

Submission to the Essential Services Commission

Unaccounted for Gas Benchmarks Review 2022

by John Godfrey, M.Org Sys, B.Chem.Eng
Independent environmental consultant

20 November 2022

Thank you for the opportunity to contribute to the interim review.

In summary, I take strong exception to the Essential Services Commission's (ESC) proposal to roll over & in one case increase the UAFG (Unaccounted For Gas) benchmarks for the next 5 year period. This is unacceptable. Fugitive emissions make up over 40% of UAFG – based on data published by the ESC.

Reducing methane leakage to the atmosphere is an effective way of mitigating climate change. To roll over the existing benchmarks ignores the impacts of climate change and the Victorian Government's legislated commitment to lower greenhouse gas emissions.

As an example of benchmarks to drive a reduction in fugitive emissions I would propose instead:

	AGN Class B Benchmark	Multinet Class B Benchmark	AusNet Class B Benchmark
2013	3.7%	4.1%	5.4%
2014	3.7%	4.1%	5.4%
2015	3.7%	4.1%	5.4%
2016	3.7%	4.1%	5.4%
2017	3.7%	4.1%	5.4%
2018	4.0%	5.3%	4.6%
2019	4.0%	5.3%	4.6%
2020	4.0%	5.3%	4.6%
2021	4.0%	5.3%	4.6%
2022	4.0%	5.3%	4.6%
2023	3.9%	5.2%	4.5%
2024	3.8%	5.0%	4.4%
2025	3.7%	4.9%	4.2%
2026	3.6%	4.8%	4.1%
2027	3.5%	4.6%	4.0%
2028	3.4%	4.5%	3.9%
2029	3.3%	4.3%	3.8%
2030	3.2%	4.2%	3.7%

In the appendix I provide excerpts from the technical work done to support this submission.

Background. I am a retired chemical engineer. I worked for a major oil company for 37 years. After starting at a refinery in Adelaide then worked in Melbourne, New Zealand, the USA and Europe. My career involved roles covering the Asia Pacific and the company's global refining interests.

Of particular relevance to this submission is that I was for a time the Energy Team Lead at a Victorian refinery. This involved detailed energy analysis of a complex fuel system that included gaseous fuels (mainly methane and hydrogen) from a mix of sources including "Class A" gas from the Victorian fossil gas system. In that role I used techniques very similar to the UAFG component breakdown that has previously been done for the ESC and the gas distribution companies by Asset Integrity Australasia.

In addition I led the preparation of that refinery's first submission to the National Greenhouse gas Emissions Reporting System (NGERS) of the site's greenhouse gas emissions. I was also involved in reviews of some of the subsequent submissions.

Time frames. I accept the six month roll-over of existing benchmarks to a financial year basis. That allows more time to consider and adopt a better set of benchmarks for the following 5 years.

Legislative Context: The Energy Safe Victoria Act 2005 empowers the Minister (prior to the state election this is the Victorian Assistant Treasurer) to direct the ESC to reflect the legislated emissions reduction targets of 50% by 2030 in the UAFG bench-marking exercise. This should be done in consultation with the Minister for Energy, Environment & Climate Change to ensure consistency with the Victorian Gas Substitution Roadmap.

The ESC should:

1. Require UAFG benchmarks to tighten in line with the trajectory of Victoria's commitment to reduce emissions as set out in the Climate Change Act 2017. The gas distribution companies should be shouldering their fair share of the effort required to reduce Victoria's emissions.
2. Require regular repeat independent assessments of each distributors' breakdown of UAFG as done previously by Asset Integrity Australasia. These assessments should be commissioned by the ESC and made publicly available to the Victorian public, who form the bulk of the customers of the gas distributed.
3. Require that the distributors reconcile their greenhouse gas emissions reporting to the Federal Government with their UAFG data. There is no such requirement currently and the distributors admit there is no correlation between the two sets of reporting. This is unacceptable. The UAFG data suggests that the greenhouse gas impact of Victorian gas distribution is 260% higher than the NGERS inventories. Accurate tracking of actual emissions is essential if Victoria is to achieve net zero by 2050 as planned.

