LDZ SHRINKAGE ASSESSMENT AND ADJUSTMENT FOR 1st APRIL 2022 – 31st MARCH 2023

Version 0.1
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WALES&WEST UTILITIES

Contents

1. Executive Summary

The purpose of this document is to present our assessment of LDZ Shrinkage for the period 1st April 2022 to 31st March 2023, in accordance with Uniform Network Code Section N 3.3.

Wales & West Utilities' (WWU) Final LDZ Shrinkage Quantity Proposal for the Formula Year 2022/23, published on the 24th February 2022[1], proposed individual LDZ Shrinkage Quantities equating to a total Distribution Network Shrinkage Quantity of 877,812 kWh per day. The Final LDZ Shrinkage Proposal for the Formula Year 2022/23 was not subject to Standard Special Condition A11 (18) disapproval and, as a result, the proposed LDZ Shrinkage Quantities were applied in accordance with Uniform Network Code Section N 3.1.8.

This year's shrinkage assessment calculates that WWU estimated and procured 34,772 kWh/day more gas than required.

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.

Calculation of Shrinkage	Shrinkage	=	Leakage	+	Own Use Gas	+	Theft of Gas
WWU proposed volumes as at 24th February 2022 for the regulatory year 2022/23	877,812 kWh/day	=	822,865 kWh/day	+	19,837 kWh/day	+	35,110 kWh/day
WWU final volumes as at 14th July 2023 for the regulatory year 2022/23	843,040 kWh/day	=	799,903 kWh/day	+	15,573 kWh/day	+	27,564 kWh/day
Difference between final and proposed volumes	-34,772 kWh/day	=	-22,962 kWh/day	+	-4,264 kWh/day	+	-7,546 kWh/day
Calculation of Shrinkage procurement	WWU are in credit	=	£804,482.50 from Shippers				

[1] https://www.gasgovernance.co.uk/shrinkage/22-23final

2. LDZ Shrinkage Quantity Assessment

LDZ Shrinkage Quantities are comprised of three main components:

- **Leakage**, with individual quantities being applied at LDZ level;
- **Own Use Gas (OUG)**, with a consistent percentage factor of the total throughput being applied across all LDZs; and
- **Theft of Gas (TOG)**, with a consistent percentage factor of the total throughput being applied across all LDZs

2.1 Leakage

LDZ specific Shrinkage Quantities for 2022/23 were proposed based on an assessment of leakage for the formula year 2022/23 with anticipated mains replacement being taken into account, leading to a leakage procurement requirement of 300.35 GWh.

WWU applied V1.4 of the Leakage Model to carry out the assessment of leakage for the formula Year 2022/23. No further amendments have been made to the methodologies applied within the leakage model.

Table 1 2022/23 Estimated and Assessed Leakage Energy by LDZ

LDZ	Estimated Leakage (GWh)	Assessed Leakage (GWh)	Estimated Leakage (kWh/Day)	Assessed Leakage (kWh/Day)
WN	40.08	39.13	109,802	107,217
WS	82.75	80.82	226,713	221,431
SW	177.52	172.01	486,349	471,255
WWU	**300.35**	**291.96**	**822,865**	**799,903**

The total assessed Leakage of 291.96 GWh (Table 1) represents a decrease in energy of approximately 8.4 GWh when compared to the estimate of 300.35 GWh. This is equivalent to 22,962 kWh per day or 2.8%.

2.2 Operational Usage

Own Use Gas is gas used within the LDZ for such purposes as pre-heater fuel to counter the impact of the Joule-Thomson effect and for other minor operational purposes.

Pre-heater fuel is the largest component of OUG and has always been determined using the output from a model that utilises the thermodynamic principles of the Joule-Thomson[2] effect and gas volume, calorific value, pressure and temperature data. The currently accepted factor is based on a model developed by GL Noble Denton, which has been shared with the User community through the Shrinkage Forum.

For the purposes of assessment in respect of the 2022/23 Formula Year, the proposed factor of 0.0113% of throughput, based on the GL Noble Denton model, was used.

Table 2 Assessment of Own Use Gas

LDZ	Throughput	OUG Factor	Daily OUG Quantity
	(GWh)		(kWh)
WN	5,749	0.0113%	1,780
WS	18,561		5,746
SW	25,993		8,047
WWU	**50,303**		**15,573**

[2] Natural gas is a compressible fluid, as the pressure of the gas is reduced at pressure reduction stations it undergoes isenthalpic expansion causing the gas to cool.

2.3 Theft of Gas

Uniform Network Code Section N1.3.2 states that LDZ Shrinkage shall include gas lost through theft either upstream of the customer control valve or downstream where there is no shipper serving the gas consumer.

A national factor of 0.02%[3] of throughput over the gas year was applied.

Table 3 Assessment of Theft of Gas

LDZ	Throughput	ToG Factor	Daily ToG Quantity
	(GWh)		(kWh)
WN	5,749	0.02%	3,150
WS	18,561		10,170
SW	25,993		14,243
WWU	**50,303**		**27,564**

2.4 Impact of Throughput Assumptions

The Shrinkage volumes procured in 2022/23 in respect of OUG and ToG were based on the application of the agreed factors (0.0313%, combined, of throughput) to the seasonal normal demand.

