

Multinet Gas Asset Management CY2017 - CY2022



PUBLIC VERSION

Issued 19/12/2016

Document. No. MG-SP-0007

Version 2.0

Owner *Multinet Gas*

Gas Network – Asset Management

Small Meter Strategy

CY2017 – CY2022

Document No. MG-SP-0007

Preparation Record

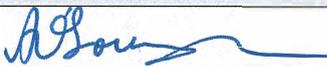
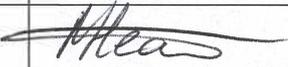
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|-------------------------|-------------|
| Issue: | Version 2.0 |
| Operative Date: | 19/12/2016 |
| Document Number: | MG-SP-0007 |

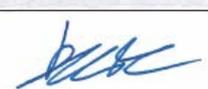
Amendment Record

| Version | Date | Amended by | Description of Change |
|---------|------------|-----------------------------|-------------------------------|
| 1.0 | 07/06/2016 | Mark Beech | Previously approved version. |
| 1.1 | 19/08/2016 | Nathan Hearn & Anna D'Souza | Revised with new MG template |
| 1.2 | 21/11/2016 | Daryl Lee | Revise content for reissue |
| 1.3 | 18/12/2016 | Mark Cooper | Final review |
| 2.0 | 19/12/2016 | Mark Cooper | Final Version - Issue for use |

Originated By

| Title | Name | Signature | Date |
|-----------------------|--------------|--|------------|
| Gas Metering Engineer | Anna D'Souza |  | 19/12/2016 |
| Gas Metering Engineer | Nathan Hearn |  | 19/12/2016 |

Reviewed & Approved By

| | Title | Name | Signature | Date |
|-----------------|--|--|--|------------|
| Reviewer | Asset Performance Engineer | Daryl Lee |  | 19/12/2016 |
| Reviewer | Gas Asset Manager | Mark Cooper |  | 19/12/2016 |
| Endorsed | Head of Gas Network Strategy and Performance | Troy Praag |  | 19/12/2016 |
| Approved | General Manager – Gas Networks |  Mark Beech |  | 19/12/2016 |

Executive Summary

This document outlines the replacement strategy for Small Gas Meters on the Multinet Gas network. A “small” gas meter is defined as those with a capacity less than 10 Sm³/hr – approximately 96.6% of Multinet’s 690,000+ installed meters.

Multinet is required by the Gas Distribution System Code to provide an appropriate metering installation at each supply point (i.e. connection) off the network. Multinet is required to periodically maintain these installations, replace meters when their field life has expired and provide periodic metering information to retailers for billing purposes.

To fulfil its obligations, Multinet completes the following annual programs:

- Time Expired meter replacement - replacement of meters at end of compliance periods;
- Field Life Extension Testing – testing of qualifying meters nearing the end of their compliance periods;
- Meter Faults – replacement of meters that fail in service; and
- Replacement of Hand Held meter reading devices.

In addition, Multinet Gas is to undertake (subject to AER approval) a Digital Gas Metering Pilot Study to understand the benefits of digital metering and the costs and benefits of a mass rollout of digital meters in the future.

Table 0-1 provides the financial summary of the capital expenditure which is expected to be incurred in the calendar year period 2017 to 2022. Table 0-1 includes a breakdown of direct, overheads and real cost escalators for the purpose of reconciliation with that of the overview documentations which support our forthcoming Access Arrangement submission.

Table 0-1: Summary of Capital Expenditure (\$'000)

| Program | CY2017 | CY2018 | CY2019 | CY2020 | CY2021 | CY2022 |
|---|--------------|----------------|----------------|----------------|----------------|--------------|
| Time Expired Meter Replacement | \$138 | \$2,363 | \$86 | \$1,355 | \$526 | \$416 |
| Field Life Extension | \$14 | \$25 | \$58 | \$47 | \$53 | \$64 |
| Defective / Faulty Meters | \$102 | \$103 | \$103 | \$104 | \$105 | \$105 |
| Hand Held Meter Reading Devices | \$70 | \$70 | \$70 | \$70 | \$70 | \$70 |
| Digital Metering Program – Incremental Network Costs Only | \$250 | \$623 | \$623 | \$623 | \$208 | - |
| Total Direct Expenditure excluding real escalation | \$575 | \$3,184 | \$939 | \$2,198 | \$962 | \$655 |
| Overhead | \$34 | \$191 | \$56 | \$132 | \$58 | \$39 |
| Total Expenditure excluding escalation | \$609 | \$3,375 | \$996 | \$2,330 | \$1,020 | \$694 |
| Real cost escalation | - | \$20 | \$5 | \$17 | \$11 | \$9 |
| Total Expenditure | \$609 | \$3,395 | \$1,001 | \$2,348 | \$1,031 | \$703 |

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1. Document Overview

1.1. Purpose

This document articulates Multinet Gas approach to the lifecycle management of its existing Small Gas Meter assets. Small Meters are defined as having capacity less than 10 Sm³/hr.

It has the following objectives:

- Articulate the key areas of focus in relation to asset management, risk, investment, cost and service standard outcomes for the “Small Meter” asset group;
- Minimise the cost of meters to the end use customer by repairing and / or purchasing new meters in line with regulatory, safety and reliability requirements; and
- Show alignment of asset management practices with Gas Network Objectives.

The document is intended for use by:

- Multinet Gas staff (and it’s contractors); and
- Regulators – Technical, Safety and Economic.

1.2. Scope

This strategy applies to small consumer meters located throughout the Multinet Gas’ distribution network and includes all meters with a capacity less than 10 Sm³/h of Natural Gas.

The strategy covers the management of the existing metering fleet, including:

- Strategies to maintain regulatory compliance and consumer safety of existing metering assets;
- Forecasts of meter replacements, meter faults and sampling programs; and
- A Digital Gas Meter Pilot program.

The strategy does not cover:

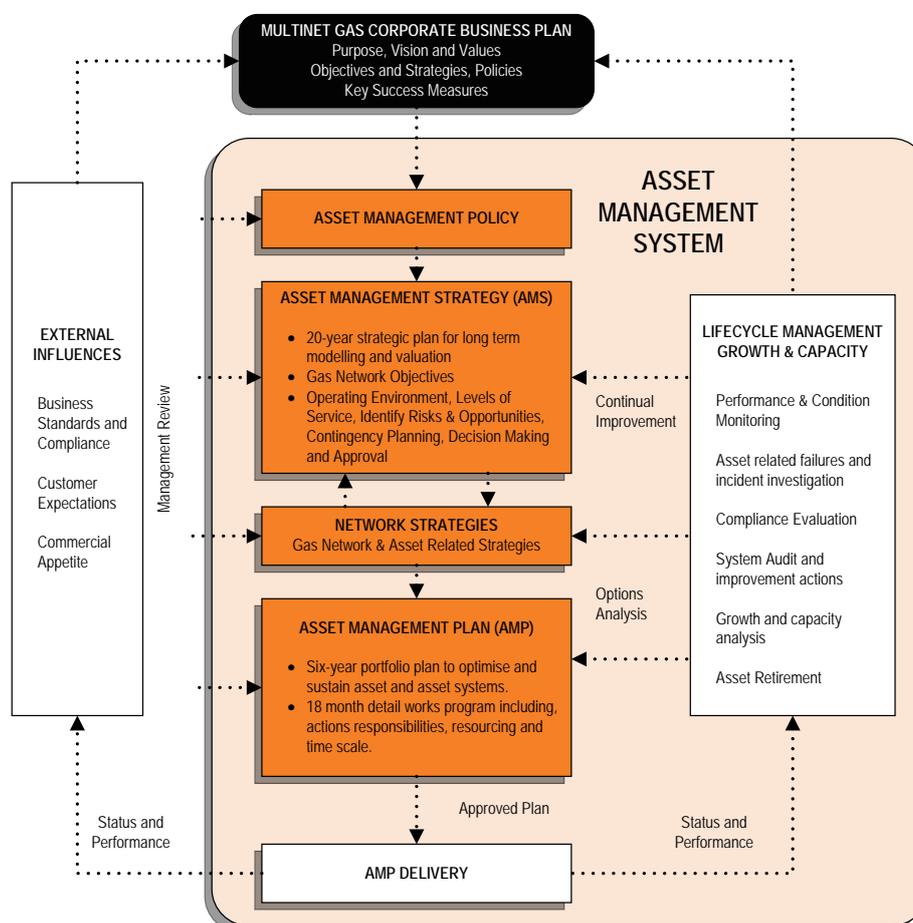
- The forecast for new meter connections (i.e. network growth)¹;
- Program specific processes and procedures;
- Market operations (i.e. meter reading operations); and
- Meters with capacity greater than 10 Sm³/h. Refer to Multinet’s Large Meter Strategy (MG-SP-0008).

1.3. Relationship With Other Key Asset Management Documents

The Small Meter Strategy is one of a number of key asset management documents developed and published by Multinet Gas in relation to its gas network. As indicated in Figure 1-1, Detailed Network Strategies - including the Small Meter Strategy - informs both the Asset Management Strategy (AMS) and Asset Management Plan (AMP) of the programs needed to achieve the long-term objectives of the gas distribution network.

¹ Refer to Multinet Gas’ Capital Growth Plan (MG-PL-0002) for more information on meter purchases for new connections.

Figure 1-1: Asset Management Framework



1.4. Phasing and Financial Disclosure

All program defined within this strategy are presented in calendar years consistent with the reporting requirements of the Australian Energy Regulator (AER) and where applicable the Gas Distribution System Code (Version 11).

