



ATTACHMENT 11.2

UAFG FORECAST STRATEGY

ATCO 2020-24 PLAN

EIM # 97106296

PUBLIC

31 August 2018



ATCO

UNACCOUNTED FOR GAS FORECAST AND PRICING STRATEGY

CONFIDENTIAL
29 August 2018

Document Information

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DOCUMENT INFORMATION

Title	Unaccounted for Gas Forecast and Pricing Strategy
Subtitle	

AUTHORISATION

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DOCUMENT HISTORY

Rev No	Date	Amended by	Details of amendment
0	20/08/2018	S. hurt	New Document
1	30/08/2018	C. Murray	Formatted for Submission

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Abbreviations

AA5	Access Arrangement Five
AEMO	Australian Energy Market Operator
ALARP	As Low As Reasonably Practicable
ATCO	ATCO Gas Australia
CF	Correction Factor
ERA	Economic Regulation Authority
GDS	Gas Distribution System
GJ	Gigajoule
GSSSR	Gas Standards (Gas Supply and System Safety) Regulations 2000
HHV	Higher Heating Value
MJ	Megajoule
NGR	National Gas Rules
opex	Operating Expenditure
PCF	Pressure Correction Factor
PTS	Principal Transmission System
RMP	Retail Market Procedures (WA)
UAFG	Unaccounted for Gas
UAFG %	UAFG 12 Month Rolling Percentage
WA	Western Australian

Overview

This document discusses the unaccounted for gas (**UAFG**) historical performance and forecast volumes in relation to the strategic initiatives for Access Arrangement five (**AA5**) as well as the pricing strategy adopted by ATCO Gas Australia (**ATCO**) to ensure a competitive low UAFG price for the 2020 to 2024 period. As part of ATCO’s AA5 proposal, ATCO is required to provide a forecast of its operating expenditure (**opex**). A key component of opex is the cost of UAFG.

UAFG refers to gas supplied into the gas distribution system (**GDS**) that is unaccounted for in delivery from the GDS. UAFG is the difference between the measurement of the quantity of gas delivered *into the gas distribution system* in each period and the measurement of the quantity of gas *delivered from the gas distribution system* during that period. The difference is effectively ‘lost’ and ATCO is required to replace UAFG under the terms of its Access Arrangement – effectively replacing the gas that belonged to the *Users* (Retailers) of the GDS that has not been delivered to customers.

UAFG is a combination of measurement error, and system and network losses. ATCO manages UAFG and ensure initiatives are carried out to improve measurement and reduce losses from the GDS. Historical UAFG 12 month rolling percentage (**UAFG %**) remained consistent from 2013 to 2016. ATCO has continued with mains replacement, reducing network leaks in these locations. In November 2016 a metering error occurred on a new third party gate station inflow into the GDS in the South Metro network. Coupled with this metering error, it was determined that the higher heating value (**HHV**) management plan was weighted in favour of one transmission supply resulting in an over-registration of consumed gas. The result of mains replacement, metering error and an overstated HHV has caused the total UAFG % to be 2.09% at the end of 2017.

ATCO has considered a number of factors in forecasting UAFG for AA5 including:

- Change in HHV management for the South Metro network
- Projects that will positively impact UAFG (e.g. Supervisory Control and Enhanced Data Acquisition program and continuation of mains replacement program)
- Historical initiatives that are now business as usual processes (e.g. reducing oversized meters, continued network replacement activity).

Based on the above factors that contribute to UAFG reduction, and a change in the HHV management plan for the South Metro, ATCO has forecast a reduction in UAFG over AA5, from a higher basis based on current predicted estimates. The below table presents the AA5 UAFG % forecast.

ATCO continue to benchmark well against other gas distribution entities with similar sized networks.

Table 1.1: Forecast UAFG % annually over AA5

2020	2021	2022	2023	2024
2.55%	2.52%	2.50%	2.48%	2.46%

The document also outlines ATCO’s strategy for forecasting pricing of UAFG over AA5. ATCO has put forward estimated pricing of UAFG based on reasonable estimates of gas pricing based on wholesale market rates, transmission tariffs and retail margins. ATCO will update the price of UAFG in response to the Economic Regulation Authority (**ERA**) Draft Decision based on ATCO procuring actual Tendered rates, with the process beginning in November 2018.

1. Introduction

1.1 Background

As part of the AA5 proposal, ATCO is required to provide a forecast of operating expenditure (opex). An element of the opex forecast is UAFG.

