



# **Review of Gas Distribution Businesses Unaccounted for Gas**

**Prepared for**

**Essential Services Commission**

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## 1. EXECUTIVE SUMMARY

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In March 2013, the Essential Services Commission (Commission) released its Draft Decision on the Unaccounted for Gas (UAFG) benchmarks for the period 2013 – 2018. The Commission concluded that there was no justification to amend the benchmarks for Class A customers. In relation to Class B customers, the Commission decided that for Envestra and Multinet, there was insufficient information to warrant a change to the current benchmarks for Class B customers. However, the Commission also concluded that there was sufficient information from SP AusNet for the Commission to set the benchmark for Class B customers using the three year average (2008-2010).

The three gas distributors have responded to the Commission and have provided additional information on their UAFG. Zincara has reviewed the gas distributors and other interested parties submissions and its conclusions are outlined below.

### **Additional Data**

In relation to the additional information provided by Envestra and Multinet on its activities related to UAFG, Zincara has grouped the activities into leakage management and metering accuracy management.

Leaks management includes activities such as mains replacement, pressure control, leakage surveys and responding to emergencies. The main driver for these activities is the distributor's safety obligation. However, benefit of reducing leaks is that there will be less gas loss which will have an impact on UAFG.

In relation to metering, the key driver for accurate metering is so that the distributor can accurately bill for the gas that it is transporting and its obligation under the Gas Distribution System Code. Like leaks management, the improved metering will also reduce the uncertainty in measurement which does has an impact on UAFG.

Zincara therefore considers that the activities carried out by Envestra and Multinet are what you can reasonably expect from a gas distributor which will have an impact on UAFG.

In relation to identifying the different components of UAFG, all three gas distributors have listed similar components of UAFG. However, the magnitude of each of the component is different which is what you would expect given the differences in each gas network. It is noted all three gas distributors have identified that metering error has the highest level of uncertainty. From the work carried out by AIA and Zincara's own experience, Zincara considers that the approach adopted by the three distributors in estimating the components of UAFG is reasonable.

### **Heating value**

There are many variables that could have an impact on the heating value one of which is the multiple gas supply. It is not conclusive there is a particular ongoing bias to Envestra due to the multiple gas supply but it is acknowledged that the multiple gas supply will have an impact on the heating value.

## Benchmarking

In relation to the AGL's comment on benchmarking UAFG, Zincara considers that UAFG for the gas distributors in Victoria are on the high end of the scale relative to other jurisdictions without taking local factors into account.

## Mains Replacement

The main driver for mains replacement is safety and not UAFG. However replacing the old and leaking gas mains does have an impact on UAFG but other components such as increasing number of leaks in high pressure mains may mask some of the benefits.

The table below shows the savings of UAFG from three leaks per km scenarios.

**Table 1-1 Estimated 2012 Class B UAFG with Various Leakage Rate Savings**

Leakage Rate	Mains Replacement	Envestra	Multinet	SP AusNet
200 GJ/km	Actual	3.71%	4.29%	5.33%
	Approved	3.67%	4.25%	5.31%
100 GJ/km	Actual	3.74%	4.31%	5.35%
	Approved	3.72%	4.29%	5.35%
50 GJ/km	Actual	3.75%	4.32%	5.37%
	Approved	3.74%	4.31%	5.37%

The table above shows the differences in UAFG between the actual mains replacement and the approved mains replacement are marginal in all three scenarios. The largest difference is 0.04% for Envestra and Multinet when the leakage rate is 200 GJ/km. SP AusNet's leakage rates are almost the same between actual and approved mains replacement due to SP AusNet almost completing its approved mains replacement program.

As the 100GJ/km is based on Advantica's recommendation and there are marginal differences between the three scenarios, it is recommended that the 100GJ/km be used as the leakage rate for estimating UAFG savings.

## Calculation of UAFG Benchmarks for 2013

A three year average is the most appropriate method for calculating the benchmark UAFG for the forthcoming period. As the data for 2011 has not been finally agreed with the retailers, Zincara considers that the most appropriate period to use is from 2008 – 2010. Using the 2008 – 2010 period includes any effects due to changes in heating value as a result of multiple gas sources.

Class A Benchmark is assumed to continue at 0.3%.

Using the 2008 – 2010 actual gas injection and demand, the 2013 Class B Benchmark with six alternatives allowing for adjustments for the mains replacement and delay in implementing the Benchmarks are shown in the table below.

**Table 1-2 Class B UAFG for 6 Alternatives**

<b>2013</b>	<b>Envestra</b>	<b>Multinet</b>	<b>SP AusNet</b>
UAFG Base	3.69%	4.10%	5.44%
UAFG Base reduced for LP Impact	3.65%	4.05%	5.44%
UAFG Base + timing Impact in year 2013	4.77%	5.08%	5.98%
UAFG Base + timing Impact in 2013 reduced for LP Impact	4.73%	5.03%	5.97%
UAFG Base + timing impact for 4.5 years	3.82%	4.21%	5.50%
UAFG Base + timing impact for 4.5 years reduced for LP Impact	3.77%	4.16%	5.50%

### **Albury Network**

In the absence of any other information from Envestra on Class A customers for the Albury network, Zincara recommends that the UAFG for these customers be maintained at 0.1%

### **Non PTS Networks**

The UAFG for Multinet's non-PTS network should continue at 2% as there are no actual data to show the effects of temperature changes due to Lang Lang not having a heater at the city gate and Korumburra's heater not operating to maintain the temperature to standard condition.

In relation to SP AusNet's non-PTS network, Zincara considers that it is still appropriate to use a regression analysis which takes into the annual variation and provides the forecast with a reflection of what has occurred in the past.

## **2. INTRODUCTION**

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### **2.1 BACKGROUND**

In March 2013, the Essential Services Commission (Commission) released its Draft Decision on the Unaccounted for Gas (UAFG) benchmarks as set out in Schedule 1 of the Gas Distribution Code (Code). The Commission concluded that there was no justification to amend the benchmarks for Class A customers. In relation to Class B customers, the Commission decided that for Envestra and Multinet, there was insufficient information to warrant a change to the current benchmarks for Class B customers. However, the Commission also concluded that there was sufficient information from SP AusNet for the Commission to set the benchmark for Class B customers using the three year average (2008-2010).

The three gas distributors have responded to the Commission and have provided additional information on their UAFG.

The Commission has therefore engaged Zincara P/L to assist it in setting the UAFG benchmarks, the method of calculating the benchmarks and the use of the benchmarking categories.

### **2.2 APPROACH**

Zincara has adopted a similar approach in analysing the information provided by the gas distributors. In summary Zincara carried out the following: carried out a desktop review on the material provided by gas distributors and has assumed that the data provided is accurate. Zincara has not verified the accuracy or veracity of the data.

- Review the DBs' submissions in relation to additional information provided by the gas distributors.
- Meet with the gas distributors to discuss their proposals.
- Consider any comments made by other third parties on UAFG.
- Advise the Commission of the technical issues arising from the submissions.
- Comment on the reasonableness of the DBs' forecasts and recommend the benchmark UAFG to apply for the period 2013 - 2017.

The following sections details Zincara's findings.



### **3. GAS DISTRIBUTORS' ADDITIONAL UAFG INFORMATION**

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#### **3.1 INTRODUCTION**

Unaccounted for Gas (UAFG) for a distribution system is the difference between the metered gas that has been injected into the distribution system and the metered gas withdrawn by the customers over a specified period (12 months in the Victorian context). UAFG is generally expressed as a percentage of the metered quantity of gas entering the distribution network.

The Commission said that except for SP AusNet, Envestra and Multinet did not provide sufficient information that demonstrates that the businesses have attempted to identify the causes of UAFG. The Commission goes on to say that a prudent business would undertake a significant review of the causes of UAFG and would undertake a significant review of the causes of UAFG and consider a comprehensive strategy for reducing UAFG levels in the 2008 – 2012 period. SP AusNet however has provided sufficient historical information for the Commission to make a decision on its UAFG.

In response to the Draft Decision, the three gas distributors provided further information on its UAFG and other related issues.

#### **3.2 GAS DISTRIBUTORS' SUBMISSIONS**

Both Envestra and Multinet provided information on what activities that they carry out for UAFG.

##### **3.2.1 Envestra's Submission**

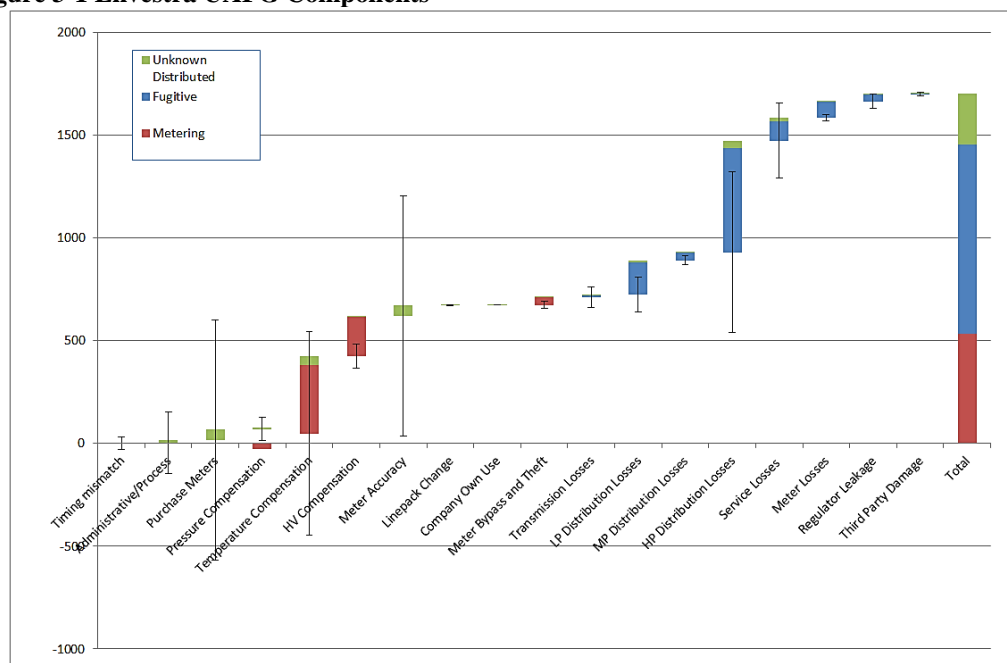
Envestra said its UAFG management can essentially be divided into the following:

- Mains replacement;
- Theft mitigation;
- Pressure correction factor reviews;
- Meter that under-record consumption;
- Ongoing review of large customers changes in consumption patterns;
- Gate station meter tolerances reviews;
- Leakage management; and
- Meter management relating to the sample testing of meters in the field.