Where required for conversion to financial year (July to June), dollars and volumes can be estimated using a 50:50 expenditure split.

All financial figures quoted within this document - unless otherwise specifically stated - have the following characteristics:

- Real Expenditure / Cost (reference year = 2017);
- Direct Expenditure only (i.e. excludes overheads and finance costs);
- In units of \$1,000 (i.e. '000);
- All years are denoted in Calendar Year format.

Total values shown in tables and referred to in the text of this document may not reconcile due to rounding.

Conversion factors used in the escalation of historic expenditure to real 2017 equivalent expenditure is provided in Table 1-1. Cumulative conversion factors have been provided by Multinet Gas' Regulatory department.

Table 1-1: CPI Conversion Factors

| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|--------------------|---------|---------|---------|---------|---------|---------|
| CPI Index - \$2017 | 1.09619 | 1.07465 | 1.05192 | 1.02819 | 1.01296 | 1.00000 |

1.5. Data Sources

The following data sources have been drawn on to develop the Small Meter Strategy:

- **SAP** - the Multinet Gas primary asset management database used to store all metering related data;
- **Tableau** - uses an extract (duplicate) of the SAP database so reporting can be performed in real time without diminishing the available bandwidth of SAP for business as usual processes.

1.6. References

- Gas Safety Case;
- Gas Distribution System Code Ver. 11.0;
- Retail Market Procedures (Victoria);
- National Gas Rules: Part 19 - Declared Wholesale Gas Market Rules;
- AS/NZS 4944:2006 Gas meters – In-service compliance testing; and
- Large Meter Strategy (MG-SP-0008).

1.7. Document Review

This document shall be reviewed every two (2) years or earlier if required. The next review is due on or before 31 December 2018.

2. Asset Overview

2.1. Introduction

Multinet Gas defines “Small” gas meters as those with a capacity of less than 10 Sm³/hr of Natural Gas.

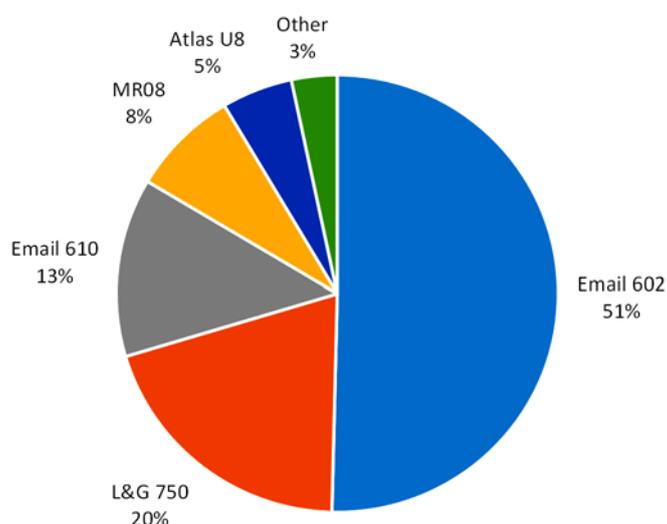
As of August 2016 Multinet had over 690,000 installed meters of which 96.6% were standard small consumer meters with a maximum capacity of 10 m³/hr. Small meters are of diaphragm type construction² with an expected technical life of approximately 20 to 25 years.

Multinet’s small meter fleet includes twelve (12) different meter types at different levels of repair. The Email 602 meter is the most common (51% of the fleet) followed by the L&G 750 (20%) and Email 610 (13%). A summarised breakdown of Multinet’s small meter fleet is provided in Figure 2-2, with addition detail in the Appendix (Section 5.2).

Figure 2-1: Email 602 (left) and L&G 750 Gas Meters



Figure 2-2: Breakdown of Small Meter Types (August 2016)



² Refer to Appendix (Section 5.3, p.37) for a summary of meter technology.

The number of new small meters purchased each year is dependent on network growth, yearly repairable meter quantities and the accuracy criteria specified in AS/NZS 4944:2006 when undertaking annual sample testing of meter families.

2.2. Asset Age Profile

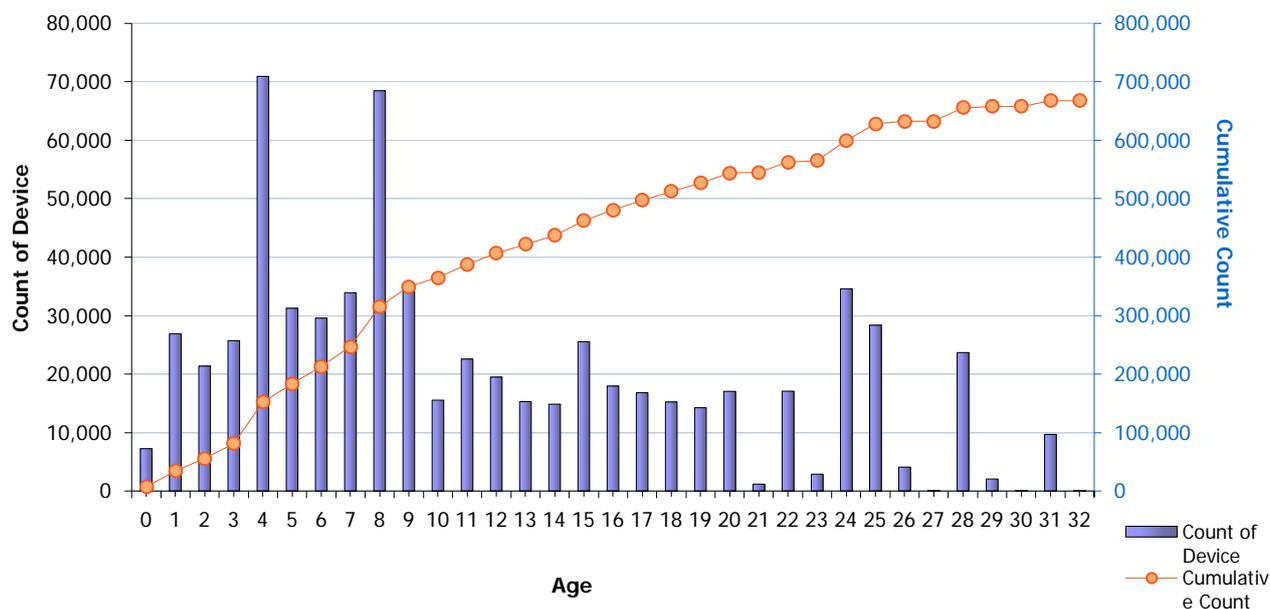
The average age of Multinet’s small meter fleet is 9 years³.

The life cycle for small meter families ranges between 15 and 25 years. The field life of each meter is dependent on:

- Environmental factors;
- Gas quality;
- Usage (i.e. gas through put); and
- Initial material construction.

The age profile of Multinet’s small meter population is depicted Figure 2-3. It illustrates the age of meter families since last installation with respect to population size. A meter family that was installed new 30 years ago and refurbished at 15 years would show on this chart as being 15 years old.

Figure 2-3: Age Profile for Small Meters



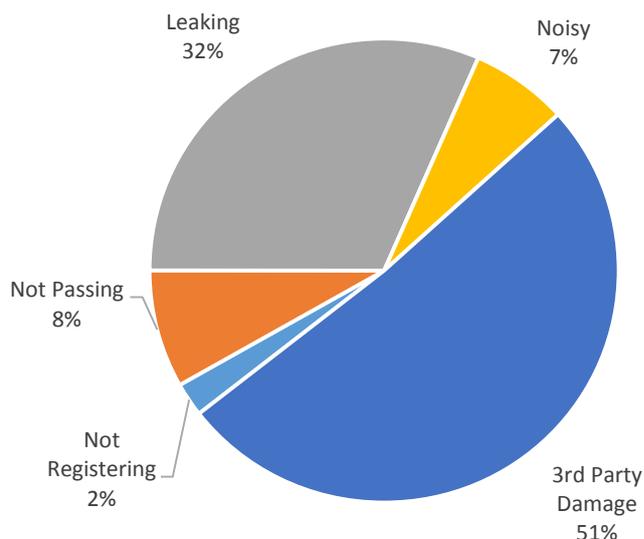
The small meter age profile at replacement generally ranges between 15 years and 31 years in the field. 30% of the total population of small meters are between 15 and 31 years old and are a mixture of mainly aluminium and tin case construction. 70% of small meters range between 0 and 15 years.

³ As of November 2016.

2.3. Asset Performance

As a whole, Multinet's metering population is considered reliable with stable failure rates of close to 0.32%⁴ of the metering population each year. Third party damage accounts for approximately half (51%) of defective meter replacements, followed by leaking meters (32%) Refer Figure 2-4.

Figure 2-4: Small Meter Failure Modes (November 2016)



Meter failure rates (from FY2014 to FY2016) are summarised in Table 2-1. The volume of meter failures as a percentage of the meter fleet has been relatively flat over the period, averaging 0.32% of the small meter fleet or 2,153 per year.

