GDN Analysis of Modification 0843 ‘Establishing the Independent Shrinkage Charge and the Independent Shrinkage Expert’ Appendix

The UNC governance process allows for code parties to review and feedback on proposed modifications, for the purpose of ensuring that outputs received by the UNC panel and Ofgem are factual and include the views of all industry stakeholders. The purpose of the analysis was to assess the relevance of the studies referenced in modification 0843 that were included by the proposer to support the statement that, "*numerous studies show that shrinkage volumes are understated*".

The GDNs have not looked to evaluate the credibility of the studies listed but to determine whether the studies were sufficiently relevant as to reach the same conclusion drawn by the proposer. The analysis found that many of the studies were not relevant or are limited in scale to conclude that findings were representative of the UK. This supports the case for the SIF funded Digital Platform for Leakage Analytics project, which looks to develop a new modelling tool informed by network data acquired from the deployment of methane leak detection technologies. This will result in advancements in targeted leakage detection and rectification, ultimately reducing networks’ shrinkage volumes.

1. (2023) Major UK methane greenhouse gas leak spotted from space.

GDN comments

This study only proves that satellites can be used to detect methane. WWU were already aware of this escape as this was reported by a member of the public. Works have been completed to replace the pipe.

Relevance - Not relevant. This is an instantaneous leak that occurred in Cheltenham which is not representative of the UK.

2. (2022) Continuous CH4 and δ13CH4 measurements in London demonstrate under-reported natural gas leakage

GDN comments

It cannot be concluded that the leakage element of the SLM is misreported by 30-35% as this paper describes a study in London which is not representative of the whole of the UK. The Digital Platform for Leakage Analytics project aims to pilot leakage detection technologies across Cadent’s North London and East of England networks, delivering a greater understanding of actual DN leakage volumes. Additionally, DN shrinkage is currently measured at an LDZ level, covering a broad range of asset types, population densities and demand profiles. The scale of the study may not be representative of shrinkage volumes at an LDZ level.

Relevance - Not relevant. This is a single study in London which is not representative of the whole of the UK. WWU which is one of the smaller networks, has approximately 35,000 km of pipelines.

3. (2022) Street-level methane emissions of Bucharest, Romania and the dominance of urban wastewater

GDN comments

This describes a study in Bucharest which identified "58-63% of CH4 elevations (above background) were attributed to biogenic wastewater". This is outside of the UK and therefore not representative of UK DN Shrinkage.

Relevance - Not relevant. Study in Bucharest which is not representative of the UK.

4. (2019) Environmental baseline monitoring for shale gas development in the UK: Identification and geochemical characterisation of local source emissions of methane to atmosphere

GDN comments

This study was to establish a baseline ahead of shale gas extraction not to allocate the background emissions and compare to any models. The sources of gas within this study are from Shale and not from the distribution network.

Relevance - No relevance. This study was later removed from the appendix.

5. (2019) Assessing London CO2, CH4 and CO emissions using aircraft measurements and dispersion modelling

GDN comments

This study is arguing that CH4 value inventories are too high contradicting other studies. This paper does not appear to be relevant to the case for suggesting that Shrinkage volumes are understated as it describes a single study in London which yielded an inventory scale factor of 0.66-0.79 for CH4. The Digital Platform for Leakage Analytics project aims to pilot leakage detection technologies across Cadent's North London and East of England networks, delivering a greater understanding of actual DN leakage volumes. The scale of the study may not be representative of shrinkage volumes at an LDZ level.

Relevance - Not relevant. This is a single study in London and not representative of the whole of the UK.

6. (2017) Characterization of interferences to in situ observations of δ13CH4 and C2H6 when using a cavity ring-down spectrometer at industrial sites

GDN comments

This paper does not appear to be relevant to the case for suggesting that Shrinkage volumes are understated as it discusses the biases that need to be accounted for when measuring elevated C2H6 for CH4 source determination.

Relevance - No relevance

7. (2017) Evaluating methane inventories by isotopic analysis in the London region

GDN comments

This paper describes a study in London which is not representative of the whole of the UK. The Digital Platform for Leakage Analytics project aims to pilot leakage detection technologies across Cadent's North London and East of England networks, delivering a greater understanding of actual DN leakage volumes. The scale of the study may not be representative of shrinkage volumes at an LDZ level.

Relevance -No relevance - Study in London not representative of the whole of the UK.

8. (2017) Origins and trends in ethane and propane in the United Kingdom from 1993 to 2012

GDN comments

This paper describes a study, using data from 13 monitoring stations. It concludes that 'a program of leak detection and repair may be a cost-effective solution for fixing leaks that have become apparent through atmospheric observations.'

Relevance - Not relevant. The number of monitoring points are not large enough to be representative of the entire UK gas network. This supports the need for the joint GDN project 'Digital Platform for Leakage Analytics' that will enhance in-field leak detection and provide greater insights into leakage.

Under engineering document T/PM/LC/18 Management Procedure for Leakage Survey the GDNs are required to complete physical gas leak detection surveys on gas mains determined by a risk rating and driven by fluctuations in temperature.

WWU's network only:

In 2022, 5506 sections of gas main were surveyed with a combined length of 699 km.

In 2023, 5307 Sections of gas main were surveyed with a combined length of 762 km.

9. (2016) Spatial and temporal variability of urban fluxes of methane, carbon monoxide and carbon dioxide above London, UK

GDN comments

This paper describes a study in London which is not representative of the whole of the UK. Additionally, it suggests that 'biogenic sources of CH4, such as wastewater, is unaccounted for by the atmospheric emissions inventories, make a substantial contribution to the overall budget'. The Digital Platform for Leakage Analytics project aims to pilot leakage detection technologies across Cadent's North London and East of England networks, delivering a greater understanding of actual DN leakage volumes. The scale of the study may not be representative of shrinkage volumes at an LDZ level.

Relevance - Not relevant. This is a study limited to London and not representative of the whole of the UK.

10. (2017) Natural gas and climate change

GDN comments

This paper does not appear to be relevant.

Relevance - No relevance. This is a very general study of methane and anthropogenic climate change.

11. (2015) Plume mapping and isotopic characterisation of anthropogenic methane sources

GDN comments

This paper does not appear to be relevant to the case for suggesting that Shrinkage volumes are understated but does make the case for the discrepancies between a "bottom up" approach and direct measurements.

Relevance - No relevance

12. (2023) Fugitive Methane Across the UK Gas Distribution Network from Terminals to Cities

GDN comments

This study contradicts other studies as it suggests shrinkage is understated and overstated in other areas.

Relevance - No relevance

13. (2018) Assessing fugitive emissions of CH4 from high-pressure gas pipelines in the UK

GDN comments

This study is about fugitive emissions from the NTS - this is out of scope of the modification.

Relevance - No relevance

14. DN provided evidence - Study commissioned by the Independent Networks Association Calculation of PE Leakage, PE distribution main leakage estimation for IGTs

GDN comments

Executive summary point 4 suggests leakage rates for PE pipelines are currently overstated.

Relevance - Relevant as a large proportion of the mains pipeline population is PE.