Envestra also carried out a detailed analysis of the components that have made up UAFG and engaged an Asset Integrity Australia P/L (AIA) to review Envestra's analysis. AIA

provided a report dated 4 May 2013 which stated that the analysis and calculations carried out by Envestra to be reasonable. The components that made up Envestra's UAFG are shown in the figure below.

**Figure 3-1 Envestra UAFG Components**



Source: Envestra's Submission

The chart shows that the largest component of UAFG is due to leaks in the high pressure network and meters have the highest level of uncertainty in terms of its contribution to UAFG.

### 3.2.2 Multinet Submission

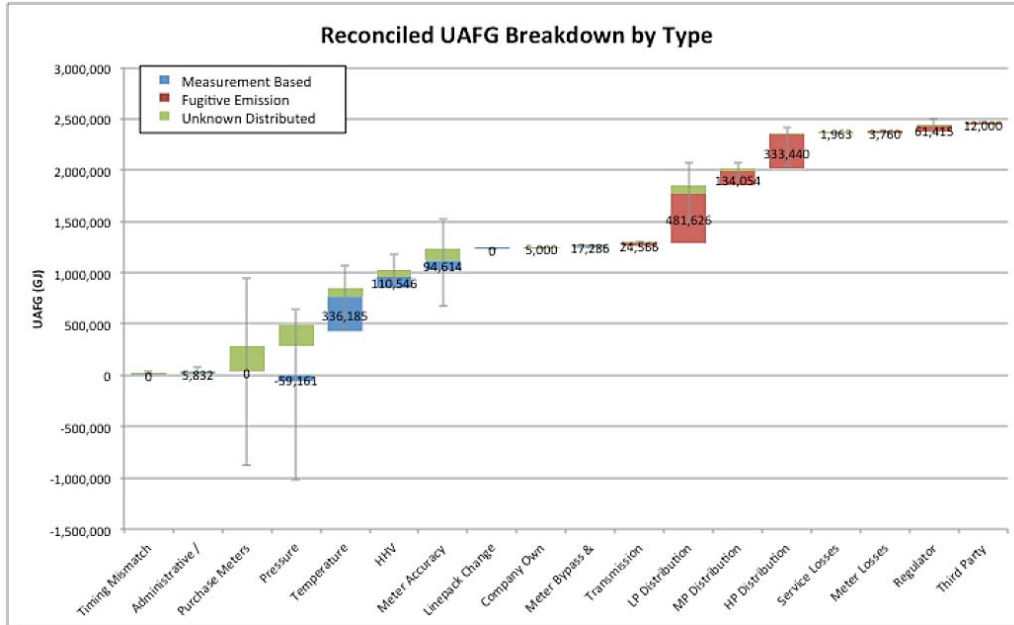
Multinet engaged AIA to carry out a management review of its UAFG. AIA reported that Multinet had carried out these activities which impact on UAFG.

- Mains replacement;
- SCADA pressure control to minimise the operating pressure of controlled networks;
- Time clock operation on District Regulators to minimise operating pressure;
- Leakage Survey (annual) and ad-hoc;
- Respond to all public reported gas escapes and repair where gas leaks found;
- Meter replacement in accordance with Australian Standards to reduce metering error;
- Larger I & C meters replaced more frequently;

- I&C customer meter/regulator sets on scheduled maintenance which includes set pressure checks;
- CTM calibration in accordance with market rules and OEM requirements to minimise metering error;
- Monthly monitoring of UAFG to identify any trend change for further investigation;
- Annual reconciliation process to identify errors, duplications of meter readings etc.;
- Pressure and temperature correction on large consumers to minimise measurement error;
- Metering of all system use gas such as water bath heaters;
- Meter sizing charts to appropriately match meter size to loads;
- Monitoring of Daily Metered Customer data for breakdown or faulty equipment;
- Substitution of incorrect or missing data with estimated or recovered actual data;
- Regular maintenance and calibration of sites with temperature and pressure transducers;
- Auditing of Contractors carrying out calibration and maintenance of Daily Metered sites;
- Type testing and batch testing of Meter manufactures meter repair and accuracy testing compliance; and
- Program to replace Welkerjet and Jetstream regulators

AIA also reported that it considered that the above activities are best practice to cost effectively minimise UAFG.

Figure 3-2 Multinet’s UAFG Components



Source: Multinet’s Submission

Multinet identified that the major component of UAFG is leaks through the Low pressure network with the highest uncertainty is due to purchase meters (i.e. meters at the city gates).

### 3.2.3 Analysis

The activities outlined by both Envestra and Multinet can be grouped into leaks management and metering accuracy management.

Leaks management includes activities such as mains replacement, pressure control, leakage surveys and responding to emergencies. The main driver for these activities is the distributor’s safety obligation. However, benefit of reducing leaks is that there will be less gas loss which will have an impact on UAFG.

In relation to metering, the key driver for accurate metering is so that the distributor can accurately bill for the gas that it is transporting and its obligation under the Gas Distribution System Code. Like leaks management, the improved metering will also reduce the uncertainty in measurement which does has an impact on UAFG.

In addition, at the meetings with the gas distributors, the issue of ensuring that the meters installed in large customer premises are monitored are accurate and appropriately sized for the gas loads was discussed. SP AusNet, at the meeting in January, said that this is an issue that it is aware of and it has a process for ongoing monitoring. Envestra referred to its May submission where it said that it carries out ongoing review of the consumption pattern of large customers to ensure that the meters are adequately sized. In the May meeting, Multinet indicated that it monitors the consumption patterns of large customers from time to time.

Zincara therefore considers that the activities carried out by Envestra and Multinet are what you can reasonably expect from a gas distributor which will have an impact on UAFG.

In relation to identifying the different components of UAFG, all three gas distributors have listed similar components of UAFG. However, the magnitude of each of the component is different which is what you would expect given the differences in each gas network. It is noted all three gas distributors have identified that metering error has the highest level of uncertainty. From the work carried out AIA and Zincara's own experience, Zincara considers that forecasts of UAFG are inherently uncertain however the approach adopted by the three distributors in estimating the components of UAFG is reasonable.

## 4. SPECIFIC ISSUES

There were a number of issues raised by the gas distributors, retailers and Australian Energy Market Operator (AEMO). These issues are discussed in the sections below.

### 4.1 HEATING VALUE

In its submission, dated 10 May 2013, AEMO disagreed with the reference that the Commission made in its Draft Decision that AEMO agrees with Envestra that over the period 2005-2008, Envestra may have been disadvantaged as a result of multiple gas sources been injected into the distribution systems. AEMO said that this issue was raised in August 2009 by Envestra. AEMO repeated the calculations carried out by Envestra between the state wide heating value measurement and the zonal average heating value and confirmed Envestra's analysis. AEMO also said that this bias cannot be assumed to be constant as there are many variables that impact on heating value and the mixture of these components can change and potentially reverse the outcome shown by Envestra.

Zincara agrees that there are many variables that could have an impact on the heating value and that the change in heating value due to multiple gas supply cannot be assumed to be constant over time. AEMO does not disagree with the fact that there is an impact on heating value but it is difficult to quantify the extent. Without further analysis being carried out since 2009, Zincara can only conclude that it is not conclusive that there is a particular bias but multiple gas sources will have an impact on heating value.

### 4.2 BENCHMARK UAFG

In its submission dated 9 May 2013, AGL again raised concern about the Commission's comment that international benchmarks are tenuous and that retailers have not provided any supporting evidence to suggest comparisons can be made on a like-for-like basis. For ease of comparisons, Zincara has replicated the information in its report dated 2 April 2013 to show that there is a range of UAFG as shown in the table below.

**Table 4-1 Benchmark UAFG**

<b>Gas Distributor</b>	<b>UAFG</b>
Allgas Queensland	4%
Envestra Queensland	0.5% <sup>1</sup>
Envestra SA	8.3%
Jemena Network NSW	2.7%
ActewAGL	1.8%
Envestra (Victoria)	2.86%
Multinet	4.03%
SP AusNet	3.53%
IGU Working Committee October 2009	2.7%

Source: Compiled from Access Arrangement Information and consultants' reports

Note: The UAFG are based on the latest information available but are not necessarily for the same year. The UAFG for Victoria is based on the 2010 level.

<sup>1</sup> There are no explanations to why Envestra's Queensland UAFG is unusually low.

The table above compares the UAFG for all the business at an aggregate level and not divided into Class A and Class B. The table shows that the gas distributors' UAFGs are on the high end of the scale. However, it is not possible to comment further on the reasons without a more comprehensive study of the UAFG in various jurisdictions.

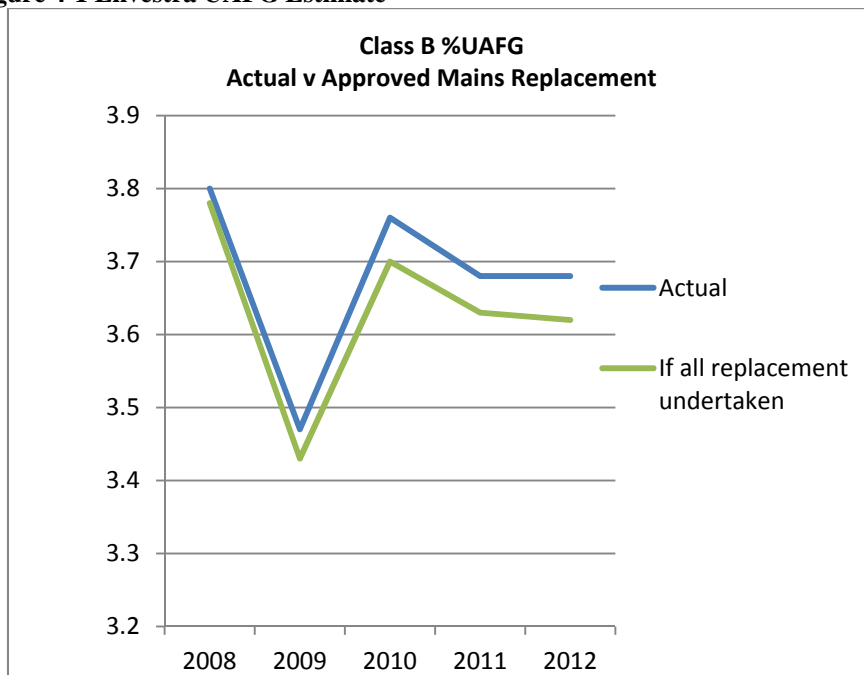
**4.3 MAINS REPLACEMENT**

In its Draft Decision, the Commission said<sup>2</sup>:

*“The onus is on the GDBs to provide clear evidence that the previous accepted relationship between low pressure mains replacement and UAFG levels no longer hold. The GDB’s argument relies heavily on the assumption that the causes of UAFG are uncertain.”*

In its response to the Draft Decision, Envestra said that if it had undertaken all of its mains replacement, the UAFG would have been 3.62% as compared to the actual UAFG of 3.68% as shown in the figure below.