Table 2-1: Small Meter Fault History

| | FY2014 | FY2015 | FY2016 | Average |
|---------------------------------|---------|---------|---------|--------------|
| Small Meter Failures | 2,055 | 2,085 | 2,318 | 2,153 |
| Total Small Meters – MG Network | 660,373 | 662,588 | 667,753 | - |
| Percentage of Failures. | 0.31% | 0.31% | 0.35% | 0.32% |

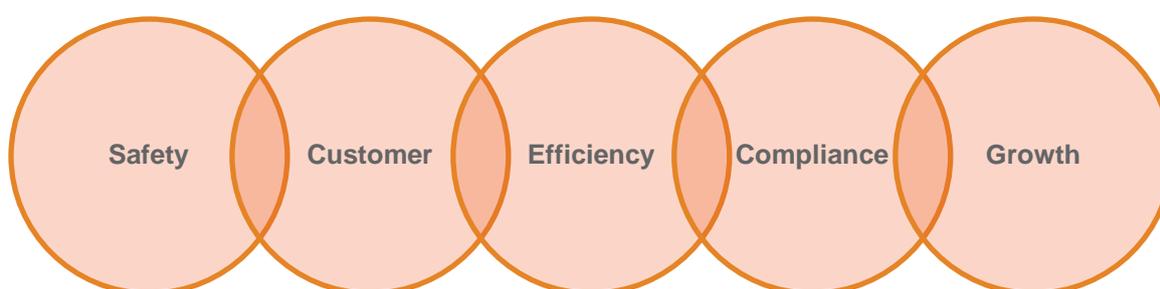
⁴ Failure statistics only include meters that have failed during operation. Results from in-service compliance testing are excluded from the percentages in Figure 2-4.

3. Asset Management Drivers

3.1. Alignment with Gas Network Objectives

Multinet Gas has established five (5) network objectives that govern how the network is operated and maintained. This is reflected mostly in regulatory obligations and in some cases prudent and responsible behaviour, justifiable on economic grounds. Achievement of these objectives ensures the sustainable and reliable operation of the gas distribution network.

Figure 3-1: Gas Network Objectives



3.1.1. Safety – Achieve Zero Harm, while maintaining current levels of network safety.

This strategy aims to achieve a high level of reliability and personnel / public safety through inspection, preventive and corrective maintenance, and asset replacement.

3.1.2. Customer – Effortless Customer Experience

This strategy aims to achieve a high level of customer satisfaction and experience by providing a reliable means of gas supply to the customer. Meter accuracy and performance is maintained through annual replacement programs and meter testing.

3.1.3. Efficiency – Sustainable and prudent network investment

The maintenance and replacement strategies outlined in this document are aimed at improving the efficiency of the meter longevity within the Multinet Gas network – providing the lowest cost of service to network users.

3.1.4. Compliance – Maintain regulatory and technical compliance

This strategy aims to achieve a high level of regulatory and technical compliance by ensuring that all replacement activities are carried out to meet the requirements of Multinet's Gas Safety Case, AS/NZS 4944, and the Gas Distribution System Code.

3.1.5. Growth – Seek opportunities for new growth

Opportunities for growth are not in scope of the Small Meter Strategy. This document outlines how Multinet Gas will replace and maintain accurate and reliable metering to current network users.

3.2. Regulatory Requirements

The Gas Distribution System Code (Version 11) outlines the requirement for Multinet to provide consumer metering installations, the standard of those installations (including testing requirements) and the provision of metering data to retailers.

In Summary, Multinet is required to provide an appropriate metering installation at each supply point (i.e. connection) off the distribution network. Multinet Gas is required to periodically maintain these installations, replace meters when their field life has expired and provide periodic metering information to retailers for billing purposes.

To fulfil its obligations, Multinet Gas completes the following activities.

1. **New Meter Connections** to the distribution network;
2. **Defective / Faulty Meter** replacements;
3. **Field Life Extension testing** of qualifying meter families nearing the end of their compliance periods; and
4. **Annual “Time Expired” meter replacement program** to remove meters at the end of the useful life (in-service compliance period).

3.3. Lifecycle Management

3.3.1. Approved Meters

Only approved meters are used on Multinet’s gas distribution network.

Any new meter pattern or type (or significant variation of an existing meter type) is reviewed and approved for use on the network by the Gas Networks (GN) Department

Technical specifications exist for all approved meter types - new and refurbished. Meters supplied for use within Multinet Gas network must conform to the approved specifications.

3.3.2. Meter Procurement

Meter supply contracts are established with Landis & Gyr & EDMI (Victoria’s two largest meter suppliers) for the purchase and repair of all meters. These contracts are novated to Multinet Gas’ Service Providers (ZNX and Comdain) and are bound by the corresponding Operations and Management Service Agreement (OMSA).

3.3.3. Inspection and Preventive Maintenance

All meters are inspected during the repair and manufacturing process for quality. Field audits are regularly conducted on contractors to ensure installation procedures and standards are being followed.

Domestic diaphragm meters are virtually maintenance free over their regulated field life. All meters purchased locally or from overseas are currently 100% acceptance tested in Australia before receipt and installation in the Multinet Gas distribution network. Any new domestic meter type proposed for introduction into Multinet Gas distribution system is type tested by accelerated life tests using a specially constructed test bed and passing approximately 20 years of average consumption over an 18 month period.

3.3.4. In-service Compliance Periods

Initial in-service compliance period

A meters' initial in-service compliance period refers to the "period of time allowed to a meter population or meter type to remain in-service without retesting or replacement⁵". The initial compliance period for gas meters is outlined in section 7.2.3 of the Gas Distribution System Code and AS/NSZ 4944:2006

With the exception of the Email 750 meter type, the initial in-service compliance period for Small meters on Multinet's distribution network is 15 years.

New Meter Types

The initial life for new diaphragm meter types (<30 Sm³/hr), including refurbished meters, are calculated as per the requirements of AS/NZS 4944:2006. In-service compliance testing of these meter families is conducted no earlier than three (3) years and no longer than five (5) years after the meter type is first installed in the field to establish the initial in-service compliance period.

Two small meter types have been tested under this provision:

- Email 750 (2008). Tested in 2012 – Received 18 year initial life; and
- UGI U8 (2007). Tested in 2011 - Received 15 year initial life.

Extension to compliance period

For Diaphragm meters of <30 m³/hr capacity, the in-service compliance period may be extended subject to the outcomes of sample testing conducted in accordance with AS/NZS 4944:2006. Testing may lead to a field life extension of five, three or one year, or the meter family being removed from operation.

Results of FLE testing and the decision to extend the life of a meter family is reported to the AER within 3 months of Multinet Gas' intention to extend the life of a meter family (i.e. 30 September each year).

Meter families (types) that are not subject to FLE are removed from the field following their initial in-service compliance period.

3.3.5. Corrective Maintenance - Faults and Defects

Faulty meters are repaired either under warranty or as part of the annual repair contracts. Warranty periods vary from manufacturer to manufacturer. Meters that can no longer be repaired or have reached the end of their economic life are disposed of. All older style diaphragm tin case meters have now been removed and are no longer in service. These meter types include the Gallus 2000, Jubilee and other meters that have already gone through a repair process.

Faults and defects are reported and rectified as follows:

- By the meter reader with rectification occurring during a special visit (if warranted);
- By the public who phone the faults and emergencies number or their retailer, with rectification occurring during a special visit (if warranted); and
- By staff/contractors during other works, audits and inspections, with rectification occurring during a special visit (if warranted).

Refer to Section 4.5 for Multinet's forecast of small meter faults to 2022.

⁵ AS/NZS 4944:2006, Section 4.2.3

3.3.6. Meter Repair / Refurbishment

Where possible, Multinet repairs (refurbishes) small gas meters as this provides the lowest cost of providing a metering installation to the end consumer. Once refurbished, the meter is identified as “refurbished” in terms of a meter family but treated as a new meter in terms of its initial in-service compliance period (Refer to Section 3.3.4).

Refurbishment of existing meters are subject to inspection for corrosion and internal meter inspection with the top half of meter components being replaced and repaired as necessary. Repair specifications are included in the tenders of meter repairs. Manufacturers are subject to regular quality audits by representatives of Multinet Gas.

The refurbish rates used for to forecast expenditure by program is summarised in Table 3-1.

Table 3-1: Meter Refurbish / Repair Rates

| Meter Type | Time Expired Replacement / FLE Testing | Defective / Faults |
|--------------------|--|--------------------|
| Davey Shepherd | ■ | ■ |
| Email 602 | ■ | ■ |
| Email 602 (Rep) | ■ | ■ |
| Email 602 (Rep x2) | ■ | ■ |
| Email 602 (IM) | ■ | ■ |
| Email 610 | ■ | ■ |
| Email 610 (Rep) | ■ | ■ |
| Email 750 | ■ | ■ |
| Rockwell MR08 | ■ | ■ |
| Rockwell MR12 | ■ | ■ |
| Atlas U8 | ■ | ■ |
| Park Cowan U6 | ■ | ■ |
| Gallus 2000 | ■ | ■ |
| UGI U10 | ■ | ■ |
| UGI U6 | ■ | ■ |
| L&G 1010 | ■ | ■ |
| Jubilee | ■ | ■ |

The procurement of new meters is driven by new customer connections to the network, and the volume and refurbish rates of replaced meters.

3.4. Asset Strategy – Current Issues

3.4.1. Pattern and Verification Testing

Gas meters are currently exempt from the relevant requirements of the National Measurement Act 1960 (Cth) via Regulation 5.6 in the National Trade Measurement Regulations 2009. The exemption for gas meters has the potential to be lifted within the five year period of this Strategy.

The lifting of this exemption will require gas meter manufacturers to obtain pattern approval and verification of gas meters to insure that each meter type is fit for trade and performs and functions as designed within the maximum permissible error (MPE) over a range of operating conditions.

The National Measurement Institute (NMI) has currently engaged a Gas Metering Advisory committee to review, adopt and implement the International Standard OIML R137 Gas Meters and OIML R140 Measuring Systems for Gaseous Fuels.

