

**LDZ SHRINKAGE ASSESSMENT AND ADJUSTMENT
FOR 1 APRIL 2009 – 31 MARCH 2010**

National Grid

July 2010

Version 1

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LDZ Shrinkage Assessment and Adjustment for the Period 1 April 2009 – 31 March 2010

1 Executive Summary

The purpose of this document is to present an assessment of LDZ Shrinkage for the period 1 April 2009 to 31 March 2010, in accordance with *Uniform Network Code Section N 3.3.3*.

National Grid's Final LDZ Shrinkage Quantity Proposal for the Formula Year 2009/10, issued 1 March 2009, proposed individual LDZ Shrinkage Quantities equating to a total RDN Shrinkage Quantity of 4,998,326kWh per day. The Final Proposal for the Formula Year 2009/10 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 2009/10 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 2009 to 31 March 2010 is 13GWh or approximately 35,067kWh/day lower than the volume of Shrinkage purchased for the Formula Year 2009/10.

For this year's leakage assessment, National Grid applied v1.3 of the Leakage Model, which includes the changes to the Low Pressure Service methodology approved by Ofgem last year. National Grid applied this model in last year's leakage assessment and no further modifications have been made. The leakage assessment resulted in an annual estimated leakage for 2009/10 of 1,719GWh for the purposes of the Shrinkage Adjustment, which is 5GWh lower than original estimated, and 1,722GWh¹ for the purposes of the Environmental Emissions Incentive ($LV_{t,i}$ as defined in Special Condition E9 of the Distribution Gas Transporter Licences). LDZ specific values can be found in Table 1.

In addition to the reduction in leakage, there was also a reduction of 8GWh in the assessed volumes for Own Use Gas and Theft of Gas, which was caused by outturn consumption being significantly 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 £121,504.00 credit to National Grid, and therefore debit to RbD Shippers, and an associated debit of £4,642.59 to Shippers for Commodity Charges under the RbD process.

¹ Calculated using the LDZ specific Baseline CVs and reported net of any applicable caps/collars.

2 LDZ Shrinkage Quantity Assessment

2.1 Leakage

LDZ specific Shrinkage Quantities for 2009/10 were proposed based on an assessment of leakage for the formula year 2007/08, leading to a procurement requirement of 4,722,648kWh/day for leakage.

2.1.1 Assessment of 2009/10 Leakage

National Grid applied V1.3 of the Leakage Model to carry out the assessment of leakage for the formula Year 2009/10. This version includes the new methodology for calculation of leakage from Low Pressure Services, which takes account of the replacement of metallic services with plastic services. 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 and Ofgem have approved the use of the new methodology. The new model was first implemented for the 2008/09 Leakage Assessment. No further amendments have been made to the methodologies applied within the leakage model.

LDZ	2009/10 Estimated Leakage (GWh)	2009/10 Assessed Leakage (GWh)	2009/10 Assessed Leakage (LV _{t,i}) ² (GWh)	2009/10 Estimated Leakage (kWh/Day)	2009/10 Assessed Leakage (kWh/Day)
EA	230	236	236	628,891	646,148
EM	336	330	332	919,722	905,066
NT	345	360	359	944,343	986,781
NW	432	438	439	1,184,841	1,201,322
WM	381	355	355	1,044,851	971,279
National Grid	1,724	1,719	1,722	4,722,648	4,710,596

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 5GWh, equivalent to 12,052kWh per day or 0.26%.

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.

For the purposes of assessment in respect of the 2009/10 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.

² This is the leakage estimation used for the purposes of the Environmental Emissions Incentive. It differs from that used for the Shrinkage Adjustment in that it is calculated using the LDZ specific Calorific Values that were used to determine the EE Incentive baselines; the leakage for the Shrinkage Adjustment being calculated using the average actual LDZ specific CVs. In addition, the EE Incentive is subject to a 10% cap and collar regime; the values have been quoted without the application of the cap/collar.

LDZ	Consumption 2009/10 (GWh)	Applied OUG Factor 2008/09	Daily OUG Quantity (kWh)
EA	46,493	0.011%	14,011
EM	66,649		20,086
NT	59,852		18,038
NW	74,511		22,455
WM	49,986		15,064
National Grid	297,490		89,655

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 2009/10 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 2009/10 (GWh)	Applied ToG Factor 2009/10	Daily ToG Quantity (kWh)
EA	46,493	0.02%	25,475
EM	66,649		36,520
NT	59,852		32,796
NW	74,511		40,828
WM	49,986		27,390
National Grid	297,490		163,008

Table 3 Assessment of ToG

2.4 Impact of Throughput Assumptions

The Shrinkage volumes procured in 2009/10 in respect of Own Use Gas and Theft of Gas were based on the application of the agreed factors (0.031%, combined, of consumption) to the 17-year seasonal normal demand for 2009/10 from the 2008 Demand Statements. However, despite the 2009/10 winter being the coldest in 30 years, the outturn throughput for 2009/10 was still significantly lower than original assumption. The impact of this is shown in Table 4 below.