**Figure 4-1 Envestra UAFG Estimate**



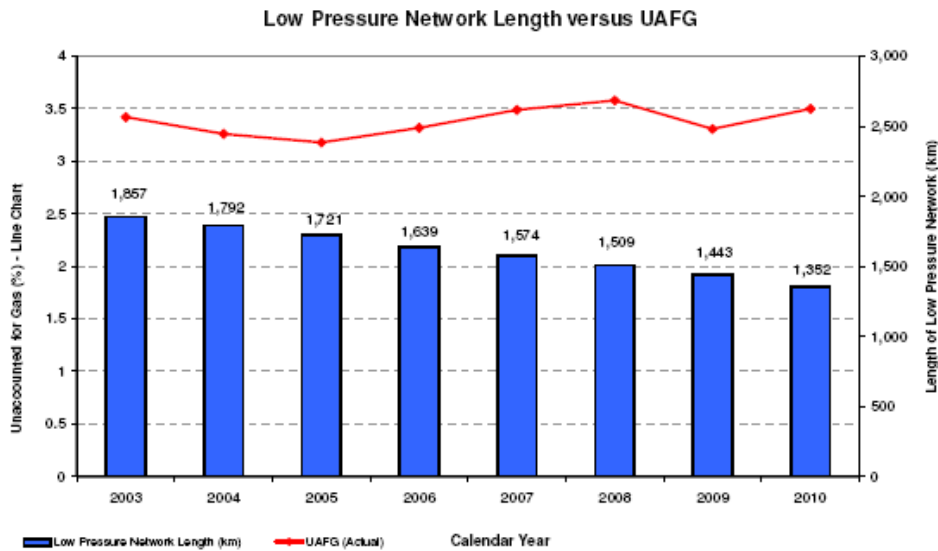
Source: Envestra May Submission

In its May submission, Multinet said that the ongoing deterioration of its remaining network will to some extent counteract the benefits of mains replacement. Multinet provided AIA with details of its network and AIA to calculate the losses in the network as shown in Figure 3-2. Multinet did not provide the difference between the actual UAFG and what the UAFG would have been had it completed its mains replacement.

SP AusNet, in its response said that there was not a correlation between its mains replacement program and UAFG as shown in the figure below.

<sup>2</sup> Draft Decision March 2013

Figure 4-2 SP AusNet Mains Replacement versus UAFG



SP AusNet Submission 10 May 2013

Both AGL and Origin Energy said that if the mains replacement has minimal impact on UAFG, the gas distributors should not be seeking any capital expenditure. Origin Energy also said the rate of leakage in the existing network may increase but the leaky pipes only makes a shrinking proportion of the network.

Zincara believes that the main driver for mains replacement is safety and not UAFG. However, replacing old and leaking gas mains does have an impact on UAFG but other components of UAFG (e.g. UAFG from high pressure networks) may mask the benefits of the mains replacement program.

Zincara also carried out an analysis to show the difference in UAFG between the actual mains replacement and that approved by the Commission in 2007. The actual mains replacement versus that approved by the Commission is shown in the table below.

Table 4-2 Gas Distributors Mains Replacement Program 2008 -2012

	Actual	Approved
Envestra	365	570
Multinet	255	557
SP AusNet	415	450

Source UAFG Draft Decision pg 23 and 25 Draft Decision

The analysis was carried out using leakage rates of 200GJ/km, 100GJ/km and 50GJ/km. The 200GJ/km is based on the Commission’s 2008 Final Decision and the 100GJ/km is based on the estimate by Advantica from the UK. The 50GJ/km was used to show the effects of a lower bound of leakage rate. The calculation was carried out using the actual gas injection into the network for 2010 and the actual gas demand for the same year. Details of the analysis are provided in Appendix B. The results of the estimate are shown in the table below.



**Table 4-3 Estimated 2012 Class B UAFG with Various Leakage Rate Savings**

Leakage Rate	Mains Replacement	Envestra	Multinet	SP AusNet
200 GJ/km	Actual	3.71%	4.29%	5.33%
	Approved	3.67%	4.25%	5.31%
100 GJ/km	Actual	3.74%	4.31%	5.35%
	Approved	3.72%	4.29%	5.35%
50 GJ/km	Actual	3.75%	4.32%	5.37%
	Approved	3.74%	4.31%	5.37%

The table above shows the differences in UAFG between the actual mains replacement and the approved mains replacement are marginal in all three scenarios. The largest difference is 0.04% for Envestra and Multinet when the leakage rate is 200 GJ/km. SP AusNet's leakage rates are almost the same between actual and approved mains replacement due to SP AusNet almost completing its approved mains replacement program.

It is noted that Envestra has estimated a difference of 0.06% between the actual and approved mains replacement whereas Zincara has only estimated 0.04% in the 200GJ/km scenario. This is possibly due to slightly different assumptions used by Envestra.

Zincara therefore considers that the UAFG effect of the three distributors not completing their approved mains replacement programs to be minimal.

#### 4.4 SETTING THE 2013 – 2017 BENCHMARK

The Commission said in its Draft Decision that a multi-year average is likely to provide a more accurate forecast as UAFG can vary from year to year. The Commission believes that a three year average 2008-2010 is consistent with its previous decision.

Envestra considers that the most recent actual UAFG is most reflective of the current environment and incorporates all current variables that impact on UAFG. It also said that there are inherent flaws in incorporating data too far back as it fails to take into factors such as changing source of gas supply.

**Table 4-4 Envestra's Actual UAFG 2008- 2012**

	Year Ending 31 December				
	2008	2009	2010	2011	2012
	Settled	Settled	Settled	Actual	Estimate
Class A	0.28%	0.28%	0.28%	0.28%	NA
Class B	3.83%	3.50%	3.77%	3.69%	NA

Source: Envestra Spreadsheet

Multinet proposes that a three year average of historical data measured over 2009 – 2011 to set the benchmarks for Class B and non-PTS. Multinet provided the following information of the actual UAFG for the period 2008 – 2012.

**Table 4-5 Multinet's Actual UAFG 2008- 2012**

	Year Ending 31 December				
	2008	2009	2010	2011	2012
	Settled	Settled	Settled	Actual	Estimate
Class A	0.3%	0.3%	0.3%	0.3%	0.3%
Class B	3.9%	4.1%	4.3%	4.4%	4.4%
Non PTS	n/a	n/a	n/a	TBD*	TBD*

\*Awaiting final injection data from AEMO  
Source: Multinet Submission

SP AusNet did not comment on the Commission's approach to setting the benchmark. The table below shows SP AusNet's actual % UAFG provided prior to the Draft Decision.

**Table 4-6 SP AusNet's Actual UAFG 2008- 2012**

	Year Ending 31 December				
	2008	2009	2010	2011	2012
	Settled	Settled	Settled	Actual	Estimate
Class A	0.30%	0.30%	0.30%	NA	NA
Class B	5.70%	5.23%	5.39%	NA	NA

Source: SP AusNet Spreadsheet

One of the major issues that all three distributors have highlighted is the complexity in calculating the components of UAFG and that the measurement accuracy could affect the overall UAFG. In regard to changes in heating value as a result of different sources of gas, AEMO had stated that whilst it concurs with Envestra's calculation in 2009, there a number of factors that could affect the calculation of heating value and Envestra's bias in heating value may not be constant over time. Given all the uncertainty in measurement of UAFG components, Zincara therefore considers that the Commission's decision to use a three years average is the most appropriate method of calculating the benchmark UAFG.

In relation to which period to use for the three year average, in principle, Zincara considers that the latest data available should be used. Envestra and Multinet had said that the 2011 data is awaiting the retailers' final approval but it is not expected that actual data will change. The issue in regard to using unsettled data is that parties have not finally agreed and there could be differences in the final stage. Zincara therefore considers that it is not appropriate to include the 2011 data given that AEMO has also not carried out the settlement process for 2011. As such, the latest data available is the declared data by AEMO in 2010. This means that the three years average would be for the period 2008 – 2010.

Using this period raised the issue of whether the period chosen incorporates any changes due to heating value from the different gas sources as discussed in Section 4.1. It is noted [in section 4.1] that in 2009 AEMO carried out a similar calculation as Envestra on the impact of heating value from different gas sources and confirmed Envestra's analysis was correct - that it was impacted by the change in heating value but AEMO also said that this impact was within the heating value measurement uncertainty. The data used by AEMO to carry out the analysis was for 2008<sup>3</sup>. This would mean that adopting the data for the period 2008 – 2010 would incorporate any changes in heating value due to gas supply from multiple sources.

Zincara therefore recommends that the 2008 – 2010 data be used to set the benchmark for the period 2013 – 2017.

<sup>3</sup> AEMO's Analysis on GMI 031/09 Zonal Heating Value

#### 4.5 DELAY IN BENCHMARK IMPLEMENTATION

All three gas distributors have expressed concern in regard to the delay in setting the benchmarks in 2013. SP AusNet, in its response to the Draft Decision, said based on a 5.4% benchmark level, the cost to SP AusNet is \$450,000. SP AusNet also offered two options to adjust the unrecovered portion into the first year of the forecast period (i.e. 2013):

- Option 1 is to adjust the 2013 Class B UAFG percentage by pro rata of number of days not recovered over a full year; and
- Option 2 is similar to option 1 but uses the gas injected and gas demand to carry out the adjustment.

Zincara has reviewed both methods and considers that if the Commission is considering any adjustment, option 1 is a reasonable approach to use. Option 2 is slightly more complicated and would not necessarily achieve a much different result.

#### 4.6 CALCULATION OF THE UAFG BENCHMARKS 2013 - 2017

Zincara has calculated the various combinations on setting the benchmarks for 2013 – 2017. It is assumed that the benchmarks for Class A customers will be retained at 0.3%. The UAFG calculations below are for Class B customers. The calculations also include how the delay in implementing the benchmarks can be blended into the forecast period using option 1 (from the above section). The alternatives considered are:

1. UAFG base – average UAFG for the three years, 2008 – 2010;
2. UAFG base reduced by the actual UAFG savings from the mains replacement (referred to as LP impact in table);
3. UAFG base including the impact of the delay in implementation recovered in 2013 (one year);
4. UAFG base including the impact of the delay recovered in 2013 minus the actual UAFG savings from the mains replacement;
5. UAFG base including the impact of the delay in implementation recovered in 2013 – 2017 (4.5 years); and
6. UAFG base including the impact of the delay recovered in 2013 – 2017 minus the actual UAFG savings from the mains replacement.

Zincara has carried out the calculations for three scenarios; leakage rates of 200GJ/km, 100GJ/km and 50GJ/km. Details of the calculations are provided in Appendix C. The tables below show the UAFG for the three distributors with the six alternatives.

