

LDZ SHRINKAGE ASSESSMENT AND ADJUSTMENT FOR 1st APRIL 2017 – 31st MARCH 2018

July 2018



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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 2017 to 31st March 2018, in accordance with Uniform Network Code Section N 3.3.

Wales & West Utilities' (WWU) Final LDZ Shrinkage Quantity Proposal for the Formula Year 2017/18, published on the 23rd February 2017¹, proposed individual LDZ Shrinkage Quantities equating to a total Distribution Network Shrinkage Quantity of 997,364 kWh per day. The Final LDZ Shrinkage Proposal for the Formula Year 2017/18 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 proposed and procured 20,497 kWh/day less gas than actually required. This comprised:

Calculation of Shrinkage	Shrinkage	=	Leakage	+	Own Use Gas	+	Theft of Gas
WWU proposed volumes as at 29 th February 2016 for the regulatory year 2016/17	997,364 kWh/day	=	946,375 kWh/day	+	18,408 kWh/day	+	32,580 kWh/day
WWU final volumes as at 29 th July 2017 for the regulatory year 2016/17	1,017,861 kWh/day	=	960,034 kWh/day	+	20,877 kWh/day	+	36,950 kWh/day
Difference between proposal and final requirements	20,497 kWh/day	=	13,659 kWh/day	+	2,469 kWh/day	+	4,370 kWh/day
Financial Impact	WWU owe	=	£122,659.29 to RbD shippers	+	£4,429.03 to all shippers		

¹ <https://www.gasgovernance.co.uk/Shrinkage/17-18final>
LDZ Shrinkage Assessment and Adjustment for 1st April 2017 – 31st March 2018

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 2017/18 were proposed based on an assessment of leakage for the formula year 2017/18 with anticipated mains replacement being taken into account, leading to a procurement requirement of 345.43 GWh.

WWU applied V1.4 of the Leakage Model to carry out the assessment of leakage for the formula Year 2017/18. No further amendments have been made to the methodologies applied within the leakage model.

Table 1 Estimated and Assessed Leakage Energy by LDZ

LDZ	2017/18 Estimated Leakage (GWh)	2017/18 Final assessed Leakage (GWh)	2017/18 Estimated Leakage (kWh/Day)	2017/18 Final assessed Leakage (kWh/Day)
WN	45.05	44.69	123,416	122,444
WS	97.42	99.61	266,907	272,893
SW	202.96	206.11	556,052	564,697
WWU	345.43	350.41	946,375	960,034

The total assessed Leakage of 350.41 GWh (Table 1) represents a increase in energy of approximately 4.98 GWh when compared to the estimate of 345.43 GWh. This is equivalent to 13,659 kWh per day or 1.4%.

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-Thompson² 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 2017/18 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.
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Table 2 Assessment of OUG

LDZ	Consumption 2017/18 (GWh)	Applied OUG Factor 2017/18	Daily OUG Quantity (kWh)
WN	6,679	0.0113%	2,068
WS	30,114		9,323
SW	30,642		9,486
WWU	67,434		20,877

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 2017/18 Gas Year, a National Factor of 0.02%³ of consumption was applied.

Table 3 Assessment of ToG

LDZ	Consumption 2017/18 (GWh)	Applied ToG Factor 2017/18	Daily ToG Quantity (kWh)
WN	6,679	0.02%	3,660
WS	30,114		16,501
SW	30,642		16,790
WWU	67,434		36,950

2.4 Impact of Consumption Assumptions

The Shrinkage volumes procured in 2017/18 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 2017/18 Consumption (GWh)	2017/18 Actual Consumption (GWh)	Combined OUG/ToG Factor	Estimated OUG/ToG (kWh)	Outturn OUG/ToG (kWh)	Adjustment (kWh)
WN	6,460	6,679	0.0313%	2,021,980	2,090,487	68,507
WS	23,640	30,114		7,399,320	9,425,549	2,026,229
SW	29,360	30,642		9,189,680	9,590,907	401,227
WWU	59,460	67,434		18,610,980	21,106,942	2,495,962

2.5 LDZ Specific Shrinkage Quantities

WWU proposed final LDZ specific Shrinkage Quantities for the Formula Year 2017/18 in February 2017. 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 2017. The proposed (applied) LDZ Shrinkage Quantities are shown in Table 5, along with the Assessed LDZ specific Shrinkage Quantities for 2017/18 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 2017/18 (kWh)	Applied Shrinkage Quantities 2017/18 (kWh)	Difference Between Assessed & Applied Quantities (kWh)
WN	122,444	2,068	3,660	128,171	128,956	-784
WS	272,893	9,323	16,501	298,717	287,179	11,538
SW	564,697	9,486	16,790	590,973	581,230	9,744
WWU	960,034	20,877	36,950	1,017,861	997,364	20,497

2.5.1 Reasons for Differences

The difference between WWU's estimated and assessed LDZ Shrinkage Quantities is 20,497 kWh/day or a 2.1% increase. This is largely due to the colder weather causing higher 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 2017 to 31st March 2018, 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 lesser quantity of Shrinkage gas than required, after accounting for using a higher 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 2017 to 31st March 2018.

