

# LDZ SHRINKAGE ASSESSMENT AND ADJUSTMENT FOR 1<sup>st</sup> APRIL 2019 – 31<sup>st</sup> MARCH 2020

July 2020



REPORTS

1. Executive Summary.....	3
2. LDZ Shrinkage Quantity Assessment.....	4
3. LDZ Shrinkage Adjustment.....	7
4. LDZ Shrinkage Commodity Charge Adjustment .....	9



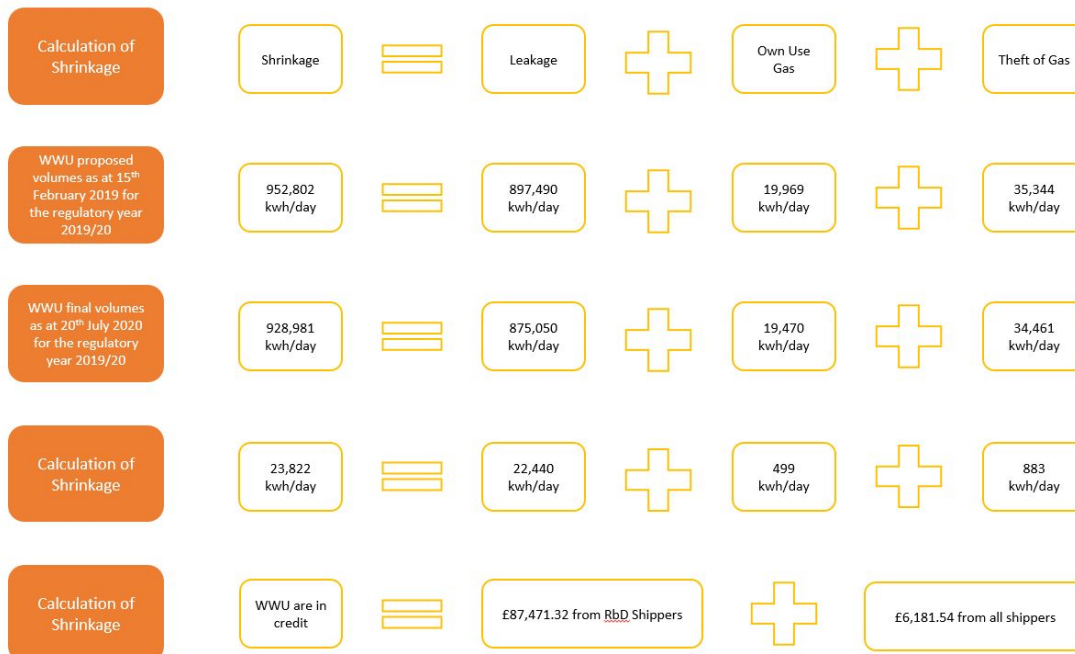
# 1. Executive Summary

The purpose of this document is to present our assessment of LDZ Shrinkage for the period 1<sup>st</sup> April 2019 to 31<sup>st</sup> March 2020, in accordance with Uniform Network Code Section N 3.3.

Wales & West Utilities' (WWU) Final LDZ Shrinkage Quantity Proposal for the Formula Year 2019/20, published on the 15<sup>th</sup> February 2019<sup>1</sup>, proposed individual LDZ Shrinkage Quantities equating to a total Distribution Network Shrinkage Quantity of 952,802 kWh per day. The Final LDZ Shrinkage Proposal for the Formula Year 2019/20 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 22,440 kWh/day more gas than actually required. This comprised:



<sup>1</sup><https://www.gasgovernance.co.uk/shrinkage/19-20final>  
LDZ Shrinkage Assessment and Adjustment for 1<sup>st</sup> April 2019 – 31<sup>st</sup> March 2020



## 2. LDZ Shrinkage Quantity Assessment

LDZ Shrinkage Quantities are comprised of three main components:

- J **Leakage**, with individual quantities being applied at LDZ level;
- J **Own Use Gas (OUG)**, with a consistent percentage factor of the total consumption being applied across all LDZs; and
- J **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 2019/20 were proposed based on an assessment of leakage for the formula year 2019/20 with anticipated mains replacement being taken into account, leading to a procurement requirement of 328.5 GWh.

WWU applied V1.4 of the Leakage Model to carry out the assessment of leakage for the formula Year 2019/20. No further amendments have been made to the methodologies applied within the leakage model.

