Wales & West Utilities
LDZ Energy Loss Initial Proposals

Formula Year 2024-25

December 2023

WALES&WEST UTILITIES

Contents

1 LDZ Energy Loss Proposals for Formula Year 2024-25

Purpose of Proposal

This paper presents the Energy Loss through transportation as proposed by Wales & West Utilities (WWU) from the respective Local Distribution Zones (LDZ) for the Formula year 2024-25. It describes the Energy Losses from the various factors within each LDZ detailing the Energy Losses associated to each component. This proposal will form the basis for WWU's LDZ Shrinkage Gas procurement during the 2024-25 formula year.

Users (defined as Distribution Network operators, gas shippers and other interested parties) are encouraged to provide feedback on this paper. Feedback is to be provided to WWU by the 1st of February 2024. Taking into consideration any representations from Users, WWU will publish a final report by the 1st of March 2024.

Summary of Proposal

The LDZ Energy Loss reflects the losses associated with leakage, theft of gas and own use gas (gas used in the operation of the system). Details of how these quantities have been determined are provided later in this paper.

Please note the values contained within this document have been rounded to an appropriate level of accuracy. This may cause immaterial discrepancies between the totals presented within this document and the summation of their constituent parts, however each individual figure is correct in its rounded form.

The Energy Loss for 2024-25 is estimated at 0.46% of total demand through the WWU system.

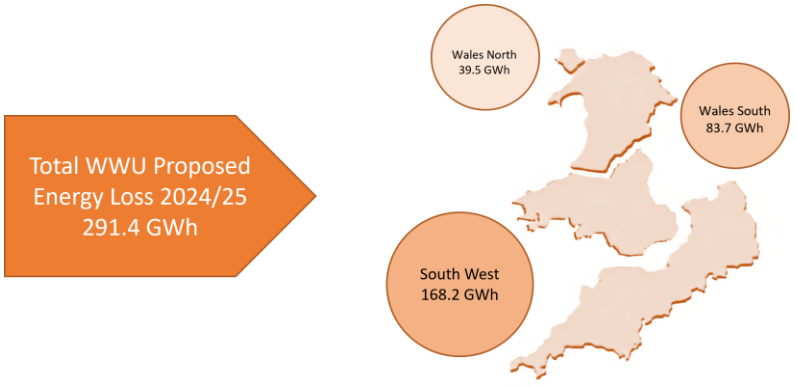

Figure 1 WWU Proposed Energy Loss

2 Component Analysis

The below diagram provides a high-level breakdown of Shrinkage gas with values forecasted for 2024-25.

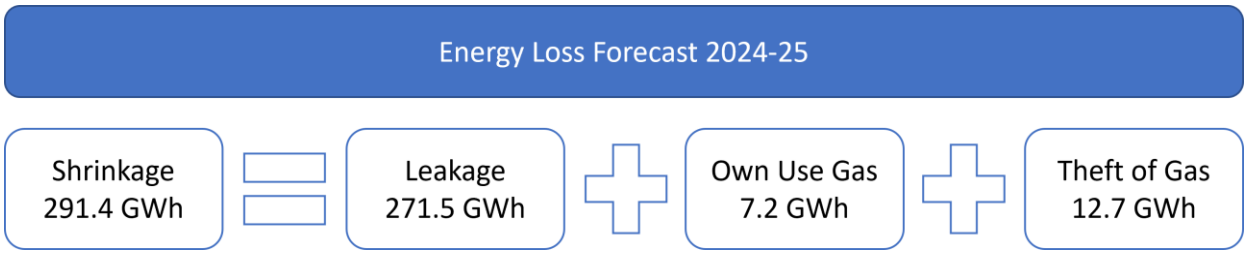

Figure 2 High-level breakdown of shrinkage forecast

Leakage can be split into three categories which are:

- Distribution mains leakage comprising of:
  - Low Pressure mains
  - Low Pressure services
  - Medium Pressure mains
- Above Ground Installations (AGIs) emissions which includes the routine venting of control equipment.
- Interference which includes gas lost as a result of third-party damage. These losses are not continuous as they are caused by specific events.

The relative proportions of total LDZ Energy loss by component is illustrated below.

