery by the manufacturer in accordance with AS 4647-2005 to an accuracy of at least ±1%.[20]

Meters received from manufacturers with accredited testing facilities are sealed prior to delivery and accepted without further testing. These meters are inspected on delivery to ensure the seals are intact and no damage has occurred during transit. If the inspection is satisfactory, these meters are accepted without further testing, prior to installation. If the inspection is not satisfactory, then the meters will be subject to further testing.

[20] Manufacturers are required to supply on this basis under the terms of their contracts with APA.

Initial in-service compliance testing

Once a new meter type is placed into the field then it may, depending on when it was installed, be subject to an initial in-service compliance test to determine the initial meter life. This is referred to in AS 4944 as the compliance period, which is the interval before FLE testing is required to demonstrate that the meter type is maintaining its accuracy within an acceptable range.

For those meters installed from 2006 onwards, the initial in-service compliance testing is usually carried out between the third and fifth year of service and, in keeping with AS 4944 is conducted by:

- Removing a random sample of meters from the meter type (population) from the field that is sufficiently large to enable the testing to meet the sample requirements set out in Table 2 of AS 4944;[21] and
- Testing whether the accuracy of this sample of meters falls within a ±1.5% band, or a ±2% band, which is then used to determine the initial meter life (compliance period) as set out in Table 2.1.[22]

Table 2.1: Meters in-service compliance period as derived from initial in-service test

	Accuracy from initial service test	
	Within ±1.5%	Within ±2.0%
Compliance period	18 years	15 years

Source: AS 4944, Table 4.

Field life extension (ongoing in-service compliance) testing

Under AS 4944, meter families with a capacity of up to 25m^3 per hour must be tested to determine whether or not a meter family's field life can be extended beyond its designated initial meter life. This is referred to as FLE testing, or ongoing in-service compliance testing.

FLE testing generally occurs early in the final year of a meter family's approved initial meter life (for example, a meter family with a 15-year initial life will be tested early in year 15). In keeping with AS 4944, the test is conducted by:

- Removing a random sample of meters from the relevant meter family (population) from the field, with the size of the sample based on the requirements set out in Table 2 of AS 4944; and
- Testing whether the accuracy of this sample of meters:
  - Falls within a ±2% band, in which case the field life can be extended by five years[23] or
  - Falls outside the ±2% band, in which case the meter family will be failed and replaced

2.3.3.2. Meters >10 m^3/hr

Initial field life

AS 4944 covers the testing requirements of small to medium I&C meters between 10 m^3/hr and 25 m^3/hr but does not cover larger I&C meters (i.e. meter families with a capacity greater than 25m^3

[21] Given the potential for meters to be damaged when they are removed or transported to the testing site, or for other factors to prevent testing, we will usually take an additional 15% of meters from the field to ensure that the sample size that is tested meets the requirements in Table 2 of AS 4944.

[22] Note that there is some flexibility that meter populations can be grouped according to year of installation rather than manufacturer.

[23] AS 4944, Table 5

per hour). The testing requirements for these larger meter types are instead set out in the South Australian Code.

For meters >10 m^3/hr, the metering provisions in the South Australian Code requires AGN to carry out, or cause to be carried out, the tests nominated in Section 2.3.3.1. These meter families do not undergo initial in-service compliance testing, rather they are deemed to have an initial field life of ten years.[24]

FLE testing

Meter families >10 m^3/hr typically do not undergo FLE testing. Their lives are not usually extended beyond ten years because even small metering inaccuracies at these sites can have a significant effect on customer billing accuracy and unaccounted for gas volumes, given the larger volumes of gas supplied to these sites. Also, because there are relatively few of each meter family installed, it makes it uneconomic to extend their lives as the cost of carrying out the testing is quite high.

However, in some selected cases, a meter family with a capacity >10 m^3/hr but <25 m^3/hr will be subject to FLE testing. This only occurs where the size of the family makes it more economic to extend the family's life than replace it. In these cases, the life extension criteria for domestic meters apply.

Acceptance testing for meters >10 m^3/hr

Like domestic meters, new I&C meters >10 m^3/hr are generally supplied by accredited manufacturers and tested by the manufacturer to an accuracy of at least ±1% prior to delivery.

Meters received from these manufacturers are sealed prior to delivery and accepted without further testing. These meters are inspected on delivery to ensure the seals are intact and no damage has occurred during transit. If the inspection is satisfactory, the meters are accepted without further testing, prior to installation.

If meters are received from a non-accredited manufacturer, they will be tested before being placed into the field using the same criteria applying to domestic meters:

- All diaphragm meters are tested at both 20% and 100% flow rate and must be accurate to ±1%
- Rotary meters are tested at 10%, 40%, 70% and 100% capacity and must be accurate to ±1%
- Turbine meters are tested at 10%, 25%, 50%, 75% and 100% capacity and must be accurate to ±1%

2.3.4. Meter replacement

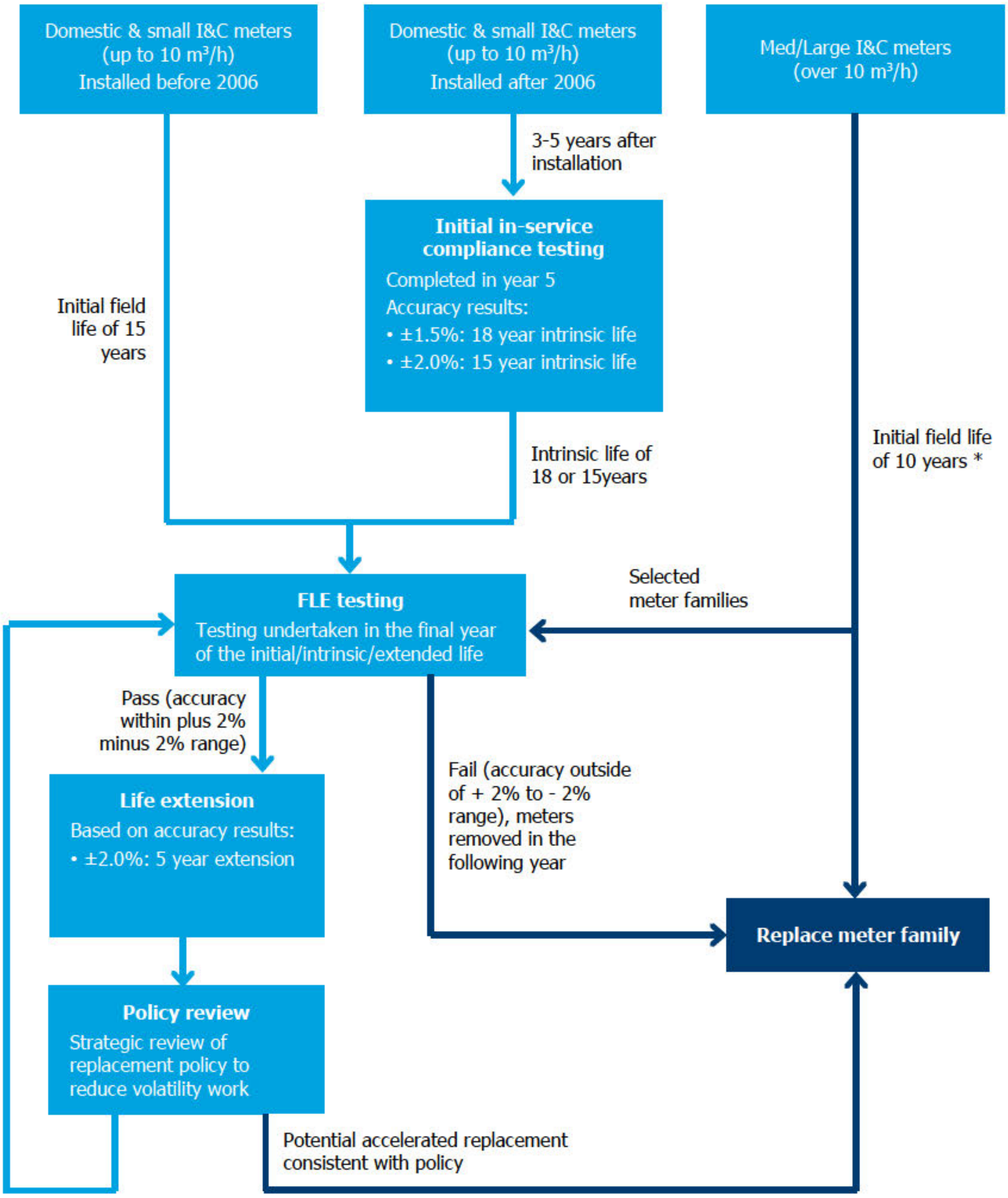
We are required by the South Australian Code to replace meters if the test results fall outside the accuracy range specified in the Code:

- *Meters sized ≤25m^3 per hour* – these meter families must be replaced if the test results (usually FLE testing) fall outside the accuracy range specified in the South Australian Code
- *Meters sized >25m^3 per hour* – these meter families are replaced once the meter family reaches 10 years of age, unless the meter family has passed an FLE test

Figure 2.2 illustrates our approach to identifying the number of meters required to be replaced. We may bring forward the replacement of meter populations to manage deliverability risk, minimise the cost of the replacement and ensure compliance with regulatory obligations.

