



# **Review of Unaccounted for Gas Benchmarks – Calculation**

**Prepared for**

**Essential Services Commission**

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## 1. EXECUTIVE SUMMARY

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The Essential Services Commission (Commission) is setting the Unaccounted for Gas (UAFG) benchmarks for the period 1 January 2018 to 31 December 2022. It is undertaking the UAFG review in two stages. The Commission has concluded stage one where the Commission determined the methodology for calculating the UAFG benchmarks. As part of stage two, the Commission engaged Zincara to advise on the efficiency of the gas distributors in relation to their management of UAFG for the period 2013-2017.

Zincara has divided its assessment into two parts:

1. An analysis of the information provided by gas distributors on the causes of UAFG.
2. The efficiency of each gas distributor's management of UAFG in the current period.

The results of Zincara's assessment are outlined below.

### **Class A UAFG**

All three distributors submitted that the Class A benchmarks should be retained. Zincara agrees with the retention of these benchmark as they have initially been derived from a bottom up approach and the networks supplying Class A customers have not materially changed to affect the UAFG for Class A customers.

### **Causes of UAFG**

All three distributors provided an assessment of the causes of UAFG. The distributors have categorised UAFG into:

1. Measurement based UAFG; and
2. Fugitive emissions.

Multinet added a separate category, "Systems". AGN and AusNet Services provided similar information in the above two categories.

Zincara concludes that the components of UAFG considered by the three distributors are consistent with gas industry practice.

## **Management of UAFG**

### **AGN**

AGN outlined a range of activities that it has undertaken in the current period. The strategies for the forecast period include all of these activities.

Zincara's review of the activities carried out by AGN for the current period has shown that AGN has efficiently managed UAFG in its DTS network. AGN's strategies for the forecast period are similar to the activities that AGN is undertaking in the current period.

However, for the non-DTS network, AGN has not provided any data that has been settled with the retailers. As the Commission's decision is to only use settled data, Zincara recommends retaining the 2013-2017 benchmarks of 2% for the forthcoming period.

### **AusNet Services**

AusNet Services said that its main focus on the network is network performance and it only investigates UAFG trends on an individual case basis. It provided a list of activities that it has carried out in the current period and the strategies for the forecast period.

AusNet Services' UAFG for the DTS network has been at or below the benchmarks since 2012, which supports AusNet Services' view that its ongoing asset management program has been able to achieve an actual Class B UAFG level which is relatively close to the benchmark. Zincara therefore believes that although AusNet Services has said that its investment decisions are primarily focused on network performance, its activities have had sufficient impact to be able to achieve a UAFG level close to the benchmark.

The UAFG for the non-DTS network has always exceeded the benchmark and has been increasing at quite an alarming rate since 2012. AusNet Services advised that it only commenced investigations in 2017 and that the previous UAFG figures had not raised sufficient alarms for it to commence investigations earlier. Given this, Zincara considers that AusNet Services should have commenced investigations on the causes of the high UAFG earlier than 2017.

Zincara does not consider the actual UAFG data for the non-DTS networks to be at an efficient level that can be used for calculating the forecast benchmarks. In the absence of any efficient data, Zincara recommends retaining the current benchmark for the forecast period.

## **Multinet**

Multinet outlined the activities that it has undertaken for UAFG. Multinet engaged Asset Integrity Australasia (AIA) to assist it in its management of UAFG. Multinet has engaged AIA on three separate occasions.

Zincara notes that Multinet's UAFG for its DTS network has shown an increasing trend. The two main contributors to changes in UAFG are fugitive emissions and measurement error. Although fugitive emissions do substantially contribute to rises in UAFG, a sudden rise in UAFG is generally due to measurement error. Despite this result, the question that remains is whether Multinet has been efficient in managing its UAFG during the current period. Zincara has considered three key aspects to answer this question:

1. Organisation commitment;
2. Fugitive emissions; and
3. Measurement error.

On all three key aspects, Zincara considers that Multinet has been acting efficiently to manage its UAFG.

In relation to the forecast period, Multinet proposes to continue with a similar program.

Zincara believes that one of the major contributors to Multinet's non-DTS UAFG trend is measurement error, possibly resulting from the low flows that occurred when the network was relatively new. As such, Zincara considers that the data is not reliable for the purpose of setting UAFG benchmarks for the forthcoming period. Zincara therefore recommends retaining the existing benchmarks for the next period.

## 2. INTRODUCTION

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### 2.1 BACKGROUND

The Essential Services Commission (Commission) proposes to set the Unaccounted for Gas (UAFG) benchmarks for the period 1 January 2018 to 31 December 2022. The Commission is undertaking the review of the UAFG benchmarks in two stages. The Commission concluded stage one when it published its final decision, “Review of Unaccounted for Gas Benchmarks: Final Decision – Methodology (July 2017)”. The Commission is now undertaking stage two which involves the calculation of the UAFG benchmarks.

As part of stage two, the Commission engaged Zincara P/L (Zincara) to assist with determining whether the gas distribution businesses have been acting efficiently with regard to their management of UAFG for the period 2013-2017.

### 2.2 SUMMARY OF THE COMMISSION’S FINAL DECISION FOR STAGE ONE

In July 2017 the Commission published its “Review of Unaccounted for Gas Benchmarks: Final Decision – Methodology”. The methodology comprises the following elements:

1. The Commission will use the revealed cost approach with a multi-year average to calculate the UAFG benchmarks.
2. The Commission will use actual UAFG data that has been settled by distributors and retailers to calculate the UAFG benchmarks.
3. The Commission will not account for possible reductions in UAFG resulting from the distributors’ mains replacement programs.
4. The Commission will not account for possible increases in UAFG caused by continued deterioration of the distribution networks.
5. The Commission will consider whether there are any efficiencies that can be achieved by the distributors, and may decide to adjust the forward UAFG benchmarks accordingly.
6. The Commission will retain separate UAFG benchmarks for Class A and Class B customers.

The Commission also determined that the submission requirements from gas distributors on the calculation of the UAFG benchmarks should include:

- Actual UAFG data that has been settled as part of the reconciliation process that is administered by AEMO.
- A detailed assessment of the causes of UAFG to support their respective UAFG benchmark proposals.

- A detailed explanation of how they have efficiently sought to reduce UAFG levels during the 2013-2017 regulatory period.
- A comprehensive strategy for how they will seek efficiencies to minimise UAFG levels during the 2018-2022 regulatory period.