UAFG is the difference between the measurement of the quantity of gas delivered *into the gas distribution system* in each period and the measurement of the quantity of gas *delivered from the gas distribution system* during that period. UAFG makes up a material proportion of opex in each access arrangement; therefore, it is in the long-term interests of customers and consistent with good industry practice that ATCO reduces the UAFG rate to as low as reasonably practicable (**ALARP**).

ATCO's UAFG forecast is based on historical data, forecast consumption and a bottom up pricing model. ATCO needs to determine the most accurate forecast volumes of UAFG and determine a price that is commensurate to the current Western Australian (**WA**) gas market for AA5.

Rule 91 of the National Gas Rules (**NGR**) requires that opex "must be such as would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of delivering pipeline services." Rule 74(2) of the NGR states that a forecast: (a) must be arrived at on a reasonable basis; and (b) must represent the best forecast or estimate possible in the circumstances.

1.2 Purpose

This report outlines the details of ATCO's forecast UAFG and explains why this proposed level of UAFG meets the criteria outlined in Rule 91 and meets the determination of Rule 74 (2) through historical build up and benchmark performance. The report also outlines the pricing mechanism ATCO proposes for the AA5 submission.

1.3 Scope

The scope of this document covers:

- An explanation around the definition of UAFG, causes of UAFG and how UAFG forecasts impact customers
- ATCO's historical UAFG performance for its coastal (Mid-West and South-West) gas distribution system
- The formulation of UAFG forecasts for AA5
- The formulation of UAFG forecast pricing for AA5.

1.4 Assumptions

- The ERA accepts that ATCO has estimated the UAFG pricing for the *Draft Decision* and will update the UAFG pricing based on actual tendered UAFG pricing rates in line with ATCO's procurement processes.
- The measurement and loss components of UAFG share a relatively equal share of the UAFG forecast.

2. Background

2.1 What is UAFG?

UAFG is the difference between the measurement of the quantity of gas delivered *into the gas distribution system* (receipts) in each period and the measurement of the quantity of gas *delivered from the gas distribution system* (withdrawals) during that period.

UAFG is reported on a rolling 12-month average as a percentage of total receipts into the network. This allows a normalisation of UAFG levels and facilitates benchmarking between peer distribution networks.

Although the calculation of UAFG is performed by Australian Energy Market Operator (**AEMO**), the distribution operator (ATCO in this case) and the transmission operator is responsible for the accuracy of receipts and withdrawals of gas.

Based on ATCO's experience as a gas distribution network operator, it is estimated that approximately 50% of UAFG volumes are related to measurement error and the other 50% predominantly due to lost gas (leaks, venting etc.).

2.2 Regulatory framework

ATCO is subject to comply with the AEMO Retail market Procedures (WA) (**RMP**). Rule 230 of AEMO RMP covers the calculation methodology of UAFG. The UAFG (in energy) calculation process is the network operator's responsibility using the data supplied by pipeline operators under Part 4.5 & 4.3 of the RMP in conjunction with heating management plans as approved by the Building & Energy Directorate (WA) for networks with two or more receipt points of differing gas supplies.

The calculation under AEMO's methodology results in a 12-month rolling percentage that is subject to daily revision up to 425 days after the fact with the most volatility in results in the first 4 months. ATCO reports UAFG percentages as actuals based on a 4-month delay however payments are based on AEMO's month end volumes and trued up 4 months after the yearly financial balances.

2.3 What UAFG means for gas customers

During AA4, ATCO has experienced a fall in UAFG volumes due to a combination of leak repair activities, HHV management plans and pipeline operator's gate meter issue. Insufficient detailed data exists to proportion the UAFG savings between leak repair and HHV offset calculation.

Customers ultimately pay for UAFG volumes and ATCO has a target UAFG allowance issued as part of the Access Arrangement as prescribed by the regulator. This amount is recoverable in the fixed charges and is seen as an incentive for the network operator to deliver under the amount which will be reset every new access period. Where UAFG is above the control limits, ATCO has to purchase the UAFG as part of their operational costs, which in turn creates an incentive to reduce UAFG volumes. Reduced UAFG amounts flows on to customers as reduced standing charges, while an increase in UAFG adds costs, both in purchasing UAFG and additional carbon emission costs. Lowering UAFG levels has financial impacts but also environmental benefits.

2.4 Factors contributing to UAFG

The sources of UAFG can be grouped into three contributing factors:

1. **Measurement uncertainties:** This can include metering uncertainties, reading errors, and pressure and temperature correction (pressure correction factor).
2. **Network Losses:** This can include mains leaks, meter leaks, theft and third party damages.
3. **System Errors:** This can include system calculation processes, calculation rounding, data flows and UAFG calculation methodology.

