

**LDZ SHRINKAGE ASSESSMENT AND ADJUSTMENT  
FOR 1 OCTOBER 2008 – 31 MARCH 2009**

**National Grid**

**July 2009**

**Version 1**

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## **LDZ Shrinkage Assessment and Adjustment for the Period 1 October 2008 – 31 March 2009**

### **1 Executive Summary**

The purpose of this document is to present an assessment of LDZ Shrinkage for the period 1 October 2008 to 31 March 2009, in accordance with *Uniform Network Code Section N 3.3.3*.

The implementation of UNC Modification Proposal 0225 aligned Shrinkage procurement and assessment to the Formula Year from April 2009. In order to facilitate this realignment, the Shrinkage Quantities that were proposed for the 2008/09 Gas Year<sup>1</sup> were superseded by Shrinkage Quantities proposed for the 2009/10 Formula Year, which became effective from 1 April 2009. Therefore, for this transitional year, there is a requirement to apply the Shrinkage reconciliation process to the six-month period 1 October 2008 to 31 March 2009.

In addition, the implementation of UNC Modification Proposal 0203v made a number of amendments to the Shrinkage process to align UNC Section N to the new Gas Transporter Licences. The primary purpose of this Modification was to change the Shrinkage calculation from Factors (percentage of consumption) to flat daily Quantities, in line with the Gas Transporter Licences. However, the opportunity was taken to clarify the Assessment and Adjustment process in terms of which elements of the leakage calculation are adjusted. In effect, the outcome of this modification was that changes to each element of the leakage model were to be taken into account.

In April 2009, the Distribution Network Operators jointly consulted on proposed improvements to the leakage model. There were no representations from Shippers received on this consultation. Following an independent review, and as required under Special Condition E9 of the Gas Transporter Licences, a further document was issued providing details of the review and the proposed implementation of the revised model. Again, there were representations from Shippers received on this. Ofgem have issued a statement approving the use of the improved model and, hence, this model has been used for this assessment.

National Grid's Final LDZ Shrinkage Quantity Proposal for the Gas Year 2008/09, issued 1 September 2008, proposed individual LDZ Shrinkage Quantities equating to a total RDN Shrinkage Quantity of 5,344,015kWh per day. The Final Proposal for the Gas Year 2008/09 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
- National Grid responsible Theft of Gas, with a single factor being applied across all LDZs

The assessment of LDZ Shrinkage for the Formula Year 2008/09 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 October 2008 to 31 March 2009 is approximately 107,297 kWh per day lower than the amount of Shrinkage purchased for the Gas Year 2008/09. The reason for this is the decrease in leakage associated with the application of the new Low Pressure Service Leakage calculation<sup>2</sup>, lower Operating Pressures and improved MEG Saturations.

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<sup>1</sup> 1 October 2008 to 30 September 2009

<sup>2</sup> 2008/09 Service Replacement was not included, due to an investigation into mains replacement misreporting.

The assessed Shrinkage leads to a financial adjustment of £338,025.38 credit to National Grid, and therefore debit to RbD Shippers, and an associated debit of £7,103.90 to Shippers for Commodity Charges under the RbD process.

## 2 LDZ Shrinkage Quantity Assessment

### 2.1 Leakage

LDZ specific Shrinkage Quantities for 2008/09 were proposed based on an assessment of leakage for the formula year 2006/07, leading to a procurement requirement of 5,068,716kWh/day for leakage.

#### 2.1.1 Assessment of 2008/09 Leakage

The assessment of leakage for the formula Year 2008/09 applied the new methodology for calculation of leakage from Low Pressure Services. The new methodology takes account of the replacement of metallic services with plastic services, which have lower leakage rates. The Distribution Network Operators consulted with the industry on these proposed changes in April 2009. There were no representations received from Shippers in respect of this consultation. Ofgem have approved the use of the new methodology.

Due to an ongoing investigation into mains replacement misreporting, National Grid considers it inappropriate to report or use certain elements of data until the investigation is complete; this includes the level of service replacement within the 2008/09 formula year. Therefore, for the purposes of the leakage estimate for the Shrinkage Assessment and Adjustment, the 2008/09 service replacement has not been included<sup>3</sup>.