The adoption of these Standards will likely create economic and technical issues concerning the implementation of pattern approval and verification of gas meters in Australia.

These changes may require Multinet Gas to change processes and IT systems to accommodate National requirements. The cost of future changes (if any) has not been included in this strategy.

3.4.2. Diversity of Meter Suppliers

The small size of the Australian Gas Industry limits the number of available meter suppliers in Australia. Multinet Gas predominantly uses the two major suppliers – Landis & Gyr, and EDMI. The availability of more than one supplier provides competitive pricing and spreads the risk of any supply issues.

The risk of one of the major Suppliers closing down remains a moderate risk to Multinet Gas and the Australian Gas Industry. A loss of one of the Suppliers would cause a sudden increase in the unit cost of new and repaired meters as well as causing availability issues across the Industry. Currently there is only one Repairer of domestic meters in Victoria. The loss of this Repairer would require Multinet Gas to purchase only new domestic meters.

3.5. Performance Measures

The performance of small customer meters is measured by:

1. Regulatory compliance - Percentage (%) of in field meters that are not Time Expired as of 31st December each year. Target = 99.5%. Some meters are not replaced with compliant meters within the required timeframe due to not being able to gain access to the meter.
2. Non failure of In-field meters (defective) - Percentage (%) of meters that remain in field until Time Expired. Target = 98.5%.

4. Capital Program - 2017 to 2022

4.1. Summary

Multinet Gas completes the following annual programs to remain compliant with its obligations under the Gas Distribution System Code.

- Time expired meter replacement;
- Field Life Extension;
- Defective meter replacement; and
- Hand Held Meter Reading Devices.

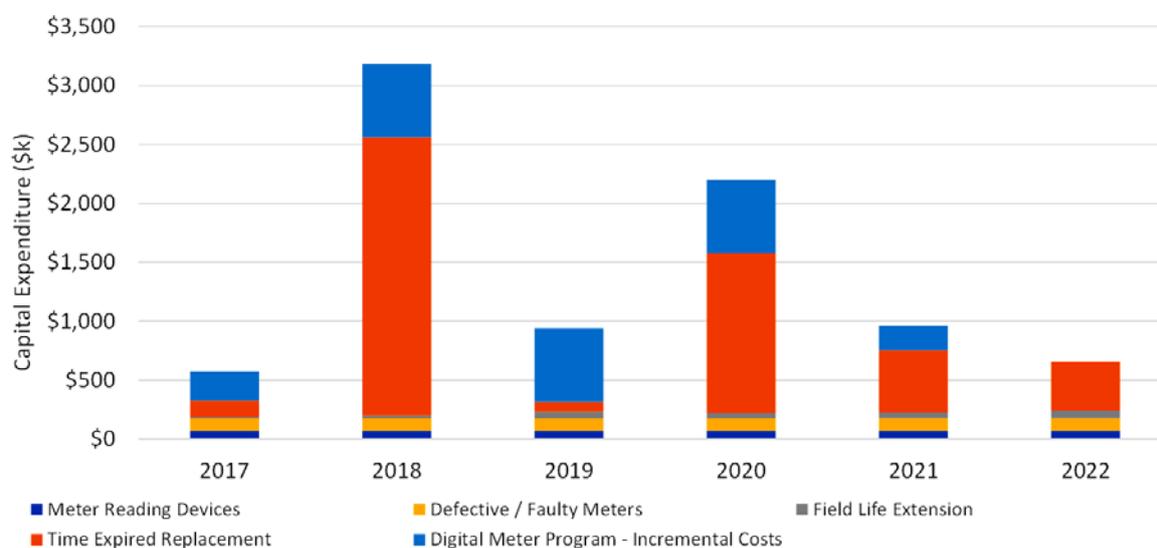
In addition, Multinet Gas is to undertake (subject to AER approval) a Digital Gas Metering Pilot Study to understand the benefits of digital metering and the costs and benefits of a mass rollout of digital meters in the future.

Table 4-1 and Figure 4-1 provides a breakdown of capital expenditure from 2017 to 2022 by program. Variation in annual capital expenditure is highly influenced by the Time Expired Replacement Program.

Table 4-1: Capital Expenditure Summary

| Ref | Program | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|--------------------------|--|--------------|----------------|--------------|----------------|--------------|--------------|
| 4.3 | Time Expired Meter Replacement | \$138 | \$2,363 | \$86 | \$1,355 | \$526 | \$416 |
| 4.4 | Field Life Extension | \$14 | \$25 | \$58 | \$47 | \$53 | \$64 |
| 4.5 | Defective / Faulty Meters | \$102 | \$103 | \$103 | \$104 | \$105 | \$105 |
| 4.6 | Hand Held Meter Reading Devices | \$70 | \$70 | \$70 | \$70 | \$70 | \$70 |
| 4.7 | Digital Meter Program – Incremental Costs Only | \$250 | \$623 | \$623 | \$623 | \$208 | - |
| Total Expenditure | | \$575 | \$3,184 | \$939 | \$2,198 | \$962 | \$655 |

Figure 4-1: Capital Expenditure Summary



4.2. Capitalisation Policy

Multinet Gas capitalises the purchase of new meters installed on the network. This includes the procurement of meters to replace existing due to regulatory requirements or meter failure. Installation (labour) is expensed for all meter replacement activities but capitalised when installing a new meter for a new network connection.

Multinet Gas' capitalisation policy is summarised in Table 4-2.

Table 4-2: Capitalisation Policy for Meter Replacement / New Connections

| | New Meter | Repaired Meter | Installation |
|---|-----------|----------------|--------------|
| New Connections ⁶ | CAPEX | OPEX | CAPEX |
| Meter Replacement (including Time expired, FLE or Faults) | CAPEX | OPEX | OPEX |

4.3. Time Expired Meter Replacement

4.3.1. Introduction

The Time expired meter replacement program is conducted to ensure Multinet Gas remains compliant with its obligation under the GDSC by replacing meters at the end of their in-service compliance period.

Time expired meter replacement is a common program undertaken for both Small and Large meter types. Refer to Multinet Gas' Large Meter Strategy (MG-SP-0008) for details of time expired replacement program for large meters.

4.3.2. Scope

The annual Small Meter replacement program is made up of the following elements:

- Meter families within the final year of their in-service compliance period; and
- Non-compliant meters outstanding from previous meter replacement programs.

4.3.3. Strategic Alignment

Undertaking time expired meter replacement is reflected in Multinet's network objectives through:

- **Compliance** - Multinet is required to undertake time expired replacement of meters by the GDSC;
- **Network Safety** - Maintaining meter integrity is a primary driver for meter replacement; and
- **Customer Experience** - Meter accuracy (within defined limits) is a primary driver for meter replacement.

4.3.4. Forecasting Field Life Extension Outcomes

A key input to forecast meter replacement capital expenditure is a forecast of the meter families that are expected to fail FLE testing, and the year in which failure is expected to occur.

⁶ The capital cost of new connections is not covered in the Small Meter Strategy. Please refer to Multinet Gas' Capital Growth Plan (MG-PL-0002) for the meter costs associated with new customer connections

For meters that qualify for FLE testing, Multinet’s approach is to extrapolate FLE testing results on a 5, 3, or 1 year extension period to determine the potential year of failure. The extension period commences from the last sample testing result, or where no sample testing has been done the extension commences at:

- 5 years for EML750 meters;
- 5 years for RKMR08 meters;
- 3 years for EML602 meters (e.g. EML602, EML602R and EML602RR); and
- 1 year for EML610 meters (e.g. EML610 and EML610R).

Commencement years are based on average FLE test results following the initial in-service compliance period (15 years). For meter families with limited history, extrapolation commences at 5 years.

4.3.5. Program Performance

Multinet’s performance (i.e. replacement rates) for the time expired replacement program is summarised in Table 4-3. Since 2011, Multinet achieved an average program completion of approximately 98%. Outstanding meters are rolled into the following year’s program.

Table 4-3: Time Expired Meter Replacement program outcomes – Small Meters

| Year | Total Program | Percentage Completed | Outstanding Meters |
|------|---------------|----------------------|--------------------|
| 2011 | 15,424 | 96.47% | 544 |
| 2012 | 65,065 | 99.45% | 361 |
| 2013 | 18,046 | 99.11% | 161 |
| 2014 | 12,015 | 98.48% | 183 |
| 2015 | 24,983 | 93.40% | 1,649 |
| 2016 | 16,000 | - | - |

Since 2011, an average of 27,100 meters have been targeted for replacement annually. However, variation in the program has been significant with 65,000 meters target for replacement in 2012, and only 12,000 in 2014.