### **2.3 APPROACH**

Our approach for stage two is outlined below:

- Review the submissions received from the gas distributors.
- Respond to any questions that Commission staff may have from the submissions.
- Prepare a draft report on Zincara's assessment of the submissions. The draft report shall consider the following factors:
  1. Whether the gas distributors have provided a detailed submission on the causes of UAFG.
  2. The efficiency of each gas distributor's management of UAFG in the current period.
- Consider any comments made by the gas distributors and other stakeholders on the Commission's draft decision.
- Prepare a final report on the efficiency of the gas distributors in regard to the management of their UAFG.

### **3. GAS DISTRIBUTORS' SUBMISSIONS**

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#### **3.1 INTRODUCTION**

All three gas distributors provided submissions to the Commission in regard to the calculation of the UAFG benchmarks. Each of the gas distributors submitted their UAFG data for both the DTS network and the non-DTS network in accordance with the Commission's spreadsheet.

The gas distributors generally supported the use of the latest UAFG data and a multi-year average of three years. All three gas distributors agreed with the retention of separate Class A and Class B UAFG benchmarks.

A summary of the gas distributors' submissions on the calculation of the forecast UAFG is discussed below. The discussion of the gas distributors' submissions on the causes of UAFG, how they have sought to reduce UAFG during the 2013-2017 period, and their strategies to minimise UAFG during the 2018-2022 period, is covered in section 5.

#### **3.2 AGN**

AGN agreed with the Commission that the most recent information should be used to set the UAFG benchmarks. It expressed concern about the use of only settled data as without further progress in settling the data, the UAFG benchmarks would be based on 2011 to 2013 data. Subsequent to the Commission's draft decision, AGN settled 2014 and 2015 data. It also said that based on six years of historical consumption data provided to retailers compared to the data settled with the retailers, the difference was within a range of 0.15% to -0.13%.

In its submission, AGN proposed that for the period 2018-2022, the Class A benchmarks should be retained at their current level for the DTS networks. It also proposed that the benchmarks for the non-DTS network should stay the same. Consistent with the Commission's final decision on methodology, AGN proposed a multi-year average of three years for the calculation of the Class B benchmarks. It also proposed that the data used should be from 2013-2015, which is the latest three years of settled data.

#### **3.3 AUSNET SERVICES**

AusNet Services said that it agreed with the Commission in using the revealed cost approach to setting UAFG benchmarks. However it also said that where a clear trend exists in the historical data that is likely to continue, then automatically

applying a multi-year average to set benchmarks will not result in a sound benchmark.

AusNet Services indicated that it supports the use of the most recent reliable UAFG data to set the benchmarks. It also said that although it considered that the most recent unsettled data should be used for setting the benchmarks, it accepts the Commission's practice of using only settled data. In its submission, AusNet Services did not propose Class A or Class B benchmarks for its DTS and non-DTS networks.

### 3.4 MULTINET

Multinet submitted that consistent with the approach adopted for the current regulatory period, a multi-year average of three years should be used to set the Class B benchmarks. Multinet said that its financial accounts include UAFG. Multinet indicated that as its accounts have been audited they can be relied on for the calculation of UAFG.

In September 2017, Multinet advised the Commission that it had also settled the 2015 data with the retailers, and as such it should be considered in the calculation of the UAFG benchmarks.

In its submission, Multinet proposed that for the period 2018-2022, the Class A UAFG benchmarks should be retained at the current levels for the DTS networks. It also proposed that the benchmarks for the non-DTS network should be retained.

### 3.5 SUMMARY

The tables below summarise the distributors' submissions:

**Table 1 - UAFG data provided: DTS**

Distributor	AGN	AusNet	Multinet
Latest year of data	2015	2016	2015
Latest year of settled data	2015	2015	2015

**Table 2 - UAFG data provided: non-DTS**

Distributor	AGN	AusNet	Multinet
Latest year of data	2015	2016	2014
Latest year of settled data	None	2015	2011

**Table 3 - Distributors' proposed benchmarks**

Distributor	AGN	AusNet	Multinet
DTS: Class B	4.0%	-	5.32%
DTS: Class A	Albury: 0.1% Victoria: 0.3%	-	0.3%
Non-DTS: Class B	2.0%	-	2.0%

Zincara agrees with the retention of the Class A benchmarks for the DTS networks. The Class A benchmarks were initially derived from a bottom up approach and the networks supplying Class A customers have not materially changed to affect the UAFG for Class A customers. In addition, the total UAFG for a network is divided into Class A and Class B UAFG. To calculate the UAFG for Class B requires that the Class A UAFG is assumed to be at the benchmark level otherwise there are too many variables in the calculations.

Comments on the Class B benchmarks are included in section 5 of this report.

## 4. CAUSES OF UAFG

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All three gas distributors provided an assessment of the causes of UAFG. A summary of their submissions on the causes of UAFG is provided below.

### 4.1 AGN

AGN engaged Asset Integrity Australia (AIA) to undertake an assessment of the elements of UAFG in its Victorian and Albury networks in 2016. AGN's details of the causes of UAFG are essentially the recommendations put forward by AIA<sup>1</sup>. The causes of its UAFG have been divided into two main categories:

1. Measurement based UAFG; and
2. Fugitive emissions.

AGN grouped a number of factors including timing mismatch, CTM<sup>2</sup> and metering accuracy, pressure and temperature compensation, company own use and theft into measurement based UAFG. Fugitive emissions included losses in transmission, high pressure, medium pressure and low pressure pipes, meter and regulator losses, and third party damage.

AGN also said that AIA had modelled AGN's UAFG for 2015 as 2,070TJ. AIA indicated that the total attributable UAFG for measurement and fugitive elements was 1,585TJ with an additional 485TJ not attributable to any one element.

### 4.2 AUSNET SERVICES

AusNet Services submitted that it had previously engaged AIA to undertake a study of the categories of drivers of UAFG. As its network had not undergone any substantive changes since the AIA study, AusNet Services said that it had not obtained further external advice on the causes of UAFG in its network. AusNet Services provided a copy of the AIA report<sup>3</sup>, dated May 2011, to the Commission. AusNet Services also provided its UAFG strategy document as Attachment 2 of its submission and resubmitted a revised strategy document on 30 August 2017.

