LDZ SHRINKAGE ASSESSMENT AND ADJUSTMENT FOR 1st APRIL 2018 – 31st MARCH 2019

July 2019

REPORTS

WALES&WEST UTILITIES

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1. Executive Summary

The purpose of this document is to present our assessment of LDZ Shrinkage for the period 1st April 2018 to 31st March 2019, in accordance with Uniform Network Code Section N 3.3.

Wales & West Utilities' (WWU) Final LDZ Shrinkage Quantity Proposal for the Formula Year 2018/19, published on the 27th February 2018[1], proposed individual LDZ Shrinkage Quantities equating to a total Distribution Network Shrinkage Quantity of 979,555 kWh per day. The Final LDZ Shrinkage Proposal for the Formula Year 2018/19 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.

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.

This year's shrinkage assessment calculates that WWU proposed and procured 16,623 kWh/day more gas than actually required. This comprised:

Calculation of Shrinkage	Shrinkage	=	Leakage	+	Own Use Gas	+ Theft of Gas
WWU proposed volumes as at 27th February 2018 for the regulatory year 2018/19	979,555 kwh/day	=	923,289 kwh/day	+	20,313 kwh/day	+ 35,953 kwh/day
WWU final volumes as at 29th July 2019 for the regulatory year 2018/19	962,932 kwh/day	=	909,818 kwh/day	+	19,175 kwh/day	+ 33,939 kwh/day
Difference between proposal and final requirements	16,623 kwh/day	=	13,471 kwh/day	+	1,138 kwh/day	+ 2,014 kwh/day
Financial Impact	WWU are owed	=	£119,885.04 from RbD shippers	+	£3,889.41 from all shippers	

[1] https://www.gasgovernance.co.uk/Shrinkage/18-19final

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 consumption being applied across all LDZs; and
- **Theft of Gas (TOG)**, with a consistent percentage factor of the total consumption being applied across all LDZs

2.1 Leakage

LDZ specific Shrinkage Quantities for 2018/19 were proposed based on an assessment of leakage for the formula year 2018/19 with anticipated mains replacement being taken into account, leading to a procurement requirement of 337 GWh.

WWU applied V1.4 of the Leakage Model to carry out the assessment of leakage for the formula Year 2018/19. No further amendments have been made to the methodologies applied within the leakage model.

Table 1 Estimated and Assessed Leakage Energy by LDZ

LDZ	2018/19 Estimated Leakage (GWh)	2018/19 Final assessed Leakage (GWh)	2018/19 Estimated Leakage (kWh/Day)	2018/19 Final assessed Leakage (kWh/Day)
WN	44.19	42.77	121,063	117,165
WS	93.92	92.60	257,322	253,705
SW	198.89	196.72	544,904	538,948
WWU	**337.00**	**332.08**	**923,289**	**909,818**

The total assessed Leakage of 332.08 GWh (Table 1) represents a decrease in energy of approximately 4.92 GWh when compared to the estimate of 337.00 GWh. This is equivalent to 13,471 kWh per day or 1.5%.

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-Thompson[2] 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-Thompson 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 2018/19 Formula Year, the proposed factor of 0.0113% of consumption, based on the GL Noble Denton model, was used.

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 too cool.

Table 2 Assessment of OUG

LDZ	Consumption 2018/19 (GWh)	Applied OUG Factor 2018/19	Daily OUG Quantity (kWh)
WN	6,409	0.0113%	1,984
WS	26,664		8,255
SW	28,865		8,936
WWU	**61,938**		**19,175**

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.

In respect of the 2 Gas Year, a National Factor of 0.02%[3] of consumption was applied.

Table 3 Assessment of ToG

LDZ	Consumption 2018/19 (GWh)	Applied ToG Factor 2018/19	Daily ToG Quantity (kWh)
WN	6,409	0.02%	3,512
WS	26,664		14,610
SW	28,865		15,816
WWU	**61,938**		**33,939**

2.4 Impact of Consumption Assumptions

The Shrinkage volumes procured in 2018/19 in respect of OUG and ToG were based on the application of the agreed factors (0.0313%, combined, of consumption) to the seasonal normal demand.