4.3.6. Works Program

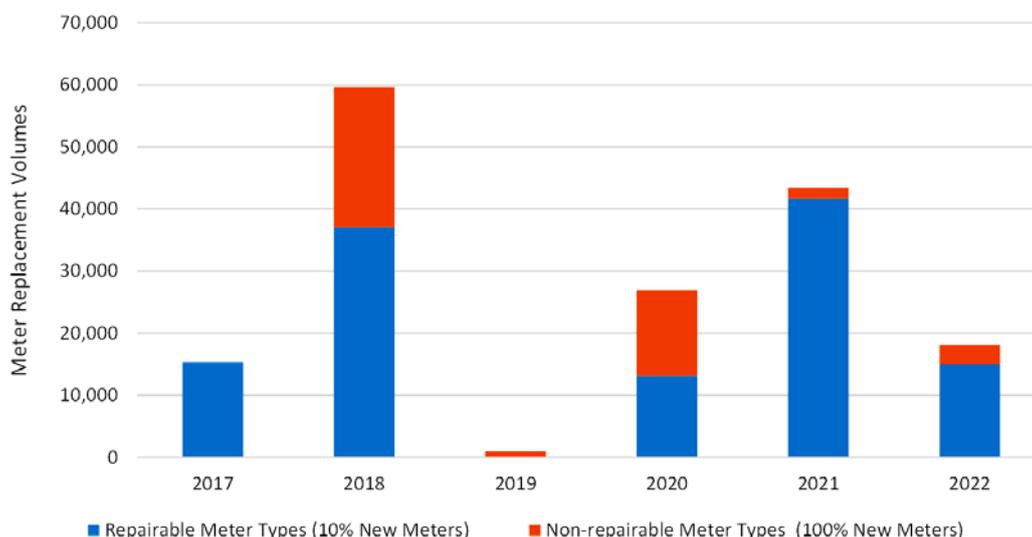
The Small Meter Time Expired Replacement Program to 2022 is summarised in Figure 4-2. The program is highly influenced by:

- The predicted results from the annual FLE testing program; and
- The composition of each program (i.e. meter types) influences the required volume of new meter purchases to service the program.

Program Characteristics - 2018 to 2022

- In total 149,011 meters are forecast to be replaced – an average of 29,802 per year.
- The program is highly variable with the largest replacement volume forecast 59,613 meters in 2018. A minimum of 953 meters is forecast for 2019.
- In total, 35% of meters replaced will require a new meter. The remaining will be replaced with refurbished or repaired meters.
- The volume of new meters required per annum is dependent on the meter families (and types) within each annual program. In 2019, 100% of replacements will require new meters, while only 13% will require new meters in 2021.

Figure 4-2: Time Expired Meter Replacement – Meters Replaced



The capital expenditure forecast for the Small Meter Time Expired meter replacement program is provided in Table 4-4. As previously noted, annual program expenditure fluctuates with the size and composition of the program which is influenced by the volume of meter purchases and repairable meters for the year.

Multinet Gas does not have a policy of prematurely removing meter families from operation before their in-service compliance periods in an attempt to smooth the replacement variation.

Table 4-4: Expenditure Forecast - Small Meter Time Expired Program

| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|--------------|----------------|-------------|----------------|--------------|--------------|
| Forecast meters | 15,320 | 59,613 | 953 | 26,879 | 43,419 | 18,147 |
| - Repairable Meter Types (█████ to be replaced) | █████ | █████ | █████ | █████ | █████ | █████ |
| - Non repairable Meter Types (█████ to be replaced) | █████ | █████ | █████ | █████ | █████ | █████ |
| New Meter Purchases | █████ | █████ | █████ | █████ | █████ | █████ |
| Unit Rate (\$/meter) | █████ | █████ | █████ | █████ | █████ | █████ |
| Total Expenditure | \$138 | \$2,363 | \$86 | \$1,355 | \$526 | \$416 |

A standard meter cost of ██████ has been applied to all meter purchases as part of the Time Expired replacement program as all small meter types are assumed to be interchangeable.

4.4. Field Life Extension

4.4.1. Introduction

Multinet Gas undertakes Field Life Extension (FLE) testing on selected diaphragm meter families (<30m³/hr) nearing the end of their service lives. The program is also known as in-service compliance testing.

FLE testing is undertaken in accordance with the requirements of AS/NZS 4944:2006 and is required to extend the in-service compliance period of a qualifying meter family. Results of annual testing along with Multinet’s intention to extend a meter family beyond their initial life, are communicated annually to the AER by 30 September each year.

4.4.2. Scope

FLE testing applies to all diaphragm meters with capacity of <30 Sm³/hr. This includes all small meters on Multinet Gas' network.

4.4.3. Business Drivers and Strategic Alignment

Undertaking of FLE testing is reflected in Multinet Gas' network objectives through maintain:

- **Compliance** - Multinet Gas is required to undertake FLE testing to extend the life of qualifying meter families.
- **Network Safety** - Maintaining meter integrity is a primary outcome of FLE testing
- **Efficiency** - Favourable outcomes of FLE testing allows for the extension of in-service compliance periods of meter families, resulting in a lower cost to the end customer.
- **Customer Experience** - Meter accuracy (within defined limits) is a primary outcome of FLE testing.

4.4.4. Program Performance

Multinet Gas adopted AS/NZS 4944:2006 in 2008 as the primary reference for the FLE program. Before this, Multinet Gas followed detailed testing criteria outline within the Gas Distribution System Code (this has since been removed), which required annual testing of all meter families beyond 15 years of age.

A summary of program results – since 2011- is provided in Table 4-5. A detailed breakdown of program results is contained in the Appendix (Section 5.4, p.32).

Table 4-5: Summary Results of Completed FLE Testing Programs

| Test Year | Meter Families Tested | Meter Population Tested | Families Failed | Meters Failed |
|-----------|-----------------------|-------------------------|-----------------|---------------|
| 2011 | 5 | 65,065 | 5 | 65,065 |
| 2012 | 7 | 79,473 | 1 | 9,984 |
| 2013 | 13 | 126,202 | 1 | 2,607 |
| 2014 | 9 | 91,025 | 2 | 25,323 |
| 2015 | 12 | 87,188 | 2 | 13,352 |
| 2016 | 15 | 121,777 | 2 | 14,091 |

4.4.5. Works Program

AS/NZS 4944:2006 outlines two methods of statistical analysis (i.e. *Variables* or *Attributes*) that can be adopted for in-service compliance testing:

- **Variables**⁷ - A method that consists of measuring a quantitative characteristic for each item of a population or a sample taken from this population. The quantitative characteristic is used to establish statistically the acceptability of the population from results contained from the items in the sample.
- **Attributes** - Inspection wherein the meter family is classified as either conforming or non-conforming or the number of nonconformities in the meter family is counted, with respect to given requirements.

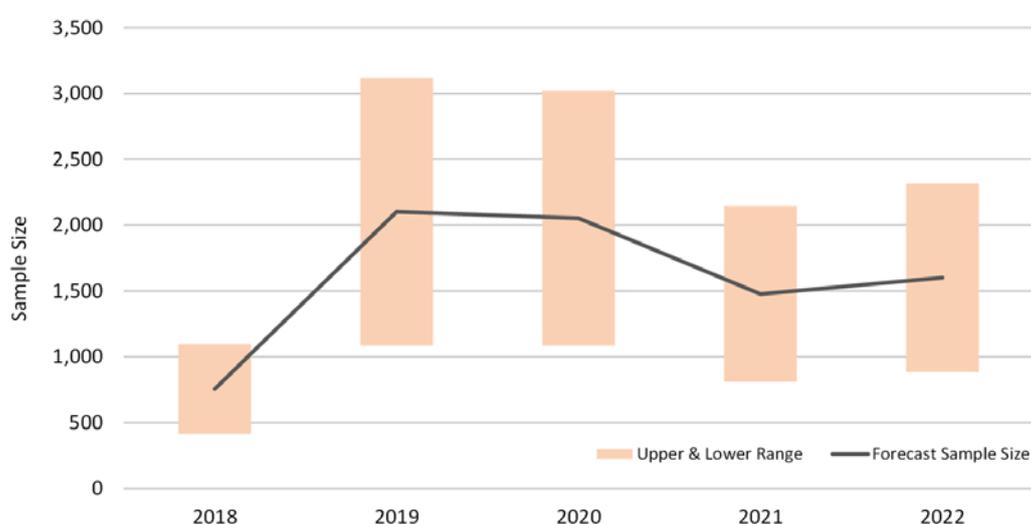
⁷ Definitions are from AS/NZS 4944:2006 Section 4.2

Testing by “Variables” requires a smaller sample size when compared to “Attributes” but must pass a test for normality to ensure the sample set is statistically relevant. With “Variables, each characteristic is tested relative to the meter, i.e. individual meters pass/fail. For attributes, each characteristic is grouped together for the family, i.e. the family passes / fails as a whole.

Multinet Gas adopts (initially) the “Variables” method of sample testing. If a meter family fails the criteria for “Variables” testing then the “Attributes” method is then adopted. Additional meters will subsequently be removed from the field to bolster required sample sizes.

Multinet’s forecast for FLE testing of Small Meters is summarised in Figure 4-3. Sample volumes are expected to range between 755 meters in 2018 and 2,102 in 2019.

Figure 4-3: Field Life Extension – Sample Ranges



The orange shaded bands within Figure 4-3 indicates the minimum (by variables) and maximum (by attributes) samples sizes required for in-service compliance testing. Modelling assumes 50% of all meter families tested will be tested by Attributes.

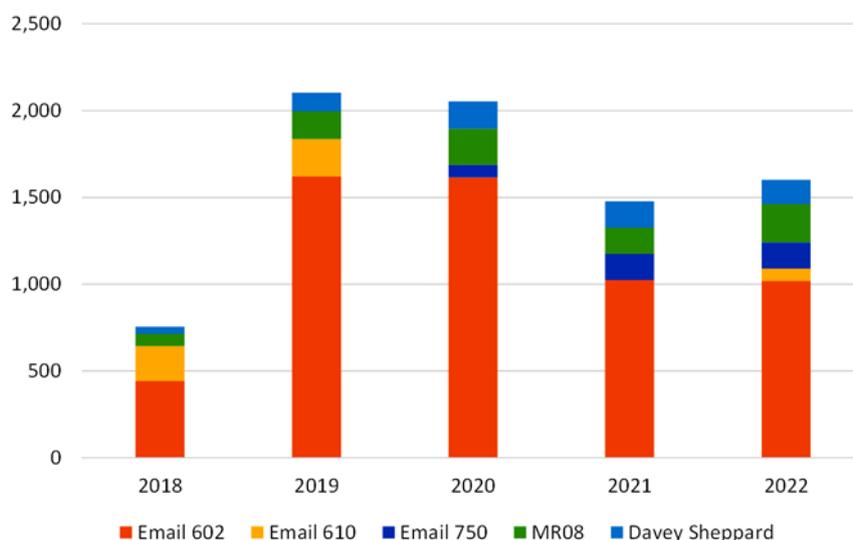
Capital expenditure for the FLE program is provided in Table 4-6. A standard new meter costs (e.g. L&G 750 replacement meter) is applied for the capital forecast.