These factors are discussed in more detail below.

2.4.1 Measurement uncertainties

Measurement errors can arise through either gas receipt metering uncertainties or withdrawal metering uncertainties:

- **Receipt metering uncertainties:** Gas receipts are measured through *gate delivery stations*; owned by transmission pipeline operators, not distribution network operators (**DNO**) (e.g. ATCO). In addition, the ‘contract to deliver’ sits with the gas retailers. Therefore, the vigilance of witnessing the calibration and accuracy of the flow measurement at gate points is typically out of ATCO’s control.

ATCO maintains positive professional relationships with pipeline operators injecting into the distribution network and as such are invited to witness gate measurement element testing. ATCO does take this opportunity but can only suggest resolution of potential issues as ATCO can report measurement errors to AEMO but not enforce investigation or resolution. Third party transmission operators self-prescribe the upper error limit of 1% to their physical gate point metering. This has been adopted in operational agreements between third party operators and ATCO. Due to the significant gas inflows at receipt points, 1% of actual flows equates to a large proportion of error in terms of energy.

- **Withdrawal metering uncertainties:** ATCO has direct responsibility for the accuracy of gas meters with the accuracy of these meters governed by Gas Standards (Gas Supply and System Safety) Regulations 2000 (**GSSSR**). Part 3 – Metering, Section 15 (3) of the GSSSR prescribes that meters measure gas consumption within a margin of error of:
 - “plus or minus 2% of the actual volume of gas supplied, if the master meter has a badged capacity of more than 7.5 m3 per hour in air; or”
 - “plus or minus 3% of the actual volume of gas supplied, if the master meter has a badged capacity of not more than 7.5 m3 per hour in air.”

ATCO ensure that meters installed on the GDS comply with the current regulations through ATCO’s asset procurement procedures and installation processes.

- **Pressure Correction Factor:** ATCO has more than 750,000 meters, and these are all subject to fixed pressures; a pressure correction factor (**PCF**) is applied to compensate metered values for the applied pressure. Encompassed within this correction factor (**CF**) is an additional correction factor applied to compensate for temperature, atmospheric pressure and an elevation factor (refer Section 6, Technical Guide to the Western Retail Market). This factor is calculated and applied annually using a 10 year rolling average as approved by the Building and Energy directorate.

Meters using external measurement elements like pressure and temperature correction (i.e. industrial customers) compensate measured volumes on a live basis in place of correction factors. Meters using volume correction within the distribution network account for approx. 40% of total withdrawals. ATCO uses standard industry practices in equipment selection and calibration methods to maintain accuracy of flow correction instrumentation. When comparing UAFG volumes on networks where the majority of customers are industrial using live pressure and temperature correction to a predominately domestic network (fixed PCF) the UAFG levels are generally higher. It can be concluded that the metering uncertainties are weighted towards fixed PCF metering where metering is less sophisticated. On this basis UAFG can increase as domestic metered networks grow. All these metering uncertainties contribute to the UAFG volumes. ATCO continually tries to improve measurement processes to ensure the metered volumes are as close to consumed volumes.

2.4.2 Network losses

Network losses include mains leaks, meter leaks, third party damages, and operational usage.

- **Mains and Service leaks:** Mains and services leaks account for a significant amount of UAFG. As pipework ages, it is typically the joints or fittings that are susceptible to leaks. Leak rates are often reported as the number of leaks per length of pipe, however the actual amount of gas leaking from a particular location depends on a number of factors including orifice size, network pressure, above or below ground and fault type (e.g. damage, corrosion etc.). It is up to the network operator to maintain mains and services and minimise leaks. ATCO continue to carry out initiatives to minimise these, as described below.
 - ATCO has a rigorous leak detection program and has embarked on many pipeline replacement projects to replace cast iron and other aging assets. ATCO has also conducted a community gas safety campaign ‘to encourage customers to report gas smells (leaks) normally reported at the meter and in the street that are dealt with as per procedures attached to KPI reporting.
 - ATCO is actively involved in Dial Before You Dig (DBYD) including Board representation. ATCO works closely with DBYD on Third Party Damage prevention strategies and campaign and actively engages in strategies to reduce third party damage that can cause either small leaks or large network breaks. ATCO has also assisted in the development of a third party underground asset detection process along with attending and organising contractor training sessions. This total asset approach and asset replacement program is having a positive impact on the level of UAFG percentages.
 - Operationally as ATCO expands and maintains the network, activities such as commissioning new mains or other activities release limited amounts of gas to the atmosphere when purging for safety reasons. These contribute to UAFG, however ATCO procedures ensure these activities are minimised to achieve the operational objective and not overly contribute to UAFG.
- **Meter Leaks:** Meter leaks typically occur at the above ground joints and fittings that join the meter and consumer pipework with the GDS. Fittings include the meter, valve, regulator, screwed fittings and test point. The majority of these leaks are publicly reported and ATCO attend a customer’s property to carry out required repairs.
- **Theft:** This is considered to be a growing issue due to the inherent hazards of unskilled work with gas, but still relatively uncommon. ATCO works with retailers who suspect theft activity as well as following up on theft identified by ATCO field personnel conducting work such as routine meter change and reactive fault activities. This contribution of this element is challenging to estimate.