[24] South Australian Code, section 3.4.1

Figure 2.2: Meter replacement identification process



* Meters >10 m³/hr are typically replaced at the end of their initial field life, but in a small number of cases the field life may be extended after the meters are subject to successful FLE testing.

2.3.5. Asset management optimisation

Consistent with good asset management practice, and in line with the tests under NGR 79/91, we continually seek ways of delivering works programs for the lowest sustainable cost. By enhancing our asset management practices, and fully integrating the in-service testing and FLE testing outlined in section 2.3.3, we forecast an avoided cost of more than $[redacted] million over the next AA period by using these approaches.

With the controlled and phased introduction of digital metering, which is becoming the industry standard, we are looking at opportunities to meet the needs of our customers, whilst improving our asset management options. We will continue to review and revise our asset management practices during the delivery of the meter replacement program and seek opportunities to improve efficiency/productivity where practicable.

2.4. Meter reading obligations

The South Australian natural gas distribution networks deliver gas to more than 485,000 consumers. Each customer connection point has a meter, which measures how much gas the customer has used. Data from our meters is provided periodically to gas retailers, who use that data to calculate and issue gas bills to end consumers.

The ESCOSA Gas Metering Code provides strict guidance on the collection, validation and accuracy of metering data. Provision of accurate metering data is particularly important where a customer transfers between gas retailers and requires a physical meter read for billing purposed. Section 4.2.1 of the Gas Metering Code states:

On request by a *retailer*, the *distributor* must use *best endeavours* to carry out an *actual meter reading* to enable the transfer of a *customer* to that *retailer* within a reasonable time of the request.

Metering data must also be periodically validated, which also requires an actual meter read rather than an estimated read. Retailers generally require accurate and validated meter data to be provided at least once every 12 months.

Essentially, this means AGN must provide retailers actual meter readings at least once per year. While estimated readings are permissible in certain circumstances, relying on estimated reads for a long period of time leads to billing inaccuracy and customer dissatisfaction. AGN must therefore ensure its meters can be read (either physically or remotely) at least once per 12-month billing cycle so that it can meet its obligations under the Code.

3. Meters in the South Australian networks

This section sets out:

- The numbers and types of meters currently installed in the South Australian networks
- The results of the testing that has recently been carried out in these networks

3.1. Meter types

We currently reticulate gas to over 485,000 customers in our networks. Each customer has a meter installed at their premises. Table 3.1 provides a breakdown of the number of meter types, meter families and meters installed in the networks.

Table 3.1: Split of meters installed in South Australian Networks (as at Nov 2024)

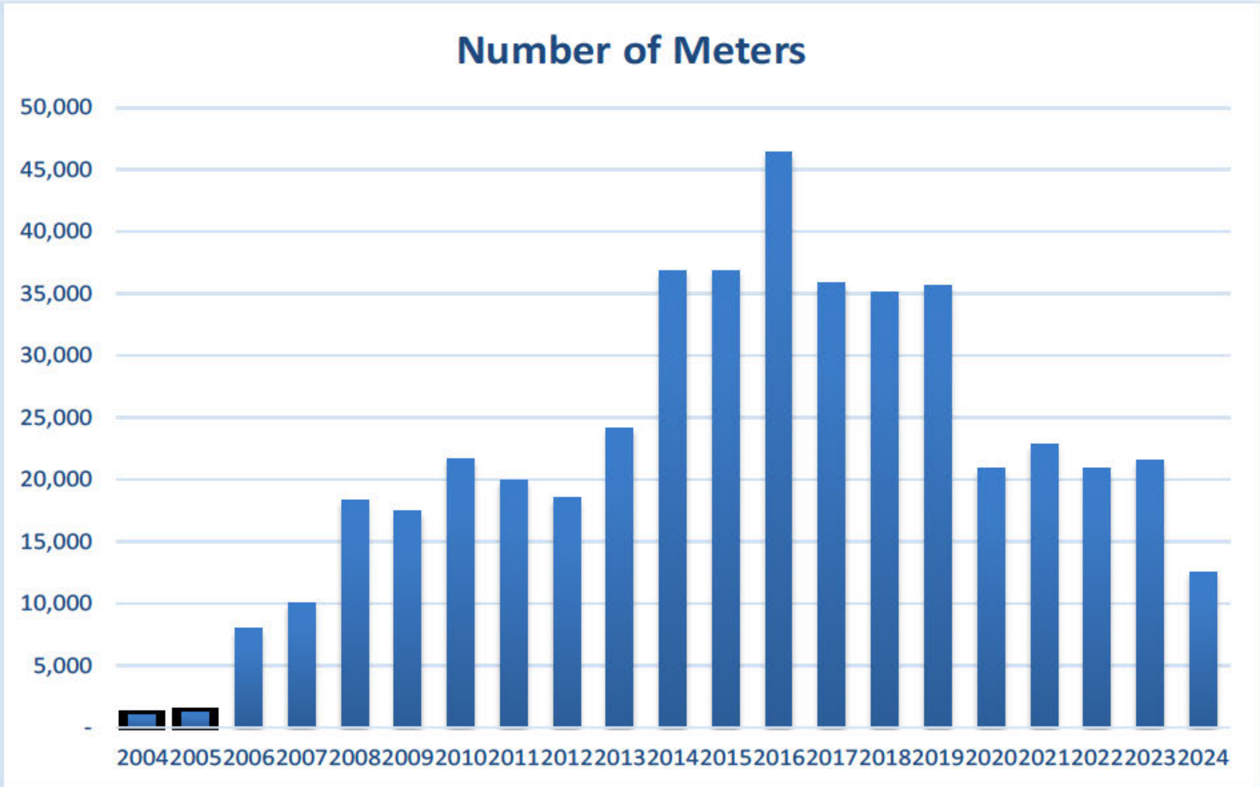
	Domestic (Capacity ≤8m³ /h)	I&C (Capacity >8m³ /h)	Total
Number of meter types	21	64	85
Number of meters	466,031	19,618	485,649

The age profile of the domestic and I&C meters that were installed as at November 2024 is set out in Table 3.2, while Figure 3.1 and Figure 3.2 provide further detail on the year these meters were installed.

Table 3.2: Age profile of meters (as at Nov 2024)

