

LDZ SHRINKAGE ASSESSMENT AND ADJUSTMENT FOR 1 APRIL 2015 – 31 MARCH 2016

July 2016



REPORTS



WALES&WEST
UTILITIES

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1. Executive Summary

The purpose of this document is to present an assessment of LDZ Shrinkage for the period 1 April 2015 to 31 March 2016, in accordance with Uniform Network Code Section N 3.3.

Wales & West Utilities' (WWU) Final LDZ Shrinkage Quantity Proposal for the Formula Year 2015/16, issued 26 February 2015, proposed individual LDZ Shrinkage Quantities equating to a total Distribution Network Shrinkage Quantity of 1,078,149.59 kWh per day. The Final Proposal for the Formula Year 2015/16 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.

LDZ Shrinkage Quantities are comprised of three main components:

- ☐ Leakage, with individual quantities being applied at LDZ level;
- ☐ Operational Usage, with a single factor being applied across all LDZs; and
- ☐ WWU responsible Theft of Gas, with a single factor being applied across all LDZs

The assessment of LDZ Shrinkage for the Formula Year 2015/16 detailed within this document provides, where applicable, reasons for significant variance between the estimated and the assessed LDZ Shrinkage Quantities for the period.

Expressed as energy, the assessment of LDZ Shrinkage for the period 1 April 2015 to 31 March 2016 is 14 GWh or approximately 36,977 kWh/day lower than the volume of Shrinkage purchased for the Formula Year 2015/16.

For this year's leakage assessment, WWU applied v1.4 of the Leakage Model. This model was approved by Ofgem on the 16 September 2014. The leakage assessment resulted in an annual estimated leakage for 2015/16 of 363 GWh for the purposes of the Shrinkage Adjustment, which is 12 GWh lower than originally forecast.

In addition to the reduction in leakage, there was also a decrease of 1.4 GWh in the assessed volumes for Own Use Gas and Theft of Gas, which was caused by throughput being lower than that assumed when setting the original shrinkage quantities. Details of this can be found in Section 2.4 Impact of Throughput Assumptions

The assessed Shrinkage leads to a financial adjustment of £177,323.18 credit to WWU, and therefore debit to RbD Shippers, and an associated debit of £8,796.93 to Shippers for Commodity Charges under the RbD process.

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 its constituent parts, however each individual figure is correct in its rounded form.

2. LDZ Shrinkage Quantity Assessment

2.1 Leakage

LDZ specific Shrinkage Quantities for 2015/16 were proposed based on an assessment of leakage for the formula year 2015/16 with anticipated mains replacement being taken into account, leading to a procurement requirement of 1,078,149.59 kWh/day for leakage.

2.1.1 Assessment of 2015/16 Leakage

WWU applied V1.4 of the Leakage Model to carry out the assessment of leakage for the formula Year 2015/16. No further amendments have been made to the methodologies applied within the leakage model.

Table 1 Estimated and Assessed Leakage Energy by LDZ

LDZ	2015/16 Estimated Leakage (GWh)	2015/16 Assessed Leakage (GWh)	2015/16 Estimated Leakage (kWh/Day)	2015/16 Assessed Leakage (kWh/Day)
WN	48.0	46.2	131,057	126,137
WS	110.0	103.8	300,455	283,598
SW	217.1	213.0	593,109	581,968
WWU	375.0	363.0	1,024,621	991,703

The total assessed Leakage of 363.0 GWh (Table 1) represents a decrease in energy of approximately 12.0 GWh when compared to the estimate of 375 GWh. This is equivalent to 32,918kWh per day or 3.2%.

2.2 Operational Usage

Operational Usage, also known as Own Use Gas (OUG), is gas used within the LDZ for such purposes as pre-heater fuel to counter the impact of the Joule-Thompson¹ 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.

¹ 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.

For the purposes of assessment in respect of the 2015/16 Formula Year, the proposed factor of 0.0113% of consumption, based on the GL Noble Denton model, was used.

Table 2 Assessment of OUG

LDZ	Consumption 2015/16 (GWh)	Applied OUG Factor 2015/16	Daily OUG Quantity (kWh)
WN	6,149	0.0113%	1,898
WS	23,777		7,341
SW	27,921		8,620
WWU	57,846		17,860

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 2015/16 Gas Year, a National Factor of 0.02%² of throughput was applied.

Table 3 Assessment of ToG

LDZ	Consumption 2015/16 (GWh)	Applied ToG Factor 2015/16	Daily ToG Quantity (kWh)
WN	6,149	0.02%	3,360
WS	23,777		12,993
SW	27,921		15,257
WWU	57,846		31,610

2.4 Impact of Throughput Assumptions

The Shrinkage volumes procured in 2015/16 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. However throughput in 2015/16 proved to be lower than estimated.

² Agreed via the Shrinkage Forum

Table 4 Assessment of the Impact of Throughput Assumptions

LDZ	Est 2015/16 Consumption (GWh)	2015/16 Actual Consumption (GWh)	Combined OUG/ToG Factor	Estimated OUG/ToG (GWh)	Outturn OUG/ToG (GWh)	Adjustment (GWh)
WN	6,485	6,149	0.031%	2.0	1.9	-0.1
WS	26,371	23,777		8.3	7.4	-0.8
SW	29,564	27,921		9.3	8.7	-0.5
WWU	62,420	57,846		19.5	18.1	-1.4

2.5 LDZ Specific Shrinkage Quantities

WWU proposed final LDZ specific Shrinkage Quantities for the Formula Year 2015/16 in February 2015. 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 April 2015. The proposed (applied) LDZ Shrinkage Quantities are shown in Table 5, along with the Assessed LDZ specific Shrinkage Quantities for 2015/16 produced in the method detailed within this document.