Table 4-6: Expenditure Forecast – Field Life Extension

| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|-------------|-------------|-------------|-------------|-------------|-------------|
| Forecast meters | 1,604 | 755 | 2,102 | 2,053 | 1,477 | 1,601 |
| - Repairable Meter Types (█████ to be replaced) | █████ | █████ | █████ | █████ | █████ | █████ |
| - Non repairable Meter Types (█████ to be replaced) | █████ | █████ | █████ | █████ | █████ | █████ |
| New Meter Purchases | █████ | █████ | █████ | █████ | █████ | █████ |
| Unit Rate (\$/meter) | █████ | █████ | █████ | █████ | █████ | █████ |
| Total Expenditure | \$14 | \$25 | \$58 | \$47 | \$53 | \$64 |

A breakdown of the FLE program by meter types is provided in Figure 4-4.

Figure 4-4: Field Life Extension – Breakdown by Meter Type



4.5. Defective / Faulty Meters

4.5.1. Introduction

Leakage, inaccuracy, damage, excess noise and seizure are all failure methods for gas meters. Meter faults are predominantly identified by the public with meters replaced following an investigation by Multinet’s primary service provider.

Meter Failure, especially those resulting in a leak increases the risk to public safety as a potentially explosive atmosphere could develop in the area surrounding the meter.

4.5.2. Scope

Small meter types that have failed during operation.

4.5.3. Business Drivers and Strategic Alignment

The replacement of defective or failed meters is reflected in Multinet Gas’ network objectives:

- **Compliance** - Multinet Gas is required to meter all gas used on the distribution network.
- **Network Safety** - Meter failures cause gas to be emitted at circa. 80% of failures⁸. Replacing defective meters reduced / maintains network safety.
- **Historical Performance Customer Experience** - Meter accuracy (within defined limits) is the primary function of a gas meter.

4.5.4. Works Program

In forecasting meter failures, historic failure rates provide the best indication of future failure rates. Table 4-7 provides a forecast of the number of meter faults expected on the network to 2022. This is calculated assuming a constant 0.32% of meter fleet failures against the anticipate growth of the Small meter fleet.

⁸ Gas escapes occur during Gas escapes (32% of failures) & third party damages (51% of failures).

Capital expenditure for the replacement of failed Small meters is also summarised Table 4-7. Only the purchase cost a new meters required to replace failed meters are capitalised by Multinet Gas. A [REDACTED] refurbish rate is applied to forecast new meter costs for failed meters.

Table 4-7: Capital Expenditure Summary

| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|--------------|--------------|--------------|--------------|--------------|--------------|
| Metering Fleet – Small Meters | 671,253 | 674,753 | 678,253 | 681,753 | 685,253 | 688,753 |
| Forecast Defective Meters / Faults (0.32% of Fleet) | 2,178 | 2,189 | 2,200 | 2,212 | 2,223 | 2,234 |
| New Meter Purchases ([REDACTED] to be replaced) | [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] |
| Unit Rate (\$/meter) ⁹ | [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] |
| Total Expenditure | \$102 | \$103 | \$103 | \$104 | \$105 | \$105 |

Due to the uncertain nature of meter failures, an average unit rate has been applied for Small meter purchases which represents the weighted average cost of small meters in Multinet’s metering fleet. Refer to Appendix (Section 5.5) for cost calculations.

4.6. Hand Held Meter Reading Devices

4.6.1. Introduction

Multinet Gas currently uses Itron FC300 Hand Held Unit (HHU) meter reading devices to read all gas meters. Skill tech (Multinet’s contracted meter reading provider) has circa 60 meter readers who all require a serviceable FC300 HHU device to do their job.

Figure 4-5: Itron FC300 HHU meter reading device



⁹ Refer to Appendix (Section 5.5, p.34) Breakdown of unit costs.

4.6.2. Scope

The purchase of new HHU meter reading devices to maintain / replace the existing fleet.

4.6.3. Business Drivers and Strategic Alignment

The replacement of hand held meter reading devices is reflected in Multinet Gas' network objectives through:

- **Compliance** - Multinet will be able to meet its obligations with regards to meter reading schedules and delivery of meter reads to the market.
- **Efficiency** - Multinet will continue to deliver meter reads to market on a timely manner.
- **Customer Experience** - Meter reading accuracy and in turn accurate gas bills will ensure customer satisfaction.

4.6.4. Works Program

Multinet Gas maintains on average 65 functional HHU meter reading devices used to read meters in the field¹⁰. Of these approximately ■ hand held devices require replacement each year due to the continued high use and exposure to the elements. All units are maintained under licence.

Table 4-8 outlines the capital cost associated with the replacement of ■ HHU units per annum.

Table 4-8: Capital Forecast – Hand Held Meter Reading Devices

| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---------------------------------|------|------|------|------|------|------|
| Hand Held Meter Reading Devices | \$70 | \$70 | \$70 | \$70 | \$70 | \$70 |

4.7. Digital Gas Metering Pilot Study

4.7.1. Introduction

On the back of United Energy's rollout of smart metering in the electricity sector, Multinet Gas is uniquely placed to investigate and demonstrate the operation of digital gas metering. This technology will leverage the information and communications technology already in place thanks to United Energy (UE).

The benefits reside in that:

- approximately 70% of Multinet Gas' customers are located in UE's geographic area; and
- together, the companies have established a single shared point of network operational control.

The successful operation of AMI meters in the electricity sector highlights the significant potential benefit of this technology in the gas sector. Multinet is to take a lead in the gas industry in investigating the full potential of remotely read gas meters, and to establish the model for the industry.

¹⁰ Note: 65 HHU units are maintained for use by 60 meter reading staff.

4.7.1. Program Overview

The pilot study involves the installation of 10,100 digital gas meters across Multinet's gas network. A two phased approach will be adopted to investigate the costs and potential benefits of digital gas metering;

- **Phase 1 (2017)** focusses on integrating a small number of functional meters into the United Energy AMI Network and demonstrate remote communication. This requires a successful working relationship between Multinet Gas & United Energy, EDMI (meter manufacturer) and Silver Springs Networks (SSN, wireless communications specialist). When SSN can prove a set of functioning meters on a Multinet Gas approved test bench, a further 100 units will be purchased, integrated and installed in the field. This small field trial provides a large enough basis to evaluate potential network and consumer benefits which can be extrapolated to large scale implementation.
- **Phase 2 (2018 - 2021)** rides off the success and failures of Phase 1. This phase allows the lessons learned in Phase 1 to apply to a 10,000 meter implementation into the Multinet Gas network and United Energy AMI framework. The size of this phase will give a tested basis for which Multinet Gas and United Energy can determine the cost vs. benefits of planning a full scale rollout or to continue with traditional gas metering systems.

The 10,100 meter sample size (<2% of the network) represents the minimum study size needed to gather sufficient information to enable a robust evaluation all costs, benefits and risks of a mass rollout.

The objectives of the digital meter pilot study are to:

1. Capture the actual costs of the digital gas meter solution, including the meter installation process and costs; licence fees; and support costs through the implementation period;
2. Assess the functional capabilities of the digital meters and the ability of these functions to service Multinet's forward metering and network information, and operational needs;
3. Identify any risks, costs or potential efficiencies associated with a network-wide rollout; and
4. Assess the benefits of the digital gas meter solution, and determine whether a network-wide rollout is justified from a cost-benefit perspective.

4.7.2. Digital Gas Meter – Helios G6000

Multinet will trial the Helios G6000 digital gas meter (Figure 4-6) as part of the Digital Meter Pilot.

The ultrasonic gas meter has been developed and certified by EDMI against the international standard R137-142:2012 (OIML). It is unique in that not only is it a completely digital gas meter – it also has several features which benefit both the network and the end use customer:

- Ability to utilise remote communications via United Energy's AMI platform;
- Remote shutoff; and
- Remote reads for retailer transfer.

Figure 4-6: The EDM Helios G6000



4.7.3. Program Benefits

For gas customers, the benefits of a mass rollout of digital meters include:

1. Eliminating the need for manual reading and estimated bills, which are a significant source of customer queries and dissatisfaction;
2. Improved information on gas usage, which will facilitate better consumption and investment decisions;
3. Facilitating more efficient retailer change processes, which will encourage retail competition;
4. Enabling more efficient and timely move in / move out meter reads, increasing customer satisfaction;
5. Enabling innovative pricing arrangements, which will encourage more efficient consumption and investment decisions; and
6. The potential to improve the identification of gas leakage, leading to improved safety and better customer service, and reductions in unaccounted for gas.

4.7.4. Works Program

The Pilot Study is to be completed over 5 years, beginning with the low scale proof of concept in 2017 (Phase 1) and the larger rollout of meter from 2018 to 2021 (Phase 2).

Program costs are shared between Network (i.e. Meter purchase & installation costs) and ICT Expenditure. Only the Network expenditure component of the program is covered within the Small Meter Strategy¹¹.