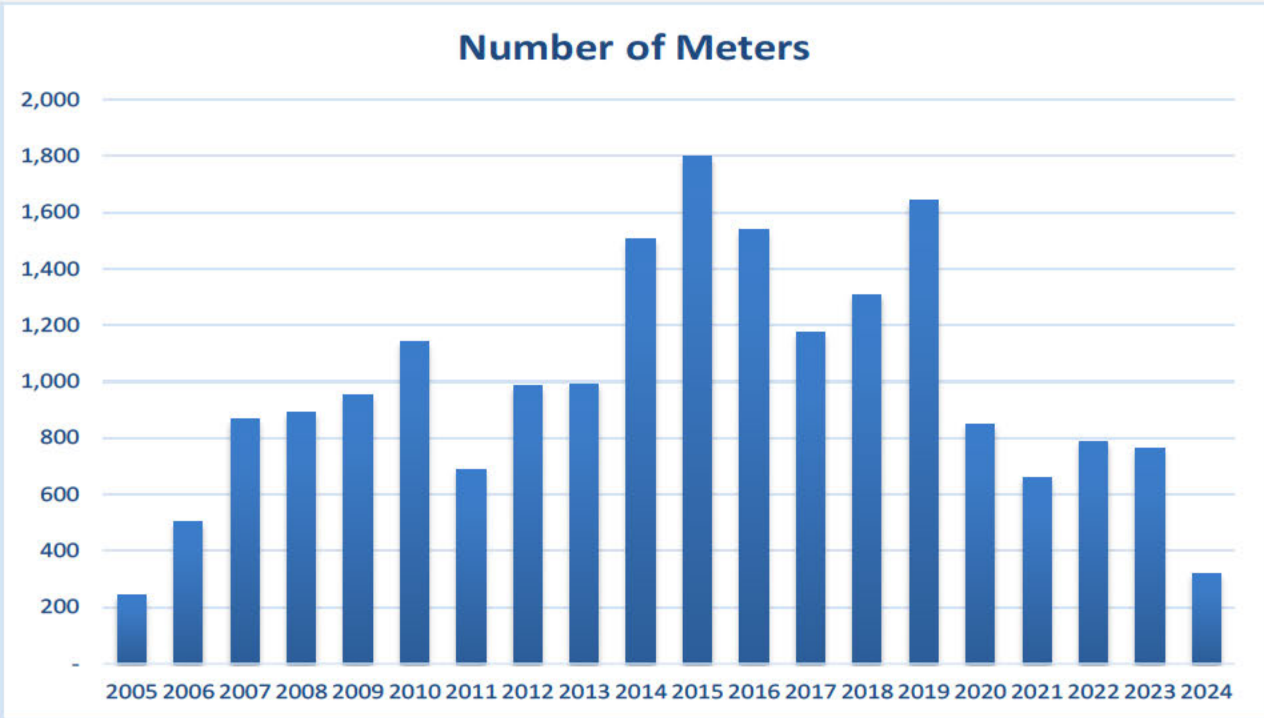
Age	Domestic	I&C
0-5 years	98,798	3,382
6-7 years	70,788	2,953
8-9 years	82,246	2,716
10-11 years	73,701	3,304
12-13 years	42,662	1,977
14-15 years	41,704	1,830
16-19 years	56,123	3,456
Total	**466,031**	**19,618**
Average age	**8.9 years**	**9.7 years**

Figure 3.1: Year of installation – domestic meters as at Nov 2024



Note: Average age of meters as at Nov 2024: 8.9 years

Figure 3.2: Year of installation – I&C meters as at Nov 2024



Note: Average age of meters as at Nov 2024: 9.7 years

As Figure 3.1 highlights, there was a significant increase in the number of domestic meters installed in 2016. This was the result of a carry-over from previous years and removing a backlog of scheduled PMCs.

3.2. Meter testing results

3.2.1. Test results for domestic and small I&C meters

The South Australian Code requires meters to be sampled and tested for accuracy, with the results of those tests being used to determine the life and forecast replacement date for the wider meter family.

In keeping with the testing requirements in AS 4944 and the South Australian Code, we have an obligation to test (or cause to be tested) the performance of these meters in the following ways:[25]

- New meters must be subject to acceptance testing before they are placed into service;
- Initial in-service compliance testing must be conducted on each new meter type installed from 2006 onwards within three to five years of the meter type being installed in the field; and
- FLE testing must be conducted to determine whether or not a meter family's field life can be extended beyond the initial meter life, which for domestic meters is typically 15 or 18 years.[26]

The remainder of this chapter provides an overview of the results of the acceptance testing, initial in-service compliance testing and the FLE testing that has been conducted.

3.2.1.1. Acceptance testing

Manufacturers with accredited testing facilities are required to test the accuracy of new meters to a standard of ±1% prior to delivery. The new meters supplied by manufacturers over the last five years have fallen well within the ±1% accuracy range.

3.2.1.2. Initial in-service compliance testing

To carry out the initial in-service compliance testing, a random sample of meters from the relevant meter family must be removed from the field and tested to determine the initial meter life. This testing is usually carried out in the third to fifth year of the service life.

The results of testing carried out since 2012 are set out in Table 3.3.

Table 3.3: In-service compliance meter family testing results 2012 to 2024

		2012	2015	2017	2020
No. of meter families tested		2	2	1	2
Meters passing:	18-year initial life	2	2	1	2
	15-year initial life	0	0	0	0
	10-year initial life	0	0	0	0

Seven meter families have been tested in the period 2012 to 2024, with all being accorded an initial meter life of 18 years.

25 Testing must also be carried out if requested by a customer.

26 South Australian Code, section 3.4.2

3.2.1.3. FLE testing

In a similar manner to the initial in-service compliance testing, FLE testing requires a random sample of meters from the relevant meter family to be removed from the field and tested to determine whether the life of the meter family can be extended beyond the meter family's initial service life. The FLE test is usually carried out early in the final year of the meter family's designated service life.

By way of example:

- One FLE test has been carried out on a meter family, with the result that a five-year extension of meter life was granted
- One FLE test was carried out with the result that the sample meters failed. This resulted in the meter family being removed from the field

Continuous improvement in operational processes has resulted in FLE testing becoming part of normal asset management practices with the networks operations in South Australia.

3.2.2. Test results for larger I&C meters

The only testing medium-to-large I&C meters (>10 m^3/hr) must undergo [27] is assurance testing. Assurance testing must be carried out on new meters before they are placed into service.

Like the manufacturers of smaller meters, manufacturers of larger meters with accredited testing facilities are required to test the accuracy of the larger meters to a standard of ±1% prior to delivery. Over the last five years the new meters provided by our manufacturers have performed well within the ±1% accuracy range.

[27] Testing must also be carried out if requested by a customer. FLE testing is undertaken in limited circumstances, however meters >10m3/hr are typically replaced at the end of their field life of ten years.

4. Meter replacement policy

4.1. Meter replacement policy

The overarching objectives of AGN's meter replacement policy are to ensure compliance with regulatory obligations and carry out the meter replacement program in the most prudent and efficient manner by:

- Optimising the level of inter-year variability in program size and, in so doing, minimising the unit rates and program delivery risks
- Using testing facilities and contractors that have been selected through a competitive tender process (for more information relating to our forecast unit rates and contracts we have in place, please refer to Attachment 9.10 Unit Rates Forecast)

Information on the processes we have in place to minimise the costs and risks associated with the meter replacement program are set out below.

4.2. Inter-year variations in program size

The age profile of the current stock of meters as highlighted in Figure 3.1 and Figure 3.2 (above), will give rise to a degree of inter-year variability in the number of meters that need to be tested and replaced. For example, during the next five years, compliance with the testing and meter replacement obligations is expected to result in the annual number of meter replacements for:

- Domestic meters fluctuating between [redacted] and [redacted] meters
- I&C meters fluctuating between [redacted] and [redacted] meters

The degree of inter-year variation can be seen more clearly in Figure 4.1 and Figure 4.2 (note the process by which the forecasts presented in these figures were developed is described in detail in Section 6).

[redacted]

[redacted]

[redacted]

[redacted]

As these figures show, there is inter-year variability. We manage this variability by scheduling replacements to smooth the works program (to the extent we can) to avoid placing upward pressure on the internal and external costs of carrying out the program.

When developing the meter replacement program, we give careful consideration to the costs of mobilising and demobilising resources on a year-to-year basis. Internal resources are used to plan, schedule and co-ordinate the meter replacement program, so if the number of meters to be replaced in a particular year substantially exceeds the average, then additional resources will need to be dedicated to this task. In peak years contractors may need to be engaged to supplement the internal work force, which will give rise to additional costs (e.g. to train the staff and to potentially work overtime to complete the program).

During the next AA period, the maximum number of meters we propose to replace in any one year is 25,881 (in 2031).

Note that smoothing – bringing forward replacements into earlier years, or to increase resources in the later years – does not result in net cost benefits for year-on-year volume adjustments.

4.3. Further project cost optimisation

4.3.1. Contractor/services cost optimisation

To help ensure testing and meter replacements are carried out in the most efficient manner, we have contracts with a range of services providers. Service providers are selected via a competitive tender process, which helps promote efficient costs and optimum outcomes for customers.

Further detail on these contracts can be found in the Unit Rates Report.

4.3.2. Project optimisation

Meter replacements are optimised geographically, and meter replacement work packages allocated by postcode to ensure travel times remain minimal between meter replacement sites.

Internal work resources are predominantly used for larger I&C and demand customer reactive meter replacements. Contractors are used occasionally for reactive domestic and I&C meter replacements, when our internal resources are at capacity.

For our internal resources, reactive meter replacement duties are combined with other operational activities, to ensure full utilisation of the workforce between reactive jobs.

