

LDZ SHRINKAGE ASSESSMENT AND ADJUSTMENT FOR 1st APRIL 2016 – 31st MARCH 2017

July 2017



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 1st April 2016 to 31st March 2017, in accordance with Uniform Network Code Section N 3.3.

Wales & West Utilities' (WWU) Final LDZ Shrinkage Quantity Proposal for the Formula Year 2016/17, published on the 29th February 2016¹, proposed individual LDZ Shrinkage Quantities equating to a total Distribution Network Shrinkage Quantity of 1,052,604 kWh per day. The Final LDZ Shrinkage Proposal for the Formula Year 2016/17 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 15,649kwh/day more gas than it 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	1,052,604 kWh/day	=	9964,438 kWh/day	+	20,273 kWh/day	+	35,882 kWh/day
WWU final volumes as at 29 th July 2017 for the regulatory year 2016/17	1,036,945 kWh/day	=	980,634 kWh/day	+	20,329 kWh/day	+	35,981 kWh/day
Difference between proposal and final requirements	-15,649 kWh/day	=	-15,804 kWh/day	+	56 kWh/day	+	99 kWh/day
Financial Impact	WWU are owed	=	£75,439.45 from RbD shippers	+	£3,721.51 from all shippers		

¹ <https://www.gasgovernance.co.uk/st/16-17final>

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 2016/17 were proposed based on an assessment of leakage for the formula year 2016/17 with anticipated mains replacement being taken into account, leading to a procurement requirement of 384.2 Gwh.

WWU applied V1.4 of the Leakage Model to carry out the assessment of leakage for the formula Year 2016/17. No further amendments have been made to the methodologies applied within the leakage model.

Table 1 Estimated and Assessed Leakage Energy by LDZ

LDZ	2016/17 Estimated Leakage (GWh)	2016/17 Final assessed Leakage (GWh)	2016/17 Estimated Leakage (kWh/Day)	2016/17 Final assessed Leakage (kWh/Day)
WN	46.9	45.1	128,493	123,580
WS	105.3	102.2	288,493	279,881
SW	211.5	210.7	579,452	577,173
WWU	363.6	357.9	996,438	980,634

The total assessed Leakage of 357.9 GWh (Table 1) represents a decrease in energy of approximately 5.7 GWh when compared to the estimate of 363.6 GWh. This is equivalent to 15,804kWh per day or 1.6%.

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 2016/17 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 2016/17 (GWh)	Applied OUG Factor 2016/17	Daily OUG Quantity (kWh)
WN	6,221	0.0113%	1,926
WS	30,219		9,355
SW	29,226		9,048
WWU	65,666		20,329

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 2016/17 Gas Year, a National Factor of 0.02%³ of consumption was applied.

Table 3 Assessment of ToG

LDZ	Consumption 2016/17 (GWh)	Applied ToG Factor 2016/17	Daily ToG Quantity (kWh)
WN	6,221	0.02%	3,409
WS	30,218		16,558
SW	29,226		16,014
WWU	65,666		35,981

2.4 Impact of Consumption Assumptions

The Shrinkage volumes procured in 2016/17 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 2016/17 Consumption (GWh)	2016/17 Actual Consumption (GWh)	Combined OUG/ToG Factor	Estimated OUG/ToG (kWh)	Outturn OUG/ToG (kWh)	Adjustment (kWh)
WN	6,235	6,221	0.0313%	1,951,705	1,947,281	-4,425
WS	30,247	30,219		9,467,452	9,458,546	-8,906
SW	29,127	29,226		9,116,828	9,147,648	30,820
WWU	65,610	65,666		20,535,985	20,553,474	17,489

2.5 LDZ Specific Shrinkage Quantities

WWU proposed final LDZ specific Shrinkage Quantities for the Formula Year 2016/17 in February 2016. 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 2016. The proposed (applied) LDZ Shrinkage Quantities are shown in Table 5, along with the Assessed LDZ specific Shrinkage Quantities for 2016/17 produced in the method detailed within this document.

Table 5 LDZ Specific Shrinkage Quantities (kWh/day)

LDZ	Leakage	OUG	ToG	Assessed Shrinkage Quantities 2016/17	Applied Shrinkage Quantities 2016/17	Difference Between Assessed & Applied Quantities
WN	123,580	1,926	3,409	128,915	133,996	-5,081
WS	279,881	9,355	16,558	305,795	314,425	-8,629
SW	577,173	9,048	16,014	602,235	604,173	-1,938
WWU	980,634	20,329	35,981	1,036,945	1,052,594	-15,649

2.5.1 Reasons for Differences

The difference between WWU's estimated and assessed LDZ Shrinkage Quantities is 15,649 kWh/day or a 1.5% decrease. This is largely due to being able to maintain low average system pressures through the mild winter.