**Table 1 Estimated and Assessed Leakage Energy by LDZ**

LDZ	2019/20 Estimated Leakage (GWh)	2019/20 Final assessed Leakage (GWh)	2019/20 Estimated Leakage (kWh/Day)	2019/20 Final assessed Leakage (kWh/Day)
WN	41.74	41.50	114,036	113,398
WS	92.29	87.95	252,145	240,311
SW	194.46	190.81	531,309	521,340
<b>WWU</b>	<b>328.48</b>	<b>320.27</b>	<b>897,490</b>	<b>875,050</b>

The total assessed Leakage of 320.27 GWh (Table 1) represents a decrease in energy of approximately 8.21 GWh when compared to the estimate of 328.48 GWh. This is equivalent to 22,040 kWh per day or 2.5%.

### 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<sup>2</sup> 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 2019/20 Formula Year, the proposed factor of 0.0113% of consumption, based on the GL Noble Denton model, was used.

<sup>2</sup> 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 2019/20 (GWh)	Applied OUG Factor 2019/20	Daily OUG Quantity (kWh)
WN	6,789	0.0113%	2,096
WS	25,855		7,983
SW	30,419		9,392
<b>WWU</b>	<b>63,063</b>		<b>19,470</b>

### 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%<sup>3</sup> of consumption was applied.

**Table 3 Assessment of ToG**

LDZ	Consumption 2019/20 (GWh)	Applied ToG Factor 2019/20	Daily ToG Quantity (kWh)
WN	6,789	0.02%	3,710
WS	25,855		14,129
SW	30,419		16,622
<b>WWU</b>	<b>63,063</b>		<b>34,461</b>

### 2.4 Impact of Consumption Assumptions

The Shrinkage volumes procured in 2019/20 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.

**Table 4 Assessment of the Impact of Consumption Assumptions**

<sup>3</sup> Agreed via the Shrinkage Forum

LDZ	Est 2019/20 Consumption (GWh)	2019/20 Actual Consumption (GWh)	Combined OUG/ToG Factor	Estimated OUG/ToG (kWh)	Outturn OUG/ToG (kWh)	Adjustment (kWh)
WN	6,201	6,789	0.0313%	1,940,958	2,124,998	184,041
WS	28,993	25,855		9,074,835	8,092,690	-982,145
SW	29,485	30,419		9,228,683	9,521,108	292,425
<b>WWU</b>	<b>64,679</b>	<b>63,063</b>		<b>20,244,475</b>	<b>19,738,796</b>	<b>-505,679</b>

## 2.5 LDZ Specific Shrinkage Quantities

WWU proposed final LDZ specific Shrinkage Quantities for the Formula Year 2019/20 in February 2019. 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 1<sup>st</sup> April 2019. The proposed (applied) LDZ Shrinkage Quantities are shown in Table 5, along with the Assessed LDZ specific Shrinkage Quantities for 2019/20 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 2019/20 (kWh)	Applied Shrinkage Quantities 2019/20 (kWh)	Difference Between Assessed & Applied Quantities (kWh)
WN	113,398	2,096	3,710	119,204	119,339	-135
WS	240,311	7,983	14,129	262,422	276,939	-14,517
SW	521,340	9,392	16,622	547,354	556,524	-9,169
<b>WWU</b>	<b>875,050</b>	<b>19,470</b>	<b>34,461</b>	<b>928,981</b>	<b>952,802</b>	<b>-23,822</b>

### 2.5.1 Reasons for Differences

The difference between WWU's estimated and assessed LDZ Shrinkage Quantities is 23,822 kWh/day or a 2.5% 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 1<sup>st</sup> April 2019 to 31<sup>st</sup> March 2020, 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:

$$S_{LRQ} = \int_{LAQ} Z S_{LPQ}^A$$

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 1<sup>st</sup> April 2019 to 31<sup>st</sup> March 2020.

**Table 6 LDZ Shrinkage Reconciliation Quantity (kWh/day)**

LDZ	LDZ Shrinkage Reconciliation Quantity (kWh/day)
WN	-9,169
WS	-135
SW	-14,517
<b>WWU</b>	<b>-23,822</b>

### 3.3 Financial Adjustment

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

$$FA(\pounds) = \sum_{01/04/19}^{31/03/20} S_{LRQ} (kWh) \times SAP(p / kWh) / 100$$

Where:

FA (£) = Financial Adjustment

SLRQ (kWh) = LDZ Shrinkage Reconciliation Quantity

SAP = Daily System Average Price for the period 1<sup>st</sup> April 2019 to 31<sup>st</sup> March 2020

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, summing 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 1<sup>st</sup> April 2019 to 31<sup>st</sup> March 2020, calculated on a daily basis in line with the methodology indicated above.

