



**LDZ SHRINKAGE ASSESSMENT AND ADJUSTMENT
FOR 1 APRIL 2014 – 31 MARCH 2015**

Wales & West Utilities

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CONTENTS

	Page
1 Executive Summary	1
2 LDZ Shrinkage Quantity Assessment	2
2.1 Leakage	2
2.1.1 Assessment of 2014/15 Leakage	2
2.2 Operational Usage	2
2.3 Theft of Gas	2
2.4 Impact of Throughput Assumptions	3
2.5 LDZ Specific Shrinkage Quantities	3
2.5.1 Reasons for Differences	3
3 LDZ Shrinkage Adjustment	3
3.1 Introduction	3
3.2 LDZ Shrinkage Reconciliation Calculations	4
3.3 Financial Adjustment.....	4
4 LDZ Shrinkage Commodity Charge Adjustment	5
4.1 Introduction	5
4.2 Applicable Commodity Charges.....	5
4.3 LDZ Shrinkage Reconciliation Quantities	5
4.4 Financial Adjustment.....	5

LDZ Shrinkage Assessment and Adjustment for the Period 1 April 2014 – 31 March 2015

1 Executive Summary

The purpose of this document is to present an assessment of LDZ Shrinkage for the period 1 April 2014 to 31 March 2015, in accordance with *Uniform Network Code Section N 3.3*.

Wales & West Utilities' (WWU) Final LDZ Shrinkage Quantity Proposal for the Formula Year 2014/15, issued 28th February 2014, proposed individual LDZ Shrinkage Quantities equating to a total Distribution Network Shrinkage Quantity of 1,122,989 kWh per day. The Final Proposal for the Formula Year 2014/15 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 2014/15 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 2014 to 31 March 2015 is 15 GWh or approximately 41,435 kWh/day lower than the volume of Shrinkage purchased for the Formula Year 2014/15.

For this year's leakage assessment, WWU applied v1.4 of the Leakage Model. This model was approved by Ofgem on the 16th September 2014. The leakage assessment resulted in an annual estimated leakage for 2014/15 of 376 GWh for the purposes of the Shrinkage Adjustment, which is 13 GWh lower than originally estimated.

In addition to the reduction in leakage, there was also a decrease of 1.9 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 £243,067.84 credit to WWU, and therefore debit to RbD Shippers, and an associated debit of £9,823.49 to Shippers for Commodity Charges under the RbD process.

2 LDZ Shrinkage Quantity Assessment

2.1 Leakage

LDZ specific Shrinkage Quantities for 2014/15 were proposed based on an assessment of leakage for the formula year 2014/15 with anticipated mains replacement being taken into account, leading to a procurement requirement of 1,066,464 kWh/day for leakage.

2.1.1 Assessment of 2014/15 Leakage

WWU applied V1.4 of the Leakage Model to carry out the assessment of leakage for the formula Year 2014/15. No further amendments have been made to the methodologies applied within the leakage model.

LDZ	2014/15 Estimated Leakage (GWh)	2014/15 Assessed Leakage (GWh)	2014/15 Estimated Leakage (kWh/Day)	2014/15 Assessed Leakage (kWh/Day)
WN	50.9	47.1	139513.1	129001.0
WS	117.1	109.2	320850.2	299192.3
SW	221.2	219.7	606100.4	602024.5
WWU	389.3	376.0	1066463.8	1030217.8

Table 1 Estimated and Assessed Leakage Energy by LDZ

As shown in Table 1, above, the assessment of leakage has resulted in a decrease in energy of approximately 13.3 GWh, equivalent to 36,246kWh per day or 3.4%.

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-Thompson 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 2014/15 Formula Year, the proposed factor of 0.0113% of consumption, based on the GL Noble Denton model, was used.