3. LDZ Shrinkage Adjustment

3.1 Introduction

This Section advises Shippers of the Shrinkage Adjustment for WWU operated LDZs for the period 1st April 2016 to 31st March 2017, 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 2016 to 31st March 2017.

Table 6 LDZ Shrinkage Reconciliation Quantity (kWh/day)

LDZ	LDZ Shrinkage Reconciliation Quantity (kWh/day)
WN	-5,081
WS	-8,629
SW	-1,938
WWU	-15,649

3.3 Financial Adjustment

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

$$FA(\pounds) = \sum_{1/4/16}^{31/3/17} S_{LRQ} (kWh) \times SAP(p/kWh) / 100$$

Where:

FA (£) = Financial Adjustment

SLRQ (kWh) = LDZ Shrinkage Reconciliation Quantity

SAP = Daily System Average Price for the period 1st April 2016 to 31st March 2017

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 2016 to 31st March 2017, calculated on a daily basis in line with the methodology indicated above.

Table 7 LDZ Shrinkage Reconciliation for the period 1st April 2016 to 31st March 2017

LDZ	LDZ Shrinkage Reconciliation Quantity (kWh/day)	Adjustment Value due to Changes to Shrinkage Quantities
WN	-5,081	-£24,494.73
WS	-8,629	-£41,600.44
SW	-1,938	-£9,344.28
WWU	-15,649	-£75,439.45

The overall financial value for the Energy Adjustment, £75,439.45 is therefore a credit to WWU. Under the rules of Reconciliation by Difference, this is an adjustment of equal and opposite value to Shippers, i.e. a debit of £75,439.45

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 2016 to 31st March 2017. 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 2016/17 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 2016 to 31st March 2017

Table 8 Applicable Commodity Charges 1st April 2016 to 31st March 2017

Commodity (£)		Period of Application	
		01/04/16 to 30/09/16	01/10/16 to 31/03/17
NTS Commodity		0.00037	0.000341
LDZ System Commodity Charge	WN	0.000296	0.000296
	WS	0.000296	0.000296
	SW	0.000296	0.000296

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	01/04/16 to 30/09/16	01/10/16 to 31/03/17
WN	-1,854,608	-929,845	-924,763
WS	-3,149,759	-1,579,194	-1,570,565
SW	-707,498	-354,718	-352,780
WWU	-5,711,865	-2,863,757	-2,848,108

⁴ <http://www.gasgovernance.co.uk/sites/default/files/UNC%20LDZSAM%20V2%200.pdf>
 LDZ Shrinkage Assessment and Adjustment for 1st April 2016 – 31st March 2017

4.4 Financial Adjustment

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

$$\left[\sum_{SW}^{WN} FA_{cc} (£) = \sum_{1/4/16}^{30/9/16} LRQ(kWh) \times CC_1 (£/kWh) + \sum_{1/10/16}^{31/3/17} LRQ(kWh) \times CC_2 (£/kWh) \right]$$

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 2016 to 30th September 2016

CC2 (£/kWh) = Commodity Charge applicable to the period 1st October 2016 to 31st March 2017

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 £3,721.51, a debit to Domestic Shippers under the RbD process.

Table 10 Financial Adjustment by LDZ for the period 1st April 2016 to 31st March 2017

Transportation Charge					
LDZ	Pricing Period		Pricing Period		Assessment Period
	01/04/16 to 30/09/16	01/10/16 to 31/03/17	01/04/16 to 30/09/16	01/10/16 to 31/03/17	01/04/16 to 31/03/17
	Total Volume (kWh)	Total Volume (kWh)	Total Adjustment	Total Adjustment	Total Adjustment
WN	-929,845	-924,763	-£619.28	-£589.07	-£1,208.35
WS	-1,579,194	-1,570,565	-£1,051.74	-£1,000.45	-£2,052.19
SW	-354,718	-352,780	-£236.24	-£224.72	-£460.96
WWU	-2,863,757	-2,848,108	-£1,907.26	-£1,814.24	-£3,721.51