Table 4-7 UAFG Adjustments for the Gas Distributors 2013 - 2017

Envestra	200GJ/km					100GJ/km					50GJ/km				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
UAFG Base	3.69%	3.69%	3.69%	3.69%	3.69%	3.69%	3.69%	3.69%	3.69%	3.69%	3.69%	3.69%	3.69%	3.69%	3.69%
UAFG Base reduced for LP Impact	3.61%	3.58%	3.54%	3.51%	3.48%	3.65%	3.64%	3.62%	3.60%	3.59%	3.69%	3.68%	3.67%	3.66%	3.66%
UAFG Base + timing Impact in year 2013	4.77%	3.69%	3.69%	3.69%	3.69%	4.77%	3.69%	3.69%	3.69%	3.69%	4.77%	3.69%	3.69%	3.69%	3.69%
UAFG Base + timing Impact in 2013 reduced for LP Impact	4.68%	3.58%	3.54%	3.51%	3.48%	4.73%	3.64%	3.62%	3.60%	3.59%	4.76%	3.68%	3.67%	3.66%	3.66%
UAFG Base + timing impact for 4.5 years	3.82%	3.82%	3.82%	3.82%	3.82%	3.82%	3.82%	3.82%	3.82%	3.82%	3.82%	3.82%	3.82%	3.82%	3.82%
UAFG Base + timing impact for 4.5 years reduced for LP Impact	3.73%	3.70%	3.67%	3.63%	3.60%	3.77%	3.76%	3.74%	3.72%	3.71%	3.81%	3.80%	3.79%	3.78%	3.78%

Multinet	200GJ/km					100GJ/km					50GJ/km				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
UAFG Base	4.10%	4.10%	4.10%	4.10%	4.10%	4.10%	4.10%	4.10%	4.10%	4.10%	4.10%	4.10%	4.10%	4.10%	4.10%
UAFG Base reduced for LP Impact	4.00%	3.98%	3.96%	3.95%	3.93%	4.05%	4.04%	4.03%	4.02%	4.01%	4.07%	4.06%	4.06%	4.05%	4.04%
UAFG Base + timing Impact in year 2013	5.08%	4.10%	4.10%	4.10%	4.10%	5.08%	4.10%	4.10%	4.10%	4.10%	4.21%	4.10%	4.10%	4.10%	4.10%
UAFG Base + timing Impact in 2013 reduced for LP Impact	4.98%	3.98%	3.96%	3.95%	3.93%	5.03%	4.04%	4.03%	4.02%	4.01%	5.05%	4.06%	4.06%	4.05%	4.04%
UAFG Base + timing impact for 4.5 years	4.21%	4.21%	4.21%	4.21%	4.21%	4.21%	4.21%	4.21%	4.21%	4.21%	4.21%	4.21%	4.21%	4.21%	4.21%
UAFG Base + timing impact for 4.5 years reduced for LP Impact	4.11%	4.09%	4.07%	4.06%	4.04%	4.16%	4.15%	4.14%	4.13%	4.12%	4.18%	4.17%	4.17%	4.16%	4.15%

SP AusNet	200GJ/km					100GJ/km					50GJ/km				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
UAFG Base	5.44%	5.44%	5.44%	5.44%	5.44%	5.44%	5.44%	5.44%	5.44%	5.44%	5.44%	5.44%	5.44%	5.44%	5.44%
UAFG Base reduced for LP Impact	5.43%	5.40%	5.36%	5.33%	5.29%	5.44%	5.42%	5.40%	5.39%	5.37%	5.44%	5.43%	5.42%	5.41%	5.41%
UAFG Base + timing Impact in year 2013	5.98% <sup>4</sup>	5.44%	5.44%	5.44%	5.44%	5.98%	5.44%	5.44%	5.44%	5.44%	5.98%	5.44%	5.44%	5.44%	5.44%
UAFG Base + timing Impact in 2013 reduced for LP Impact	5.96%	5.40%	5.36%	5.33%	5.29%	5.97%	5.42%	5.40%	5.39%	5.37%	5.97%	5.43%	5.42%	5.41%	5.41%
UAFG Base + timing impact for 4.5 years	5.50%	5.50%	5.50%	5.50%	5.50%	5.50%	5.50%	5.50%	5.50%	5.50%	5.50%	5.50%	5.50%	5.50%	5.50%
UAFG Base + timing impact for 4.5 years reduced for LP Impact	5.49%	5.46%	5.42%	5.39%	5.35%	5.50%	5.48%	5.46%	5.45%	5.43%	5.50%	5.49%	5.48%	5.47%	5.47%

<sup>4</sup> SP AusNet in its response to the Draft Decision calculated the UAFG adjustment to be 5.89%. This is due to SP AusNet using a UAFG base of 5.4% as compared to Zincara's 5.44%.

The tables above show the following:

- The UAFG bases which are calculated using the three year Class B UAFG average for the period 2008 -2010 do not change with the three leakage rates.
- The UAFG bases adjusted for mains replacement for the three leakage rate scenarios show that there are only marginal changes in Class B UAFG. The scenario with the 200GJ/km leakage rate has the highest reduction (i.e. Envestra 3.69% to 3.61%, Multinet 4.10% to 4.00% and SP AusNet 5.44% to 5.41%). Section 4.7 below discusses Zincara's recommendation on which leakage rate scenario to adopt.
- The adjustment in 2013 only, due to the delay in implementing the revised benchmarks has increased the UAFG base: Envestra 4.77% from 3.69%, Multinet 5.08% from 4.10% and SP AusNet 5.98% from 5.44%
- The adjustment to the 2013 – 2017 Class B UAFG (ie. 4.5years) due to the delay in implementing the revised benchmarks has increased the UAFG base: Envestra 3.82% from 3.69%, Multinet 4.21% from 4.10% and SP AusNet 5.50% from 5.44%.

The tables above show that most of differences for a year-on-year basis and the six options are in the second decimal place. If the Commission declares the values to only one decimal place, most of the differences would not appear.

#### 4.7 LEAKAGE RATE RECOMMENDATION

The three leakage rates used in this report are 200GJ/km, 100GJ/km and 50GJ/km. The 200GJ/km was from the Commission's decision in 2008 following advice from ECG that the leakage rate is higher than 100GJ/km (Advantica's recommendation) and lower than 400GJ/km (from Gas and Fuel Corporation's formula). The 50GJ/km has been calculated as part of the sensitivity analysis to show the effects on the percentage of UAFG with a low leakage rate.

Zincara's calculation of the UAFG savings was discussed in Section 4.3 and the results have been replicated in the table below.

**Table 4-8 Estimated 2012 Class B UAFG with Various Leakage Rate Savings**

Leakage Rate	Mains Replacement	Envestra	Multinet	SP AusNet
200 GJ/km	Actual	3.71%	4.29%	5.33%
	Approved	3.67%	4.25%	5.31%
100 GJ/km	Actual	3.74%	4.31%	5.35%
	Approved	3.72%	4.29%	5.35%
50 GJ/km	Actual	3.75%	4.32%	5.37%
	Approved	3.74%	4.31%	5.37%

The table above shows that there are marginal differences (in the second decimal place) between the three scenarios. This is further illustrated when we compare the calculated differences in Class B UAFG for the forecast period (Table 4-7).

Zincara is aware that Advantica's recommendation is based on work carried out by British Gas on its UK networks and adjusted for the Victorian networks. Advantica's recommendation has been used from time to time by the Health and Safety Executive (HSE) and Offgem in the UK. In addition, given the marginal differences between the three scenarios, Zincara recommends adopting the 100GJ/km.

#### 4.8 ALBURY NETWORK

In its Draft Decision, the Commission considered that there is merit in aligning the benchmarks for Envestra's Albury network with Envestra's Victorian network. However for the purpose of the Draft Decision, the Commission maintained the existing benchmark to apply for the period 2013 – 2017 pending any further information provided.

In its response to the Draft Decision, Envestra reported on its activities in relation to UAFG (refer section 3.2.1). However, there was no specific mention that the activities apply to Class A customers for the Albury network.

In section 3.2.3, Zincara concluded that given the inherent uncertainty in estimating UAFG, the approach adopted by Envestra in estimating its UAFG the components of UAFG was reasonable. However, without specific mention of the Class A customers, Zincara has concluded that Envestra's submission was specifically for Class B customers only. Zincara there recommends that the Class A customers for the Albury network be retained at the same level as the Commission's Draft Decision of 0.1%.

#### 4.9 NON - PTS UAFG

For the non-Principal Transmission System (non-PTS), the Commission, in its Draft Decision, considered that in the absence of further evidence that the current benchmarks for Multinet are appropriate. As Envestra had not proposed a change, the Commission considered that the current benchmarks should also be retained. In regard to SP AusNet, the Commission considered that it is appropriate to use the trend to set the starting point and the forward benchmarks. There is a reduction in UAFG from 7.61% in 2006 to 6.11% in 2011. As such, the Commission had used a regression analysis of the historical data to set the benchmark.

Multinet said that its non-PTS is a recently-constructed polyethylene network with low leakage rate. The UAFG data is yet to be finalised and the initial indications are that the actual UAFG will exceed the Class B UAFG benchmarks due to the following reasons:

- Lang Lang city gate does not have a heater which means that the pressure reduction at the city gate will result in a gas temperature reduction of 27 degrees Centigrade which translates to 9 percent change in volume which is not corrected.
- Korumburra city gate is supplied with a heater but it is not economic to heat the gas temperature to standard condition. Multinet estimates that there will be a 5 percent loss due to temperature.

- The city gates at Inverloch and Wonthaggi have lower temperature losses due to the distances the city gates are located relative to the towns which allows for the gas temperature to recover.

Multinet considers that in the absence of final data, it proposes a 3% benchmark for Class B customers.

SP AusNet said that it disagrees with the approach adopted by the Commission in setting the benchmark. SP AusNet said that the non-PTS network is ageing dating back to the early 1950's. This network shows similar characteristics as that of the PTS network. Based on its submission for the PTS network identifying the components of UAFG, it does not consider it credible that the non-PTS UAFG can fall below that of the PTS network by 2015 (i.e. PTS benchmark of 5.4% compared to the 5.3% for the non – PTS network in 2015, falling to 4.9% in 2017).

Zincara acknowledges that the lack of heaters in some of the city gates for the Multinet's non-PTS network may have an impact on the UAFG. However, there is no actual data to show the effects of such temperature change. As such, Zincara considers that the most appropriate benchmark for the Multinet's network is 2% consistent with what has been adopted for the period 2008-2012.