LDZ	2008/09 Estimated Leakage (GWh)	2008/09 Assessed Leakage (GWh)	2008/09 Estimated Leakage (kWh/Day)	2008/09 Assessed Leakage (kWh/Day)
EA	250	250	685,197	683,975
EM	359	351	983,313	962,447
NT	363	362	993,843	990,863
NW	471	471	1,289,171	1,289,994
WM	408	380	1,117,193	1,041,779
<b>National Grid</b>	<b>1850</b>	<b>1814</b>	<b>5,068,716</b>	<b>4,969,057</b>

**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 36GWh, equivalent to 99,659kWh per day or 2%. The leakage reduction is due to the improved assessment of leakage from Low Pressure Services (10GWh), and a general reduction in Average System Pressures and improved treatment with MEG providing a combined 26GWh reduction.

### 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 Advantica, which has been shared with the User community through the Shrinkage Forum.

<sup>3</sup> This will overstate the leakage by an amount equal to the leakage reduction associated with one-year's service replacement (in the order of 10GWh).

For the purposes of assessment in respect of the 2008/09 Gas Year, no better information (meter readings) or calculation for actual OUG was available; therefore, the proposed factor of 0.011% of consumption, based on the Advantica model, was used.

LDZ	Consumption 2008/09 (GWh)	Applied OUG Factor 2008/09	Daily OUG Quantity (kWh)
EA	48,605	0.011%	14,648
EM	71,085		21,423
NT	63,085		19,012
NW	78,638		23,699
WM	53,736		16,194
National Grid	315,149		94,976

**Table 2 Assessment of OUG**

### 2.3 Theft of Gas

Uniform Network Code Section N1.4.2 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 2008/09 Gas Year, a National Factor of 0.02% of throughput, equating to a deemed Transporter responsibility of 6.67% of assumed theft, was applied.

LDZ	Consumption 2008/09 (GWh)	Applied ToG Factor 2008/09	Daily ToG Quantity (kWh)
EA	48,605	0.02%	26,633
EM	71,085		38,951
NT	63,085		34,567
NW	78,638		43,089
WM	53,736		29,444
National Grid	315,149		172,684

**Table 3 Assessment of ToG**

### 2.4 LDZ Specific Shrinkage Quantities

National Grid initially proposed LDZ specific Shrinkage Quantities for the Gas Year 2008/09 in July 2008, with the same quantities again being included within the Final Proposal. National Grid’s 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 October 2008. The proposed (applied) LDZ Shrinkage Quantities are shown in Table 4, along with the Assessed LDZ specific Shrinkage Quantities for 2008/09 produced in the method detailed within this document.

LDZ	Leakage	OUG	ToG	Assessed Shrinkage Quantities 2008/09	Applied Shrinkage Quantities 2008/09	Difference Between Assessed & Applied Quantities
EA	683,975	14,648	26,633	725,256	726,479	-1,223
EM	962,447	21,423	38,951	1,022,820	1,046,687	-23,867
NT	990,863	19,012	34,567	1,044,442	1,046,960	-2,518
NW	1,289,994	23,699	43,089	1,356,782	1,359,379	-2,597
WM	1,041,779	16,194	29,444	1,087,417	1,164,510	-77,093
National Grid	4,969,057	94,976	172,684	5,236,718	5,344,015	-107,297

**Table 4 LDZ Specific Shrinkage Quantities (kWh/day)**

### 2.4.1 Reasons for Differences

The difference between National Grid's estimated and assessed LDZ Shrinkage Quantities is 107,297 kWh per day or a 2% decrease. This is due primarily to a leakage reduction equivalent to 99,659kWh per day.

## 3 LDZ Shrinkage Adjustment

### 3.1 Introduction

This Section advises Shippers of the Shrinkage Adjustment for National Grid operated LDZs for the period 1 October 2008 to 31 March 2009, 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. This reconciliation quantity is the amount that National Grid 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 5 below, shows the LDZ Reconciliation Quantities for the Shrinkage Adjustment for the period 1 October 2008 to 31 March 2009<sup>4</sup>.

LDZ	LDZ Shrinkage Reconciliation Quantity (kWh/day)
EA	-1,223
EM	-23,867
NT	-2,518
NW	-2,597
WM	-77,093
National Grid	-107,297

Table 5 LDZ Shrinkage Reconciliation Quantity (kWh/day)

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<sup>4</sup> See Table 4 LDZ Specific Shrinkage Quantities (kWh/day)

### 3.3 Financial Adjustment

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

$$FA(\pounds) = \sum_{1/10/08}^{31/3/09} S_{LRQ}(kWh) \times SAP(p/kWh)/100$$

Where:

FA (£) = Financial Adjustment

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

SAP = Daily System Average Price for the period 1 October 2008 to 31 March 2009

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 6, below, shows the financial adjustment by LDZ for the period 1 October 2008 to 31 March 2009, 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
EA	-1,223	-£3,852.01
EM	-23,867	-£75,188.43
NT	-2,518	-£7,933.45
NW	-2,597	-£8,180.36
WM	-77,093	-£242,871.13
<b>National Grid</b>	<b>-107,297</b>	<b>-£338,025.38</b>

**Table 6 LDZ Shrinkage Reconciliation for the period 1 October 2008 to 31 March 2009**

The overall financial value for the Energy Adjustment, £338,025.38, is therefore a credit to National Grid. Under the rules of Reconciliation by Difference, this is an adjustment of equal and opposite value to Domestic Shippers, i.e. a debit of £338,025.38.