Table 4 Assessment of the impact of throughput assumptions

LDZ	Estimated throughput (GWh)	Actual throughput (GWh)	Combined OUG/ToG Factor	Estimated OUG/ToG (GWh)	Outturn OUG/ToG (GWh)	Adjustment (GWh)
WN	6,835	5,749	0.0313%	2.1	1.8	-0.34
WS	26,146	18,561		8.2	5.8	-2.37
SW	31,094	25,993		9.7	8.1	-1.60
WWU	**64,076**	**50,303**		**20.1**	**15.7**	**-4.31**

[3] Agreed via the Shrinkage Forum

2.5 LDZ Specific Shrinkage Quantities

WWU proposed final LDZ specific Shrinkage Quantities for the Formula Year 2022/23 in February 2022. The WWU proposal was not subject to Ofgem disapproval under Standard Special Condition A11 (18), with the proposed LDZ specific Shrinkage Quantities being applied with effect from the 1st April 2022. The proposed (estimated) LDZ Shrinkage Quantities are shown in Table 5, along with the Assessed LDZ specific Shrinkage Quantities for 2022/23 produced in the method detailed within this document.

Table 5 LDZ Specific Shrinkage Quantities (kWh/day)

LDZ	Leakage	OUG	ToG	Assessed Shrinkage Quantities 2022/23	Applied Shrinkage Quantities 2022/23	Difference Between Assessed & Applied Quantities
WN	107,217	1,780	3,150	112,147	115,664	-3,516
WS	221,431	5,746	10,170	237,348	249,135	-11,787
SW	471,255	8,047	14,243	493,545	513,014	-19,469
WWU	**799,903**	**15,573**	**27,564**	**843,040**	**877,812**	**-34,772**

2.5.1 Reasons for Differences

The difference between WWU's estimated and assessed LDZ Shrinkage Quantities is 34,772 kWh/day or a 4.0% decrease. This is due to milder weather causing lower than expected system pressures and throughput was lower than anticipated.

3. LDZ Shrinkage Adjustment

3.1 LDZ Shrinkage Adjustment Introduction

This Section advises Shippers of the Shrinkage Adjustment for WWU operated LDZs for the period 1st April 2022 to 31st March 2023, as referred to in Network Code Section N 3.4.1. The Shrinkage Adjustments have been calculated in accordance with the LDZ Shrinkage Adjustments Methodology Version 3.1.

The Shrinkage Adjustments are due because WWU procured a greater quantity of Shrinkage gas than required, after accounting for using a lower volume of Shrinkage gas than had been forecast.

3.2 LDZ Shrinkage Reconciliation Calculations

The LDZ Shrinkage Reconciliation Quantity (SLRQ) is calculated as the difference between the Assessed and Procured LDZ Shrinkage Quantities (SLPQ). This reconciliation quantity is the amount that WWU has over or under procured.

Therefore, for each LDZ:

SLRQ = SLAQ-SLPQ

Where SLRQ = Reconciliation LDZ specific Daily Shrinkage Quantity (kWh)
SLAQ = Assessed LDZ specific Daily Shrinkage Quantity (kWh)
SLPQ = Procured LDZ specific Daily Shrinkage Quantity (kWh)

Table 6 shows the LDZ Reconciliation Quantities for the Shrinkage Adjustment for the period 1st April 2022 to 31st March 2023.

Table 6 LDZ Shrinkage Reconciliation Quantity (kWh/day)

LDZ	LDZ Shrinkage Reconciliation Quantity (kWh/day)
WN	-3,516
WS	-11,787
SW	-19,469
WWU	**-34,772**

3.3 Financial Adjustment

The Financial Adjustment (FA) due to WWU for Energy (cost of the gas) is calculated as shown below:

$$FA(£) = \sum_{01/04/22}^{31/03/23} S_{LRQ}(kWh) \times SAP(p/kWh)/100$$

Where:

FA (£) = Financial Adjustment

SLRQ (kWh) = LDZ Shrinkage Reconciliation Quantity

SAP = Daily System Average Price for the period 1st April 2022 to 31st March 2023

The allocation of any debit or credit to Shippers resulting from the Adjustment process is achieved by calculating the energy adjustment on a daily basis, multiplying this by the daily system average price, summating this by LDZ by month and apportioning this by the relevant Shipper affected portfolio in each LDZ for each month.

Table 7, shows the financial adjustment by LDZ for the period 1st April 2022 to 31st March 2023, calculated on a daily basis in line with the methodology indicated above.

Table 7 LDZ Shrinkage Reconciliation

LDZ	LDZ Shrinkage Reconciliation Quantity (kWh/day)	Adjustment Value due to Changes to Shrinkage Quantities
WN	-3,516	-£81,356.47
WS	-11,787	-£272,699.24
SW	-19,469	-£450,426.79
WWU	-34,772	-£804,482.50

The overall financial value for the Energy Adjustment, £804,482.50 is therefore a debit to Shippers.