3 Agreed via the Shrinkage Forum

Table 4 Assessment of the Impact of Consumption Assumptions

LDZ	Est 2018/19 Consumption (GWh)	2018/19 Actual Consumption (GWh)	Combined OUG/ToG Factor	Estimated OUG/ToG (kWh)	Outturn OUG/ToG (kWh)	Adjustment (kWh)
WN	6,440	6,409	0.0313%	2,015,786	2,006,012	9,774
WS	29,667	26,664		9,285,712	8,345,820	939,892
SW	29,507	28,865		9,235,611	9,034,705	200,905
WWU	**65,614**	**61,938**		**20,537,109**	**19,386,537**	**1,150,571**

2.5 LDZ Specific Shrinkage Quantities

WWU proposed final LDZ specific Shrinkage Quantities for the Formula Year 2018/19 in February 2018. 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 2018. The proposed (applied) LDZ Shrinkage Quantities are shown in Table 5, along with the Assessed LDZ specific Shrinkage Quantities for 2018/19 produced in the method detailed within this document.

Table 5 LDZ Specific Shrinkage Quantities (kWh/day)

LDZ	Leakage (kWh)	OUG (kWh)	ToG (kWh)	Assessed Shrinkage Quantities 2018/19 (kWh)	Applied Shrinkage Quantities 2018/19 (kWh)	Difference Between Assessed & Applied Quantities (kWh)
WN	117,165	1,984	3,512	122,661	126,585	-3,924
WS	253,705	8,255	14,610	276,571	282,763	-6,192
SW	538,948	8,936	15,816	563,700	570,207	-6,506
WWU	**909,818**	**19,175**	**33,939**	**962,932**	**979,555**	**-16,623**

2.5.1 Reasons for Differences

The difference between WWU's estimated and assessed LDZ Shrinkage Quantities is 16,623 kWh/day or a 1.7% decrease. This is largely due to the milder weather causing lower than expected system pressures.

3. LDZ Shrinkage Adjustment

3.1 Introduction

This Section advises Shippers of the Shrinkage Adjustment for WWU operated LDZs for the period 1st April 2018 to 31st March 2019, 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 2.0.

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:

$$S_{LRQ} = S_{LAQ} - S_{LPQ}$$

Where S_{LRQ} = Reconciliation LDZ specific Daily Shrinkage Quantity (kWh)
S_{LAQ} = Assessed LDZ specific Daily Shrinkage Quantity (kWh)
S_{LPQ} = Procured LDZ specific Daily Shrinkage Quantity (kWh)

Table 6, shows the LDZ Reconciliation Quantities for the Shrinkage Adjustment for the period 1st April 2018 to 31st March 2019.

Table 6 LDZ Shrinkage Reconciliation Quantity (kWh/day)

LDZ	LDZ Shrinkage Reconciliation Quantity (kWh/day)
WN	-6,192
WS	-6,506
SW	-3,924
WWU	**-16,623**

3.3 Financial Adjustment

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

$$FA(£) = \sum_{01/04/18}^{31/03/19} S_{LRQ}(kWh) \times SAP(p/kWh)/100$$

Where:

FA (£) = Financial Adjustment

SLRQ (kWh) = LDZ Shrinkage Reconciliation Quantity

SAP = Daily System Average Price for the period 1st April 2018 to 31st March 2019

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 RbD affected portfolio in each LDZ for each month.

Table 7, shows the financial adjustment by LDZ for the period 1st April 2018 to 31st March 2019, calculated on a daily basis in line with the methodology indicated above.