All of these align with the Minister's expectation that "I look forward to seeing the ESC continuously working towards achieving best practice in the administration and enforcement of regulation."¹

Climate Context: Fossil gas (methane) leaks from the Gas Distribution Network, particularly from the lower pressure Class B networks. Methane is a highly destructive greenhouse gas. It lasts in the atmosphere for up to 12 years, and over a 20 year time frame (GWP20yr) has an impact about 83 times that of CO₂. The 20 year time frame is important as emissions in the next two decades will determine what we can achieve by 2050 to avoid climate tipping points.

COP-27 is focusing on methane reduction. "Reducing methane emissions can make a big and rapid difference, as this gas leaves the atmosphere far quicker than carbon dioxide."²

- 1 [Statement of Expectations for the Essential Services Commission](#), 5/11/2020
- 2 Inger Andersen, executive director of the U.N. Environment Program, COP27 [statement](#).

Of note is the US response. The US Inflation Reduction Act of 2022 provides strong incentives for methane mitigation, including by levying an [emissions tax](#) on large oil and gas producers starting at \$900 per ton in 2024, increasing to \$1,500 in 2026. That fee, which can be [waived](#) by the Environmental Protection Agency and doesn't affect small producers or leaks below 0.2% of gas produced, is based on the [social cost](#) to society from methane's contribution to climate damage.³

Based on documents published by the ESC, fugitive emissions from Victoria's Class B network amount to about 40% of the UAFG. With Class B UAFG rates of around 5%, this means about 2% of the Class B customers' gas is fugitive. Using the GWP20yr factors this means that these leaks increase climate impact by 50% over what they would be if all the gas was burnt to CO₂.

Regulatory Context: The ESC draft report, and Zincara's report for the ESC are disappointing. Of particular note are:

- The ESC proposal to "propose to continue applying the same methodology as in previous years" when the social license context has changed significantly (including the release of the Climate Change Act).
- The ESC stating that while it is difficult to estimate the fugitive contribution to UAFG, and then choosing to not follow its own past practice and experience to make best efforts to do so despite the devastating climate change impact of fugitive methane. Just because something is difficult doesn't mean it's not important and shouldn't be done. Especially when it's already been done before.
- Zincara's finding that: "Given the extensive program for over twenty years, there has not been a quantifiable improvement of the UAFG. This is due to the key drivers for the mains replacement program are safety and reliability and not so much UAFG." While true, it steps over the obvious conclusion that the mains replacement programs that have been undertaken have only barely kept pace with the overall deterioration of the ageing network. Buried pipeline networks deteriorate over time due to factors such as ground movement and corrosion.
- The significance of possibly injecting hydrogen is considerably downplayed. "As the injection of hydrogen and other renewable gases would gradually alter the gas mixture and heating values, we expect this to require consideration with future UAFG benchmarks. We will assess in due time or when these issues have a considerable material impact how these changes may interact with UAFG benchmarks. However, based on the finalised changes and information currently available, we consider the current approach to setting UAFG benchmarks is appropriate." This understates the potential impact. As hydrogen is far less energy dense than methane, so higher network pressures are required to deliver the same quantity of energy to end customers, as 10% hydrogen as a fuel is equivalent to only about 3% methane. A higher pressure network containing gas of tiny molecules that is famously difficult to contain is bound to leak more. When it leaks, hydrogen does warm the atmosphere. It has GWP20yr of 33 times that of CO₂, and a GWP100yr of 11. In addition, higher pipeline pressures will increase methane leakage.

3 [Why fixing methane leaks from the oil and gas industry can be a climate game-changer](#), The Conversation, 18/11/2022

- MultiNet's UAFG is higher than that of the other companies. They seem to be being rewarded for this by having their benchmark increased from 5.3% to 5.4%. "We expect Multinet to maintain and, where appropriate, seek to improve their DTS UAFG performance." Why would they do that if their target is relaxed? Why is the Multinet UAFG so much higher than the UAFG of other distribution businesses? If meter reading errors are consistent over the network this means that the UAFG from the Multinet network is much higher than average.