To minimise the cost of the pilot study, Multinet proposes to install digital meters in parallel with Time Expired meter replacement and new customer connections. Incremental program costs are provided for in Table 4-9.

¹¹ Refer the Multinet's IT Strategy for further details.

Table 4-9: Capital Forecast – Digital Gas Metering Pilot Study

| | Phase 1 | Phase 2 | | | | |
|---|--------------|----------------|----------------|----------------|----------------|----------|
| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
| Digital Meters (Meters Installed) | 100 | 3,000 | 3,000 | 3,000 | 1,000 | - |
| ICT Expenditure | - | \$560 | - | - | - | - |
| Network Expenditure | \$250 | \$1,128 | \$1,128 | \$1,128 | \$376 | - |
| Standalone Program Expenditure | \$250 | \$1,688 | \$1,128 | \$1,128 | \$376 | - |
| <i>Discount for BAU Activities</i> | <i>(-)</i> | <i>(\$505)</i> | <i>(\$505)</i> | <i>(\$505)</i> | <i>(\$168)</i> | <i>-</i> |
| Total Program Expenditure Forecast | \$250 | \$1,183 | \$623 | \$623 | \$208 | - |

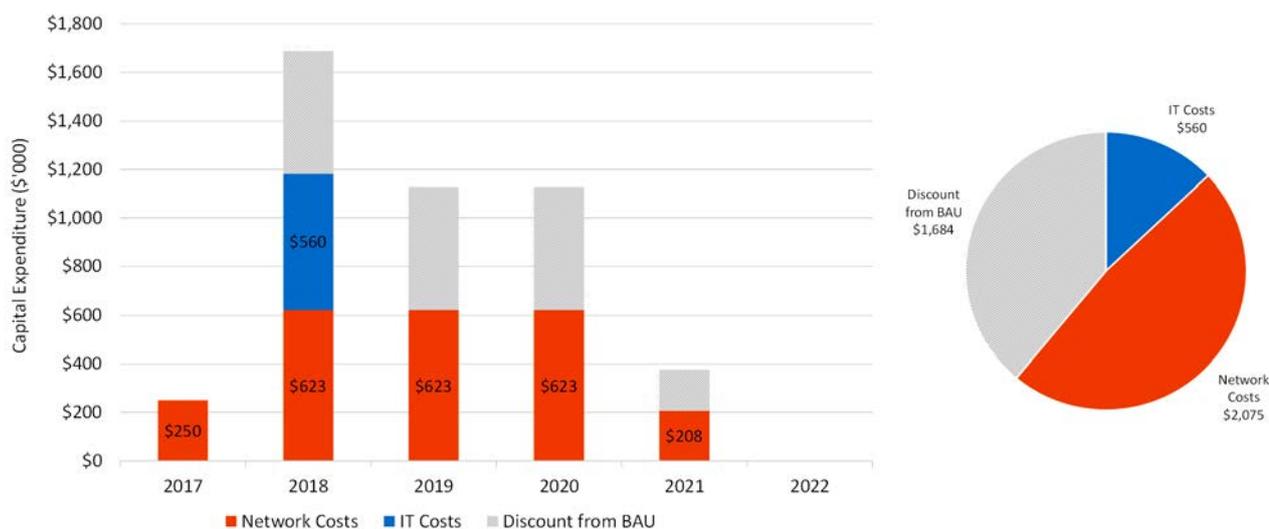
BREAKDOWN

| | | | | | | |
|------------------------------|-------|-------|-------|-------|-------|---|
| ICT Expenditure Forecast | - | \$560 | - | - | - | - |
| Network Expenditure Forecast | \$250 | \$623 | \$623 | \$623 | \$208 | - |

A detailed breakdown of Phase 2 of the meter trial is provided in the Appendix (Section 5.6, p.34). Phase 1 is forecast to cost \$250k and is considered Network Expenditure.

Figure 4-7 provides a split between IT and Network program expenditure. It also shows the 39% reduction in program expenditure gained through integration of the pilot study with BAU activities.

Figure 4-7: Capital Expenditure Phasing - Digital Gas Metering Pilot Study (Phase 1 & 2)



5. Appendix

5.1. Glossary & Definitions

| Term | Meaning |
|---------------------|---|
| AMI | Advanced Metering Infrastructure |
| AER | Australian Energy Regulator: Responsible for the economic regulation of energy networks. |
| CAPEX | Capital Expenditure |
| CTM | Custody Transfer Meter. A large capacity meter installed at every injection point from the DTS to MG's network. |
| DTS | Declared Transmission System |
| EDMI | Meter manufacture and supplier to Multinet Gas |
| ESV | Energy Safe Victoria. A government body responsible for the safety and technical regulation of energy networks in Victoria. |
| FLE | Field Life Extension. Alternative name for in-service compliance testing of domestic diaphragm meters. |
| FY | Financial Year |
| GAAR | Gas Access Arrangement Review |
| Gas Meter | Mechanical device (usually) used to measure the volumetric flow rate of gas that passes the device. |
| GDSC | Gas Distribution System Code |
| GFC | Gas and Fuel Corporation |
| HHU | Hand Held Unit or meter reading devices |
| I&C | Industrial and Commercial |
| L&G | Landis & Gyr – Meter manufacture and supplier to Multinet Gas |
| Large Meter | Meter with capacity less than >10 Sm ³ /hr. |
| Meter Family | A group of the same meter brand and type installed in the same calendar year. |
| Meter Type | Refers to the technique employed to measure gas flow i.e. Rotary, Turbine, Diaphragm. |
| MG | Multinet Gas |
| MPE | Maximum Permissible Error |
| NMI | National Measurement Institute |
| OEM | Original Equipment Manufacturer |
| OPEX | Operational Expenditure |
| SAP | An Enterprise Resource Planning tool which used recording asset data and maintenance management. |
| Sm ³ /hr | Standard cubic meters per hour (either Gas or Air). |
| Small Meter | Meter with capacity less than 10 Sm ³ /hr. Normally used for Residential (domestic) purposes. |

5.2. Installations by Meter Model Type

| Installed on MG Network (1 Aug 2016) | | |
|--------------------------------------|----------------|-------------|
| Meter Type: | Population: | % |
| EML602R | 154,721 | 23.04% |
| EML750 | 134,206 | 19.98% |
| EML602 | 94,478 | 14.07% |
| EML602RR | 86,130 | 12.82% |
| EML610 | 64,375 | 9.58% |
| RKMR08 | 52,200 | 7.77% |
| ATLASU8 | 34,886 | 5.19% |
| EML610R | 24,225 | 3.61% |
| DS5AR | 11,768 | 1.75% |
| UGIU10 | 4,925 | 0.73% |
| EML602IM | 3,114 | 0.46% |
| LG1010 | 2,765 | 0.41% |
| PCU6 | 1,630 | 0.24% |
| RKMR0806 | 911 | 0.14% |
| UGIU6 | 400 | 0.06% |
| GAL2000 | 300 | 0.04% |
| GAL2000H | 216 | 0.03% |
| RKMR1210 | 199 | 0.03% |
| EML610H | 112 | 0.02% |
| U10100KPA | 44 | 0.01% |
| JUBILEE | 42 | 0.01% |
| EML610PP | 13 | 0.00% |
| JUBLJNR | 2 | 0.00% |
| Grand Total | 671,662 | 100% |

5.3. Meter Technology

A variety of metering technologies are utilised on Multinet Gas' distribution and transmission network. The most common are summarised.

| Meter Type | Description | Applications | Examples |
|------------|--|--|-------------------------------------|
| Diaphragm | Positive displacement meters with two or more chambers formed by movable diaphragms. | Domestic & Commercial | L&G 750, U10, AL-425 to AL-5000 |
| Rotary | Two figure "8" shaped lobes (also known as impellers), spin in precise alignment, with a known volume of gas passing through the meter with each revolution. | Commercial & Industrial | Romet Meters & Roots Meters |
| Turbine | Volume of gas is inferred by determining the speed of the gas moving through the meter. | Industrial | AMC GT 18M to 60M, Fluxi, Instromet |
| Orifice | A differential meter that infers the flow rate by measuring the pressure differential across a known orifice (flow disturbance) | Custody Transfer Meters only | Specific Applications |
| Ultrasonic | Measures the volume of gas by measuring the speed at which sound travels in the gaseous medium within the pipe. | Custody Transfer Meters / Digital meter trial. | Specific Applications |
| Coriolis | Uses resonant frequency vibrations within the meter caused by the gas flow to infer the volume of gas passing through the meter. | Custody Transfer Meters only | Specific Applications |