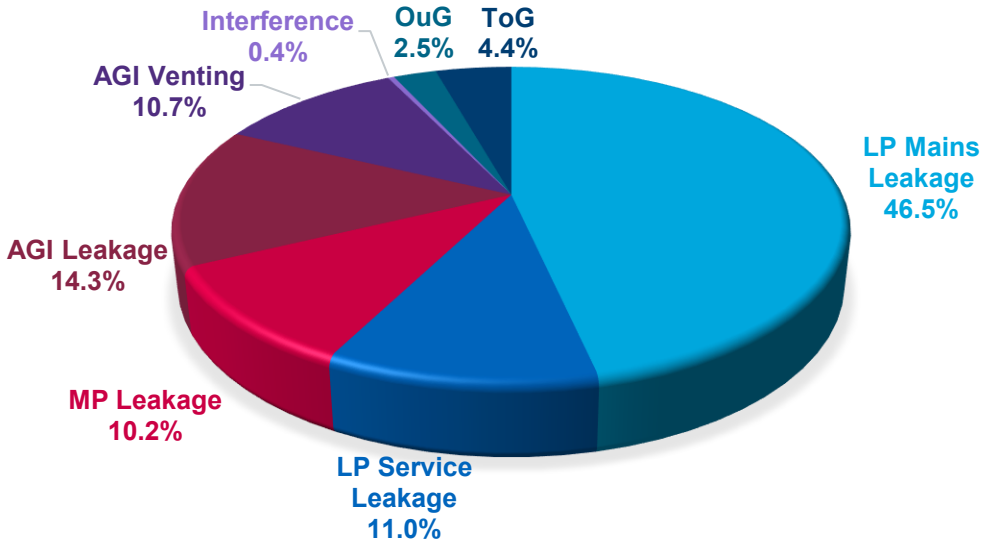

Figure 3 Component breakdown of total LDZ Energy loss

Leakage

The table below shows the total amount of predicted leakage (in GWh) for Formula Year 2024-25 split by LDZ.

LDZ	Distribution Mains			AGI Emissions	Interference	Total Leakage
	LP Mains Leakage	LP Service Leakage	Medium Pressure			
WN	11.61	2.42	2.62	20.64	0.12	37.40
WS	33.43	10.32	9.03	22.58	0.24	75.61
SW	90.56	19.40	18.19	29.68	0.70	158.52
Total	**135.60**	**32.14**	**29.84**	**72.90**	**1.06**	**271.54**

Table 1 Predicted leakage by LDZ

Low Pressure

The low pressure mains pipe leakage and service pipe leakage is calculated by applying linear regression on the actual data from Formula Year 2021-22 to 2022-23. This is then apportioned to each LDZ based on Formula Year 2022-23 proportions.

Above ground installation (AGI) Emissions

The figure for leakage from AGIs has been calculated by applying the rates derived from the National Leakage Tests (2002-03) to the AGI population at Formula Year End 2022-23. Gas venting at AGIs is also included using rates from the 1994 Watt Committee Report.

Medium Pressure

Medium Pressure leakage has been calculated by applying linear regression on the actual data from Formula Year 2021-22 to 2022-23. This is then apportioned to each LDZ based on Formula Year 2022-23 proportions.

Interference

Gas may be lost from LDZ equipment as a result of specific events. Statistics in respect of the number of broken mains and damages were used in conjunction with calculations on the amount of gas lost through each type of incident to derive the total amount of gas lost as a result of these events. The number of events in 2022-23 have been used, considered the most relevant to the current period.

Own Use Gas

Typically, at an offtake or pressure reduction installation, the gas is pre-heated so that the gas does not fall below freezing temperature when the pressure is reduced due to the Joule-Thomson effect, causing pipe and equipment to freeze thus damaging assets.

The amount of gas required for pre-heating is estimated by applying industry standard thermodynamic equations, LDZ throughput and system pressures together with assumptions about the efficiency (50%) of the pre-heating equipment. The current own use gas factor of LDZ consumption is 0.0113% following studies carried out by Advantica. For the Formula Year 2024-25, Own Use Gas is proposed to be 7.2 GWh based on the National Gas "falling short" formula year annual throughput forecast.

Theft of Gas

UNC Section N 1.3.2 states that LDZ Shrinkage shall include, and WWU is therefore responsible for, gas illegally taken upstream of the emergency control valve (ECV) and downstream where there is no shipper contract with the end-user.

There is a current consensus agreement that Transporter responsible Theft of Gas is 0.02% of LDZ throughput, equating to 12.7 GWh for the WWU network based on the National Gas "falling short" formula year annual throughput forecast.

3 LDZ Energy Loss Summary

The proposed LDZ Energy Loss for the Formula Year 2024-25 is presented in the following table.

LDZ	Leakage (GWh)	Own Use Gas (GWh	Theft of Gas (GWh)	Proposed Shrinkage Quantity 2024/25 (GWh)
WN	37.40	0.77	1.36	**39.53**
WS	75.61	2.93	5.19	**83.73**
SW	158.52	3.49	6.18	**168.19**
Total	**271.54**	**7.19**	**12.72**	**291.44**

Table 2 Proposed Energy Loss by LDZ

Detailed Analysis

Leakage

In May 2003, Advantica – on behalf of Transco – completed an extensive programme of Leakage Tests. These tests were undertaken at the request of Users. Before commencing the testing programme, Users were invited to help Transco scope the project. Subsequently Users were updated in respect of progress and had the opportunity to witness one of the tests. The tests were the largest scale leakage tests completed worldwide.