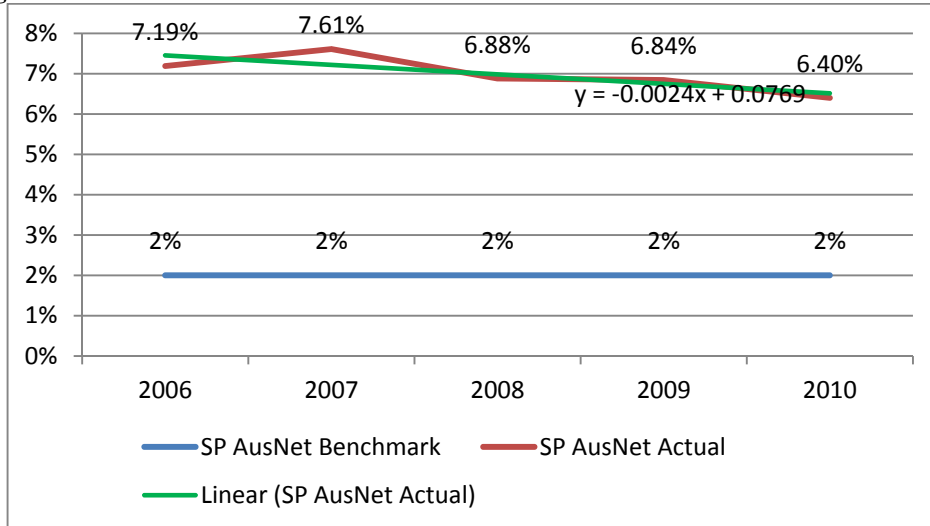
In relation to SP AusNet's non-PTS, there has been a consistent declining trend in UAFG since 2006 as shown in Figure 4-3. However, as can be seen in Figure 4-4, the Class B actual UAFG for the PTS network shows a relatively flat profile from 2005 to 2010. This contradicts SP AusNet's comment that the non-PTS network is an ageing network which shows similar characteristics to the PTS network.

SP AusNet has not provided any information outlining what it has done to achieve a declining UAFG for the non-PTS network and that these activities will not sustain an ongoing decline for the forthcoming period. In addition, during the meeting in January, SP AusNet said that it was considering installing meters in the inlet to the gas supply to Ararat, Stawell and Horsham which should improve the accuracy of the UAFG measurement for the non-PTS network as it would eliminate any line pack effect from the transmission network. This could further improve the UAFG for the non-PTS network.

Zincara therefore considers it appropriate to adopt the actual declining trend to determine the UAFG benchmark for the forthcoming period of 2013-2017.



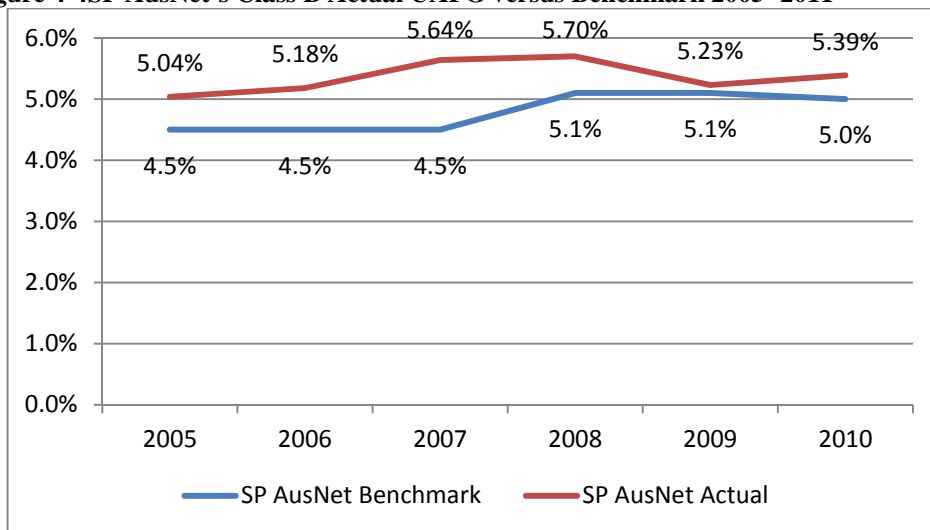
**Figure 4-3 SP AusNet Non – PTS UAFG versus Benchmark 2006 - 2010**



Source: SP AusNet's UAFG Annual Summaries 2011 Non PTS 16.02.2012

Note: There are no Class A customers in the non – PTS towns.

**Figure 4-4 SP AusNet's Class B Actual UAFG versus Benchmark 2005 -2011**



Source: SP AusNet's UAFG Annual Summaries 2011 PTS Spreadsheet

A regression analysis on the data was completed and based on the analysis the calculated UAFG for the period 2006 – 2017 are shown in the table below. This data was used in the Draft Decision.

**Table 4-9 Calculated UAFG Values**

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
7.19%	7.22%	6.98%	6.75%	6.51%	6.28%	6.04%	5.81%	5.57%	5.34%	5.10%	4.87%

Zincara considers that it is still appropriate to use a regression analysis which takes into the annual variation and provides the forecast with a reflection of what has occurred in the past. Zincara therefore recommends that we adopt the 2013 – 2017 UAFG figures shown in the table above as the benchmark for SP AusNet's non PTS system.

#### 4.10 CONCLUSION

Based on the above analysis, Zincara has concluded the following:

There are many variables that could have an impact on the heating value one of which is the multiple gas supply. It is not conclusive there is a particular ongoing bias to Envestra due to the multiple gas supply but it is acknowledged that the multiple gas supply will have an impact on the heating value.

In relation to the AGL's comment on benchmarking UAFG, Zincara considers that UAFG for the gas distributors in Victoria are on the high end of the scale relative to other jurisdictions without taking local factors into account.

The main driver for mains replacement is safety and not UAFG. However replacing the old and leaking gas mains does have an impact on UAFG but other components such as increasing number of leaks in high pressure mains may mask some of the benefits.

The table below shows the savings of UAFG from three leaks per km scenarios.

**Table 4-10 Estimated 2012 Class B UAFG with Various Leakage Rate Savings**

Leakage Rate	Mains Replacement	Envestra	Multinet	SP AusNet
200 GJ/km	Actual	3.71%	4.29%	5.33%
	Approved	3.67%	4.25%	5.31%
100 GJ/km	Actual	3.74%	4.31%	5.35%
	Approved	3.72%	4.29%	5.35%
50 GJ/km	Actual	3.75%	4.32%	5.37%
	Approved	3.74%	4.31%	5.37%

The table above shows the differences in UAFG between the actual mains replacement and the approved mains replacement are marginal in all three scenarios. The largest difference is 0.04% for Envestra and Multinet when the leakage rate is 200 GJ/km. SP AusNet's leakage rates are almost the same between actual and approved mains replacement due to SP AusNet almost completing its approved mains replacement program.

As the 100GJ/km is based on Advantica's recommendation and there are marginal differences between the three scenarios, it is recommended that the 100GJ/km be used as the leakage rate for estimating UAFG savings.

A three year average is the most appropriate method for calculating the benchmark UAFG for the forthcoming period. As the data for 2011 has not been finally agreed with the retailers, Zincara considers that the most appropriate period to use is from 2008 – 2010. Using the 2008 – 2010 period includes any effects due to changes in heating value as a result of multiple gas sources.

Class A Benchmark is assumed to continue as 0.3% for the forthcoming period.

Using the 2008 – 2010 actual gas injection and demand, the 2013 Class B Benchmark with six alternatives allowing for adjustments for the mains replacement and delay in implementing the Benchmarks are shown in the table below.

**Table 4-11 Class B UAFG for 6 Alternatives**

<b>2013</b>	<b>Envestra</b>	<b>Multinet</b>	<b>SP AusNet</b>
UAFG Base	3.69%	4.10%	5.44%
UAFG Base reduced for LP Impact	3.65%	4.05%	5.44%
UAFG Base + timing Impact in year 2013	4.77%	5.08%	5.98%
UAFG Base + timing Impact in 2013 reduced for LP Impact	4.73%	5.03%	5.97%
UAFG Base + timing impact for 4.5 years	3.82%	4.21%	5.50%
UAFG Base + timing impact for 4.5 years reduced for LP Impact	3.77%	4.16%	5.50%

In the absence of any other information from Envestra on Class A customers for the Albury network, Zincara recommends that the UAFG for these customers be maintained at 0.1%.

The UAFG for Multinet's non-PTS network should continue at 2% as there are no actual data to show the effects of temperature changes due to Lang Lang not having a heater at the city gate and Korumburra's heater not operating to maintain the temperature to standard condition.

In relation to SP AusNet's non-PTS network, Zincara considers that it is still appropriate to use a regression analysis which takes into the annual variation and provides the forecast with a reflection of what has occurred in the past.

**Appendix A**

<b>LIST OF REFERENCES</b>
Review of Unaccounted for Gas Benchmarks – Draft Decision
AEMO Submission to UAFG Draft Decision
AGL Letter 9 May 2013
UAFG – Envestra Response to Draft Decision
Envestra UAFG Vic component analysis spreadsheet
Multinet Submission to UAFG Draft Decision
Origin Letter 10 May 2013
SP AusNet submission 10 May 2013
Email from Envestra to ESC dated 27 May 2013

## Appendix B

## Class B 2012 UAFG Calculations

<b>Reduction GJ/km</b>	200	100	50
<b>Source Draft Decision pg 23 and 25 Draft Decision</b>	Actual	Approve	
Mains Replacement 2008-2012			
Envestra	365	570	
Multinet	255	557	
SP AusNet	415	450	

<b>Source Draft Decision pg 23 and 25 Draft Decision</b>	Actual pa	Approve pa
Mains Replacement 2008-2012		
Envestra	73	114
Multinet	51	111
SP AusNet	83	90

<b>UAFG Reduction</b>	200GJ/km		100GJ/km		50GJ/km	
	Actual GJ pa	Approve GJ pa	Actual GJ pa	Approve GJ pa	Actual pa GJ pa	Approve GJ pa
Envestra	14600	22800	7300	11400	3650	5700
Multinet	10200	22280	5100	11140	2550	5570
SP AusNet	16600	18000	8300	9000	4150	4500