2.4.3 System errors

System errors occur as a result of errors in system calculation processes, calculation rounding and UAFG calculation methodology.

- **System calculation processes:** ATCO, via the AEMO UAFG calculation processes, declares the energy content of the delivered gas based on various calculations. ATCO measures the metered volumes of gas at customer premise's as uncorrected volumes then converted by algorithms to a corrected volume, which is then converted to an energy value and provided for Retailers to bill customers as energy in megajoules (**MJ**). These processes are all subject to rounding and averaging calculations that add to the uncertainty of measurement. Energy calculations or HHV determination has the most potential for system errors and this is particular evident on networks supplied by two or more pipeline operators delivering gases of varying quality. These calculation methodologies are approved by the WA Building & Energy Director however the nature of the calculation and the geographical location of receipt points will have varying influences on UAFG.
- **Calculation rounding:** Rounding errors do contribute to UAFG levels however this can fall either positive or negative and is assumed to balance out over a longer period (12 month rolling). Some exceptions on small networks are identified but being small in whole of network terms have little impact on the overall UAFG total.
- **UAFG calculation methodology:** The UAFG calculation method sits with AEMO (RMP 230) this method relies on the quality of inputs and is estimated on the current gas day and reconciled back as the billed network deliveries are received (approx. 12,000 reads per working day over approximately a 90 day period). This process under the RMP is reconciled for 425 days. Therefore depending on the timing of the results this calculation delay will influence the accuracy of these results.

3. UAFG Performance

3.1 Historical UAFG

Figure 3.1 shows the historical performance of UAFG levels in ATCO’s GDS. Included were the target rates provided as part of the AA4 submission.