5.4. Field Life Extension Results – Small Meters – 2011 to 2016

| Sample Test Year: | Meter Construction Year: | Meter Type: | Result: | Field Life Extension: |
|-------------------|--------------------------|-------------|---------|-----------------------|
| 2011 | 1987 | EML602 | Failed | |
| | 1993 | EML602R | Failed | |
| | 1995 | EML610 | Failed | |
| | 2000 | UGIU6 | Failed | |
| | 2004 | UGIU6 | Failed | |
| 2012 | 1993 | EML602 | Passed | 1 Year |
| | 1991 | EML602R | Passed | 3 Years |
| | 1992 | EML602R | Passed | 1 Year |
| | 1996 | EML602R | Passed | 3 Years |
| | 1996 | EML610 | Passed | 3 Years |
| | 1987 | P&CU6 | Passed | 3 Years |
| | 2005 | UGIU6 | Failed | |
| 2013 | 1997 | DS5AR | Passed | 5 Years |
| | 1985 | EML602 | Passed | 3 Years |
| | 1988 | EML602 | Passed | 3 Years |
| | 1991 | EML602 | Passed | 3 Years |
| | 1993 | EML602 | Passed | 1 Year |
| | 1994 | EML602 | Passed | 3 Years |
| | 1997 | EML602 | Passed | 5 Years |
| | 1992 | EML602R | Passed | 1 Year |
| | 1995 | EML602R | Passed | 5 Years |
| | 1997 | EML602R | Passed | 3 Years |
| | 1997 | EML602IM | Passed | 1 Year |
| | 1997 | EML610 | Passed | 1 Year |
| | 1998 | P&CU6 | Failed | |

| Sample Test Year: | Meter Construction Year: | Meter Type: | Result: | Field Life Extension: |
|-------------------|--------------------------|-------------|---------|-----------------------|
| 2014 | 1998 | DS5AR | Passed | 5 Years |
| | 1992 | EML602 | Passed | 5 Years |
| | 1993 | EML602 | Failed | |
| | 1998 | EML602IM | Passed | 1 Year |
| | 1992 | EML602R | Passed | 1 Year |
| | 1998 | EML602R | Failed | |
| | 1997 | EML610 | Passed | 1 Year |
| | 1998 | EML610 | Passed | 1 Year |
| | 1998 | UGIU10 | Passed | 5 Years |
| | 2015 | 1999 | UGIU10 | Passed |
| 1987 | | P&CU6 | Failed | |
| 1996 | | EML610 | Passed | 3 Years |
| 1997 | | EML610 | Passed | 1 Year |
| 1998 | | EML610 | Failed | |
| 1999 | | EML610 | Passed | 1 Year |
| 1991 | | EML602R | Passed | 3 Years |
| 1992 | | EML602R | Passed | 1 Year |
| 1996 | | EML602R | Passed | 5 Years |
| 1999 | | EML602R | Passed | 1 Year |
| 1998 | | EML602IM | Passed | 1 Year |
| 1999 | DS5AR | Passed | 5 Years | |

| Sample Test Year: | Meter Construction Year: | Meter Type: | Result: | Field Life Extension: |
|-------------------|--------------------------|-------------|---------|-----------------------|
| 2016 | 2000 | DS5AR | Passed | 5 Years |
| | 1985 | EML602 | Passed | 1 Year |
| | 1988 | EML602 | Passed | 1 Year |
| | 1991 | EML602 | Passed | 3 Years |
| | 1994 | EML602 | Passed | 3 Years |
| | 1992 | EML602R | Failed | |
| | 1997 | EML602R | Passed | 3 Years |
| | 1999 | EML602R | Passed | 3 Years |
| | 2000 | EML602R | Passed | 1 Year |
| | 2000 | EML602RR | Passed | 3 Years |
| | 1997 | EML610 | Passed | 1 Year |
| | 1999 | EML610 | Passed | 1 Year |
| | 2000 | EML610 | Passed | 1 Year |
| | 1998 | EML602IM | Failed | |
| | 2000 | UGIU10 | Passed | 3 Years |

5.5. Unit Rates – Small Meter Faults

| Installed on MG Network | | | | |
|-------------------------|------------|--------|------------------------------|-------------------|
| Meter Type | Population | % | Unit Rate for Replacement | Cost of Rep (\$M) |
| EML602R | 154,721 | 23.04% | █ | █ |
| EML750 | 134,206 | 19.98% | █ | █ |
| EML602 | 94,478 | 14.07% | █ | █ |
| EML602RR | 86,130 | 12.82% | █ | █ |
| EML610 | 64,375 | 9.58% | █ | █ |
| RKMR08 | 52,200 | 7.77% | █ | █ |
| ATLASU8 | 34,886 | 5.19% | █ | █ |
| EML610R | 24,225 | 3.61% | █ | █ |
| DS5AR | 11,768 | 1.75% | █ | █ |
| UGIU10 | 4,925 | 0.73% | █ | █ |
| EML602IM | 3,114 | 0.46% | █ | █ |
| LG1010 | 2,765 | 0.41% | █ | █ |
| PCU6 | 1,630 | 0.24% | █ | █ |
| RKMR0806 | 911 | 0.14% | █ | █ |
| UGIU6 | 400 | 0.06% | █ | █ |
| GAL2000 | 300 | 0.04% | █ | █ |
| GAL2000H | 216 | 0.03% | █ | █ |
| RKMR1210 | 199 | 0.03% | █ | █ |
| EML610H | 112 | 0.02% | █ | █ |
| U10100KPA | 44 | 0.01% | █ | █ |
| JUBILEE | 42 | 0.01% | █ | █ |
| EML610PP | 13 | 0.00% | █ | █ |
| JUBLJNR | 2 | 0.00% | █ | █ |
| TOTAL | 671,662 | 100% | TOTAL Replacement Cost (\$M) | █ |
| | | | Weighted Average Unit Rate | \$94.07 |

5.6. Digital Metering Program – Phase 2 Cost Breakdown

Phase 2 of the Gas Digital Metering Pilot Study involves the installation of 10,000 EDMI Helios G6000 digital meters in the field from 2018 to 2021. The forecast cost of the trial is summarised below including:

- Table 5-1 - Standalone cost of pilot study (delivered outside BAU activities);
- Table 5-2 - BAU activities overlapping with the Digital Metering Pilot; and
- Table 5-3 - Incremental study costs.

Table 5-1: Scope and Cost of Digital Metering Pilot - excluding IT

| Function | Trial Services | Units | Unit Price | Project Cost | Comments |
|----------------------------------|---|--------|------------|--------------|--|
| Meter & Installation | Digital Gas Meter (EDMI or Secure Australasia) & Mill-NIC | 10,000 | █ | █ | Including cost of meter vendor doing NIC insertion into the meter. NIC is SSN Supply – available as a schedule to the existing NMS License Agreement. |
| | Installation – Replacement of existing meters | 8,000 | █ | █ | Meters to be installed as part of annual Time Expired Replacement Program. |
| | Installation – New Metes | 2,000 | █ | █ | Meters to be installed at new connections. |
| Communications | UtilityIQ license fee per meter - Trial license for gas meters | 10,000 | █ | █ | Proposed as a SoW behind the existing UE SSN NMS License Agreement. |
| | SSN Trial Support Services | NA | NA | █ | Support for first Australian digital gas meter and milli-NIC deployment. Proposed as T&M Services (available under existing Ts & Cs of the NMS License). |
| Customer Service | Incremental 3.0 x FT resources for coordination and enquiry support | NA | NA | █ | Allow 8 months x 1; 6 months x 1; 4 months x 1; then BAU |
| Analysis | Gas Graduate Engineer | NA | N/A | █ | Undertake all analysis for the project to support business case benefits and costs evaluation |
| Total cost (excluding IT) | | | | 3,985 | |

To minimise the cost of the pilot study, Multinet proposes to install digital meters in parallel with the Time Expired meter replacement program and new customer connections. Meter installation will take place over the four year period commencing in 2018 at a rate of 3,000 installs each year from 2018 to 2020, and 1,000 installs in 2021.

The incremental cost of the pilot study is calculated by taking into account the avoided cost of purchasing 10,000 conventional meters and by utilising existing programs (Time expired meter replacement & new customer connections) eliminating field installation costs. Table 5-2 shows the calculation of the ongoing BAU activities used to offset the cost of the pilot study.

Table 5-2: BAU Activities overlapping with the Digital Metering Pilot

| Function | BAU Activity | Units | Unit Price | Project Cost | Comments |
|--------------------------|---|--------|------------|----------------|--|
| Meter & Installation | Meter Purchase (<10m ³ unit) | 10,000 | █ | █ | Including cost of meter vendor doing NIC insertion into the meter. NIC is SSN Supply – available as a schedule to the existing NMS License Agreement. |
| | Installation – Replacement of existing meters | 8,000 | █ | █ | Meters to be installed as part of annual Time Expired Replacement Program. |
| | Installation – New Metes | 2,000 | █ | █ | Meters to be installed at new connections. |
| Total Offset cost | | | | \$1,785 | |

Table 5-3: Scope and cost of digital metering pilot costs excluding IT

| Function | Trial Services | Units | Unit Price | Project Cost | Comments |
|--------------------------------|---|--------|------------|--------------|--|
| Meter & Installation | Digital Gas Meter (EDMI or Secure Australasia) & Mill-NIC | 10,000 | █ | █ | Including cost of meter vendor doing NIC insertion into the meter. NIC is SSN Supply – available as a schedule to the existing NMS License Agreement. |
| | Installation – Replacement of existing meters | 8,000 | NA | - | Meters to be installed as part of annual Time Expired Replacement Program. |
| | Installation – New Metes | 2,000 | NA | - | Meters to be installed at new connections. |
| Communications | UtilityIQ license fee per meter - Trial license for gas meters | 10,000 | █ | █ | Proposed as a SoW behind the existing UE SSN NMS License Agreement. |
| | SSN Trial Support Services | NA | NA | █ | Support for first Australian digital gas meter and milli-NIC deployment. Proposed as T&M Services (available under existing Ts & Cs of the NMS License). |
| Customer Service | Incremental 3.0 x FT resources for coordination and enquiry support | NA | NA | █ | Allow 8 months x 1; 6 months x 1; 4 months x 1; then BAU |
| Analysis | Gas Graduate Engineer | NA | N/A | █ | Undertake all analysis for the project to support business case benefits and costs evaluation |
| Total cost excluding IT | | | | 2,075 | |

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