5. Current performance

This section provides an overview of historical meter replacement activities and expenditure for the South Australian natural gas distribution networks. The unit rates we incur when replacing meters differs depending on the type of meter being replaced, for example industrial, commercial or domestic applications. Further detail on these metering unit rates can be found in the Unit Rates Report.

5.1. Meter replacement – Meters < 10m^3 (Domestic)

5.1.1. Nature of works and costs

Replacing domestic gas meters involves:

- Procuring new meters, including quality control
- Planning and scheduling of meters to be changed over
- Organising resources (combination of direct and contractor) to carry out the meter change, which includes testing of outlet service and relighting appliances, and if required, re-attending premises after hours if the customer requires assistance
- Inspections of assets around the meter for integrity or compliance issues
- Testing meters brought in from the field
- Life extension

The replacement of domestic meters over the five years is required to ensure meters are calibrated and fit for purpose in accurately measuring gas usage within ±2%, as required by Australian Standard AS 4944 and the South Australian Gas Metering Code.

5.1.2. Historical and forecast domestic meter installation volumes

Table 5.1 shows the number of domestic meters replaced during the current AA period, compared to the approved forecast in the AER's Final Decision for the current AA period. It also shows how we are tracking in terms of capex incurred vs the AER Final Decision.

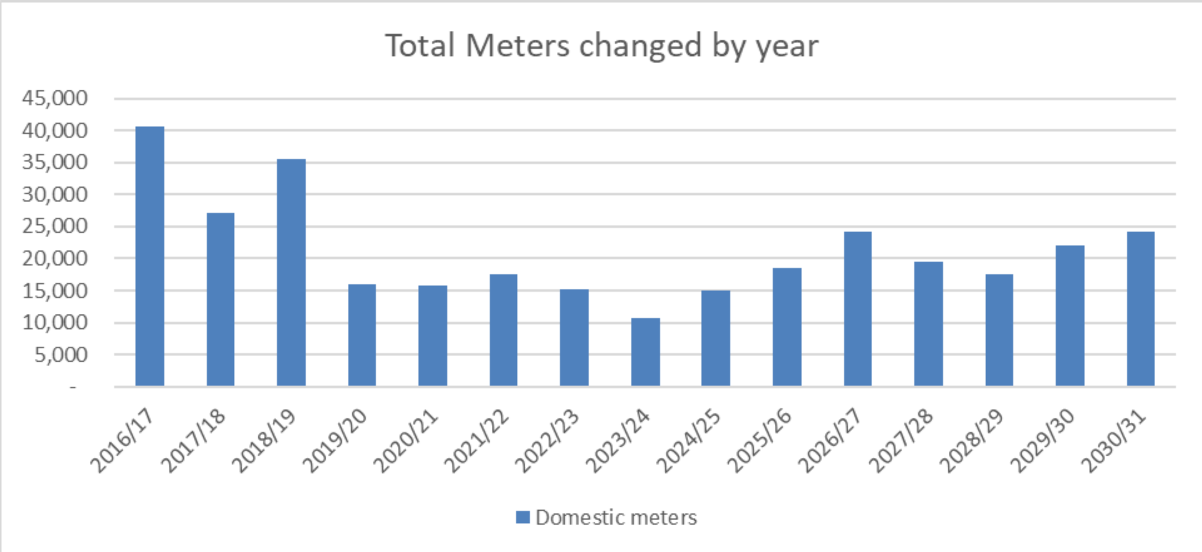
Table 5.1: Domestic meter replacement volumes and expenditure ($'000 January 2025)

Domestic meters		2021/22	2022/23	2023/24	2024/25*	2025/26*	Total
Actual	Volumes (no. of meters)	17,551	15,210	10,673	14,944	18,589	76,967
	Capex ($'000)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
AER Final Decision	Volumes (no. of meters)	15,365	14,582	21,985	17,444	21,098	90,474
	Capex ($'000)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Variance	Volumes (no. of meters)	2,186	628	-11,312	-2,500	-2,509	-13,507
	Capex ($'000)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

*Forecast

The replacement volumes are broadly in line with the forecast after the first three years of the current period, but with some inter-year variability. The overarching profile of meter replacement can vary with time depending on the age of the assets, and predominantly aligns to historical peaks and troughs in residential property construction. Figure 5.1. shows historical and forecast domestic meter replacement volumes.

Figure 5.1: Historical and forecast domestic meter replacement volumes



We continually review and adapt our FLE strategies so that we are undertaking more value added FLE tests where we consider we can extend the life of meter assets. Historically, we have tended not to conduct FLE on smaller asset families due to the high cost of testing. If the population of that meter family is small (for example 200 to 300) it was often assumed to be more economical to simply replace the meters rather than conduct testing to extend the asset life.

We have reviewed this position and tested whether changes in testing costs and improvements in data quality mean it may be more economical to conduct FLE on smaller meter families. Net present cost (NPC) analysis indicates it is now economical to replace families containing 100 or more meters.[28] As a result, more meters are having their field lives extended and the volume of replacements has fallen.

For information on how the domestic meter replacement unit rates have changed over the current AA period, refer to Attachment 9.10 Unit Rates Report.

5.2. Meter replacement – Meters > 10m^3 (I&C)

5.2.1. Nature of works and costs

Replacing commercial gas meters involves:

- Procuring new meters as required, including quality control
- Fabrication of site-specific fittings and pipework
- Planning and scheduling of meters to be changed over

[28] Meter families of less than 100 are still replaced rather than having a field life extension.

- Organising resources to carry out the meter change in conjunction with customer requirements/restrictions
- Inspections of assets around the meter for integrity or compliance issues
- Testing meters brought in from the field
- Refurbishing I&C meters as required

This work is low volume and subject to a significant degree of volatility because the scope of work can differ depending on the mix of sizes of the non-domestic meters that need to be replaced.

5.2.2. Historical and forecast I&C meter installation volumes

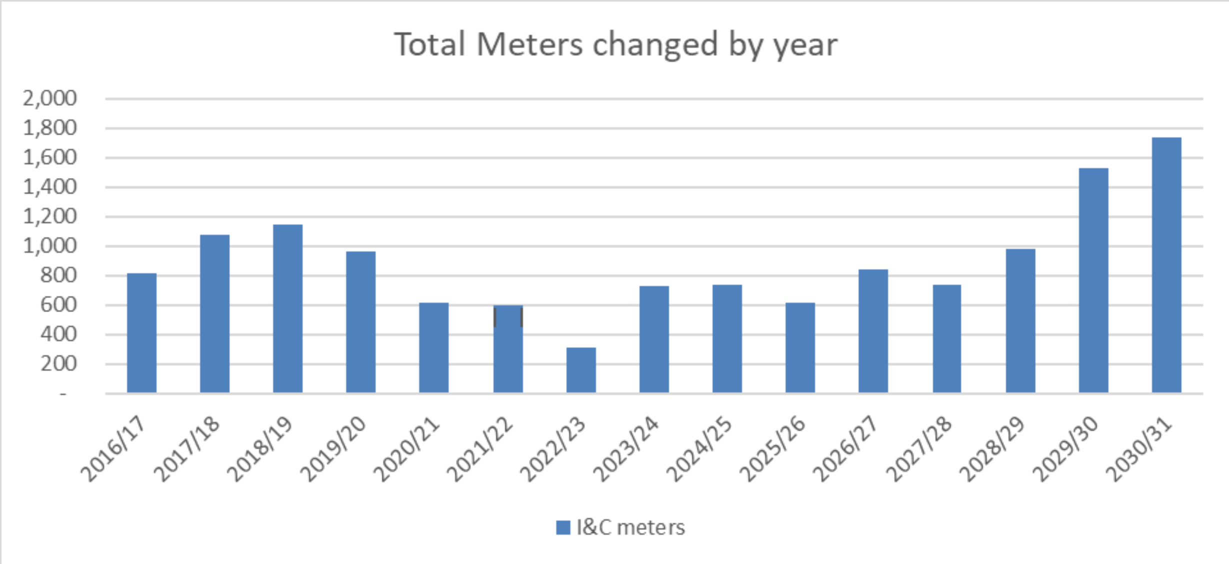
Table 5.2 shows the number of I&C meters replaced during the current AA period, compared with the amount forecast in the AER's determination for the current AA period. It also shows how we are tracking in terms of capex incurred vs the AER determination.