Figure 3.1: Historical performance of UAFG levels against target UAFG over AA4

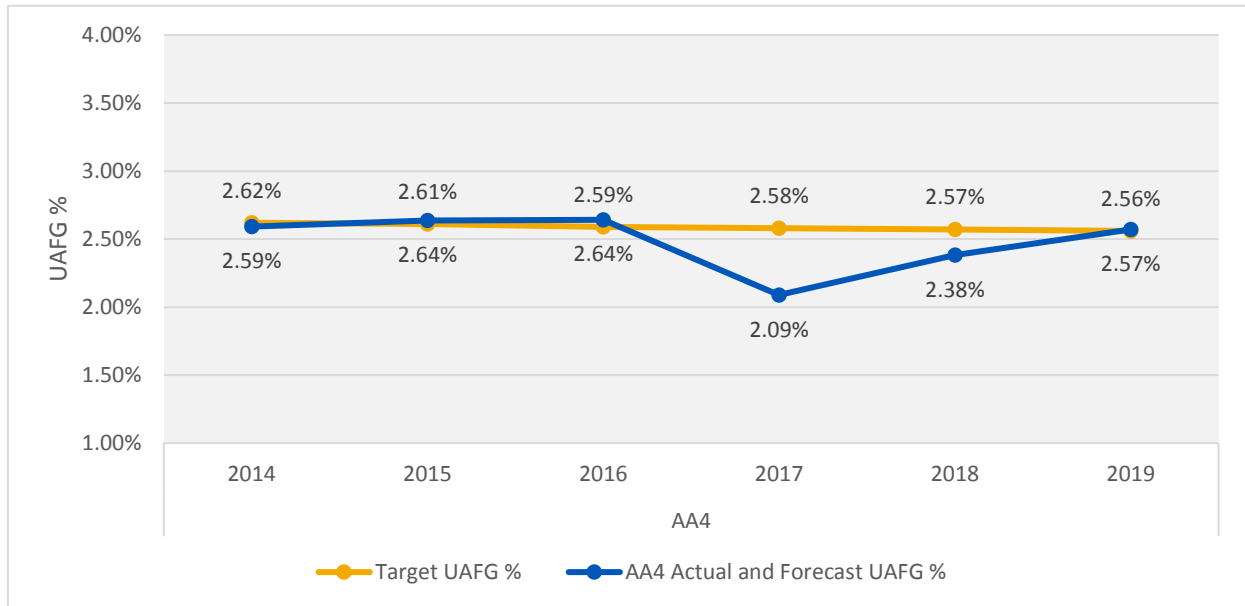
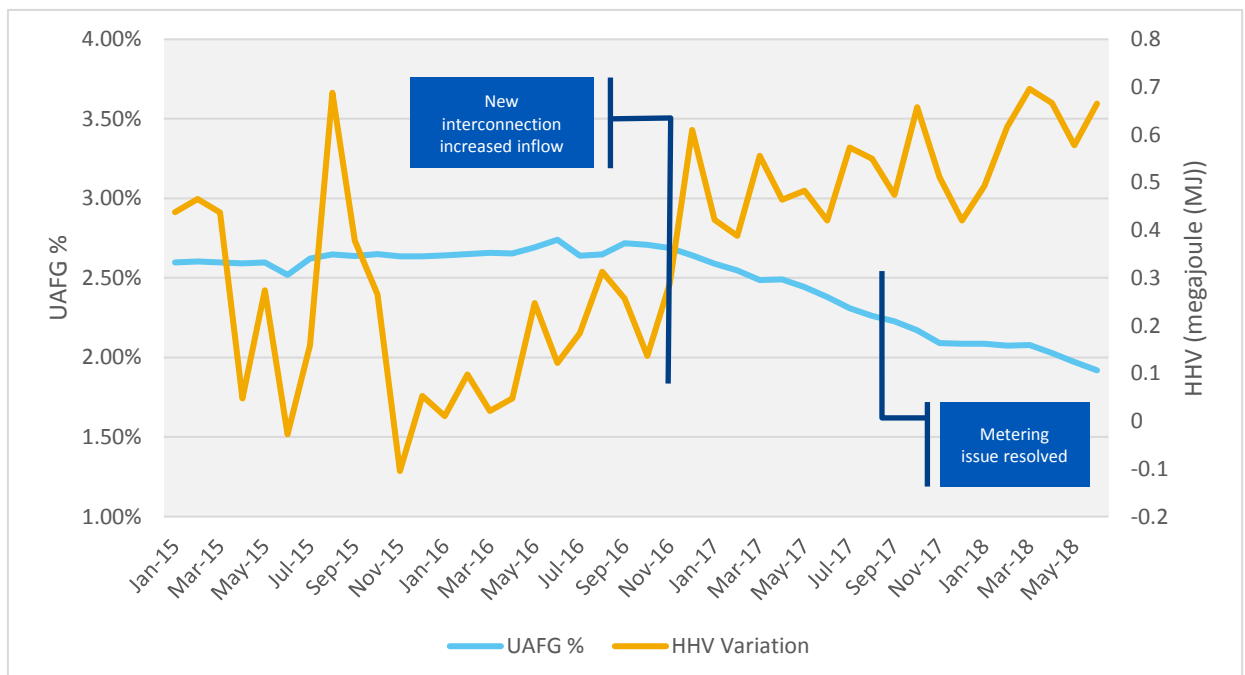


Figure 3.2 below shows the recent UAFG profile compared with the HHV variation between the two transmission operators based on gas receipts and provided data.

Figure 3.2: Historical UAFG % versus HHV variation between the two transmission operators gas receipts



3.2 UAFG Management

ATCO continues to manage UAFG in the GDS through a number of continuous improvement initiatives, and have achieved further reductions in UAFG through:

- Additional accuracy verification tests at third-party interconnections (gate stations) to validate the least metering error possible.
- Replacement of all unprotected metallic mains (by the end of AA4) (excluding crossings).
- Strong focus on mains replacement in areas experiencing above-average leakage rates.
- Ensuring all values in the billing system are accurate and using the latest data.
- Increasing leak survey and leak elimination activities while utilising better techniques and technology to ensure better sensitivity and precision.
- Theft mitigation.
- Ongoing review of large consumer metering.

3.2.1 Accuracy verification testing

ATCO regularly attends gate stations to witness the testing of these facilities by the asset owners, to ensure the test processes and results do not identify issues requiring corrective actions and/or revisions to inflow data.