In its UAFG strategy document, AusNet Services classified UAFG into two categories:

1. Measurement based UAFG, and
2. Fugitive emissions.

The components of UAFG that are in the two categories are detailed in the AIA report.

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<sup>1</sup> AIA report, Review of UAFG in AGN's Victorian and Albury Networks, August 2017.

<sup>2</sup> CTM stands for Custody Transfer Meter and it measures the amount of gas injected into the network.

<sup>3</sup> AIA report, Review of SP AusNet Strategy and Data Requirements for Desktop UAFG Review, May 2011.

In its submission, AusNet Services said that a key finding of the AIA study was that the cause of a large proportion of UAFG is essentially unknown and quoted the AIA report:

*“The estimation of UAFG to each category results in 54% of actual UAFG not attributed to any category. This emphasises the uncertainty associated with UAFG.”*

### 4.3 MULTINET

In support of its submission, Multinet submitted its UAFG strategy document<sup>4</sup> to the Commission. In the document, Multinet said that since 2012, it had engaged AIA to undertake three independent assessments in an effort to quantify and reduce UAFG. Multinet submitted the AIA report “Review of Multinet Gas’ Unaccounted for Gas, April 2017”. Multinet’s strategy document provides a detailed assessment of the causes of UAFG. Multinet has grouped the sources of UAFG into three categories:

1. Measurement
2. Fugitive emissions
3. Systems

The range of factors that contribute to measurement UAFG include timing mismatch, CTM uncertainty, line pack, company own use, pressure and temperature compensation. The factors for fugitive emission include transmission and distribution losses, regulator venting and third party damage. In relation to System UAFG, the factors that are attributable to this component include data reconciliation model, meter reads and meters not installed in the billing system.

Further details of each of the UAFG sources and their relative contribution to UAFG are provided in section 4 of Multinet’s strategy document.

A review of the AIA document showed that Multinet’s strategy document is consistent with the report from AIA and that the percentages of attributable UAFG and non-attributable UAFG are similar to the other gas distributors.

### 4.4 CONCLUSION

Zincara considers that the components of UAFG considered by the three gas distributors are similar to the components that you would expect the gas industry to consider as UAFG. Zincara therefore accepts the work carried out by AIA in identifying the components of UAFG, noting that AusNet Services has relied on the work carried out by AIA in 2011.

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<sup>4</sup> Multinet Gas Asset Management: Unaccounted for Gas Strategy CY 2017-2022, dated 16/6/2017.

## 5. MANAGEMENT OF UAFG

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### 5.1 INTRODUCTION

In its final decision on methodology, the Commission stated that<sup>5</sup> *“the revealed cost approach assumes that the distributors are efficiently minimising UAFG because they are subject to a profit-maximising incentive structure. There is nevertheless a risk that distributors may not be acting efficiently in all cases. Therefore the Commission will retain the discretion to adjust the forward UAFG benchmarks for efficiencies in appropriate circumstances. The Commission considers the forward UAFG benchmarks should only be adjusted for an expected efficiency if the efficiency can be identified and its impact on UAFG levels can be quantified”*.

Further, *In relation to the source of potential efficiencies, the Commission will carefully consider the detailed explanations from distributors on how they have efficiently sought to reduce UAFG levels during the current regulatory period, as well as the distributors’ strategies for how they will seek efficiencies to minimise UAFG levels during the next regulatory period”*.

Zincara has reviewed the information provided by the distributors and reports on its findings for the 2013-2017 regulatory period.

### 5.2 AGN

In section 4 of its submission<sup>6</sup>, AGN provided details of how it has sought to reduce UAFG levels during the 2013-2017 regulatory period. It also provided a report prepared by AIA, “Review of UAFG in AGN’s Victorian and Albury Networks”, dated August 2017.

AGN said that its UAFG is reviewed at senior management and board level. Its monthly report contains information on the annual UAFG, as well as its history and progress on UAFG reconciliation with the retailers.

AGN also indicated that it leverages experience gained in addressing UAFG across its various networks nationally to manage the Victorian networks.

AGN outlined a range of recurrent activities it undertakes as part of its UAFG management strategy, including:

1. Mains replacement;
2. Meter management;

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<sup>5</sup> ESC, “Review of Unaccounted for Gas Benchmarks: Final Decision – Methodology”, section 4.3.

<sup>6</sup> AGN, “Submission on Calculation of new Unaccounted for Gas Benchmarks”, August 2017.

3. Pressure control – upgrade of SCADA<sup>7</sup> system;
4. Leak management;
5. Management of third party damage;
6. CTM replacement;
7. Pressure set points monitor;
8. National Customer Care and Billing implementation;
9. Billing systems audits; and
10. Large customer consumption monitoring.

Refer to Appendix A for a detailed list of activities and their description.

In section 5 of its submission<sup>8</sup>, AGN provided details of its strategy for the forthcoming period 2018-2022. AIA in its report noted that AGN has developed strategic plans to cost effectively manage UAFG for the next period.

AGN said that its key document which describes its asset management over the next five to six years is the Asset Management Plan (AMP). Other related key documents include its Distribution Mains & Services Integrity Plan (DMSIP) and Meter Replacement Management Plan (MRP).

In addition to the ongoing monitoring of UAFG by the senior management, section 5 of AGN's submission discusses its key strategies for minimising UAFG which include:

1. Mains replacement;
2. Meter replacement;
3. SCADA – monitoring of large customer sites and extension of SCADA to regional towns;
4. Leak management;
5. Replacement/refurbishment of 12 CTMs;
6. Management of third party damage;
7. Pressure and temperature correction devices fitted to selected domestic meters;
8. Billing systems audits; and
9. Monitoring of UAFG at monthly operational meetings.

Refer to Appendix A for a detailed list of strategies and their description.