Table 5 LDZ Specific Shrinkage Quantities (kWh/day)

LDZ	Leakage	OUG	ToG	Assessed Shrinkage Quantities 2015/16	Applied Shrinkage Quantities 2015/16	Difference Between Assessed & Applied Quantities
WN	126,137	1,898	3,360	131,395	136,621	-5,226
WS	283,598	7,341	12,993	303,931	323,052	-19,121
SW	581,968	8,620	15,257	605,846	618,476	-12,630
WWU	991,703	17,860	31,610	1,041,172	1,078,150	-36,977

2.5.1 Reasons for Differences

The difference between WWU's estimated and assessed LDZ Shrinkage Quantities is 36,977 kWh/day or a 3.4% decrease. This is largely due to being able to maintain low average system pressures through the mild winter. Throughput volumes were also reduced from those predicted, thereby reducing the volumes of ToG and OUG.

3. LDZ Shrinkage Adjustment

3.1 Introduction

This Section advises Shippers of the Shrinkage Adjustment for WWU operated LDZs for the period 1 April 2015 to 31 March 2016, 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.

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 1 April 2015 to 31 March 2016.

Table 6 LDZ Shrinkage Reconciliation Quantity (kWh/day)

LDZ	LDZ Shrinkage Reconciliation Quantity (kWh/day)
WN	- 5,226
WS	- 19,121
SW	- 12,630
WWU	- 36,977

3.3 Financial Adjustment

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

$$FA(\pounds) = \sum_{1/4/15}^{31/3/16} S_{LRQ}(kWh) \times SAP(p/kWh) / 100$$

Where:

FA (£) = Financial Adjustment

SLRQ (kWh) = LDZ Shrinkage Reconciliation Quantity

SAP = Daily System Average Price for the period 1 April 2015 to 31 March 2016

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 April 2015 to 31 March 2016, calculated on a daily basis in line with the methodology indicated above.

Table 7 LDZ Shrinkage Reconciliation for the period 1 April 2015 to 31 March 2016

LDZ	LDZ Shrinkage Reconciliation Quantity (kWh/day)	Adjustment Value due to Changes to Shrinkage Quantities
WN	-5,226	-£25,061.99
WS	-19,121	-£91,693.76
SW	-12,630	-£60,567.43
WWU	-36,977	-£177,323.18

The overall financial value for the Energy Adjustment, £177,323.18 is therefore a credit to WWU. Under the rules of Reconciliation by Difference, this is an adjustment of equal and opposite value to Domestic Shippers, i.e. a debit of £177,323.18.

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 April 2015 to 31 March 2016. The Commodity Charge Adjustments have been calculated in accordance with the LDZ Shrinkage Adjustments Methodology Version 2.0³

4.2 Applicable Commodity Charges

Table 8 shows the Commodity Charges that applied over the period 1 April 2015 to 31 March 2016

Table 8 Applicable Commodity Charges 1 April 2015 to 31 March 2016

Commodity (£)		Period of Application	
		01/04/15 to 30/09/15	01/10/2015 to 31/03/16
NTS Commodity		0.000367	0.000357
LDZ System Commodity Charge	WN	0.000288	0.000288
	WS	0.000288	0.000288
	SW	0.000288	0.000288

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	01/04/15 to 30/09/15	01/10/15 to 31/03/16
WN	-1,912,793	-956,396	-956,396
WS	-6,998,293	-3,499,146	-3,499,146
SW	-4,622,655	-2,311,328	-2,311,328
WWU	-13,533,741	-6,766,870	-6,766,870

³ <http://www.gasgovernance.co.uk/sites/default/files/UNC%20LDZSAM%20V2%200.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:

$$\left[\sum_{SW}^{WW} FA_{cc} (\pounds) = \sum_{1/4/15}^{30/9/15} LRQ(kWh) \times CC_1 (\pounds / kWh) + \sum_{1/10/15}^{31/3/16} LRQ(kWh) \times CC_2 (\pounds / kWh) \right]$$

Where:

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

LRQ (kWh) = LDZ Shrinkage Reconciliation Quantity

CC1 (£/kWh) = Commodity Charge applicable to the period 1 April 2015 to 30 September 2015

CC2 (£/kWh) = Commodity Charge applicable to the period 1 October 2015 to 31 March 2016

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 -£8,796.93, a debit to Domestic Shippers under the RbD process.

Table 10 Financial Adjustment by LDZ for the period 1 April 2015 to 31 March 2016

Transportation Charge					
LDZ	Pricing Period		Pricing Period		Assessment Period
	01/04/15 to 30/09/15	01/10/15 – 31/03/16	01/04/15 to 30/09/15	01/10/15 – 31/03/16	01/04/15 to 31/03/16
	Total Volume (kWh)	Total Volume (kWh)	Total Adjustment	Total Adjustment	Total Adjustment
WN	-956,396	-956,396	-£626.44	-£616.88	-£1,243.32
WS	-3,499,146	-3,499,146	-£2,291.94	-£2,256.95	-£4,548.89
SW	-2,311,328	-2,311,328	-£1,513.92	-£1,490.81	-£3,004.73
WWU	-6,766,870	-6,766,870	-£4,432.30	-£4,364.63	-£8,796.93