

**Memo to:**

Allocation of Unidentified Gas Interested Parties

**Date:** 12 April 2019

**Prep. By:** Andy Gordon

**Analysis of Theft vs Unidentified Gas by LDZ**

**Background**

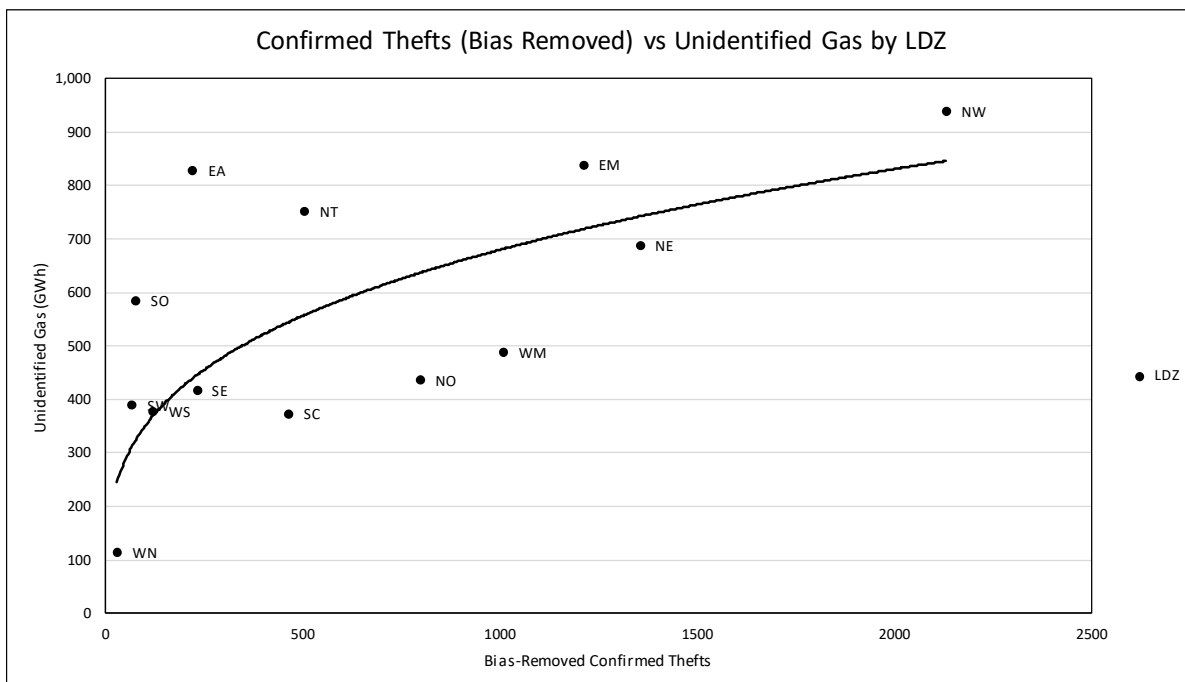
At the AUG Sub-Committee meeting held on 15/03/2019, the AUGE was asked by the industry to carry out an analysis of theft levels against Unidentified Gas by LDZ, to provide reassurance regarding the ongoing assumption that the Balancing Factor is mainly composed of undetected theft. This document contains the results of this analysis and associated commentary.


In line with the AUGE’s current theft methodology, it is vital for this analysis that as much bias as possible is removed from the confirmed theft figures – theft will only be found where it is looked for, and so the raw figures for confirmed theft will be highly affected by the theft detection strategies of individual Suppliers. Therefore, this bias must be removed so that the resulting figures – bias-adjusted confirmed thefts – give the best possible estimate of the overall underlying theft levels in the population (rather than simply reflecting the focus of Suppliers in trying to detect this theft).

This analysis is subject to the same restrictions as the main theft calculation as described in the AUG Statement – not all of the data required to completely remove theft bias is currently available to the AUGE, and this has resulted in only one of the two main sources of bias being removed. This issue adds noise to the output, but does not prevent the underlying trend being apparent, as shown in the results below.

**Results**

The following graph shows the total Unidentified Gas (as calculated by the AUGE for historic years) for each LDZ plotted against the bias-adjusted number of confirmed thefts for that LDZ. The Unidentified Gas is the average across all 5 historic years used by the AUGE.





**Page 2 of 2**

Whilst there is visible scatter around the relationship (particularly the outlier EA LDZ), it can be clearly seen that there is a relationship between the two variables and that there is a tendency for Unidentified Gas to increase as the number of bias-adjusted confirmed thefts increases. This relationship is statistically significant.

It should be noted that this type of analysis cannot prove that a cause-and-effect relationship exists – it can only show that the two variables change together in a particular way. The possibility that Unidentified Gas is in fact linked to a different influencing factor that behaves in a similar manner to undetected theft cannot therefore be ruled out based on this analysis. It does, however, provide evidence that as bias-adjusted theft increases so does Unidentified Gas, and this supports the assertion that the Balancing Factor is indeed composed largely of theft.

In particular, it should be noted that the relationship in the graph is not caused simply by LDZ size (i.e. a large LDZ has more theft and more Unidentified Gas). Whilst NW is the largest LDZ (in terms of total allocation) and also has the highest Unidentified Gas, the pattern of LDZs is largely geographical rather than linked to size:

- The northern LDZs NW, NO and NE have high levels of bias-adjusted confirmed thefts compared to their size.
- The southern and Welsh LDZs SE, SO, SW, WN and WS have very low levels of bias-adjusted confirmed thefts compared to their size.

This results in a general pattern where the southern LDZs are at the low end of the graph and the northern and midland ones are at the high end. This geographical split does not follow LDZ size and would be unusual if there was no genuine link between bias-adjusted theft and Unidentified Gas.

Therefore, whilst as stated above cause-and-effect cannot be proved, these results provide additional confidence in the assumption that the Balancing Factor is largely composed of undetected theft.