### 5.2.1 Conclusion

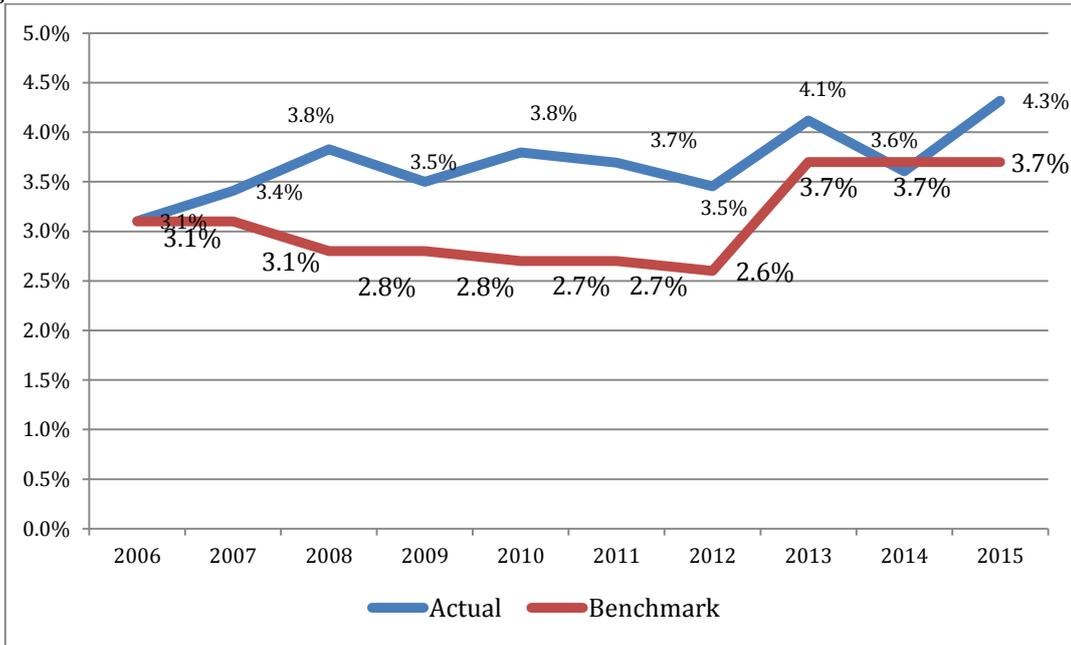
AGN's UAFG for its Class B customers in the DTS network is shown in the figure below.

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<sup>7</sup> SCADA stands for Supervisory Control And Data Acquisition.

<sup>8</sup> AGN, "Submission on Calculation of new Unaccounted for Gas Benchmarks", August 2017.

**Figure 1 - AGN’s Class B UAFG for the DTS network**



Zincara notes that the actual Class B UAFG between 2013 – 2015 is marginally higher than the benchmark. Zincara considers that for the 2013 – 2017 period, the range of activities carried out by AGN is what you would expect of a prudent gas distributor. As such, Zincara concludes that AGN has managed its UAFG efficiently.

In regard to the non-DTS network, AGN did not submit any data that had been settled with the retailers. As the Commission’s decision is to only use settled data, Zincara recommends retaining the 2013 – 2017 benchmarks of 2% for the forthcoming period.

**5.3 AUSNET SERVICES**

AusNet Services’ submission included its “Unaccounted for Gas (UAFG) Strategy” (referenced as Attachment 2) and “Attachment 1: Investigation into causes of Non-DTS UAFG”.

In its submission letter, AusNet Services says that its “UAFG Strategy details the sources of UAFG on our network and identifies potential projects that could potentially lead to incremental UAFG reductions. However, due to the inherent uncertainty in the drivers of UAFG, limited projects have been initiated during the current AA period with the specific objective of reducing UAFG. This approach recognises the limited extent to which AusNet Services is able to actively reduce UAFG through asset replacement or metering projects, and that UAFG is instead best managed indirectly through prudent asset management practices.” It notes that mains replacement has not had a noticeable effect on UAFG.

AusNet Services' submission letter indicates that *"our general approach to managing UAFG on our network during the current period has involved:*

- *Driving high reliability and network performance through best practice asset management; and*
- *Conducting investigations into UAFG trends on a case by case basis (eg. our ongoing investigation of non-DTS UAFG)."*

AusNet Services' UAFG strategy document provided further details on its program to manage UAFG. The UAFG strategy discusses each of the sources of UAFG, the activities undertaken relative to these sources, and suggests potential initiatives. These initiatives include:

1. Investigation of timing mismatch;
2. Calibration of the CTMs;
3. Company own use gas;
4. Meter replacement;
5. Mains replacement; and
6. Management of third party damage.

Refer to Appendix B for a detailed list of strategies and their description.

With respect to its non-DTS network, AusNet Services provided an investigation report into the causes of non-DTS UAFG (referenced as Attachment 1). This investigation commenced in 2017. The non-DTS network has been experiencing significantly increasing UAFG levels in recent years. The report details the investigations and analysis undertaken by AusNet Services in order to determine the cause(s) of the increasing UAFG.

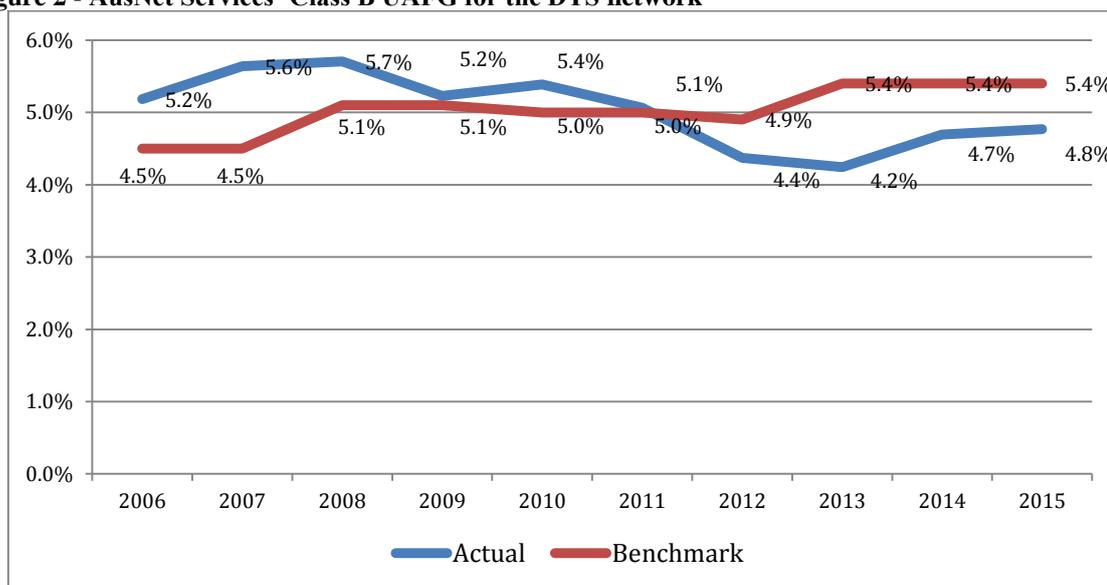
For the 2018-2022 period, AusNet Services proposes to continue with the activities discussed above. In addition, AusNet Services proposes to continue its investigations into the causes of UAFG in the non-DTS network.