Thank you for seeking feedback from the public. I would welcome an opportunity to discuss these issues with you.

Regards

John Godfrey

Victoria

Appendix

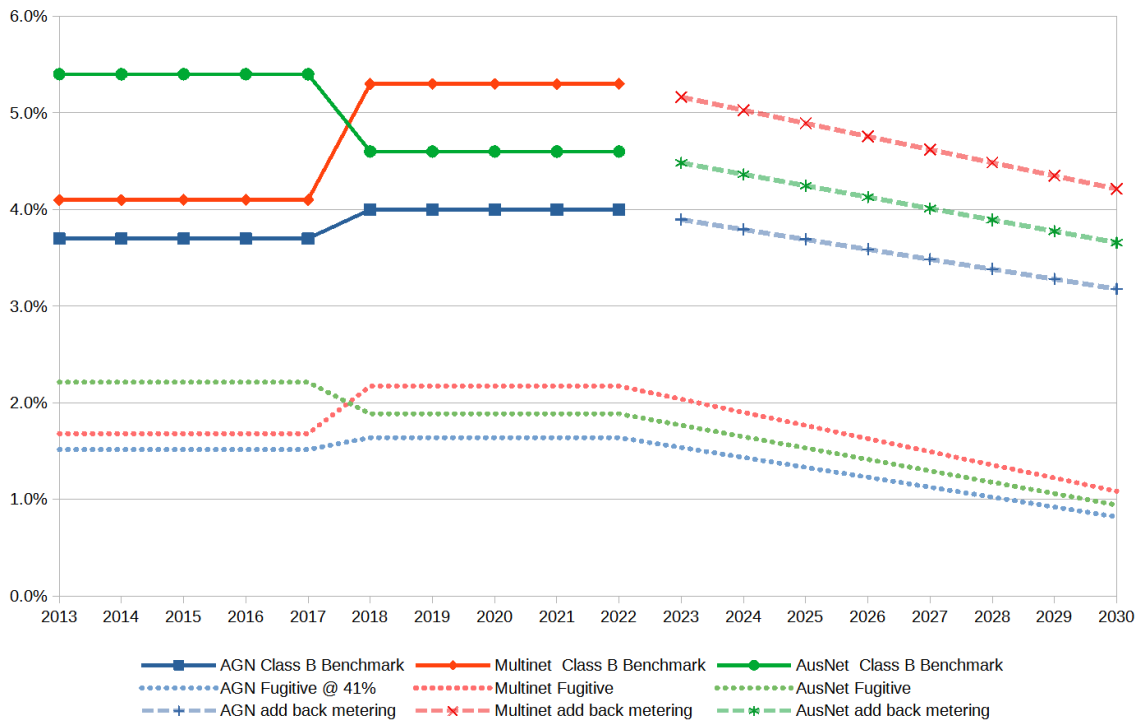
Class B UAFG Benchmark Proposal

To achieve 50% reduction of fugitive emissions by 2030

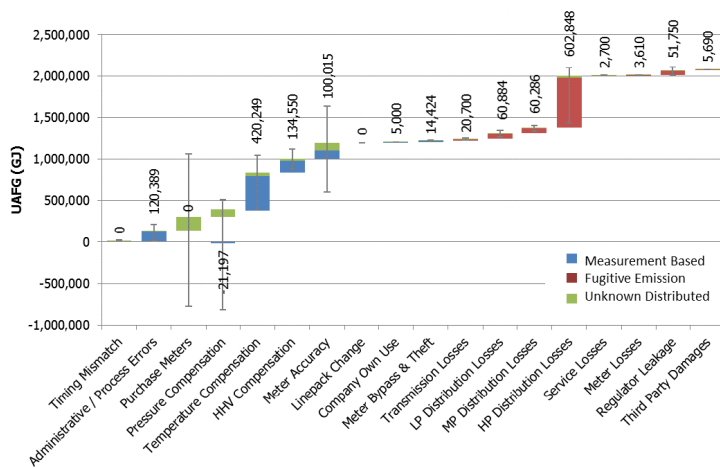
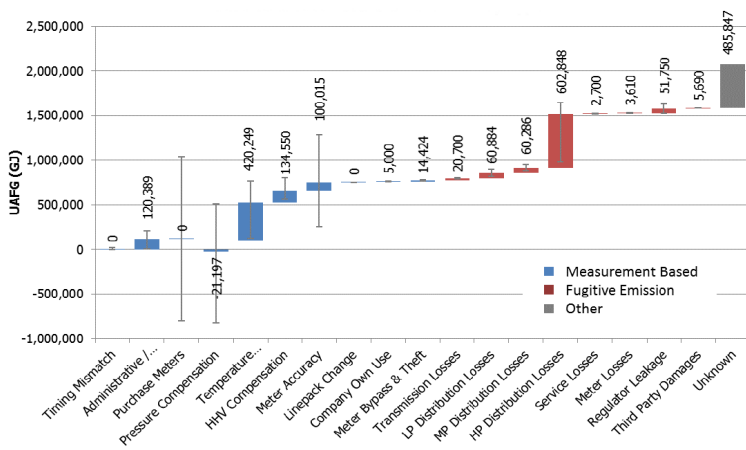
Class B UAFG Benchmark Proposal (customers <250,000 GJ/pa)										
	AGN Class B Benchmark	Multinet Class B Benchmark	AusNet Class B Benchmark	AGN Fugitive @ 41%	Multinet Fugitive	AusNet Fugitive	AGN add back metering	Multinet add back metering	AusNet add back metering	
2013	3.7%	4.1%	5.4%	1.5%	1.7%	2.2%				
2014	3.7%	4.1%	5.4%	1.5%	1.7%	2.2%				
2015	3.7%	4.1%	5.4%	1.5%	1.7%	2.2%				