## Envestra

	2010	2011	2012
<b>Envestra Actual 200GJ/km</b>			
CTM Injection (GJ)	<b>62,382,745</b>	62,368,145	62,353,545
Class A >250 TJ	16,112,334	16,112,334	16,112,334
ClassB<250 TJ (D customers)	8,722,692		
ClassB<250 TJ (V customers)	35,758,704		
Total Withdrawals (GJ)	<b>60,593,729</b>	60,593,729	60,593,729
Actual UAFG (GJ)	1,789,015	1,774,415	1,759,815
% UAFG	<b>2.87%</b>	2.85%	2.82%
Class A UAFG (GJ) *	45,467	48,337	48,337
Class B UAFG (GJ)	1,743,548	1,726,078	1,711,478
% Class A UAFG *	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>
% Class B UAFG	3.77%	3.74%	3.71%
<b>Envestra Approved 200GJ/km</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
CTM Injection (GJ)	<b>62,382,745</b>	62,359,945	62,337,145
Class A >250 TJ	16,112,334	16,112,334	16,112,334
ClassB<250 TJ (D customers)	8,722,692		
ClassB<250 TJ (V customers)	35,758,704		
Total Withdrawals (GJ)	<b>60,593,729</b>	60,593,729	60,593,729
Actual UAFG (GJ)	1,789,015	1,766,215	1,743,415
% UAFG	<b>2.87%</b>	0.028322912	0.02796752
Class A UAFG (GJ) *	45,467	48,337	48,337
Class B UAFG (GJ)	1,743,548	1,717,878	1,695,078
% Class A UAFG *	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>
% Class B UAFG	3.77%	3.72%	3.67%
<b>Envestra Actual 100 GJ/km</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
CTM Injection (GJ)	<b>62,382,745</b>	62,375,445	62,368,145
Class A >250 TJ	16,112,334	16,112,334	16,112,334
ClassB<250 TJ (D customers)	8,722,692		
ClassB<250 TJ (V customers)	35,758,704		
Total Withdrawals (GJ)	<b>60,593,729</b>	60,593,729	60,593,729
Actual UAFG (GJ)	1,789,015	1,781,715	1,774,415
% UAFG	<b>2.87%</b>	2.86%	2.85%
Class A UAFG (GJ) *	45,467	48,337	48,337
Class B UAFG (GJ)	1,743,548	1,733,378	1,726,078
% Class A UAFG *	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>
% Class B UAFG	3.77%	3.75%	3.74%
<b>Envestra Approved 100 GJ/km</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
CTM Injection (GJ)	<b>62,382,745</b>	<b>62,371,345</b>	<b>62,359,945</b>
Class A >250 TJ	16,112,334	<b>16,112,334</b>	<b>16,112,334</b>
ClassB<250 TJ (D customers)	8,722,692		

	2010	2011	2012
ClassB<250 TJ (V customers)	35,758,704		
Total Withdrawals (GJ)	<b>60,593,729</b>	60,593,729	60,593,729
Actual UAFG (GJ)	1,789,015	1,777,615	1,766,215
% UAFG	<b>2.87%</b>	2.85%	2.83%
Class A UAFG (GJ) *	45,467	48,337	48,337
Class B UAFG (GJ)	1,743,548	1,729,278	1,717,878
% Class A UAFG *	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>
% Class B UAFG	3.77%	3.74%	3.72%

	2010	2011	2012
<b>Envestra Actual 50 GJ/km</b>			
CTM Injection (GJ)	<b>62,382,745</b>	62,379,095	62,375,445
Class A >250 TJ	16,112,334	16,112,334	16,112,334
ClassB<250 TJ (D customers)	8,722,692		
ClassB<250 TJ (V customers)	35,758,704		
Total Withdrawals (GJ)	<b>60,593,729</b>	60,593,729	60,593,729
Actual UAFG (GJ)	1,789,015	1,785,365	1,781,715
% UAFG	<b>2.87%</b>	2.86%	2.86%
Class A UAFG (GJ) *	45,467	48,337	48,337
Class B UAFG (GJ)	1,743,548	1,737,028	1,733,378
% Class A UAFG *	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>
% Class B UAFG	3.77%	3.76%	3.75%
<b>Envestra Approved 50GJ/km</b>			
CTM Injection (GJ)	<b>62,382,745</b>	62,377,045	62,371,345
Class A >250 TJ	16,112,334	16,112,334	16,112,334
ClassB<250 TJ (D customers)	8,722,692		
ClassB<250 TJ (V customers)	35,758,704		
Total Withdrawals (GJ)	<b>60,593,729</b>	60,593,729	60,593,729
Actual UAFG (GJ)	1,789,015	1,783,315	1,777,615
% UAFG	<b>2.87%</b>	2.86%	2.85%
Class A UAFG (GJ) *	45,467	48,337	48,337
Class B UAFG (GJ)	1,743,548	1,734,978	1,729,278
% Class A UAFG *	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>
% Class B UAFG	3.77%	3.75%	3.74%

## Multinet

	2010	2011	2012
<b>Multinet Actual 200GJ/km</b>			
CTM Injection (GJ)	<b>60,895,871</b>	60,885,671	60,875,471
Class A >250 TJ	4,411,062	4,411,062	4,411,062
ClassB<250 TJ (D customers)	-		
ClassB<250 TJ (V customers)	54,028,226		
Total Withdrawals (GJ)	<b>58,439,287</b>	58,439,287	58,439,287
Actual UAFG (GJ)	2,456,583	2,446,383	2,436,183
% UAFG	<b>4.03%</b>	4.02%	4.00%
Class A UAFG (GJ) *	285,100	13,233	13,233
Class B UAFG (GJ)	2,171,483	2,433,150	2,422,950
% Class A UAFG *	<b>0.3%</b>	<b>0.30%</b>	<b>0.30%</b>
% Class B UAFG	<b>4.33%</b>	4.31%	4.29%
<b>Multinet Approved 200GJ/km</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
CTM Injection (GJ)	<b>60,895,871</b>	60,873,591	60,851,311
Class A >250 TJ	4,411,062	4,411,062	4,411,062
ClassB<250 TJ (D customers)	-		
ClassB<250 TJ (V customers)	54,028,226		
Total Withdrawals (GJ)	<b>58,439,287</b>	58,439,287	58,439,287
Actual UAFG (GJ)	2,456,583	2,434,303	2,412,023
% UAFG	<b>4.03%</b>	4.00%	3.96%
Class A UAFG (GJ) *	285,100	13,233	13,233
Class B UAFG (GJ)	2,171,483	2,421,070	2,398,790
% Class A UAFG *	<b>0.3%</b>	0.30%	0.30%
% Class B UAFG	<b>4.33%</b>	4.29%	4.25%
<b>Multinet Actual 100 GJ/km</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
CTM Injection (GJ)	<b>60,895,871</b>	60,890,771	60,885,671
Class A >250 TJ	4,411,062	4,411,062	4,411,062
ClassB<250 TJ (D customers)	-		
ClassB<250 TJ (V customers)	54,028,226		
Total Withdrawals (GJ)	<b>58,439,287</b>	58,439,287	58,439,287
Actual UAFG (GJ)	2,456,583	2,451,483	2,446,383
% UAFG	<b>4.03%</b>	4.03%	4.02%
Class A UAFG (GJ) *	285,100	13,233	13,233
Class B UAFG (GJ)	2,171,483	2,438,250	2,433,150
% Class A UAFG *	<b>0.3%</b>	0.30%	0.30%
% Class B UAFG	<b>4.33%</b>	4.32%	4.31%
<b>Multinet Approved 100 GJ/km</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
CTM Injection (GJ)	<b>60,895,871</b>	<b>60,884,731</b>	<b>60,873,591</b>
Class A >250 TJ	4,411,062	<b>4,411,062</b>	<b>4,411,062</b>



	2010	2011	2012
ClassB<250 TJ (D customers)	-		
ClassB<250 TJ (V customers)	54,028,226	54,028,226	54,028,226
Total Withdrawals (GJ)	<b>58,439,287</b>	58,439,287	58,439,287
Actual UAFG (GJ)	2,456,583	2,445,443	2,434,303
% UAFG	4.03%	4.02%	4.00%
Class A UAFG (GJ) *	285,100	13,233	13,233
Class B UAFG (GJ)	2,171,483	2,432,210	2,421,070
% Class A UAFG *	0.3%	0.30%	0.30%
% Class B UAFG	4.33%	4.31%	4.29%
<b>Multinet Actual 50 GJ/km</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
CTM Injection (GJ)	<b>60,895,871</b>	<b>60,893,321</b>	<b>60,890,771</b>
Class A >250 TJ	4,411,062	4,411,062	4,411,062
ClassB<250 TJ (D customers)	-		
ClassB<250 TJ (V customers)	54,028,226		
Total Withdrawals (GJ)	<b>58,439,287</b>	58,439,287	58,439,287
Actual UAFG (GJ)	2,456,583	2,454,033	2,451,483
% UAFG	4.03%	4.03%	4.03%
Class A UAFG (GJ) *	285,100	13,233	13,233
Class B UAFG (GJ)	2,171,483	2,440,800	2,438,250
% Class A UAFG *	0.3%	0.30%	0.30%
% Class B UAFG	4.33%	4.32%	4.32%
<b>Multinet Approved 50GJ/km</b>	2010	2011	2012
CTM Injection (GJ)	<b>60,895,871</b>	<b>60,890,301</b>	<b>60,884,731</b>
Class A >250 TJ	4,411,062	<b>4,411,062</b>	<b>4,411,062</b>
ClassB<250 TJ (D customers)	-		
ClassB<250 TJ (V customers)	54,028,226		
Total Withdrawals (GJ)	<b>58,439,287</b>	58,439,287	58,439,287
Actual UAFG (GJ)	2,456,583	2,451,013	2,445,443
% UAFG	4.03%	4.03%	4.02%
Class A UAFG (GJ) *	285,100	13,233	13,233
Class B UAFG (GJ)	2,171,483	2,437,780	2,432,210
% Class A UAFG *	0.3%	0.30%	0.30%
% Class B UAFG	4.33%	4.32%	4.31%

## SP AusNet

	2010	2011	2012
<b>SP AusNet Actual 200GJ/km</b>			
CTM Injection (GJ)	<b>75,020,365</b>	75,003,765	74,987,165
Class A >250 TJ	27,327,426	27,327,426	27,327,426
Class B (GJ)<250 TJ	45,046,537	45,046,537	45,046,537
Total Withdrawals (GJ)	<b>72,373,964</b>	72,373,964	72,373,964
Actual UAFG (GJ)	2,646,401	2,629,801	2,613,201
% UAFG	<b>3.53%</b>	3.51%	3.48%
Class A UAFG (GJ) *	81,982	77,114	77,114
Class B UAFG (GJ)	2,564,419	2,552,687	2,536,087
% Class A UAFG *	<b>0.30%</b>	<b>0.28%</b>	<b>0.28%</b>
% Class B UAFG	<b>5.39%</b>	5.36%	5.33%
<b>SP AusNet Approved 200GJ/km</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
CTM Injection (GJ)	<b>75,020,365</b>	75,002,365	74,984,365
Class A >250 TJ	27,327,426	27,327,426	27,327,426
Total Class B (GJ)	45,046,537	45,046,537	45,046,537
Total Withdrawals (GJ)	<b>72,373,964</b>	72,373,964	72,373,964
Actual UAFG (GJ)	2,646,401	2,628,401	2,610,401
% UAFG	<b>3.53%</b>	3.50%	3.48%
Class A UAFG (GJ) *	81,982	81,982	81,982
Class B UAFG (GJ)	2,564,419	2,546,419	2,528,419
% Class A UAFG *	<b>0.30%</b>	0.30%	0.30%
% Class B UAFG	<b>5.39%</b>	5.35%	5.31%
<b>SP AusNet Actual 100 GJ/km</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
CTM Injection (GJ)	<b>75,020,365</b>	75,012,065	75,003,765
Class A >250 TJ	27,327,426	27,327,426	27,327,426
Total Class B (GJ)	45,046,537	45,046,537	45,046,537
Total Withdrawals (GJ)	<b>72,373,964</b>	72,373,964	72,373,964
Actual UAFG (GJ)	2,646,401	2,638,101	2,629,801
% UAFG	<b>3.53%</b>	3.52%	3.51%
Class A UAFG (GJ) *	81,982	81,982	81,982
Class B UAFG (GJ)	2,564,419	2,556,119	2,547,819
% Class A UAFG *	<b>0.30%</b>	0.30%	0.30%
% Class B UAFG	<b>5.39%</b>	5.37%	5.35%
<b>SP AusNet Approved 100GJ/km</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
CTM Injection (GJ)	<b>75,020,365</b>	<b>75,011,365</b>	<b>75,002,365</b>
Class A >250 TJ	27,327,426	<b>27,327,426</b>	<b>27,327,426</b>
Total Class B (GJ)	45,046,537	45,046,537	45,046,537
Total Withdrawals (GJ)	<b>72,373,964</b>	72,373,964	72,373,964
Actual UAFG (GJ)	2,646,401	2,637,401	2,628,401