Altogether 849 sets of test results were obtained. The full test results were presented to Users on the 10th of June 2003. Users subsequently received a report, written by Advantica, detailing the programme and its findings.

To ensure that the testing programme was effective, Stone and Websters (a firm of consulting engineers) were asked to investigate the planned methodology. They found that both the proposed testing process and the equipment were fit for purpose.

Dr Shirley Coleman from the Industrial Statistics Research Unit of Newcastle University was also invited to comment upon and discuss with Users the proposed sample plan. It was concluded that the proposed sample was likely to produce the results that were required.

In addition to testing distribution mains, Transco also tested above ground assets. The AGI testing programme was introduced during the March 2003 Shrinkage Forum. Subsequently Users had the opportunity to question Dr Peter Russell - who led the work - and to visit a test in progress. To ensure the integrity of the testing programme Nottingham University (Environment Science Department) examined the testing procedure and Dr Coleman commented upon the results prior to their being used in the Final Proposals in respect of the 2003-04 Formula Year.

The results of the leakage testing programmes are used in conjunction with WWU asset records, and system pressures to derive the actual total leakage by LDZ.

Own Use Gas

The 2024-25 proposals utilise the methodology applied in previous years and incorporates the conclusions of studies carried out by Advantica, whereby Own Use Gas is indicated as being 0.0113% of LDZ throughput.

Theft of Gas

The responsibility for Theft of Gas is split between Gas Transporters and Shippers where Transporter responsible theft has been deemed 0.02% of

LDZ throughput. Transporter responsible theft is assessed as theft upstream of the ECV and downstream where there is no supplier contract present. Shipper responsible theft is considered to be theft on site with a registered system User downstream of the ECV.

4 Extent to which the Proposal would better facilitate the relevant objectives

This proposal provides a robust estimate of LDZ Energy Loss for the Formula Year 2024-25. The gas usage and loss in transportation within the LDZs will be reflective of actual conditions. This in turn facilitates the achievement of efficient and economic operation of the system through effective targeting of costs.

It will also lead to accurate targeting of costs to Users through the reconciliation process and this is consistent with securing effective competition.

5 The implications for Wales & West Utilities of implementing the Proposal

a) Implications for operation of the System:

We are not aware of any such implications that would result from implementing this proposal.

b) Development and capital cost and operating cost implications:

The proposed LDZ Energy Loss (which has been prepared without Pressure and Temperature correction) leads to a fair allocation of operating costs between LDZ systems.

c) Extent to which it is appropriate for Wales & West Utilities to recover the costs, and proposal for the most appropriate way for Wales & West Utilities to recover the costs:

It is appropriate for each LDZ to incur a share of the overall Shrinkage Energy cost dependent upon the actual shrinkage in that LDZ.

d) Analysis of the consequences (if any) this proposal would have on price regulation

We are not aware of any such implications that would result from implementing this proposal.

6 The implications of implementing the Proposal for Users

This proposal improves the equitability and accuracy of cost targeting across all Users.

7 Analysis of any advantages or disadvantages on implementation of the Proposal

Advantages: Representation of the actual system usage and losses relevant to current network composition.

Disadvantages: Purchasing shrinkage gas on a flat daily profile throughout the year may cause some very minor inconsistencies on UIG. During summer where gas demand is lower, Shrinkage gas would make up a greater proportion of UIG whilst during the winter, the proportion would be smaller.

8 Summary of the representations (to the extent that the import of those representations are not reflected elsewhere in the Proposal)

This paper outlines our initial proposals. We appreciate hearing the views of Ofgem and users; these views will help inform our final proposals that are due to be published no later than 1st March 2024.

It would be appreciated if users could let us have any feedback that they would like to share with us by 1st of February 2024 in order for views to be considered prior to the notification of our LDZ Energy Loss final estimates.

9 Programme of works required as a consequence of implementing the Proposal

The only required modification is to the LDZ Energy Loss values entered into GEMINI.

10 Proposed implementation timetable (including timetable for any necessary information system changes)

When WWU publish its final proposals, users have until 15th March 2024 to request that Ofgem issues a Standard Special Condition A11 (18) disapproval of this proposal. This provision is in the UNC Section N 3.1.8.

If no disapproval notice is issued beforehand, it will be our intention to implement revised LDZ Energy Loss from 05:00 hrs on 1st April 2024.

11 Recommendation concerning the implementation of the Proposal

We recommend the proposed LDZ Energy Loss be implemented with effect from 05:00 hrs on 1st April 2024.

12 Feedback on Proposal

This report contains our proposal for the LDZ Energy Loss for the Formula Year 2024-25. Feedback should be provided to the following person;

Julie Chou, Asset Officer

Email: julie.chou@wwutilities.co.uk

Write to: Julie Chou, Wales & West Utilities

Wales & West Utilities, Wales & West House, Spooner Close, Coedkernew, Newport, NP10 8FZ

Alternatively email; Joint Office: enquiries@gasgovernance.co.uk