Table 5.2: I&C meter replacement volumes and expenditure ($'000 January 2025)

I&C meters	Year	2021/22	2022/23	2023/24	2024/25	2025/26	Total
Actual	Volumes (no. of meters)	601	312	727	741	620	3,001
	Capex ($'000)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
AER Final Decision	Volumes (no. of meters)	501	617	516	741	620	2,995
	Capex ($'000)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Variance	Volumes (no. of meters)	100	-305	211	0	0	6
	Capex ($'000)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

The replacement volumes for I&C meters are in line with the AER forecast but notably the cost of replacing the I&C meters has been considerably higher than forecast.

Figure 5.2: Historical and forecast I&C replacement volumes



The profile of meter replacement can vary with time depending on the age of the assets, and predominantly aligns to historical peaks and troughs in commercial property construction and economic growth. As with domestic meters, our in-field service testing and asset life extension strategies aim to extend these meter lives where it is prudent to do so.

For information on how the I&C meter replacement unit rates have changed over the current AA period, refer Attachment 9.10 Unit Rates Report.

6. Forecast meter replacement program

This chapter sets out our forecast costs for domestic and I&C PMCs in the South Australian networks over the next AA period.

In developing these forecasts, we have had regard to the regulatory obligations set out in the South Australian Code, AS 4944 and the National Measurement Act. We have also had regard to Rule 79/91 of the NGR, which requires our expenditure to be:

- Such as would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services in a manner consistent with the achievement of the national gas objective; and
- Justifiable on a ground set out in Rule 79(2); and
- Allocated properly between reference services and other services.

The grounds for conforming capex set out in Rule 79(2) are as follows:

- a *the overall economic value of the expenditure is positive, subject to subrule (3); or*
- b *the present value of the expected incremental revenue to be generated as a result of the expenditure exceeds the present value of the capital expenditure; or*
- c *the capital expenditure is necessary:*
  - i *to maintain and improve the safety of services; or*
  - ii *to maintain the integrity of services; or*
  - iii *to comply with a regulatory obligation or requirement; or*
  - iv *to maintain the service provider's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred (as distinct from projected demand that is dependent on an expansion of pipeline capacity); or*
  - v *to contribute to meeting emissions reduction targets through the supply of services; or*
- d *the capital expenditure is an aggregate amount divisible into 2 parts, one referable to incremental services and the other referable to a purpose referred to in paragraph (c), and the former is justifiable under paragraph (b) and the latter under paragraph (c).*

Subrule (3) of Rule 79 states:

In deciding whether the overall economic value of capital expenditure is positive, consider the sum of:

- a *the economic value, other than of changes to Australia's greenhouse gas emissions, directly accruing to the service provider, producers, users and end users; and*
- b *the economic value of changes to Australia's greenhouse gas emissions, whether or not that value accrues (directly or indirectly) to the service provider, producers, users or end users*

.

With regard to metering testing and replacements, capex is generally required to comply with the regulatory obligations under the South Australian Code and AS 4944, therefore capex is typically conforming under Rule 79(2)(c)iii. However, as a prudent asset manager, we consider the ongoing safety and network integrity risks and consider whether capex is conforming from a number of perspectives before committing to capital investment.

We also give regard to Rule 74 of the NGR, which states that any forecast or estimate must be arrived at on a reasonable basis and represent the best forecast or estimate possible in the circumstances.

6.1. Forecasting approach for PMCs

To develop the five-year forecasts for periodic meter changes, we have taken the following steps:

Step 1. **Forecast the number of PMCs for meters with low installed volumes to occur in the next AA period**

Where there is a small volume[29] of a certain meter family installed, it becomes uneconomical to conduct in-service or FLE testing. These low volume meter types (as at Nov 2024) will be replaced with new meters at the end of their field life. Note that we plan to increase standardisation of meter type, which will mean more meter families can be subject to FLE in the future, increasing the asset life and allowing more efficient asset management strategies.

Step 2. **Forecast the number of PMCs for domestic meters to occur in the next AA period**

Based on the age of domestic meters installed as at Nov 2024, we have developed a five-year forecast of:

- The number of domestic meters at the end of their lives and will be required to be removed
- The number of initial in-service compliance tests that will be required
- The number of FLE tests that will be required and forecast the extensions that will flow from this testing
- The number of domestic meters that will fail the FLE testing and require replacement
- The number of defective[30] meters that will need to be replaced on a reactive basis

Step 3. **Forecast the number of PMCs for I&C meters**

Based on the age of I&C meters installed as at Nov 2024, we have developed a five-year forecast of:

- The number of I&C meters at the end of their lives and will be required to be removed
- The number of initial in-service compliance tests that will be required
- The number of FLE tests that will be required and the extensions that will flow from this testing

[29] Low volume is defined as fewer than 100 meters of a particular meter type/family reaching the end of their service period in any one year.

[30] These replacements are usually the result of consumer requests to check correct functioning of their meter. The term defective is used in this context to distinguish these meters from those that are replaced because the meter family is no longer providing an accurate measure of the volume of gas consumed.

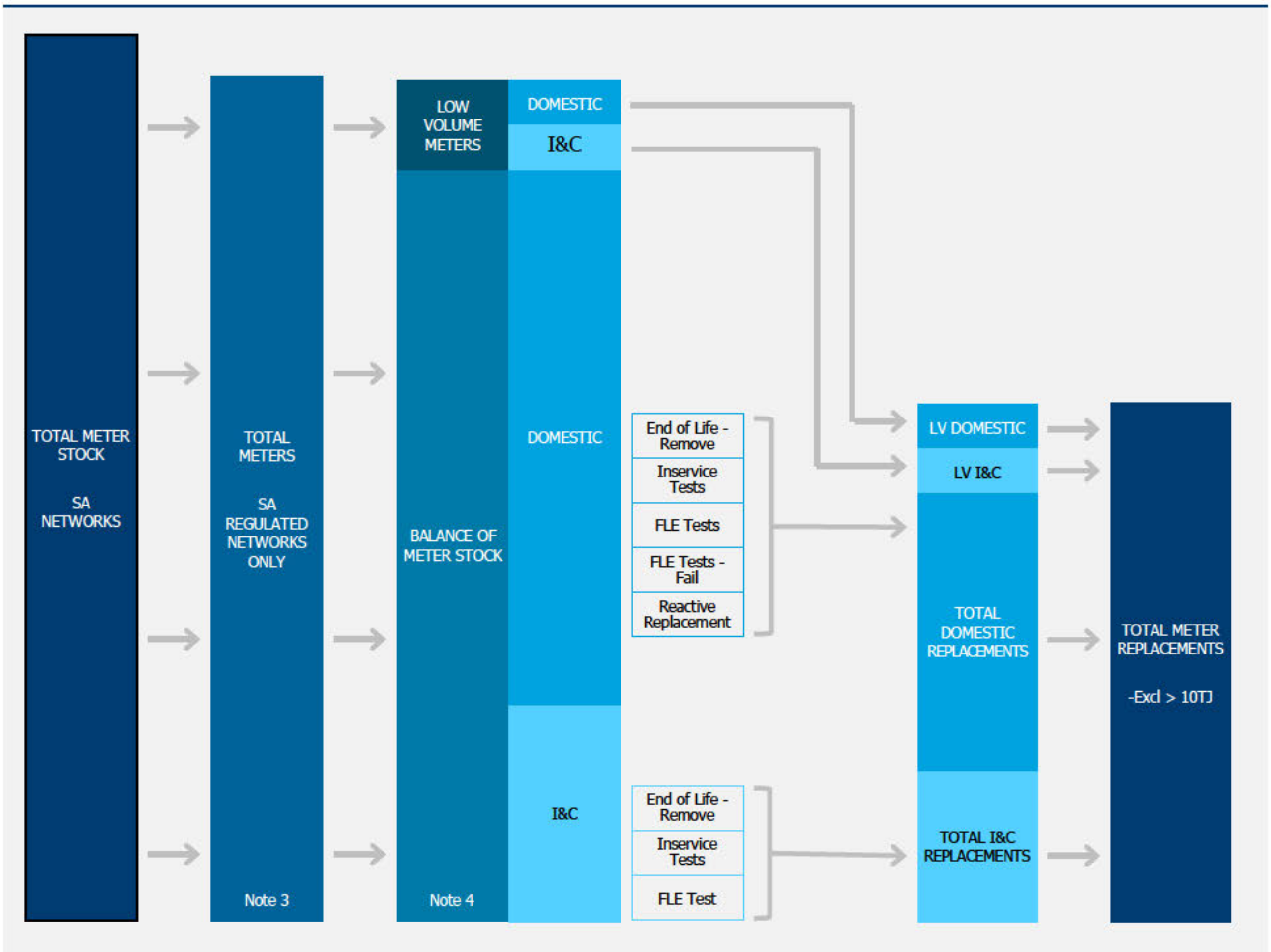
- The number of I&C meters that will fail the FLE testing and require replacement

Step 4. Calculate the forecast cost of the PMC program in the next AA period

Using the meter replacement profiles derived in Steps 1 to 3 and the unit rates set out in the Unit Rates Report (refer Attachment 9.10), we have calculated the forecast cost of the PMC program.