LDZ	Est 2009/10 Consumption (2008 Demand Statements) (GWh)	2009/10 Actual Consumption (GWh)	Combined OUG/ToG Factor	Estimate OUG/ ToG (GWh)	Outturn OUG/ToG (GWh)	Adjustment (GWh)
EA	48,772	46,493	0.031%	15	14	1
EM	74,673	66,649		23	21	2
NT	62,680	59,852		19	19	1
NW	82,808	74,511		26	23	3
WM	55,655	49,986		17	15	2
National Grid	324,588	297,490		101	92	8

Table 4 Assessment of the Impact of Throughput Assumptions

2.5 LDZ Specific Shrinkage Quantities

National Grid initially proposed LDZ specific Shrinkage Quantities for the Formula Year 2009/10 in January 2009, 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 April 2009. The proposed (applied) LDZ Shrinkage Quantities are shown in Table 5, along with the Assessed LDZ specific Shrinkage Quantities for 2009/10 produced in the method detailed within this document.

LDZ	Leakage	OUG	ToG	Assessed Shrinkage Quantities 2009/10	Applied Shrinkage Quantities 2009/10	Difference Between Assessed & Applied Quantities
EA	646,148	14,011	25,475	685,635	670,314	15,321
EM	905,066	20,086	36,520	961,672	983,143	-21,471
NT	986,781	18,038	32,796	1,037,614	997,578	40,036
NW	1,201,322	22,455	40,828	1,264,605	1,255,171	9,434
WM	971,279	15,064	27,390	1,013,733	1,092,120	-78,387
National Grid	4,710,596	89,655	163,008	4,963,259	4,998,326	-35,067

Table 5 LDZ Specific Shrinkage Quantities (kWh/day)

2.5.1 Reasons for Differences

The difference between National Grid's estimated and assessed LDZ Shrinkage Quantities is 35,067kWh/day or a 0.7% decrease. This is due actual throughput being lower than the estimated 17-year seasonal normal leading to lower OUG and ToG equivalent to 23,015kWh/day, and a leakage reduction equivalent to 12,052kWh 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 April 2009 to 31 March 2010, 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 6 below, shows the LDZ Reconciliation Quantities for the Shrinkage Adjustment for the period 1 April 2009 to 31 March 2010³.

LDZ	LDZ Shrinkage Reconciliation Quantity (kWh/day)
EA	15,321
EM	-21,471
NT	40,036
NW	9,434
WM	-78,387
National Grid	-35,067

Table 6 LDZ Shrinkage Reconciliation Quantity (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 April 2009 to 31 March 2010

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 2009 to 31 March 2010, 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	15,321	£53,086.61
EM	-21,471	-£74,395.66
NT	40,036	£138,723.07
NW	9,434	£32,689.48
WM	-78,387	-£271,607.49
National Grid	-35,067	-£121,504.00

Table 7 LDZ Shrinkage Reconciliation for the period 1 April 2009 to 31 March 2010

The overall financial value for the Energy Adjustment, £121,504.00, 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 £121,504.00.

³ See Table 5 LDZ Specific Shrinkage Quantities (kWh/day)

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 April 2009 to 31 March 2010. 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 2009 to 31 March 2010.

Commodity		Period of Application	
		01/04/09 to 30/09/09	01/10/09 to 31/03/10
NTS Commodity		0.0155	0.0181
LDZ System Commodity Charge	EA	0.0178	0.0178
	EM	0.0178	0.0178
	NT	0.0229	0.0206
	NW	0.0189	0.0189
	WM	0.0211	0.0203

Table 8 Applicable Commodity Charges 1 April 2009 to 31 March 2010

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	Total over Period	01/04/09 to 30/09/09	01/10/09 to 31/03/10
EA	5,592,178	2,803,750	2,788,429
EM	-7,836,888	-3,929,180	-3,907,709
NT	14,613,179	7,326,607	7,286,571
NW	3,443,532	1,726,483	1,717,049
WM	-28,611,311	-14,344,849	-14,266,462
National Grid	-12,799,311	-6,417,189	-6,382,122

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:

$$\sum_{EA}^{WM} FA_{cc}(\pounds) = \sum_{1/4/09}^{30/9/09} LRQ(kWh) \times CC_1(\pounds / kWh) + \sum_{1/10/09}^{31/3/10} LRQ(kWh) \times CC_2(\pounds / kWh)$$

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 April 2009 to 30 September 2009

CC₂ (£/kWh) = Commodity Charge applicable to the period 1 October 2009 to 31 March 2010

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

Transportation Charges					
LDZ	Pricing Period		Pricing Period		Assessment Period
	01/04/09 to 30/09/09	01/10/09 to 31/03/10	01/04/09 to 30/09/09	01/10/09 to 31/03/10	01/04/09 to 31/03/10
	Total Volume (kWh)	Total Volume (kWh)	Total Adjustment	Total Adjustment	Total Adjustment
EA	2,803,750	2,788,429	£933.65	£1,001.05	£1,934.69
EM	-3,929,180	-3,907,709	-£1,308.42	-£1,402.87	-£2,711.28
NT	7,326,607	7,286,571	£2,813.42	£2,819.90	£5,633.32
NW	1,726,483	1,717,049	£593.91	£635.31	£1,229.22
WM	-14,344,849	-14,266,462	-£5,250.21	-£5,478.32	-£10,728.54
National Grid	-6,417,189	-6,382,122	-£2,217.66	-£2,424.93	-£4,642.59

Table 10 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 £4,642.59, a debit to Domestic Shippers under the RbD process.