3.2.2 Mains replacement

ATCO increased the mains replacement program in AA4 aligned to the AA4 capital program. The reduction in unprotected metallic mains and mains with high leak rates have continued to reduce UAFG.

3.2.3 Leak survey and leak elimination

ATCO has a comprehensive leak survey and leakage response/repair strategy that ensures all detected and reported leaks are attended to in a timely manner. Timely repair of leaks assists in minimising UAFG.

In AA5, ATCO will be increasing leak survey and leak elimination activities while utilising better techniques and technology to ensure better sensitivity and precision in locating leaks on the GDS.

3.2.4 Pressure correction factor reviews

The pressure correction factor used for billing a consumer is important in determining the volume of gas used by that customer. If it is incorrect, it will contribute to UAFG.

ATCO undertakes annual reconciliations of the PCF recorded in ATCO's billing system to ensure the components of the CF (including pressure and temperature) are not in error and are up-to-date.

3.2.5 Theft mitigation

Theft of gas contributes to UAFG. To combat theft, ATCO investigates sites where consumption of gas may have changed based on historical usage or where a third party report has identified an issue.

The quarterly visit by a meter reader identifies instances where a customer has been using gas illegally, via a stolen meter, or via a bypass function, as well as providing a check for the internal administration of meter connection services.

3.2.6 Ongoing review of large gas consumers

ATCO reviews the gas usage of every interval metered customer every day of the year. ATCO has built dedicated applications to allow the Data Management function to review, investigate anomalies and dispatch personnel if required. Due to the size and potential impact on UAFG, interval-metered data (i.e. for large consumers) is analysed on an individual meter basis to identify changes in consumption patterns that could result in UAFG.

3.2.7 Oversized metering

ATCO identified a number of oversized meters in 2013 and 2014 for replacement and the process for identifying and 'right sizing' similar installations has been imbedded into business as usual activities.

3.2.8 Heating value management

Gas quality is becoming a larger issue as more networks receive deliveries from multiple gas transmission operators and gas suppliers. It is ATCO's responsibility as part of the AEMO obligations to declare the energy content of the supplied natural gas for each network. Historically this has been done via algorithms based on delivered energies, however the new injection points being randomly located around the GDS has created challenges for ATCO in ensuring customers on the same subnetwork receive energy values with no greater than a one mega-joule (1MJ) variation.

ATCO has a mandate to allow third party gas transmission operators and gas supplier's access to the GDS. The variable energy content of these gases and the varied location of the injection points means determining the energy content of the gas that customers receive at their meter may be a limiting factor for the continuing interconnection of the GDS. ATCO has already observed broadening of energy values in gas inflows, which is a divergence from historical averages. Prior to the new interconnection of a third party gas supplier into the South Metro gas network the 12 month UAFG was tracking as expected at approximately 2.6% (January 2017). After 12 months, the rolling 12 month UAFG is reporting approximately 2.1% (January 2018). This reduction in UAFG is primarily through differential energy content between metered gas and calculated quantities. With an average energy variation between the two supplies of 0.5MJ this equates to a 1.3% variation in energy delivered. ATCO has a responsibility to ensure that metering energies are balanced and have a neutral impact on UAFG determination.

ATCO has rectified this discrepancy by altering the algorithm and has requested the Directorate's consent to approve the new algorithm ATCO will instigate this change in the last quarter of 2018. Over the following 12 months, ATCO expects UAFG rates to return to levels around 2.5%.

3.3 UAFG benchmark performance

Table 3.1 identifies the UAFG of other gas distribution businesses throughout Australia. It can be concluded that ATCO has one of the lowest UAFG levels in regards to the peer review. ATCO will continue to implement initiatives to reduce UAFG over AA5.

Table 3.1: UAFG benchmarking levels against other similar sized gas distribution businesses¹

Gas Distribution Business	UAFG Benchmark %	Year of Benchmark Data
Allgas Queensland	4%	-
Envestra Queensland	0.5%**	-
Envestra SA	8.3%	-
Jemena Network NSW	2.7% ²	2014
ActewAGL	1.8%	-
AGN (Victoria)	4.3% (PTS) and 2.4% (non-PTS) ³	2015
Multinet	6.01% (PTS*) and 4.1% (non-PTS) ⁴	2015
AusNet Services	3.41% (PTS) and 18.84% (non-PTS) ⁵	2015

*UAFG for distribution networks fed directly off the Principle Transmission System (PTS).