**Table 7 LDZ Shrinkage Reconciliation for the period 1<sup>st</sup> April 2019 to 31<sup>st</sup> March 2020**

LDZ	LDZ Shrinkage Reconciliation Quantity (kWh/day)	Adjustment Value due to Changes to Shrinkage Quantities
WN	-3,356,032	-£33,669.87
WS	-49,417	-£495.78
SW	-5,313,224	-£53,305.67
<b>WWU</b>	<b>-8,718,673</b>	<b>-£87,471.32</b>

The overall financial value for the Energy Adjustment, £87,471.32 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 £87,471.32



## 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 1<sup>st</sup> April 2019 to 31<sup>st</sup> March 2020. The Commodity Charge Adjustments have been calculated in accordance with the LDZ Shrinkage Adjustments Methodology Version 3.0<sup>4</sup>

The Commodity Charge Adjustments are due because WWU paid for a higher proportion of Commodity Charges payable to the Distribution Networks during 2019/20 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 1<sup>st</sup> April 2019 to 31<sup>st</sup> March 2020

**Table 8 Applicable Commodity Charges 1<sup>st</sup> April 2019 to 31<sup>st</sup> March 2020**

Commodity (£)		Period of Application	
		01/04/19 to 30/09/19	01/10/19 to 31/03/20
<b>NTS Commodity</b>		0.000385	0.000341
<b>LDZ System Commodity Charge</b>	SW	0.000346	0.000346
	WN	0.000346	0.000346
	WS	0.000346	0.000346

### 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	-49,417	-24,708	-24,708
WS	-5,313,224	-2,656,612	-2,656,612
SW	-3,356,032	-1,678,016	-1,678,016
<b>WWU</b>	<b>-8,718,673</b>	<b>-4,359,336</b>	<b>-4,359,336</b>

<sup>4</sup> <https://gasgov-mst-files.s3.eu-west-1.amazonaws.com/s3fs-public/ggf/UNC%20LDZ%20Shrinkage%20Adjustment%20Methodology%20V3.0.pdf>  
 LDZ Shrinkage Assessment and Adjustment for 1<sup>st</sup> April 2019 – 31<sup>st</sup> March 2020

#### 4.4 Financial Adjustment

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

$$\left[ \sum_{WN}^{SW} FA_{cc} (\pounds) = \sum_{30/09/19}^{01/04/19} LRQ (kWh) \times CC_1 (\pounds / kWh) + \sum_{31/03/20}^{01/10/19} LRQ (kWh) \times CC_2 (\pounds / kWh) \right]$$

Where:

F<sub>Acc</sub> (£) = Financial Adjustment associated with the Commodity Charge

LRQ (kWh) = LDZ Shrinkage Reconciliation Quantity

CC1 (£/kWh) = Commodity Charge applicable to the period 1<sup>st</sup> April 2019 to 30<sup>th</sup> September 2019

CC2 (£/kWh) = Commodity Charge applicable to the period 1<sup>st</sup> October 2019 to 31<sup>st</sup> March 2020

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 £6,181.54, a debit to Domestic Shippers under the RbD process.

**Table 10 Financial Adjustment by LDZ for the period 1<sup>st</sup> April 2019 to 31<sup>st</sup> March 2020**

Transportation Charge					
LDZ	Pricing Period		Pricing Period		Assessment Period
	01/04/19 to 30/09/19	01/10/19 to 31/03/20	01/04/19 to 30/09/19	01/10/19 to 31/03/20	01/04/19 to 31/03/20
	Total Volume (kWh)	Total Volume (kWh)	Total Adjustment	Total Adjustment	Total Adjustment
WN	-24,708	-24,708	£18.06	£16.97	£35.04
WS	-2,656,612	-2,656,612	£1,941.98	£1,825.09	£3,767.08
SW	-1,678,016	-1,678,016	£1,226.63	£1,152.80	£2,379.43
<b>WWU</b>	<b>-4,359,336</b>	<b>-4,359,336</b>	<b>£3,186.67</b>	<b>£2,994.86</b>	<b>£6,181.54</b>