2016	3.7%	4.1%	5.4%	1.5%	1.7%	2.2%				
2017	3.7%	4.1%	5.4%	1.5%	1.7%	2.2%				
2018	4.0%	5.3%	4.6%	1.6%	2.2%	1.9%				
2019	4.0%	5.3%	4.6%	1.6%	2.2%	1.9%				
2020	4.0%	5.3%	4.6%	1.6%	2.2%	1.9%				
2021	4.0%	5.3%	4.6%	1.6%	2.2%	1.9%				
2022	4.0%	5.3%	4.6%	1.6%	2.2%	1.9%				
2023				1.5%	2.0%	1.8%	3.9%	5.2%	4.5%	
2024				1.4%	1.9%	1.7%	3.8%	5.0%	4.4%	
2025				1.3%	1.8%	1.5%	3.7%	4.9%	4.2%	
2026				1.2%	1.6%	1.4%	3.6%	4.8%	4.1%	
2027				1.1%	1.5%	1.3%	3.5%	4.6%	4.0%	
2028				1.0%	1.4%	1.2%	3.4%	4.5%	3.9%	
2029				0.9%	1.2%	1.1%	3.3%	4.3%	3.8%	
2030				0.8%	1.1%	0.9%	3.2%	4.2%	3.7%	

Class B targets reducing fugitive emissions by 50% by 2030

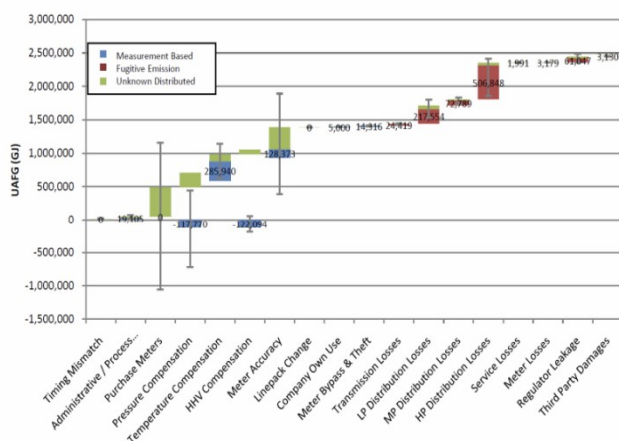
Assuming 41% UAFG is fugitive



Example of UAfG breakdown into components by Asset Integrity Australasia.