LDZ	Consumption 2014/15 (GWh)	Applied OUG Factor 2014/15	Daily OUG Quantity (kWh)
WN	6,121	0.0113%	1,895
WS	25,098		7,770
SW	28,646		8,869
WWU	59,865		18,534

Table 2 Assessment of OUG

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 2014/15 Gas Year, a National Factor of 0.02% of throughput was applied.

LDZ	Consumption 2014/15 (GWh)	Applied ToG Factor 2014/15	Daily ToG Quantity (kWh)
WN	6,121	0.02%	3,354
WS	25,098		13,753
SW	28,646		15,696
WWU	59,865		32,803

Table 3 Assessment of ToG

2.4 Impact of Throughput Assumptions

The Shrinkage volumes procured in 2014/15 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 2014/15 proved to be lower than estimated largely due to unforeseen reductions in industrial demand in South Wales.

LDZ	Est 2014/15 Consumption (GWh)	2014/15 Actual Consumption (GWh)	Combined OUG/ToG Factor	Estimated OUG/ToG (GWh)	Outturn OUG/ToG (GWh)	Adjustment (GWh)
WN	6,722	6,121	0.0313%	2.1	1.9	-0.2
WS	29,231	25,098		9.1	7.8	-1.3
SW	29,932	28,646		9.4	9.0	-0.4
WWU	65,885	59,865		20.6	18.7	-1.9

Table 4 Assessment of the Impact of Throughput Assumptions

2.5 LDZ Specific Shrinkage Quantities

WWU proposed final LDZ specific Shrinkage Quantities for the Formula Year 2014/15 in February 2014. 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 2014. The proposed (applied) LDZ Shrinkage Quantities are shown in Table 5, along with the Assessed LDZ specific Shrinkage Quantities for 2014/15 produced in the method detailed within this document.

LDZ	Leakage	OUG	ToG	Assessed Shrinkage Quantities 2014/15	Applied Shrinkage Quantities 2014/15	Difference Between Assessed & Applied Quantities
WN	129,001	1,895	3,354	134,250	145,281	-11,031
WS	299,192	7,770	13,753	320,715	345,925	-25,210
SW	602,025	8,868	15,696	626,589	631,783	-5,194
WWU	1,030,218	18,534	32,803	1,081,554	1,122,989	-41,435

Table 5 LDZ Specific Shrinkage Quantities (kWh/day)

2.5.1 Reasons for Differences

The difference between WWU' estimated and assessed LDZ Shrinkage Quantities is 41,435 kWh/day or a 3.7% decrease. This is largely due to exceptionally low average system pressures (9 GWh) as well as slight differences in the REPEX length / materials abandoned compared to those predicted. 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 2014 to 31 March 2015, 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 (S_{LRQ}) is calculated as the difference between the Assessed and Procured LDZ Shrinkage Quantities (S_{LPQ}). 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 below, shows the LDZ Reconciliation Quantities for the Shrinkage Adjustment for the period 1 April 2014 to 31 March 2015.

LDZ	LDZ Shrinkage Reconciliation Quantity (kWh/day)
WN	- 11,031
WS	- 25,210
SW	- 5,194
WWU	- 41,435

Table 6 LDZ Shrinkage Reconciliation Quantity (kWh/day)

3.3 Financial Adjustment

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

$$FA(\pounds) = \sum_{1/4/14}^{31/3/15} S_{LRQ} (kWh) \times SAP(p/kWh) / 100$$

Where:

FA (£) = Financial Adjustment

S_{LRQ} (kWh) = LDZ Shrinkage Reconciliation Quantity

SAP = Daily System Average Price for the period 1 April 2014 to 31 March 2015

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, below, shows the financial adjustment by LDZ for the period 1 April 2014 to 31 March 2015, calculated on a daily basis in line with the methodology indicated above.

LDZ	LDZ Shrinkage Reconciliation Quantity (kWh/day)	Adjustment Value due to Changes to Shrinkage Quantities
WN	-11,031	-£64,710.77
WS	-25,210	-£147,887.53
SW	-5,194	-£30,469.55
WWU	-41,435	-£243,067.84

Table 7 LDZ Shrinkage Reconciliation for the period 1 April 2014 to 31 March 2015

The overall financial value for the Energy Adjustment, £243,067.84 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 £243,067.84.