### 5.3.1 Conclusion

In section 6 of the UAFG Strategy, AusNet Services stated that internal priorities shifted away from a direct focus on minimising UAFG through specific projects or investments, since the UAFG fell below the benchmark in its DTS network. It stated that this was recognised by the ESC at the last review in 2013 where it stated *"...UAFG is not necessarily a big enough problem to drive investment decisions – the GDBs' primary obligations relate to safety and reliability."* In addition, AusNet Services stated: *"Under this approach AusNet Services continued to have positive UAFG outcomes in the DTS during the current 2013-17 access arrangement period."*

AusNet Services' actual UAFG for its DTS network is shown in the figure below.

**Figure 2 - AusNet Services' Class B UAFG for the DTS network**



The figure shows that its UAFG has been at or below the benchmarks since 2012, which would support AusNet Services' view that its ongoing asset management program has been able to achieve an actual Class B UAFG which is below the benchmarks. The question that remains is whether AusNet Services could have done more to achieve an even lower UAFG level.

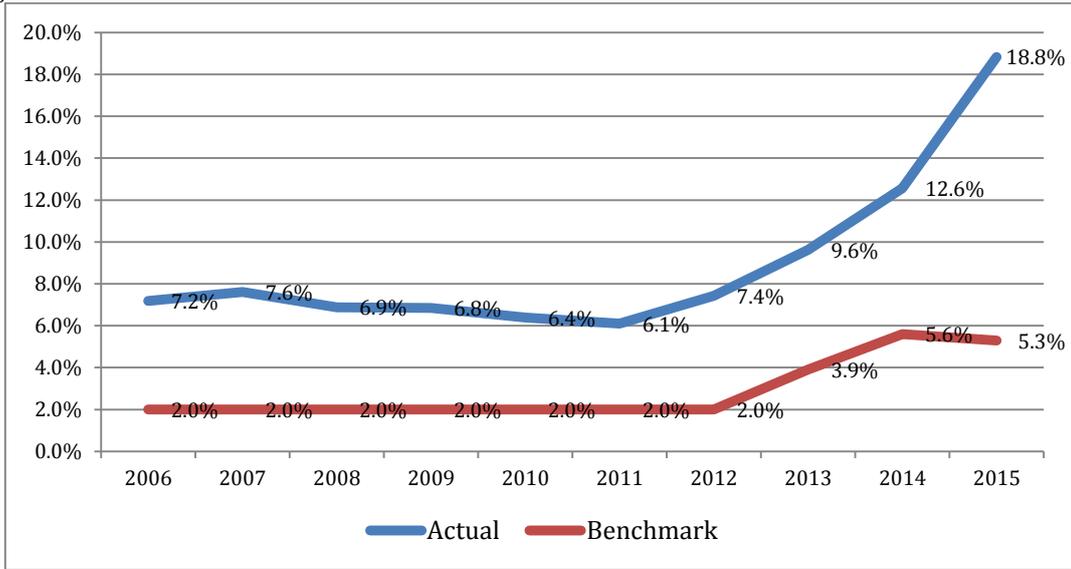
Zincara acknowledges that AusNet Services' investment decisions have been able to achieve a low UAFG. The key drivers for its investment decisions are safety and reliability. Unless there is a need for additional investment to meet these drivers, it is not expected that AusNet Services would invest further just to achieve a lower level of UAFG.

Given the above results, Zincara considers that AusNet Services' actions for the period 2013-2017 for its DTS network have achieved an efficient result.

In relation to the forecast period 2018-2022, AusNet Services is relying essentially on its ongoing asset management practices and the initiatives listed above.

In the case of the non-DTS network, AusNet Services' actual UAFG compared to the benchmarks is shown in the figure below.

**Figure 3 - AusNet Services' UAFG for the non-DTS network**



From the figure, the UAFG for the non-DTS network has always exceeded the benchmark and has been increasing at quite an alarming rate since 2012. AusNet Services advised that it only commenced an investigation in 2017 and that the previous UAFG figures had not raised sufficient alarms for it to commence investigations earlier. Given the results, Zincara considers that AusNet Services should have commenced investigations into the causes of the high UAFG earlier than 2017.

It is also unclear from the strategy paper whether the actions which AusNet Services had listed for its DTS network were even considered for the non-DTS network. Actions such as:

- Investigation on meter reading timing mismatch;
- Calibration of the CTMs;
- Measurement of own gas use at city gate;
- Calibration of meters for high volume customers; and
- Mains replacement of old cast iron and unprotected steel mains.

As such, Zincara does not consider the actual UAFG data for the non-DTS network to be at an efficient level that can be used for calculating the future benchmarks.

AusNet Services acknowledged that the reported UAFG is too high to be the actual loss. This further supports Zincara’s conclusion that the data cannot be used for calculating the forecast UAFG. In the absence of any efficient data, Zincara recommends the use of the current benchmarks for the forecast period.

## 5.4 MULTINET

Multinet submitted its UAFG strategy document to the Commission, together with AIA's most recent "Review of Multinet Gas' Unaccounted for Gas". Multinet said its UAFG strategy "aims to define UAFG, articulate and quantify its drivers and provide an overview of strategies adopted by Multinet Gas to efficiently reduce UAFG". Multinet's UAFG strategy is reviewed on a two yearly basis, the most recent being in June 2017.

Multinet said that its strategy draws on work undertaken by AIA. Since 2012, Multinet has commissioned AIA to undertake three separate assessments of UAFG – in 2013, 2014 and 2017. The briefs to AIA ranged from identifying the contributory elements of Multinet's UAFG, reviewing Multinet's actions in relation to industry best practice, and recommending actions to reduce UAFG. The strategy document also said that it had incorporated findings and recommendations from the AIA reviews. The strategy document quoted the conclusion in AIA's latest report (2017)<sup>9</sup>:

*"Multinet has maintained its UAFG at efficient and economically prudent levels over the 2013 to 2017 period given the nature of its network. There are no additional cost effective actions available to Multinet that would have effectively reduced the current effective Class B UAFG level below 6.01%" (referring to calendar year 2015).*

Details of Multinet's activities to minimise UAFG during 2013-2017 are:

1. CTM replacement program;
2. Meter management;
3. Pressure and temperature correction;
4. Mains replacement program;
5. Leak survey;
6. SCADA;
7. Meter reading and validation.

