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Draft Consultation – Gas Distribution Price Control

Ofgem has published its draft consultation for the next price control period of the Gas Distribution sector, known as RIIO-GD2, and requested responses. In this note we wish to raise significant concerns in relation to the following questions:

- (1) Do you have any views on what clarifications are needed to ensure a consistent method of calculating the benchmark shrinkage volumes? (GDQ10)
- (2) What are your views on the consultation position for the four GDN's EAP proposals? (GDQ12)

Our concerns are centred around the continued use of the estimation factor of 0.0113% for the calculation of own use gas (OUG). During the original Network Code negotiations, it was understandable that British Gas as a Nationalised Company would not have metered its own use of gas since all the gas at that time was bought and sold by British Gas. The fact that this failure to accurately measure the gas taken from the system by the Distribution Companies for their own use, over 20 years later, is bizarre. Furthermore, the proposition that OUG, at 2% of shrinkage is half the amount of theft¹ seems unlikely based on alternative assessments and data from elsewhere.

In the North West, West Midlands, East of England and North London areas, the assessment of OUG for the year ending March 2020 was **29.9GWh**.² This figure is calculated either as ~2.5% of total shrinkage or as factor of consumption; the factor used is 0.0113% and the rough estimate for consumption is 265,000GWh p.a.

However, using approximations for installed heating capacity for this region of at least 50MWth, the efficiency of the pre-heating assets at 60% as a mid-point between Water Bath Heaters and Heat Exchanger and a conservative load factor of 40% p.a. one arrives at OUG of **292GWh** p.a.

The differential is so great that the credibility of the assumptions behind the use of the estimated calculation factor must be in doubt. In fact, comparisons with other countries reveal higher assumptions for this factor. We quote Australia at between 0.18% and 0.53% and Iran between 0.15% to 0.28%.³ These factors match more

¹ Shrinkage and Leakage Model Review 2018, Gas Distribution Networks

² Reference: Shrinkage Assessment and Adjustment, dated July 2020, Cadent;

³ Reference: Efficiency and heat losses of indirect water bath heater installed in natural gas pressure reduction station; evaluating a case study in Iran, Table 2, p8 – dated 2008.

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closely the alternative ways of calculating OUG at 0.1% of consumption than the estimated OUG factor 0.0113%.

Another approach to identify the true OUG is as follows:

Assess the enthalpy change and flow rates:

1. Convert the throughput gas volume (consumption or demand) from 265,000GWh p.a. for the region to $24,091 \times 10^6$ m³ (assuming 90,909GWh per m³ of NG).
2. Multiply the volume of gas $24,091 \times 10^6$ m³ by the density of Natural Gas 0.78kg/m³ and divide by the number of seconds in a year to calculate the average flow rate in kg/s
3. This yields an approximate enthalpy change of 29kj/kg and multiplied by the average flow rate of 596kg/s gives a result of 17,280kJ/s which is equivalent to 17,280kW.
4. Annualized by multiplying by 8,760 hrs we arrive at a heating requirement of 151GWh p.a., and assuming an average portfolio efficiency of 60%, the net heating requirement would require an OUG of **252GWh**.

The difference between an estimated ~30GWh and the calculated ~300GWh would make a significant contribution to explain the long-standing anomaly of unaccounted for gas (UAG). How with the tools available today do we still have so much UAG?

The consequence is very important for the target reduction of Carbon Footprint as follows:

- Natural Gas, when combusted, produces approximately 185kg of CO₂ per MWh.
- Therefore, assuming 30GWh of OUG emissions would total 5,500 million tonnes of CO₂ p.a.
- However, if the correct figure for OUG is emissions (approximately 300GWh) would be 55,500 million tCO₂ p.a.

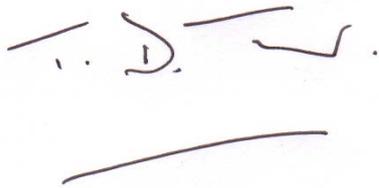
The target reduction for Business Carbon Footprint (BCF) recorded on p.45 of the consultation is 26,750 tCO₂ by 2026. The proposed target appears small compared to the more likely overall emissions of CO₂.

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To fix the problems in the draft consultation outlined above will require a thorough review of the shrinkage assessment upon which much of the outputs and incentives on the specific topic of OUG and emissions are based.

In the longer term the price control determination should require the installation of appropriate measurement of OUG which in the smart meter and digital age we are entering will be essential for accurate system management.



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Trevor Turner is the senior Managing Consultant at CeTurn Ltd and a Director of sentri Ltd. Trevor was Managing Director at Eastern Natural Gas during the Network Code negotiations and has subsequently undertaken many UK and international projects.

These include industry specialist for Monitoring Trustee overseeing the EDF takeover of British Energy, integrated risk assessment of the ill fated Nabucco project, risk assessment of a major associated gas production and transportation into power in Western Siberia, due diligence for European gas storage projects and a gas utilisation plan (unpublished) for South Africa.