## 4 LDZ Shrinkage Commodity Charge Adjustment

### 4.1 Introduction

This section advises Shippers of the Commodity Charge associated with the National Grid operated LDZ Shrinkage Adjustment for the period 1 October 2008 to 31 March 2009. The Commodity Charge Adjustments have been calculated in accordance with the LDZ Shrinkage Adjustments Methodology Version 2.0.

### 4.2 Applicable Commodity Charges

Table 7 below shows the Commodity Charges that applied over the period 1 October 2008 to 31 March 2009.

Commodity		Period of Application	
		01/10/08 to 31/01/09	01/02/09 to 31/03/09
NTS Commodity		0.0186	0.0088
LDZ System Commodity Charge	EA	0.0217	0.0217
	EM	0.0217	0.0217
	NT	0.0219	0.0219
	NW	0.0204	0.0204
	WM	0.0207	0.0207

**Table 7 Applicable Commodity Charges 1 October 2008 to 31 March 2009**

### 4.3 LDZ Shrinkage Reconciliation Quantities

Table 8, below, shows the total LDZ Shrinkage Reconciliation Quantities (LRQ) for each LDZ for each period of differing Commodity Charge.

LDZ	Total over Period	01/10/08 to 31/01/09	01/02/09 to 31/03/09
EA	-222,535	-150,394	-72,140
EM	-4,343,722	-2,935,593	-1,408,130
NT	-458,325	-309,747	-148,578
NW	-472,589	-319,387	-153,202
WM	-14,030,946	-9,482,453	-4,548,493
National Grid	-19,528,117	-13,197,574	-6,330,543

**Table 8 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:

$$\sum_{EA}^{WM} FA_{cc}(\pounds) = \sum_{1/10/08}^{31/1/09} LRQ(kWh) \times CC_1(\pounds / kWh) + \sum_{1/2/09}^{31/3/09} LRQ(kWh) \times CC_2(\pounds / kWh)$$

Where:

$FA_{cc}(\pounds)$  = Financial Adjustment associated with the Commodity Charge

$LRQ(kWh)$  = LDZ Shrinkage Reconciliation Quantity

$CC_1(\pounds/kWh)$  = Commodity Charge applicable to the period 1 October 2008 to 31 January 2009

$CC_2(\pounds/kWh)$  = Commodity Charge applicable to the period 1 February 2009 to 31 March 2009



Table 9 below, shows the financial adjustment, calculated on a daily basis in line with the methodology indicated above.

<b>Transportation Charges</b>					
<b>LDZ</b>	<b>Pricing Period</b>		<b>Pricing Period</b>		<b>Assessment Period</b>
	<b>01/10/08 to 31/01/09</b>	<b>01/02/09 to 31/03/09</b>	<b>01/10/08 to 31/01/09</b>	<b>01/02/09 to 31/03/09</b>	<b>01/10/08 to 31/03/09</b>
	<b>Total Volume (kWh)</b>	<b>Total Volume (kWh)</b>	<b>Total Adjustment</b>	<b>Total Adjustment</b>	<b>Total Adjustment</b>
<b>EA</b>	-150,394	-72,140	-£60.61	-£22.00	-£82.61
<b>EM</b>	-2,935,593	-1,408,130	-£1,183.04	-£429.48	-£1,612.52
<b>NT</b>	-309,747	-148,578	-£125.45	-£45.61	-£171.06
<b>NW</b>	-319,387	-153,202	-£124.56	-£44.73	-£169.30
<b>WM</b>	-9,482,453	-4,548,493	-£3,726.60	-£1,341.81	-£5,068.41
<b>National Grid</b>	<b>-13,197,574</b>	<b>-6,330,543</b>	<b>-£5,220.27</b>	<b>-£1,883.64</b>	<b>-£7,103.90</b>

**Table 9 Financial Adjustment by LDZ for the period 1 October 2008 to 31 March 2009**

The overall financial value for the Commodity Charge Adjustment is therefore £7,103.90, a debit to Domestic Shippers under the RbD process.