***Note: Zincara notes that “There are no explanations to why Envestra’s Queensland UAG is unusually low.”

¹ Zincara (2017) "Review of Unaccounted for Gas Benchmarks – Methodology", July 2017. Prepared for Essential Services Commission. Available at: <https://www.esc.vic.gov.au/sites/default/files/documents/review-of-unaccounted-for-gas-benchmarks-methodology-prepared-by-Zincara-20170731.pdf>

² Jemena Gas Networks (NSW) Ltd (2014) "2015-20 Access Arrangement Information Appendix 7.5 UAG methodology and justification", June 2014. Available at: <https://www.aer.gov.au/system/files/JGN%20-%20AA%20review%20-%207%20OPEX%20-%20Appendix%207.5%20UAG%20methodology%20and%20justification%20-%20PUBLIC.pdf>

³ Australian Gas Networks (2017) "Submission on Calculation of new Unaccounted for Gas Benchmarks Victorian and Albury Networks", August 2017. Available at: <https://www.esc.vic.gov.au/sites/default/files/submissions/australian-gas-networks-submission-to-uafg-review-final-decision-methodology-20170811.pdf>

⁴ Multinet (2017) "Unaccounted for Gas Strategy CY2017 – CY2022", June 2017. Available at: <https://www.esc.vic.gov.au/sites/default/files/submissions/multinet-gas-submission-to-review-of-uafg-benchmarks-final-decision-methodology-20170921.pdf>

⁵ Ausnet Services (2017) "Un-Accounted for Gas (UAFG) Strategy", August 2017. Available at: <https://www.esc.vic.gov.au/sites/default/files/submissions/ausnet-services-submission-to-uafg-review-final-decision-methodology-version-4-20170830.pdf>

4. Proposed UAFG forecast

During the AA4 period UAFG variables have had some inconsistencies and created large variations in declared UAFG volumes making forecast predictions challenging. Leading into the AA4 a gradual decline in UAFG was forecast this being based on some remedial pipeline replacement and other initiatives. The decline was understated mainly due to three factors:

1. **Mains replacement** and odd size steel replacement was completed and had a progressive impact due to the rolling nature of reporting UAFG therefore this impact was underestimated.
2. **Gate Station metering issue:** after the new interconnection in the South Metro was commissioned and flows increased in December 2016, UAFG levels started to slightly decline. Investigations were enacted and by March 2017 UAFG levels were continuing to decline. ATCO requested an attendance to a gate point metering witness test at the new gate interconnection were concerned over some calibration points used by the transmission operator. ATCO re-calculated the calibration points used by in the correction software and suspected an error in the reference points used. After raising the issue with the third party operator they could not identify the issue, but eventually replaced the meter with an ultrasonic meter thus resolving the issue in August 2017.
3. **Heating Management Plan:** the new interconnection triggered the requirement for a HHV Management Plan as the new gas supply has, on average, a lower heating value than gas already being supplied into the sub-network. ATCO, working on the supplied information at that time and the commercial restrictions limiting knowledge of contracted gas supplies, made certain assumptions based around retailer and customer arrangements. The HHV Management Plan was approved utilising the Munster sub gas zone. It was assumed the majority of gas would be consumed by large industrial customers due to the usage profiles at the time. This assumption proved to be limited and the gas supplied by this new interconnection assumption was larger than expected. The approved HHV Management Plan continues to operate within prescribed limits, however has had a significant impact on lowering the UAFG level. This has resulted in ATCO going back to the Directorate to approve a new plan that will neutralise network effects that heating value variations have on reported UAFG volumes. This new plan is scheduled to be implement in the last quarter of 2018.

The UAFG decline is caused by a combination of issues and trying to proportion the volumes to the various issues is challenging as UAFG is reported on a 12 month rolling average. The new HHV Management Plan once activated will take at least 14 months before UAFG levels are corrected.