Refer to Appendix C for a more detailed description of the activities.

In relation to the 2018 - 2022 regulatory period, Multinet's UAFG strategy (section 6) provides a comprehensive list of initiatives in a "Program of Works Summary" to be undertaken under the categories of measurement, fugitive emissions and systems. The key activities noted in Multinet's covering letter to the Commission (dated 11 August 2017) are:

1. Mains replacement program – as per its revised Access Arrangements, including continuation of replacement of (531kms) low pressure cast iron and unprotected steel, replacement/abandoning (24kms) of medium

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<sup>9</sup> Multinet, "UAFG Strategy", section 3.3.

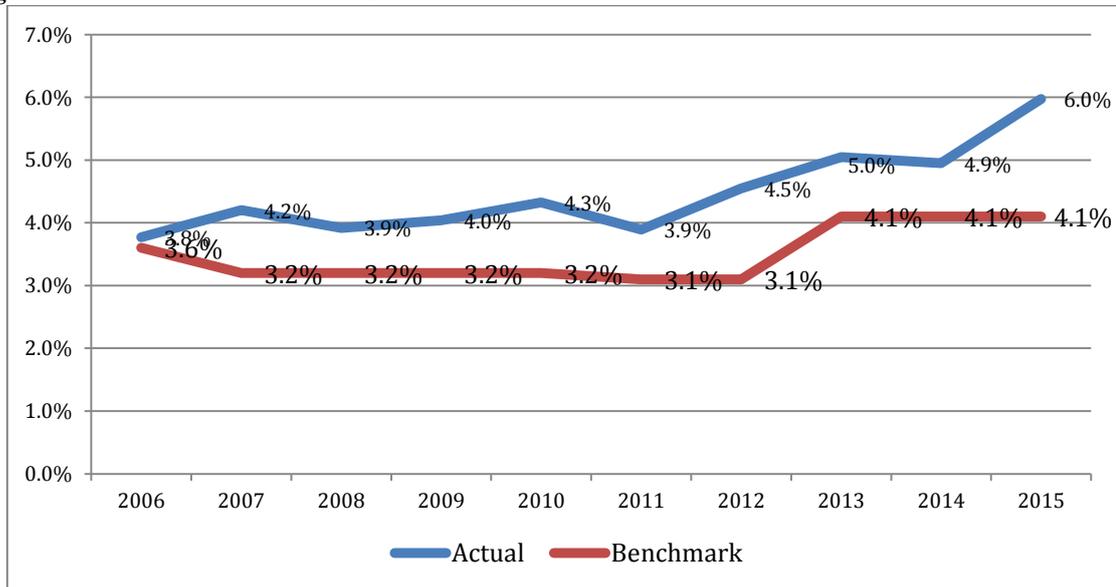
pressure cast iron, and replacement of (40kms) early first generation HDPE;

2. Custody Transfer Meter (CTM) – work with GasNet to upgrade and/or replace the 11 CTM sites;
3. Large Tariff D meters – review all aspects of their metering design, operation and maintenance are in order;
4. Temperature – work with the other gas distribution businesses to undertake a review of the method and ability to change fixed correction factors for basic meters to reflect the actual or weighted average temperature of gas;
5. Higher Heating Value (HHV) – work with AEMO to review the current methodology for HHV compensation; and
6. Class A classification – continue annual reviews of the Class A customers.

**5.4.1 Conclusion**

Multinet’s Class B UAFG for its DTS network is shown in the figure below.

**Figure 4 - Multinet’s Class B UAFG for the DTS network**



Multinet’s UAFG has remained relatively constant but rose to 5.0% in 2013 and then reduced to 4.9% in 2014 before rising to 6.0% in 2015. This could be due to a range of factors. Zincara believes that the two main contributors of changes to UAFG are fugitive emissions and measurement error. Although fugitive emissions do substantially contribute to rises in UAFG, a sudden rise in UAFG is generally

due to measurement error. However, as discussed in stage one of the Commission's UAFG review, the factors that contribute to UAFG could work together or counteract each other making it difficult to determine exactly what has caused the annual changes. Zincara believes that the most important question arising from this is whether Multinet has been efficient in managing its UAFG in the current period 2013-2017. To answer this question, Zincara has considered three key aspects:

- Organisation commitment;
- Fugitive emissions; and
- Measurement error.

From an organisation perspective, Zincara believes that Multinet has been committed to reducing UAFG. Multinet has sought external advice since 2012 and in particular engaged AIA three times to assist it in managing its UAFG. In addition, Zincara is aware that Multinet set up an in-house team of engineers in 2015 to address the UAFG levels.

Fugitive emissions are one of the major contributors to UAFG. From an emission perspective, Zincara believes that Multinet has invested efficiently in managing fugitive emissions. In its Access Arrangement submission to the AER, Multinet indicated that it will achieve 527 kms of mains replacement which was the target set by the AER for the 2013-2017 regulatory period. In addition, Multinet controls its network using SCADA which aims to ensure the network has the optimum pressure for reliability and minimising gas losses. Other activities such as ongoing leak survey and managing third party damages aims to minimise gas losses in the network. These activities support the view that Multinet has invested efficiently in managing fugitive emissions.

The other major contributor of UAFG is measurement error. In relation to measurement error, Zincara considers that Multinet has invested efficiently. In 2015, following a report from APA on the CTM<sup>11</sup> supplying into Multinet's network, Multinet together with APA implemented a program to replace 11 CTMs commencing in 2016. In addition, Multinet administers an in-service compliance program for all its customers' meters. Zincara has reviewed the in-service period<sup>13</sup> and considers the period to be consistent with the GDSC and also industry practice. Other activities that Multinet is carrying out such as extending checks from industrial and commercial customers to domestic meters to ensure that the meter indexes are operating effectively and ensuring customers have the correct temperature and pressure correction factors are also important in reducing UAFG. As a result, Zincara considers that Multinet has effectively managed its measurement errors.