Source: Australian Gas Networks. *Submission on Calculation of new Unaccounted for Gas Benchmarks. August 2017, p. 20ff*



Source: Asset Integrity Australasia P/L, *Review of SP AusNet Strategy and Data Requirements for Desktop UafG, p10 Figure 4 In AusNet Services Un-Accounted for Gas (UAfG) Strategy.*

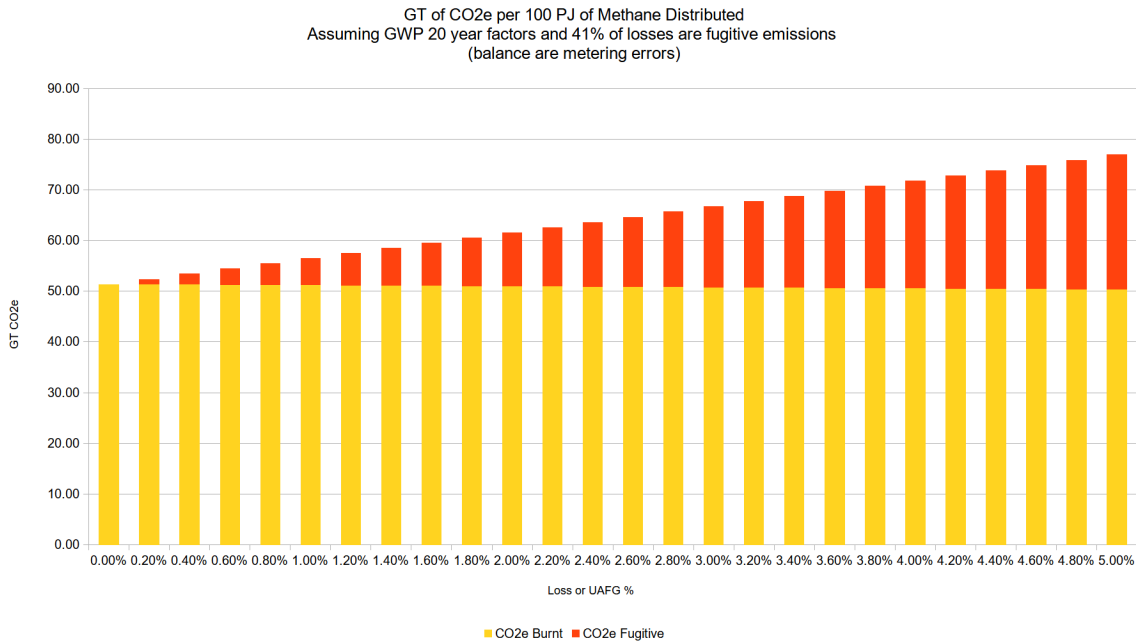
Asset Integrity Australasia. *Review of UAfG in AGN's Victorian and Albury Networks, p. 12, Figure 3. In Australian Gas Networks. Submission on Calculation of new Unaccounted for Gas Benchmarks. August 2017.*

Units GJ	UAFG excl unknown	Unknown	Total UAFG	Fugitive excluding unknown	Eyeball unknown to fugitive	Fugitive including uncertainty	Fugitive % of total UAFG
AGN	1,581,898	485,847	2,067,745	808,468	20,000	828,468	40.1%
AusNet	1,103,827	1,295,797	2,399,624	890,957	131,979	1,022,936	42.6%
Multinet	2,188,814	1,201,496	3,390,310	1,359,550	80,000	1,439,550	42.5%
Total	4,874,539	2,283,410	7,857,679	3,058,975	160,000	3,218,975	41.0%

Author's workup of % fugitive of total UAFG based on ESC published data.

CO2e Emissions for Distributed Methane using 20yr GWP and 41% Fugitive Emissions

At 5% UAFG, assuming 41% are fugitive, then fugitive emissions make up 35% of the total emissions which are 50% higher than if all the gas was burnt.



Uses 83.5 as the 20 year GWP for methane.