Table 6 LDZ Shrinkage Reconciliation Quantity (kWh/day)

LDZ	LDZ Shrinkage Reconciliation Quantity (kWh/day)
WN	-784
WS	11,538
SW	9,744
WWU	20,497

3.3 Financial Adjustment

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

$$FA(£) = \sum_{31/03/18}^{01/04/17} S_{LRQ}(kWh) \times SAP(p / kWh) / 100$$

Where:

FA (£) = Financial Adjustment

SLRQ (kWh) = LDZ Shrinkage Reconciliation Quantity

SAP = Daily System Average Price for the period 1st April 2017 to 31st March 2018

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 1st April 2017 to 31st March 2018, calculated on a daily basis in line with the methodology indicated above.

Table 7 LDZ Shrinkage Reconciliation for the period 1st April 2017 to 31st March 2018

LDZ	LDZ Shrinkage Reconciliation Quantity (kWh/day)	Adjustment Value due to Changes to Shrinkage Quantities
WN	-784	-£4,693.71
WS	11,538	£69,045.70
SW	9,744	£58,307.30
WWU	20,497	£122,659.29

The overall financial value for the Energy Adjustment, £122,659.29 is therefore a credit to Shippers. Under the rules of Reconciliation by Difference, this is an adjustment of equal and opposite value to Shippers, i.e. a credit of £122,659.29

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 2017 to 31st March 2018. The Commodity Charge Adjustments have been calculated in accordance with the LDZ Shrinkage Adjustments Methodology Version 2.0⁴

The Commodity Charge Adjustments are due because WWU paid for a higher proportion of Commodity Charges payable to the Distribution Networks during 2017/18 than 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 2017 to 31st March 2018

Table 8 Applicable Commodity Charges 1st April 2017 to 31st March 2018

Commodity (£)		Period of Application	
		01/04/17 to 30/09/17	01/10/17 to 31/03/18
NTS Commodity		0.000339	0.000341
LDZ System Commodity Charge	SW	0.000252	0.000252
	WN	0.000252	0.000252
	WS	0.000252	0.000252

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	01/04/17 to 30/09/17	01/10/17 to 31/03/18
WN	-286,289	-143,537	-142,752
WS	4,211,384	2,111,461	2,099,923
SW	3,556,405	1,783,074	1,773,331
WWU	7,481,500	3,750,999	3,730,501

⁴ <http://www.gasgovernance.co.uk/sites/default/files/UNC%20LDZSAM%20V2%200.pdf>
 LDZ Shrinkage Assessment and Adjustment for 1st April 2017 – 31st March 2018

4.4 Financial Adjustment

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

$$\left[\sum_{LDZ} FA_{cc} (£) - \sum_{01/04/17}^{30/09/17} LRQ (kWh) \times CC_1 (£ / kWh) + \sum_{01/10/17}^{31/03/18} LRQ (kWh) \times CC_2 (£ / kWh) \right]$$

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 2017 to 30th September 2017

CC2 (£/kWh) = Commodity Charge applicable to the period 1st October 2017 to 31st March 2018

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 £4,429.03, a credit to Domestic Shippers under the RbD process.

Table 10 Financial Adjustment by LDZ for the period 1st April 2017 to 31st March 2018

Transportation Charge					
LDZ	Pricing Period		Pricing Period		Assessment Period
	01/04/17 to 30/09/17	01/10/17 to 31/03/18	01/04/17 to 30/09/17	01/10/17 to 31/03/18	01/04/17 to 31/03/18
	Total Volume (kWh)	Total Volume (kWh)	Total Adjustment	Total Adjustment	Total Adjustment
WN	-143,537	-142,752	-£84.83	-£84.65	-£169.48
WS	2,111,461	2,099,923	£1,247.87	£1,245.25	£2,493.13
SW	1,783,074	1,773,331	£1,053.80	£1,051.59	£2,105.38
WWU	3,750,999	3,730,501	£2,216.84	£2,212.19	£4,429.03