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<sup>11</sup> Multinet pays a charge to access the measurement data from the CTM. As such, any changes to the CTM must be agreed by both parties as they have an impact on the ongoing charges.

<sup>13</sup> Table 5-5 of the UAFG strategy document, June 2017.

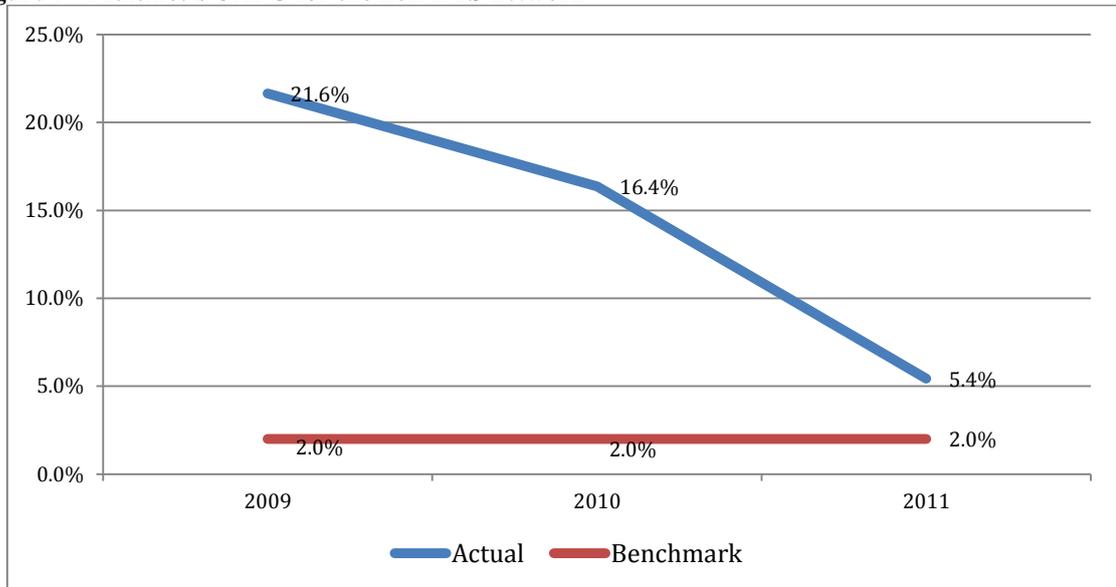
In summary, Zincara considers that for the current period, Multinet has taken steps that can be reasonably expected by a prudent distributor to ensure that its UAFG has been managed efficiently.

In relation to the forecast period 2018-2022, Multinet proposes to continue to manage fugitive emissions via a similar program in the current period.

A key activity that Multinet is carrying into the next period is the replacement of the CTMs. A CTM has a major input into the calculation of UAFG; ensuring its accuracy will reduce the measurement uncertainty which can cause changes in UAFG from year to year. Multinet’s program of reviewing its large tariff D design and operation, temperature compensation for domestic meters and ensuring that Class A customers are appropriately classified, are important activities in reducing the contribution of measurement errors to UAFG.

The UAFG for the non-DTS network is shown in the figure below.

**Figure 5 - Multinet’s UAFG for the non-DTS network**



Zincara believes that one of the major contributors to the UAFG trend shown in the graph above is measurement error, possibly resulting from the low flows that occurred when the network was relatively new. As such, Zincara considers that the data is not reliable for the purpose of setting UAFG benchmarks for the forthcoming period. Zincara therefore recommends retaining the existing benchmarks for the next period.

## Appendix A

### AGN's Activities for Managing UAFG

#### Summary of AGN's activities for managing UAFG for 2013-2017

1. Mains Replacement. AGN will complete its approved replacement of 696 kilometres during the current period. Its mains replacement strategy is reviewed annually and involves analysis of trends on leaks and integrity related indicators reflected in its Distribution Mains & Services Integrity Plan (DMSIP). AGN notes that its analysis of UAFG trends in its Melbourne network has been unresponsive to the mains replacement program over the 2010-2015 period, suggesting factors other than leakage on the low pressure network are key influences in the level of UAFG.
2. Meter Management. The AIA review found that AGN's meter replacement program during the 2013-2017 period was in line with planned replacement levels.
3. Pressure Control Upgrade. AGN upgraded its SCADA system in 2014 and will complete remote SCADA monitoring to 30 gate stations by the end of 2017. This action has enabled improved pressure control and reduced the frequency of the system defaulting to high pressure.
4. Leakage Management. AIA reviewed leak management performance over the 2013-2017 period and confirmed leak response times, leak repairs and leak surveys were in line with performance targets. AIA also noted that the high level reporting and action by senior management, including the CEO, keeps a strong performance focus on this activity.
5. Management of Third Party Damage. There has been an increasing use of the Dial Before You Dig (DBYD) service across the period and a decreasing incidence of damage by third parties. AGN's invoicing of third parties for damage caused places an additional deterrent to minimise damage.
6. CTM replacement and refurbishment. AGN together with APA GasNet have a program of asset refurbishment or replacement based on asset condition and performance.
7. Pressure Set Points. AIA's review found that AGN undertakes regular checks on the set points to correct for any variation.
8. Network Temperature. AGN initiated an analysis of network temperatures from the larger meters that have temperature correction, which found that

temperature reduction can be more than anticipated. Temperature variations are an important influence on UAFG, and AGN has proposed an initiative during 2018-2022 to consider the cost effectiveness of applying pressure and temperature correction to commercial and domestic meters.

9. Billing Systems. During the current period, AGN has implemented both a national Enterprise Asset Management (Maximo) system and a national Customer Care and Billing (CCB) system.
10. Billing System Audits. AGN routinely undertakes audit checks of correction factors across its billing and asset management systems. It also audits consumption and meter details.
11. Large customers. AGN routinely analyses interval-metered data to determine any changes in consumption that may result in UAFG.