4.1 AA5 UAFG forecast

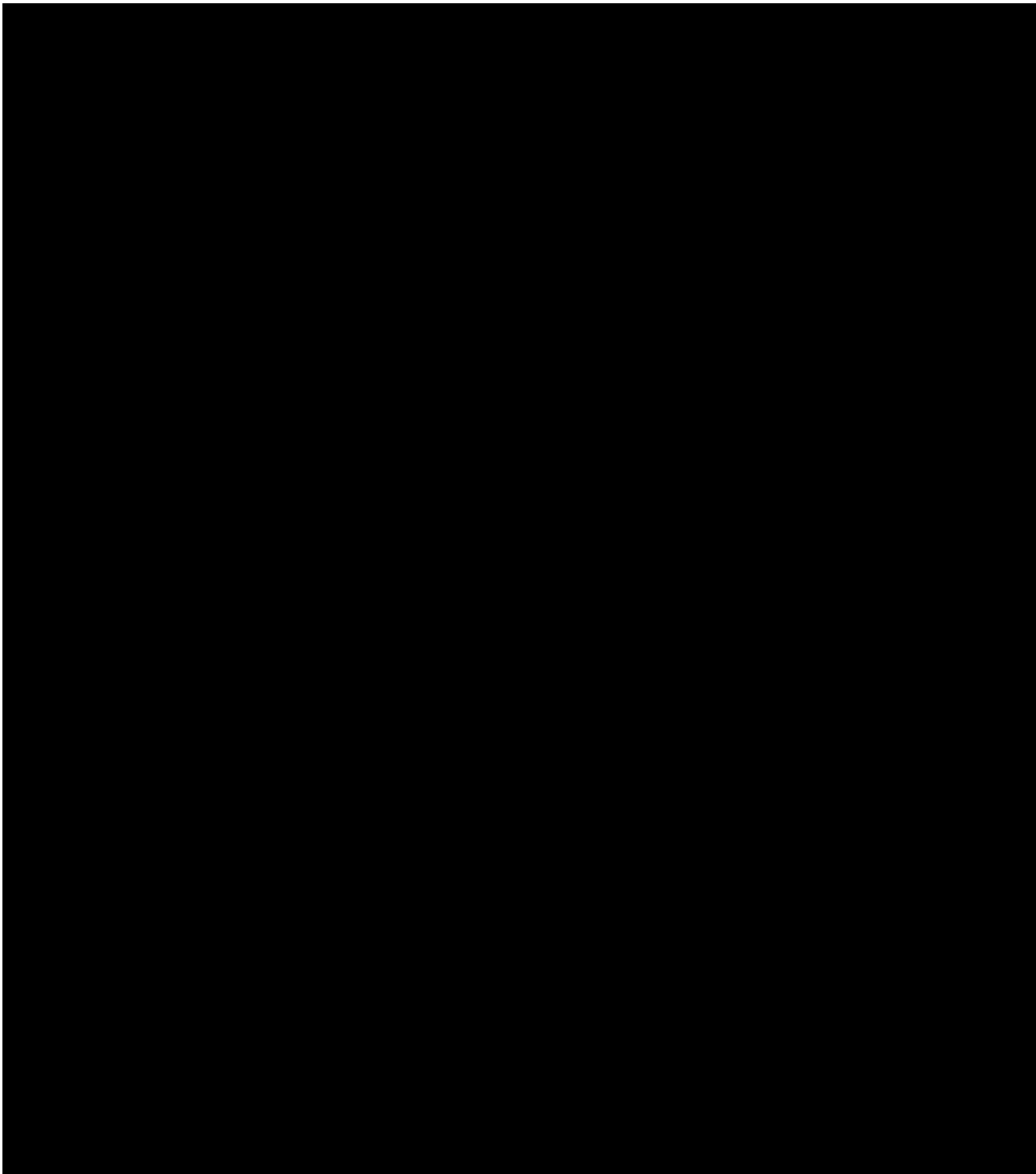
ATCO has separately forecast the costs of UAFG in AA5 through the calculation of forecast UAFG volumes using historical UAFG rates as a percentage of total gas throughput, taking into account UAFG reductions (e.g. mains replacement). Table 4.1 is ATCO’s forecast UAFG % over AA5:

Table 4.1: Forecast UAFG % annually over AA5

2020	2021	2022	2023	2024
2.55%	2.52%	2.50%	2.48%	2.46%

4.2 UAFG pricing forecast

4.2.1 Proposed mechanism



⁶ AEMO (2017) "Gas Statement of Opportunities for Western Australia", December 2017. Available at: <https://www.aemo.com.au/Gas/National-planning-and-forecasting/WA-Gas-Statement-of-Opportunities>

⁷ Thong, J. (2018) "Gas Price Trends Review 2017", published by Oakley Greenwood. Available at: <https://www.energy.gov.au/publications/gas-price-trends-review-report>

⁸ AEMO (2017) "Gas Statement of Opportunities for Western Australia", pg. 65, December 2017. Available at: <https://www.aemo.com.au/Gas/National-planning-and-forecasting/WA-Gas-Statement-of-Opportunities>