This process is shown diagrammatically in Figure 6.1.

Figure 6.1: PMC forecasting methodology



Notes:

1. Vertical bars are for illustration only – they **do not** represent numbers
2. Meter Replacement Plan numbers exclude > 10 TJ customers
3. SA regulated networks meters = appx 98% of total SA meter numbers
4. Low volume meters to be removed = appx 4.7% of total SA regulated network meters, but 78% of total installed meter types

Each of the steps illustrated in Figure 6.1 are discussed in further detail in the sections that follow.

6.2. Step 1: Forecast PMCs for meters with low installed volumes

As at November 2024, there are a 49 meter types out of a total 85 that have small installed volumes, and which will be required to be replaced in the next five years.

For these low volumes of meter types, it is not economical to undertake FLE testing. We therefore replace these meter types when their field life expires. Table 6.1 shows the number of PMCs required for this category.

Table 6.1: South Australian networks: Low volume meter types replacements

	2026/27	2027/28	2028/29	2029/30	2030/31	Total
Domestic meters to be changed	[redacted]					
I&C meters to be changed	[redacted]					
Total meters to be changed	[redacted]					

6.3. Step 2: Forecast PMCs for domestic meters

6.3.1. End-of-life domestic meters

As at Nov 2024, there are [redacted] domestic meter types that have reached/will reach the end of their field life during the next five years. We propose to replace these meter types when their field life expires with new meters. Table 6.2 shows the number of PMCs required for this category.

Table 6.2: South Australian networks: Domestic end-of-life replacements

	2026/27	2027/28	2028/29	2029/30	2030/31	Total
Number of meters to be changed	[redacted]					

6.3.2. Initial in-service compliance testing

To forecast the number of initial in-service compliance tests required over the next five years, we have assumed:

- The testing is carried out in the third to fifth year the meter type came into service
- In accordance with AS 4944, once a meter type has successfully passed the testing and is assigned an initial in-service life, the total population that can be installed is five times the population initially tested before any further in-service testing is required
- Further in-service compliance testing is carried out in the year prior to when the approved number is forecast to be exceeded

Using these assumptions, as well as information on the age of the meters and the sample size requirements set out in Table 2 of AS 4944,[31] we estimate [redacted] meters will need to be removed from the field during the next five years and be subject to initial in-service compliance testing (see Table 6.3).

[31] Given the potential for meters to be damaged when they are removed or transported to the testing site, or for other factors to prevent testing, we have assumed that an additional 15% of meters from each family will need to be removed from the field for testing.

Table 6.3: South Australian networks: Initial in-service compliance testing (Domestic)

	2026/27	2027/28	2028/29	2029/30	2030/31	Total
Number of meters to be tested	[redacted]		[redacted]	[redacted]		[redacted]

6.3.3. FLE testing

In contrast to initial in-service compliance testing, FLE testing is harder to predict because meters do not deteriorate (fail meter testing) in a standardised and predictable manner. Some assumptions must therefore be made about when the FLE tests will be required.

For meters that have not previously been subject to any form of in-service testing (i.e. initial in-service compliance or FLE testing), we assume the following:

- The initial service life of newly manufactured meters is 18 years[32] and meter accuracy is maintained with an FLE test at the commencement of year 18, and results in a five-year extension with the meter family being removed at the end of year 23

We use these assumptions, as well as information on:

- The age of the assets that are stock as at Nov 2024
- The results of previous initial in-service compliance and FLE testing
- The sample size requirements set out in Table 2 of AS 4944

We estimate [redacted] meters from these meter families will need to be removed from the field and subject to FLE testing in the next five years (see Table 6.4).

Table 6.4: South Australian networks: Domestic FLE testing

	2026/27	2027/28	2028/29	2029/30	2030/31	Total
Number of meters to be tested	[redacted]					
Number of families	3	3	3	2	4	**15**

6.3.4. Meters forecast to fail the FLE test

The number of meters that will need to be replaced in a particular year will depend on the results of the previous year's FLE testing. Meters that fail this testing will be removed from service in the following year.

To estimate the number of meters that will fail the FLE in the next five years, we make an assumption based on whether the meter family has previously been subject to an FLE test, and previous history with other meter families of the same meter type. For meters that have not previously been subject to any form of in-service testing, we assumed that newly manufactured meters have a 23-year life (i.e. an initial service life of 18 years plus one FLE extension totalling five years).

For meters previously subject to initial in-service compliance and/or FLE testing, the life of the meters will be informed by the results of the last tests that were conducted.

32 The only new meters that have been purchased for a number of years now are AMPY 750 and Atlas U8 meters. Early in-service compliance testing has confirmed a consistent 18 year initial life for these meter types, so this is the assumption used in the forecasts

Using these assumptions, as well as information on the age of the assets in stock as at Nov 2024 and prior test results, we estimate [redacted] meters will need to be removed from the field during the next five years because they fail the FLE testing (see Table 6.5).

Table 6.5: South Australian networks: Domestic meters replaced due to failure of FLE testing

	2026/27	2027/28	2028/29	2029/30	2030/31	Total
Meters to be replaced	[redacted]					

6.3.5. Reactive replacements of defective meters

In addition to having to replace meter families that no longer satisfy the prescribed tolerance band for metering accuracy, there are occasions where individual meters become defective and require replacement. This is referred to as reactive replacement.

Over the last 7 years around 1,300 meters per annum have had to be replaced on this basis.

Table 6.6: South Australian networks: Reactive replacements

	2026/27	2027/28	2028/29	2029/30	2030/31	Total
Meters to be replaced	[redacted]					

6.3.6. Summary of forecast PMCs for domestic meters

The total number of PMCs for domestic meters that are forecast to be required in the next five years in the South Australian networks are set out in Table 6.7.

Table 6.7: South Australian Networks: PMC forecast for domestic meters

	2026/27	2027/28	2028/29	2029/30	2030/31	Total
Low volume meter families	[redacted]					
End-of-life meters	[redacted]					
Initial in-service testing	[redacted]					
FLE testing	[redacted]					
Meters requiring replacement after failing FLE testing	[redacted]					
Reactive replacements of defective meters	[redacted]					
Total	[redacted]					

6.3.6.1. Continuous improvement

The number of domestic PMCs forecast to occur over the next five years is approximately 17% lower than the number we expect to conduct in the current AA period. This reduction can be attributed to the following:

- The use of 18-year life domestic meters over the last decade, which has resulted in a trough in the meter replacement cycle because the shorter life meters are replaced and longer life meters have yet to come up to their replacement dates
- Analysis undertaken on the FLE process to verify the historical practice of selecting meters for FLE testing based on an anecdotal lower limit of meter family size. This has resulted in a smaller meter family size being economic to FLE test (<100), and thus a greater number of meter families being planned for FLE testing than previously. Historical practice would be to replace the family rather than FLE test. Our revised approach therefore significantly reduces the number of changeovers required
- A generally younger age of the whole meter population, with the average age of domestic meters being 8.9 years and I&C meters being 9.7 years

The volume of PMCs is forecast to rise again after the next AA period due to large numbers of meters with 10-year lives reaching their replacement date, and which won't undergo FLE tests. These will be replaced with 18-year life meters (the same meter types as in Section 6.3.1).

6.4. Step 3: Forecast PMCs for I&C meters

To forecast the number of PMCs that will be required in the next five years for I&C meters consideration must be given to:

- The number of meters which are at the end of their lives and will required to be removed
- The number of initial in-service compliance tests
- The number of FLE tests and the resulting field life extensions
- The number of meters in families that, while of the type that would normally be FLE tested, are not present in great enough number to justify FLE testing

6.4.1. End-of life I&C meters

As at Nov 2024 there are [redacted] I&C meter types that have reached/will reach the end of their field life during the next five years. We therefore propose to replace these meter types when their field life expires with new, more reliable, longer life (15 or 18 years) meters. Table 6.8 shows the number of PMCs required for this category.