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 2014 to 31 March 2015. The Commodity Charge Adjustments have been calculated in accordance with the LDZ Shrinkage Adjustments Methodology Version 2.0.

4.2 Applicable Commodity Charges

Table 8 below shows the Commodity Charges that applied over the period 1 April 2014 to 31 March 2015.

Commodity (£)		Period of Application	
		01/04/14 to 30/09/14	01/10/14 to 31/03/15
NTS Commodity		0.000372	0.000345
LDZ System Commodity Charge	SW	0.000291	0.000291
	WN	0.000291	0.000291
	WS	0.000291	0.000291

Table 8 Applicable Commodity Charges 1 April 2014 to 31 March 2015

4.3 LDZ Shrinkage Reconciliation Quantities

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

LDZ (kWh)	Total over Period	01/04/14 to 30/09/14	01/10/2014 to 31/03/15
WN	-4,026,346	-2,018,689	-2,007,658
WS	-9,201,659	-4,613,435	-4,588,224
SW	-1,895,835	-950,515	-945,321
WWU	-15,123,840	-7,582,638	-7,541,203

Table 9 LDZ Shrinkage Reconciliation Quantities

4.4 Financial Adjustment

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

$$\left[\sum_{SW}^{WN} FA_{cc}(\pounds) = \sum_{1/4/14}^{30/9/14} LRQ(kWh) \times CC_1(\pounds/kWh) + \sum_{1/10/14}^{31/3/15} LRQ(kWh) \times CC_2(\pounds/kWh) \right]$$

Where:

FA_{cc} (£) = Financial Adjustment associated with the Commodity Charge

LRQ (kWh) = LDZ Shrinkage Reconciliation Quantity

CC₁ (£/kWh) = Commodity Charge applicable to the period 1 April 2014 to 30 September 2014

CC₂ (£/kWh) = Commodity Charge applicable to the period 1 October 2014 to 31 March 2015

Transportation Charge					
LDZ	Pricing Period		Pricing Period		Assessment Period
	01/04/14 to 30/09/14	01/10/14 – 31/03/15	01/04/14 to 30/09/14	01/10/14 – 31/03/15	01/04/14 to 31/03/15
	Total Volume (kWh)	Total Volume (kWh)	Total Adjustment	Total Adjustment	Total Adjustment
WN	-2,018,689	-2,007,658	-£1,338.39	-£1,276.87	-£2,615.26
WS	-4,613,435	-4,588,224	-£3,058.71	-£2,918.11	-£5,976.82
SW	-950,515	-945,321	-£630.19	-£601.22	-£1,231.42
WWU	-7,582,638	-7,541,203	-£5,027.29	-£4,796.20	-£9,823.49

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

Transportation Charge					
LDZ	Pricing Period		Pricing Period		Assessment Period
	01/04/14 to 30/09/14	01/10/14 – 31/03/15	01/04/14 to 30/09/14	01/10/14 – 31/03/15	01/04/14 to 31/03/15
	Total Volume (kWh)	Total Volume (kWh)	Total Adjustment	Total Adjustment	Total Adjustment
WN	-2,018,689	-2,007,658	-£1,338.39	-£1,276.87	-£2,615.26
WS	-4,613,435	-4,588,224	-£3,058.71	-£2,918.11	-£5,976.82
SW	-950,515	-945,321	-£630.19	-£601.22	-£1,231.42
WWU	-7,582,638	-7,541,203	-£5,027.29	-£4,796.20	-£9,823.49

Table 10 Financial Adjustment by LDZ for the period 1 April 2014 to 31 March 2015

The overall financial value for the Commodity Charge Adjustment is therefore -£9,823.49, a debit to Domestic Shippers under the RbD process.