#### **Summary of AGN's UAFG strategies for the period 2018-2022**

1. Mains Replacement. AGN's DMSIP sets out the strategy for replacement of ageing/deteriorating mains in the network, which is a key driver in the minimisation of the leakage component of UAFG. AGN's program commenced in 2003 and during the 2013-2017 regulatory period it will complete the full 696 kilometres of mains replacement allowed. Over the next regulatory period (2018-2022), AGN is planning to complete the low pressure mains replacement program and replace other mains determined to be at risk. AGN notes that Energy Safe Victoria supports the program. The program of 297 kilometres of (cast iron, unprotected steel, PVC, and HDPE) mains was accepted in full by the AER's Gas Access Arrangement Review Draft Decision.
2. Meter Replacement. AGN's meter replacement strategy for 2018-2022 is detailed in its MRP.
3. SCADA. AGN proposes to more effectively manage monthly meter reading of large customer sites and to extend the SCADA network to regional towns and certain fringe points of the network, allowing for real-time monitoring of network conditions and, in some cases, remote control.
4. Leak Management. AGN's AMP sets out its strategy for leak management for the 2018-2022 regulatory period, including response times for public reported leaks, times for repairing leaks and completion of the leakage survey program. AGN says that robust monitoring of performance includes monthly reporting to senior management.
5. Replacement or refurbishment of 12 CTM sites.

6. Third Party Damage. Continue to invoice third parties causing damage to the network.
7. Domestic meters fitted with pressure and temperature correction, at strategic locations around the network, to ascertain the impact of UAFG from the current billing assumptions of gas pressure and temperature. This data will be analysed as part of a study on the cost effectiveness of extending pressure and temperature correction to commercial and domestic meters.
8. Billing system audits to continue to ensure critical customer billing accuracy.
9. UAFG monitoring and a focus on actions to continue at monthly operational meetings.

## Appendix B

### AusNet Services' Activities for Managing UAFG

#### Summary of AusNet Services' activities for managing UAFG

##### Measurement based:

1. Timing mismatch

Estimated meter reads – AusNet Services has established a process to monitor the number of estimated reads and is satisfied that the current number is not a contributor to UAFG.

2. CTM

APA maintains and calibrates CTMs on an annual basis (Carisbrook is calibrated by IM&C Engineering – refer to AusNet Services' non-DTS investigation).

AusNet Services has an arrangement with APA to be notified when CTMs are planned to be calibrated so they can also attend the site to witness the work.

3. Company's own use

Approximately 50% of AusNet Services' own gas use metering at city gate heaters are actual reads. An implementation plan proposes that all own use gas sites should be metered.

4. Inclusion of high-volume meters

No current activities related to Class A customer audit. An implementation plan suggests the inclusion of a small number of customer sites in any calibration/maintenance audit using the same criteria as applied to CTMs.

Section 6 notes that an investigation was performed on larger Tariff D customer sites to identify metering accuracy and any anomalies. The outcome was that losses from Tariff D metering were negligible.

5. Temperature and pressure compensation for meters

An implementation plan suggests an industry approach to change the framework for pressure and temperature correction factors. The aim is to enable the calculation of values for UAFG due to pressure compensation to be performed in an automated fashion.

AusNet Services has no current activities to influence industry change in this matter.

6. Higher Heating Value (HHV) compensation

An implementation plan suggests a review of application of HHV values relating to Coriolis meters.

AusNet Services has no current activities relating to the review of the application of HHV values, as a review in 2008 showed that application of a state-wide HV is the best economic option.

7. Meter accuracy and regulator settings

AusNet Services' Meter Management Strategy details management of meter accuracy. In addition, large industrial and commercial metering undergo regular maintenance checks.

AusNet Services' implementation plan also suggests all CTM and Class A meters be included in a meter audit to assess performance against design standards. AusNet Services makes no comment in the UAFG strategy on undertaking a CTM performance audit.

8. Meter-bypass and theft

AusNet Services relies on meter readers to identify instances of meter bypass and theft. AusNet Services says the number of cases is very small and hence an immaterial impact on UAFG.

**Fugitive emissions**

9. Mains renewals

AusNet Services' Mains and Services Strategy details its mains replacement program, with progress in line with the approved Access Arrangement.

10. Leakage from valves and regulators

Faulty regulators are replaced in a timely manner.

AusNet Services' proposal to initiate a proactive domestic regulator program during the 2018-22 period has been approved by the AER in its Gas Access Arrangement Review draft decision.

11. Third Party Damage

AusNet Services monitors and reports internally on third party damage on a monthly basis, including trend analysis. Analysis shows that the number of cases of damage is decreasing.

AusNet Services provides a free asset location service and also DBYD service.

12. SCADA pressure control

AusNet Services manages network pressures to the minimal level necessary for supply to manage safety and minimise UAFG.

## Appendix C

### Multinet's Activities for Managing UAFG

#### Summary of Multinet's activities for managing UAFG for 2013 - 2017

1. CTM replacement program. In 2015, APA Group conducted an assessment of its CTMs and with Multinet agreed a program of refurbishment/replacement, which is currently in progress.
2. Meter management. Multinet has developed a Small Meter Strategy and a Large Meter Strategy to manage the field life extension and meter replacement programs. It also undertakes investigations to detect and replace meters with index faults.
3. Pressure and temperature correction. Multinet has undertaken a review of its interval meter sites and initiated a program to upgrade a number of sites. Routine maintenance of industrial and commercial meter sites includes a check and recalibration of set points. An initiative to review temperature correction for domestic meters is underway.
4. Mains Replacement Program. Multinet says that it is on schedule to complete its approved 2013-2017 program of 527 kilometres of low pressure mains.
5. Leak survey. Multinet carries out an annual leakage survey on areas of its network that have a high population and building density. It also conducted a special survey of its medium pressure cast iron network in 2017.
6. SCADA. Multinet monitors and controls particular areas of its gas network in real-time using the SCADA system.
7. Meter reading and validation. Multinet has initiated programs to improve accuracy of meter reading and reconciling meter details between asset and billing systems.

#### Summary of Multinet's UAFG strategies for the period 2018-2022

1. Mains Replacement Program – as per its revised Access Arrangements, including continuation of replacement of (531kms) low pressure cast iron and unprotected steel, replacement/abandoning of (24kms) medium pressure cast iron, and replacement of (40kms) early first generation HDPE.

2. CTM – work with GasNet to implement the program to upgrade and/or replace 11 CTM sites.
3. Large Tariff D meters – undertake a review to ensure all aspects of their metering design, operation and maintenance are in order.
4. Temperature – work with the other gas distribution businesses to undertake a review of the method and ability to change fixed correction factors for basic meters to reflect the actual or weighted average temperature of gas.
5. Higher Heating Value (HHV) – work with AEMO to review the current methodology for HHV compensation.
6. Class A classification – continue annual reviews of the Class A customers.