Table 6.8: South Australian networks: I&C end-of-life replacements

	2026/27	2027/28	2028/29	2029/30	2030/31	Total
Number of meters to be changed	[redacted]					

6.4.2. Initial in-service compliance testing

To forecast the number of initial in-service compliance tests required over the next five years, we have assumed the testing is carried out in the third to fifth year the meter population came into service. Using these assumptions, as well as information on the age of the meters and the sample size requirements set out in Table 2 of AS 4944,[33] we estimate [redacted] meters will need to be removed

[33] Given the potential for meters to be damaged when they are removed or transported to the testing site, or for other factors to prevent testing, we have assumed that an additional 15% of meters from each family will need to be removed from the field for testing.

from the field during the next five years and subject to initial in-service compliance testing (see Table 6.9).

Table 6.9: South Australian networks: Initial in-service compliance testing – I&C meters

	2026/27	2027/28	2028/29	2029/30	2030/31	Total
Number of meters to be tested	[redacted]					

6.4.3. FLE testing

I&C meters less than 10m³/hr typically undergo FLE testing, but those above this capacity do not.[34] Similar to domestic meter FLE testing, some assumptions must be made about when the FLE tests will be required. For those meters that have not previously been subject to any form of in-service testing (i.e. Initial In-Service Compliance or FLE testing).

We assume the initial service life of newly manufactured meters is either ten years or 18 years and an FLE test is conducted at the commencement of year ten or 18 and result in a five year extension with the meter family being removed at the end of year 15 or 23.

Using these assumptions, as well as information on the age of the assets as at Nov 2024, the results of previous initial in-service compliance and FLE testing and the sample size requirements set out in Table 2 of AS 4944, we estimate [redacted] meters will need to be removed from the field and subject to FLE testing in the next five years (see Table 6.10).

Table 6.10: South Australian Networks: I&C meter FLE testing

	2026/27	2027/28	2028/29	2029/30	2030/31	Total
Number of meters to be tested	[redacted]					
Number of families	4	4	4	4	4	**20**

6.4.4. Summary of forecast PMCs for I&C meters

The total number of PMCs for I&C meters that are forecast to be required in the next five years in the South Australian networks are set out in Table 6.11.

Table 6.11: South Australian Networks: PMC forecast for I&C meters

	2026/27	2027/28	2028/29	2029/30	2030/31	Total
Low volume meter families	[redacted]					
End of life meters	[redacted]					
Initial in-service testing	[redacted]					
FLE testing	[redacted]					
Total	[redacted]					

[34] Except in some selected circumstances where it is reasonable to do so

6.5. Summary PMC forecast

Table 6.12 provides a summary of the total PMC profile (domestic and commercial) we intend to deliver over next AA period.

Table 6.12: South Australian networks – PMC forecast volumes

	2026/27	2027/28	2028/29	2029/30	2030/31	Total
Predicted number of domestic PMCs	[redacted]					
Predicted number of I&C PMCs	[redacted]					
Total number of PMCs	[redacted]					

6.6. Step 4: Calculate the forecast cost of the PMC program

The forecast cost of the PMC program has been calculated by multiplying the forecast number of PMCs by the unit rates set out in the Unit Rates Report (refer Attachment 9.10). In the Unit Rates Report, separate unit rates have been calculated for:

- Domestic meters – the unit rate in this case is [redacted] ($2024/25) per meter
- I&C meters – the unit rate in this case is $[redacted] ($2024/25) per meter

The unit rates in both cases reflects the costs of:

- Procuring new meters
- Planning and scheduling the meters to be changed over and organising the resources (combination of direct and contractor) to carry out the meter change
- Installing the meters
- Carrying out the testing required by AS 4944 and the South Australian Code

Further detail on these unit rates can be found in the Unit Rates Report.

Table 6.13 sets out the forecast cost of the PMC program in the networks.

Table 6.13: South Australian networks – Forecast PMCs in the next AA period

	2026/27	2027/28	2028/29	2029/30	2030/31	Total
Domestic meters						
Number of PMCs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Unit rate ($/meter)			[redacted]			[redacted]
Forecast cost ($'000)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
I&C meters						
Number of PMCs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Unit rate ($/meter)			[redacted]			[redacted]
Forecast cost ($'000)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total program						
Total PMCs (volume)	24,995	20,228	18,515	23,562	25,881	**113,181**
Total all meters ($'000)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Note: Some totals may not add due to rounding

6.7. Remote digital meter reading

As discussed in section 2.4, AGN has an obligation to send timely and accurate meter data to gas retailers. To ensure customers' gas bills are accurate, we must provide actual (not estimated) meter readings at least once every 12 months.

Most meters installed in our network are diaphragm (analogue) meters that must be physically read by meter reading personnel. Unfortunately, not all meters can be accessed easily.

In some cases, accessing customer's property may pose health and safety risks to our meter readers, such as dangerous dogs. At other properties the meter simply is not accessible, for example a gate or barrier may have been installed blocking access to the meter, or the meter is located in a heritage building and cannot be accessed and/or relocated. We are also seeing an increasing propensity for apartments and high-rise developments with more limited capability for easy-to-read meter locations, as well as smaller sized residential blocks which is putting pressure on ease of access for meter reading.

Where a meter cannot be physically read, it is an industry requirement to issue an estimate in the absence of a physical reading. While estimates are permissible, they may result in inaccurate measurement and in turn, inaccurate billing. Billing inaccuracy can result in significant volatility in costs, price shock, and customer dissatisfaction. Being unable to provide actual meter data at least once every 12 months may also cause meter data to be unvalidated, which means we are not fulfilling our obligations under the Gas Metering Code.

Current data shows there are around 5,800 customers on our network that have not had a physical meter read for more than 12 months. In some cases these customers' meters have not been read for many years. Historically, the safety and health risk posed by inaccessible/dangerous meter locations has been managed by simply not requiring our staff to attend the site and place themselves in harm's way. While this manages the safety risk, it does little to address the reputational and compliance risks posed by estimated reads. This reputational/compliance risk has been tolerable to date simply because there were no practicable (affordable) alternatives to estimated reads. However, developments in metering technology means there are now practicable options to allow inaccessible meters to be read accurately, while mitigating the safety risks. The reputational/compliance risk is therefore no longer ALARP.

Digital metering has become a viable alternative to manual reads. Digital meters can be installed at a customer's premises at relatively low cost and can be read remotely via a communications network, or via a vendor head end system. This eliminates the need for meter readers to attend the site and enables accurate billing information to be provided to retailers as required.

In addition to meeting regulatory obligations for actual meter reads, digital meters can offer additional benefits including improved customer service offerings via:

- Monthly meter reads for customers to manage cash-flow and bill shock expectations
- Improved capability and timeliness to transfer to different retailer resulting in enhanced retailer competitive tension – noting current South Australian customer transfer rate is 13% (or 1 in 8 customers during 2024)
- Greater accuracy of bills through the incorporation of pressure and temperature measurement at site
- Enhanced safety aspects through automatic meter shut-off in the case of a downstream rupture or fire, in addition to meter tampering and reverse flow alerts
- Improved customer data to enable customers to understand their energy consumption and better manage their costs

Digital meters also offer benefits to our business, including:

- Digital meters have no moving parts and experience less degradation caused by weather / temperature conditions than diaphragm meters, which means they may have longer useful lives
- A better understanding of gas to customers by time of use, that can be factored into improved meter offerings to business customers and domestic customers with higher than average consumption requirements
- The provision of time of use and fringe point data enabling enhanced supply pressure management application

Internationally, the impetus of growth in digital metering in gaining momentum with a global smart meter value increasing from USD 3.2B in 2023 to USD 7.3B in 2024. Further, the projected to have a compound annual growth rate (CAGR) in 2023 was estimated to grow at a rate of 6.9% from 2024 – 2030, but this has been revised in 2024 with the CAGR now estimated to grow at a rate of 17.3% from 2025 to 2034. This is being driven by the increasing demand for energy-efficient solutions and growing adoption of advanced metering infrastructure by utilities globally. Essentially, this means that digital metering has moved past the early adopter stage and is on the escalation path for global implementation.