	2010	2011	2012
% UAFG	3.53%	3.52%	3.50%
Class A UAFG (GJ) *	81,982	81,982	81,982
Class B UAFG (GJ)	2,564,419	2,555,419	2,546,419
% Class A UAFG *	0.30%	0.30%	0.30%
% Class B UAFG	5.39%	5.37%	5.35%
<b>SP AusNet Actual 50 GJ/km</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
CTM Injection (GJ)	75,020,365	75,016,215	75,012,065
Class A >250 TJ	27,327,426	27,327,426	27,327,426
Total Class B (GJ)	45,046,537	45,046,537	45,046,537
Total Withdrawals (GJ)	72,373,964	72,373,964	72,373,964
Actual UAFG (GJ)	2,646,401	2,642,251	2,638,101
% UAFG	3.53%	3.52%	3.52%
Class A UAFG (GJ) *	81,982	81,982	81,982
Class B UAFG (GJ)	2,564,419	2,560,269	2,556,119
% Class A UAFG *	0.30%	0.30%	0.30%
% Class B UAFG	5.39%	5.38%	5.37%
<b>SP AusNet Approved 50GJ/km</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
CTM Injection (GJ)	75,020,365	75,015,865	75,011,365
Class A >250 TJ	27,327,426	27,327,426	27,327,426
Total Class B (GJ)	45,046,537	45,046,537	45,046,537
Total Withdrawals (GJ)	72,373,964	72,373,964	72,373,964
Actual UAFG (GJ)	2,646,401	2,641,901	2,637,401
% UAFG	3.53%	3.52%	3.52%
Class A UAFG (GJ) *	81,982	81,982	81,982
Class B UAFG (GJ)	2,564,419	2,559,919	2,555,419
% Class A UAFG *	0.30%	0.30%	0.30%
% Class B UAFG	5.39%	5.38%	5.37%

## Appendix C

## Class B UAFG Calculations for 2013 - 2017

Reduction GJ/km	200	100	50
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Source Draft Decision pg 23 and 25 Draft Decision	Actual	Approved	Difference
Mains Replacement 2008-2012			
Envestra	365	570	205
Multinet	255	537	282
SP AusNet	415	450	35

Source Draft Decision pg 23 and 25 Draft Decision	Actual pa	Approved pa
Mains Replacement 2008-2012		
Envestra	73	114
Multinet	51	107.4
SP AusNet	83	90

UAFG Reduction	200GJ/km		100GJ/pa		50GJ/km	
	Actual pa GJ	Approved pa GJ	Actual pa GJ	Approved pa GJ	Actual pa GJ	Approved pa GJ
Envestra	14600	22800	7300	11400	3650	5700
Multinet	10200	21480	5100	10740	2550	5370
SP AusNet	16600	18000	8300	9000	4150	4500

GJ Savings	200GJ/km	100GJ/km	50GJ/km
Envestra	41,000	20,500	10,250
Multinet	56400	28200	14100
SP AusNet	7000	3,500	1,750

### Adjustments for delay in implementation

#### Formula used for calculating adjustment

No of days from Jan 1 to June 30 = 181 days

No of days per year = 365 days

No of day for 5 years = 1,825 days

Adjustment benchmark = x

Benchmark in 2012 = BM

Estimated UAFG for 2013 = Base UAFG

$x = \text{Base UAFG} - (\text{BM} * 181 / 365) * (365 / 365 - 181)$  Adjustment to be applied for 2013 only

$x = \text{Base UAFG} - (\text{BM} * 181 / 1,825) * (1,825 / 1,825 - 181)$  Adjustment to be applied for 4.5 years

Investra	Adjustment for 2013	Adjustment for 4.5 years
No of days 1 Jan - 30 Jun	181	181
No of days for adjustment	365	1825
Benchmark 1 Jan - 30 Jun to be Adjusted	1.29%	0.26%
Adjusted benchmark	4.77%	3.82%

Approved Benchmark in 2012	2.60%		
	200GJ/km	100GJ/km	50GJ/km
6 months to be included in 2013	1.08%	1.08%	1.08%
Difference to be included over 4.5 years	0.12%	0.12%	0.12%

Multinet	Adjustment for 2013	Adjustment for 4.5 years
No of days 1 Jan - 30 Jun	181	181
No of days for adjustment	365	1825
Benchmark 1 Jan - 30 Jun to be Adjusted	1.54%	0.31%
Adjusted benchmark (x)	5.08%	4.21%

Benchmark in 2012 (BM)	3.10%		
	200GJ/km	100GJ/km	50GJ/km
6 months to be included in 2013	0.98%	0.98%	0.98%
Difference to be included over 4.5 years	0.11%	0.11%	0.11%

SP AusNet	Adjustment for 2013	Adjustment for 4.5 years
No of days 1 Jan - 30 Jun	181	181
No of days for adjustment	365	1825
Benchmark 1 Jan - 30 Jun to be Adjusted	2.43%	0.49%
Adjusted benchmark	5.98%	5.50%

Benchmark in 2012	4.90%		
	200GJ/km	100GJ/km	50GJ/km
6 months adjustment to be included in 2013	0.53%	0.53%	0.53%
Difference to be included over 4.5 years	0.06%	0.06%	0.06%

## 200GJ/km

Envestra	2008	2009	2010	Average	2013	2014	2015	2016	2017
CTM Injection (GJ)	61,817,239	59,049,530	62,382,745	61,083,171	61,042,171	61,027,571	61,012,971	60,998,371	60,983,771
Class A >250 TJ	16,575,897	14,973,037	16,112,334	15,887,089	15,887,089	15,887,089	15,887,089	15,887,089	15,887,089
ClassB<250 TJ (D customers)	8,636,814	8,229,223	8,722,692	8,529,576					
ClassB<250 TJ (V customers)	34,828,155	34,265,216	35,758,704	34,950,691					
Total Withdrawals (GJ)	60,040,866	57,467,475	60,593,729	59,367,357	59,367,357	59,367,357	59,367,357	59,367,357	59,367,357
Actual UAFG (GJ)	1,776,373	1,582,055	1,789,015	1,715,814	1,674,814	1,660,214	1,645,614	1,631,014	1,616,414
% UAFG	2.87%	2.68%	2.87%	2.81%	2.74%	2.72%	2.70%	2.67%	2.65%
Class A UAFG (GJ) *	46,444	41,780	45,467	47,661	47,661	47,661	47,661	47,661	47,661
Class B UAFG (GJ)	1,729,929	1,540,275	1,743,548	1,668,153	1,627,153	1,612,553	1,597,953	1,583,353	1,568,753
% Class A UAFG *	0.28%	0.28%	0.28%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%
% Class B UAFG	3.83%	3.50%	3.77%	3.69%	3.61%	3.58%	3.54%	3.51%	3.48%

## 100 GJ/km

Envestra	2008	2009	2010	Average	2013	2014	2015	2016	2017
CTM Injection (GJ)	61,817,239	59,049,530	62,382,745	61,083,171	61,062,671	61,055,371	61,048,071	61,040,771	61,033,471
Class A >250 TJ	16,575,897	14,973,037	16,112,334	15,887,089	15,887,089	15,887,089	15,887,089	15,887,089	15,887,089
ClassB<250 TJ (D customers)	8,636,814	8,229,223	8,722,692	8,529,576					
ClassB<250 TJ (V customers)	34,828,155	34,265,216	35,758,704	34,950,691					
Total Withdrawals (GJ)	60,040,866	57,467,475	60,593,729	59,367,357	59,367,357	59,367,357	59,367,357	59,367,357	59,367,357
Actual UAFG (GJ)	1,776,373	1,582,055	1,789,015	1,715,814	1,695,314	1,688,014	1,680,714	1,673,414	1,666,114
% UAFG	2.87%	2.68%	2.87%	2.81%	2.78%	2.76%	2.75%	2.74%	2.73%
Class A UAFG (GJ) *	46,444	41,780	45,467	47,661	47,661	47,661	47,661	47,661	47,661
Class B UAFG (GJ)	1,729,929	1,540,275	1,743,548	1,668,153	1,647,653	1,640,353	1,633,053	1,625,753	1,618,453
% Class A UAFG *	0.28%	0.28%	0.28%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%
% Class B UAFG	3.83%	3.50%	3.77%	3.69%	3.65%	3.64%	3.62%	3.60%	3.59%

<b>50 GJ/km</b>									
<b>Envestra</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>Average</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
CTM Injection (GJ)	<b>61,817,239</b>	<b>59,049,530</b>	<b>62,382,745</b>	<b>61,083,171</b>	<b>61,079,521</b>	<b>61,075,871</b>	<b>61,072,221</b>	<b>61,068,571</b>	<b>61,064,921</b>
Class A >250 TJ	16,575,897	14,973,037	16,112,334	<b>15,887,089</b>	15,887,089	15,887,089	15,887,089	15,887,089	15,887,089
ClassB<250 TJ (D customers)	8,636,814	8,229,223	8,722,692	<b>8,529,576</b>					
ClassB<250 TJ (V customers)	34,828,155	34,265,216	35,758,704	<b>34,950,691</b>					
Total Withdrawals (GJ)	<b>60,040,866</b>	<b>57,467,475</b>	<b>60,593,729</b>	<b>59,367,357</b>	59,367,357	59,367,357	59,367,357	59,367,357	59,367,357
Actual UAFG (GJ)	1,776,373	1,582,055	1,789,015	1,715,814	1,712,164	1,708,514	1,704,864	1,701,214	1,697,564
% UAFG	<b>2.87%</b>	<b>2.68%</b>	<b>2.87%</b>	<b>2.81%</b>	2.80%	2.80%	2.79%	2.79%	2.78%
Class A UAFG (GJ) *	46,444	41,780	45,467	47,661	47,661	47,661	47,661	47,661	47,661
Class B UAFG (GJ)	1,729,929	1,540,275	1,743,548	1,668,153	1,664,503	1,660,853	1,657,203	1,653,553	1,649,903
% Class A UAFG *	<b>0.28%</b>	<b>0.28%</b>	<b>0.28%</b>	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>
% Class B UAFG	<b>3.83%</b>	<b>3.50%</b>	<b>3.77%</b>	<b>3.69%</b>	3.69%	3.68%	3.67%	3.66%	3.66%