Table 7 LDZ Shrinkage Reconciliation for the period 1st April 2018 to 31st March 2019

LDZ	LDZ Shrinkage Reconciliation Quantity (kWh/day)	Adjustment Value due to Changes to Shrinkage Quantities
WN	-3,924	-£28,301.22
WS	-6,192	-£44,658.94
SW	-6,506	-£46,924.89
WWU	**-16,623**	**-£119,885.04**

The overall financial value for the Energy Adjustment, £119,885.04 is therefore a debit to Shippers. Under the rules of Reconciliation by Difference, this is an adjustment of equal and opposite value to Shippers, i.e. a debit of £119,885.04

4. LDZ Shrinkage Commodity Charge Adjustment

4.1 Introduction

This section advises Shippers of the Commodity Charge associated with the WWU operated LDZ Shrinkage Adjustment for the period 1st April 2018 to 31st March 2019. The Commodity Charge Adjustments have been calculated in accordance with the LDZ Shrinkage Adjustments Methodology Version 3.0[4]

The Commodity Charge Adjustments are due because WWU paid for a higher proportion of Commodity Charges payable to the Distribution Networks during 2018/19 then it should have, after accounting for using a lower volume of gas than had been forecast.

4.2 Applicable Commodity Charges

Table 8 shows the Commodity Charges that applied over the period 1st April 2018 to 31st March 2019

Table 8 Applicable Commodity Charges 1st April 2018 to 31st March 2019

Commodity (£)		Period of Application	
		01/04/18 to 30/09/18	01/10/18 to 31/03/19
NTS Commodity		0.000341	0.000309
LDZ System Commodity Charge	WN	0.000316	0.000316
	WS	0.000316	0.000316
	SW	0.000316	0.000316

4.3 LDZ Shrinkage Reconciliation Quantities

Table 9 shows the total LDZ Shrinkage Reconciliation Quantities (LRQ) for each LDZ for each period of differing Commodity Charge.

Table 9 LDZ Shrinkage Reconciliation Quantities

LDZ (kWh)	Total over Period	01/04/18 to 30/09/18	01/10/18 to 31/03/19
WN	-1,432,309	-718,117	-714,192
WS	-2,260,164	-1,133,178	-1,126,986
SW	-2,374,842	-1,190,674	-1,184,168
WWU	**-6,067,315**	**-3,041,969**	**-3,025,346**

4 https://gasgov-mst-files.s3.eu-west-1.amazonaws.com/s3fs-public/ggf/UNC%20LDZ%20Shrinkage%20Adjustment%20Methodology%20V3.0.pdf

4.4 Financial Adjustment

The Financial Adjustment (FA) due for Commodity Charge reconciliation is calculated, as a sum for each LDZ, as shown below:

$$\left[\sum_{SW}^{WN} FA_{cc}(£) = \sum_{30/09/18}^{01/04/18} LRQ\,(kWh) \times CC_1(£/kWh) + \sum_{31/03/19}^{01/10/18} LRQ\,(kWh) \times CC_2(£/kWh)\right]$$

Where:

FAcc (£) = Financial Adjustment associated with the Commodity Charge

LRQ (kWh) = LDZ Shrinkage Reconciliation Quantity

CC1 (£/kWh) = Commodity Charge applicable to the period 1st April 2018 to 30th September 2018

CC2 (£/kWh) = Commodity Charge applicable to the period 1st October 2018 to 31st March 2019

Table 10 shows the financial adjustment, calculated on a daily basis in line with the methodology indicated above.

The overall financial value for the Commodity Charge Adjustment is therefore £3,889.41, a debit to Domestic Shippers under the RbD process.

Table 10 Financial Adjustment by LDZ for the period 1st April 2018 to 31st March 2019

Transportation Charge					
LDZ	**Pricing Period**		**Pricing Period**		**Assessment Period**
	01/04/18 to 30/09/18	**01/10/18 to 31/03/19**	**01/04/18 to 30/09/18**	**01/10/18 to 31/03/19**	**01/04/18 to 31/03/19**
	Total Volume (kWh)	**Total Volume (kWh)**	**Total Adjustment**	**Total Adjustment**	**Total Adjustment**
WN	-718,117	-714,192	-£471.80	-£446.37	-£918.17
WS	-1,133,178	-1,126,986	-£744.50	-£704.37	-£1,448.86
SW	-1,190,674	-1,184,168	-£782.27	-£740.10	-£1,522.38
WWU	**-3,041,969**	**-3,025,346**	**-£1,998.57**	**-£1,890.84**	**-£3,889.41**