We recognise that electricity has been the forerunner in the development of smart / digital metering. This has afforded the gas industry the benefits of being able to trial a mature product and service offering to ensure digital meter roll out is undertaken in the most prudent and cost-efficient manner.

6.7.1. Proposed solution

Inaccessible meters

During the next AA period we propose to install digital meters at the [redacted] sites identified as inaccessible or difficult/dangerous to access. The meters can be installed at a customer's premises at a relatively low cost. The technology we are looking at uses existing cellular 4G/5G networks, with a service provider delivering the data that is ingested into AGN's existing meter data system.

This solution will allow multiple remote reads to be conducted each year and ensure we can provide actual meter data to retailers to allow accurate customer billing. It will also enable us to meet our compliance requirements and eliminate some costs associated with special meter reads.

Note this is a proactive replacement program, which means some of these 5,800 sites will be replaced ahead of their scheduled PMC. The recurring PMC program will be adjusted to reflect this new meter family going forwards.

We considered the option of only replacing these meters upon their scheduled PMC, however, adopting such a piecemeal approach would limit our ability to achieve efficiencies through delivering the works as a scheduled program and purchasing meters in bulk. More importantly, a piecemeal approach would significantly extend the timeframe for addressing this non-compliance issue, resulting in customers receiving estimated reads for several years to come.

This proposed program will be delivered in full during the first three years of the next AA period and recovered via regulated tariffs. We consider this expenditure is justifiable under NGR 79 as it is necessary to enable us to maintain/improve the safety of services and meet our compliance obligations.

6.7.2. Forecast capex – inaccessible meters

Table 6.14 shows the capital cost estimate for installing [redacted] digital meters at currently inaccessible sites.

Table 6.14: Capex estimate – Digital metering at inaccessible sites, $'000 January 2025

	2026/27	2027/28	2028/29	2029/30	2030/31	Total
No. of meters installed at inaccessible sites	[redacted]					
Unit cost of installation ($/000)	[redacted]	[redacted]	[redacted]			
Meter purchase and install ($'000)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total capex ($'000)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

This capex estimate is based on hardware and installation costs provided by the meter vendor. Note installation costs for inaccessible meters are assumed to be higher than those for standard (accessible) sites or new installations, due to the need for specific appointment times and the potential for multiple site visits.

6.8. Digital meters for I&C Customers – an asset management opportunity

Customers are looking for ways to manage their gas usage and reduce their bills. A digital metering solution can offer customers more control and transparency over their bills, and we believe would be consistent with their technology expectations. However, we are conscious the solution we offer must be delivered at the lowest practicably sustainable cost and offer benefits and/or cost savings to customers. We are currently deploying a production trial of digital meters in Victoria and gaining insights from the technology and capacity to collect daily index details for customers.

We aim to apply the insights from the Victorian trial in South Australia via deployment of I&C digital meters to a tranche of customers whose I&C meters will reach end of life in the next AA. This tranche of approximately 2,500 customers currently have AL-425 diaphragm gas meters. The unit cost difference of replacing these particular meters with digital equivalents is negligible, therefore it makes sense to replace this outdated analogue technology with modern digital meters.

The deployment of digital meters to these customers will give us opportunity to explore the benefits of the time of use data (i.e. hourly consumption). It will also provide opportunity to capture direct customer feedback though engagement with these I&C customers, and test value-adding services such as providing regular or real time gas consumption data to customers.

Installation of digital meters will require a relatively small one-off investment in our meter data management system (approximately $1 million) to ensure our IT systems can support the increase in data volumes. This is included in our IT operational apps forecast. Notwithstanding this minor IT cost, the end-of-life replacement of AL-425 diaphragm meters presents an inexpensive and prudent opportunity to introduce digital metering technology to our network.

Forecast capex – digital metering for I&C customers

Table 6.15 shows the forecast incremental capital costs of installing I&C digital meters for the proposed tranche of I&C customers.

Table 6.15: Capex estimate – Digital metering for I&C Customers, $'000 January 2025

	2026/27	2027/28	2028/29	2029/30	2030/31	Total
No. of meters installed at I&C sites	[redacted]					
Unit cost of installation ($,000)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Forecast total cost of all installations ($,000)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Incremental costs to purchase and install digital meters ($,000)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total incremental capex ($,000)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

For the purposes of clarity, all AL-425 meters as part of the digital metering strategy will be exchanged at the end of their working life. The EOL replacement will be completed at no incremental capital cost compared to the standard I&C unit rate.

6.8.1. Operating costs associated with digital meters

There are ongoing operating costs for data collection and processing, which is charged by the digital solution service provided at [redacted] per meter. However, these costs will be mitigated by annual savings in physical meter read costs, which will reduce the overall forecast opex requirement.

Table 6.16 shows the forecast operating costs associated with the digital meters installed in our network over the next AA period, including offsets.

Table 6.16: Forecast opex - remote metering solution, $'000 January 2025

	2026/27	2027/28	2028/29	2029/30	2030/31	Total
Number of digital meters installed	[redacted]					
Digital meter hosted service charge ($,000)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Meter read savings ($,000)*	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total opex	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

* Based on 4 meter reads pa per customer, and one special read pa for inaccessible sites.

Costs are based on quotations for the digital meters and service charges. The rates include supply of the digital meters, service charges for IT hosting and commissioning. The meters will be installed using the current capex program for the hard to access sites, incorporating the additional costs for coordinating access to these sites.

I&C digital meters incorporate the incremental cost of digital meters comparative to the current diaphragm meters.

6.9. Consistency of Forecast with the National Gas Rules

Consistent with the requirements of rule 79(1)(a) of the NGR, AGN considers the forecast capex for this project to be:

- *Prudent* – The expenditure is necessary to maintain the accuracy of meters and the integrity of metering services, and is of a nature that a prudent service provider that is subject to the regulatory obligations set out in the South Australian Code, the National Measurement Act and AS 4944, would incur.
- *Efficient* – The manner in which we intend to carry out the replacement program can also be considered efficient, because it will be carried out:
  - By meter testers, manufacturers and gas fitters that have all been selected through competitive tender processes
  - On a continuous basis over the five-year period, which will enable us to:
    - Reduce the field risks to as low as reasonably practicable, because it will allow retention of, and investment in, trained contractors
    - Minimise the non-compliance risks
- *Consistent with accepted good industry practice* – complying with the regulatory obligations set out in the South Australian Code, the National Measurement Act and AS 4944 is consistent with accepted good industry practice. Assumptions used as part of the analysis regarding volumes of replacements are in line with good industry practice
- *Achieves the lowest sustainable cost of delivering pipeline services* – carrying out the replacement program by procuring meters in line with our procurement policy and subsequently carrying out FLE testing on all meter family sizes above the minimum economic size represents the most cost effective option and will contribute to the attainment of the lowest sustainable cost of delivering pipeline services over the next five years. It should be noted that were FLE testing not to be carried out, and the meters just replaced, expenditure would increase by more than $13 million over the term of the access arrangement period

- *Is consistent with feedback received from customers and stakeholders* – Customers consider the safe operation of our networks to be of highest importance and value a reliable natural gas supply and accurate billing

The capex can therefore be viewed as being consistent with rule 79(1)(a) of the NGR.

The proposed capex is also consistent with rule 79(1)(b), because it is necessary to:

- *Maintain the integrity of services (rule 79(2)(c)(ii))* – carrying out the testing and meter replacements proposed in this Plan will enable us to maintain the integrity of the metering services, which is, as noted above, critical to:
  - Ensuring the accuracy of the measurement of our customers' gas usage falls within the prescribed tolerance band of +2% to -2%
  - Minimising the volume of unaccounted for gas at larger consuming sites
  - Ensure customer bills accurately reflect their usage
- *comply with a regulatory obligation (rule 79(2)(c)(iii))* – carrying out the testing and meter replacements proposed in this Plan will ensure that we comply with the regulatory obligations prescribed in:
  - The National Measurement Act 1960
  - The South Australian Code
  - AS 4944

As noted above, if we fail to comply with the obligations set out in these instruments it can constitute a breach of our license, result in penalties and a range of other compliance related actions.

Consistent with the requirements of Rule 74 of the NGR, We consider the forecasts and estimates have been arrived at on a reasonable basis by following realistic assumptions of volumes that are in line with good asset management practices and industry standards, along with market tested rates and project optimisations, which have been outlined in the Plan. The program outlined in the Meter Replacement Plan therefore represents the best forecast or estimate possible in the circumstances.