## 200GJ/km

Multinet	2008	2009	2010	Average	2013	2014	2015	2016	2017
CTM Injection (GJ)	60,764,227	58,433,551	60,895,871	60,031,216	59,974,816	59,964,616	59,954,416	59,944,216	59,934,016
Class A >250 TJ	4,343,787	4,646,787	4,411,062	4,467,212	4,467,212	4,467,212	4,467,212	4,467,212	4,467,212
ClassB<250 TJ (D customers)	-	-	-	0					
ClassB<250 TJ (V customers)	54,196,622	51,600,132	54,028,226	53,274,994					
Total Withdrawals (GJ)	58,540,409	56,246,920	58,439,287	57,742,206	57,742,206	57,742,206	57,742,206	57,742,206	57,742,206
Actual UAFG (GJ)	2,223,818	2,186,631	2,456,583	2,289,011	2,232,611	2,222,411	2,212,211	2,202,011	2,191,811
% UAFG	3.66%	3.74%	4.03%	3.81%	3.72%	3.71%	3.69%	3.67%	3.66%
Class A UAFG (GJ) *	52,335	15,148	285,100	13,402	13,402	13,402	13,402	13,402	13,402
Class B UAFG (GJ)	2,171,483	2,171,483	2,171,483	2,275,609	2,219,209	2,209,009	2,198,809	2,188,609	2,178,409
% Class A UAFG *	0.3%	0.3%	0.3%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%
% Class B UAFG	3.92%	4.04%	4.33%	4.10%	4.00%	3.98%	3.96%	3.95%	3.93%

## 100 GJ/km

Multinet	2008	2009	2010	Average	2013	2014	2015	2016	2017
CTM Injection (GJ)	60,764,227	58,433,551	60,895,871	60,031,216	60,003,016	59,997,916	59,992,816	59,987,716	59,982,616
Class A >250 TJ	4,343,787	4,646,787	4,411,062	4,467,212	4,467,212	4,467,212	4,467,212	4,467,212	4,467,212
ClassB<250 TJ (D customers)	-	-	-	0					
ClassB<250 TJ (V customers)	54,196,622	51,600,132	54,028,226	53,274,994					
Total Withdrawals (GJ)	58,540,409	56,246,920	58,439,287	57,742,206	57,742,206	57,742,206	57,742,206	57,742,206	57,742,206
Actual UAFG (GJ)	2,223,818	2,186,631	2,456,583	2,289,011	2,260,811	2,255,711	2,250,611	2,245,511	2,240,411
% UAFG	3.66%	3.74%	4.03%	3.81%	3.77%	3.76%	3.75%	3.74%	3.74%
Class A UAFG (GJ) *	52,335	15,148	285,100	13,402	13,402	13,402	13,402	13,402	13,402
Class B UAFG (GJ)	2,171,483	2,171,483	2,171,483	2,275,609	2,247,409	2,242,309	2,237,209	2,232,109	2,227,009
% Class A UAFG *	0.3%	0.3%	0.3%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%
% Class B UAFG	3.92%	4.04%	4.33%	4.10%	4.05%	4.04%	4.03%	4.02%	4.01%

50 GJ/km									
Multinet	2008	2009	2010	Average	2013	2014	2015	2016	2017
CTM Injection (GJ)	60,764,227	58,433,551	60,895,871	60,031,216	60,017,116	60,012,966	60,008,816	60,004,666	60,000,516
Class A >250 TJ	4,343,787	4,646,787	4,411,062	4,467,212	4,467,212	4,467,212	4,467,212	4,467,212	4,467,212
ClassB<250 TJ (D customers)	-	-	-	0					
ClassB<250 TJ (V customers)	54,196,622	51,600,132	54,028,226	53,274,994					
Total Withdrawals (GJ)	58,540,409	56,246,920	58,439,287	57,742,206	57,742,206	57,742,206	57,742,206	57,742,206	57,742,206
Actual UAFG (GJ)	2,223,818	2,186,631	2,456,583	2,289,011	2,274,911	2,270,761	2,266,611	2,262,461	2,258,311
% UAFG	3.66%	3.74%	4.03%	3.81%	3.79%	3.78%	3.78%	3.77%	3.76%
Class A UAFG (GJ) *	52,335	15,148	285,100	13,402	13,402	13,402	13,402	13,402	13,402
Class B UAFG (GJ)	2,171,483	2,171,483	2,171,483	2,275,609	2,261,509	2,257,359	2,253,209	2,249,059	2,244,909
% Class A UAFG *	0.3%	0.3%	0.3%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%
% Class B UAFG	3.92%	4.04%	4.33%	4.10%	4.07%	4.06%	4.06%	4.05%	4.04%

**200GJ/km**

<b>SP AusNet</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>Average</b>	2013	2014	2015	2016	2017
CTM Injection (GJ)	<b>78,084,549</b>	<b>73,815,406</b>	<b>75,020,365</b>	<b>75,640,107</b>	<b>75,633,107</b>	<b>75,616,507</b>	<b>75,599,907</b>	<b>75,583,307</b>	<b>75,566,707</b>
Class A >250 TJ	30,602,032	28,681,291	27,327,426	<b>28,870,250</b>	28,870,250	28,870,250	28,870,250	28,870,250	28,870,250
ClassB<250 TJ (V customers)	44,687,193	42,692,226	45,046,537	<b>44,141,986</b>					
Total Withdrawals (GJ)	<b>75,289,225</b>	<b>71,373,518</b>	<b>72,373,964</b>	<b>73,012,235</b>	73,012,235	73,012,235	73,012,235	73,012,235	73,012,235
Actual UAFG (GJ)	2,795,324	2,441,888	2,646,401	2,627,871	2,620,871	2,604,271	2,587,671	2,571,071	2,554,471
% UAFG	<b>3.58%</b>	<b>3.31%</b>	<b>3.53%</b>	<b>3.47%</b>	3.47%	3.44%	3.42%	3.40%	3.38%
Class A UAFG (GJ) *	91,806	86,044	81,982	86,611	86,611	86,611	86,611	86,611	86,611
Class B UAFG (GJ)	2,703,518	2,355,844	2,564,419	2,541,261	2,534,261	2,517,661	2,501,061	2,484,461	2,467,861
% Class A UAFG *	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>
% Class B UAFG	<b>5.70%</b>	<b>5.23%</b>	<b>5.39%</b>	<b>5.44%</b>	5.43%	5.40%	5.36%	5.33%	5.29%

**100 GJ/km**

<b>SP AusNet</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>Average</b>	2013	2014	2015	2016	2017
CTM Injection (GJ)	<b>78,084,549</b>	<b>73,815,406</b>	<b>75,020,365</b>	<b>75,640,107</b>	75,636,607	75,628,307	75,620,007	75,611,707	75,603,407
Class A >250 TJ	30,602,032	28,681,291	27,327,426	<b>28,870,250</b>	28,870,250	28,870,250	28,870,250	28,870,250	28,870,250
ClassB<250 TJ (V customers)	44,687,193	42,692,226	45,046,537	<b>44,141,986</b>					
Total Withdrawals (GJ)	<b>75,289,225</b>	<b>71,373,518</b>	<b>72,373,964</b>	<b>73,012,235</b>	73,012,235	73,012,235	73,012,235	73,012,235	73,012,235
Actual UAFG (GJ)	2,795,324	2,441,888	2,646,401	2,627,871	2,624,371	2,616,071	2,607,771	2,599,471	2,591,171
% UAFG	<b>3.58%</b>	<b>3.31%</b>	<b>3.53%</b>	<b>3.47%</b>	3.47%	3.46%	3.45%	3.44%	3.43%
Class A UAFG (GJ) *	91,806	86,044	81,982	86,611	86,611	86,611	86,611	86,611	86,611
Class B UAFG (GJ)	2,703,518	2,355,844	2,564,419	2,541,261	2,537,761	2,529,461	2,521,161	2,512,861	2,504,561
% Class A UAFG *	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>	0.30%	0.30%	0.30%	0.30%	0.30%
% Class B UAFG	<b>5.70%</b>	<b>5.23%</b>	<b>5.39%</b>	<b>5.44%</b>	5.44%	5.42%	5.40%	5.39%	5.37%

<b>50 GJ/km</b>									
<b>SP AusNet</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>Average</b>	2013	2014	2015	2016	2017
CTM Injection (GJ)	<b>78,084,549</b>	<b>73,815,406</b>	<b>75,020,365</b>	<b>75,640,107</b>	<b>75,638,357</b>	<b>75,634,207</b>	<b>75,630,057</b>	<b>75,625,907</b>	<b>75,621,757</b>
Class A >250 TJ	30,602,032	28,681,291	27,327,426	<b>28,870,250</b>	28,870,250	28,870,250	28,870,250	28,870,250	28,870,250
ClassB<250 TJ (V customers)	44,687,193	42,692,226	45,046,537	<b>44,141,986</b>					
Total Withdrawals (GJ)	<b>75,289,225</b>	<b>71,373,518</b>	<b>72,373,964</b>	<b>73,012,235</b>	73,012,235	73,012,235	73,012,235	73,012,235	73,012,235
Actual UAFG (GJ)	2,795,324	2,441,888	2,646,401	2,627,871	2,626,121	2,621,971	2,617,821	2,613,671	2,609,521
% UAFG	<b>3.58%</b>	<b>3.31%</b>	<b>3.53%</b>	<b>3.47%</b>	3.47%	3.47%	3.46%	3.46%	3.45%
Class A UAFG (GJ) *	91,806	86,044	81,982	86,611	86,611	86,611	86,611	86,611	86,611
Class B UAFG (GJ)	2,703,518	2,355,844	2,564,419	2,541,261	2,539,511	2,535,361	2,531,211	2,527,061	2,522,911
% Class A UAFG *	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>	<b>0.30%</b>
% Class B UAFG	<b>5.70%</b>	<b>5.23%</b>	<b>5.39%</b>	<b>5.44%</b>	5.44%	5.43%	5.42%	5.41%	5.41%