

**LDZ SHRINKAGE ASSESSMENT AND ADJUSTMENT
FOR 1 APRIL 2011 – 31 MARCH 2012**

National Grid

September 2012

Version 2

CONTENTS

	Page
1 Executive Summary	1
2 LDZ Shrinkage Quantity Assessment	2
2.1 Leakage	2
2.1.1 Assessment of 2011/12 Leakage	2
2.2 Operational Usage	2
2.3 Theft of Gas	3
2.4 Impact of Throughput Assumptions	3
2.5 LDZ Specific Shrinkage Quantities	3
2.5.1 Reasons for Differences	4
3 LDZ Shrinkage Adjustment	4
3.1 Introduction	4
3.2 LDZ Shrinkage Reconciliation Calculations	4
3.3 Financial Adjustment.....	5
4 LDZ Shrinkage Commodity Charge Adjustment	6
4.1 Introduction	6
4.2 Applicable Commodity Charges.....	6
4.3 LDZ Shrinkage Reconciliation Quantities	6
4.4 Financial Adjustment.....	6

LDZ Shrinkage Assessment and Adjustment for the Period 1 April 2011 – 31 March 2012

1 Executive Summary

The purpose of this document is to present an assessment of LDZ Shrinkage for the period 1 April 2011 to 31 March 2012, in accordance with *Uniform Network Code Section N 3.3.3*.

National Grid's Final LDZ Shrinkage Quantity Proposal for the Formula Year 2011/12, issued 1 March 2011, proposed individual LDZ Shrinkage Quantities equating to a total RDN Shrinkage Quantity of 4,624,294kWh per day. The Final Proposal for the Formula Year 2011/12 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 2011/12 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 2011 to 31 March 2012 is 73GWh or approximately 201,045kWh/day lower than the volume of Shrinkage purchased for the Formula Year 2011/12.

For this year's leakage assessment, National Grid applied v1.3 of the Leakage Model. 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 2011/12 of 1,538GWh for the purposes of the Shrinkage Adjustment, which is 65GWh lower than originally estimated, and 1,544GWh¹ 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 decrease in leakage, there was also a decrease of 9GWh 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 £1,418,631.23 credit to National Grid, and therefore debit to RbD Shippers, and an associated debit of £32,098.59 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 2011/12 were proposed based on an assessment of leakage for the formula year 2010/11 with anticipated mains replacement being taken into account, leading to a procurement requirement of 4,380,695kWh/day for leakage.

2.1.1 Assessment of 2011/12 Leakage

National Grid applied V1.3 of the Leakage Model to carry out the assessment of leakage for the formula Year 2011/12. No further amendments have been made to the methodologies applied within the leakage model.

Table 1, below, shows that the assessment of leakage has resulted in a decrease in energy of approximately 65GWh, equivalent to 177,300kWh per day or 4.05%.

LDZ	2011/12 Estimated Leakage (GWh)	2011/12 Assessed Leakage (GWh)	2011/12 Assessed Leakage (LV _{t,i}) ² (GWh)	2011/12 Estimated Leakage (kWh/Day)	2011/12 Assessed Leakage (kWh/Day)
EA	221	214	214	603,696	583,431
EM	304	293	294	831,458	800,644
NT	339	319	319	925,245	872,602
NW	406	394	398	1,108,207	1,076,766
WM	334	318	319	912,089	869,952
National Grid	1,603	1,538	1,544	4,380,695	4,203,395

Table 1 Estimated and Assessed Leakage Energy by LDZ

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 2011/12 Gas Year, no better information (meter readings) or calculation for actual OUG was available; therefore, the proposed factor of 0.0113% of consumption, based on the GL Noble Denton 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 2011/12 (GWh)	Applied OUG Factor 2011/12	Daily OUG Quantity (kWh)
EA	40,605	0.0113%	12,536
EM	56,515		17,449
NT	51,559		15,918
NW	65,749		20,300
WM	42,654		13,169
National Grid	257,082		79,372

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 2011/12 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 2011/12 (GWh)	Applied ToG Factor 2011/12	Daily ToG Quantity (kWh)
EA	40,605	0.020%	22,188
EM	56,515		30,883
NT	51,559		28,174
NW	65,749		35,928
WM	42,654		23,308
National Grid	257,082		140,482

Table 3 Assessment of ToG

2.4 Impact of Throughput Assumptions

The Shrinkage volumes procured in 2011/12 in respect of Own Use Gas and Theft of Gas were based on the application of the agreed factors (0.0313%, combined, of consumption) to the 17-year seasonal normal demand for 2011/12 from the 2010 Demand Statements. The actual demand in 2011/12 was significantly lower than seasonal normal. The impact of this is shown in Table 4, below.

LDZ	Est 2011/12 Consumption (2010 Demand Statements) (GWh)	2011/12 Actual Consumption (GWh)	Combined OUG/ToG Factor	Estimated OUG/ ToG (GWh)	Outturn OUG/ToG (GWh)	Adjustment (GWh)
EA	45,599	40,605	0.0313%	14	13	1
EM	65,226	56,515		20	18	3
NT	57,480	51,559		18	16	2
NW	71,497	65,749		22	21	2
WM	47,800	42,654		15	13	1
National Grid	287,602	257,082		89	80	9

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 2011/12 in January 2011, 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 2011. The proposed (applied) LDZ Shrinkage Quantities are shown in Table 5, below, along with the Assessed LDZ specific Shrinkage Quantities for 2011/12 produced in the method detailed within this document.

LDZ	Leakage	OUG	ToG	Assessed Shrinkage Quantities 2011/12	Applied Shrinkage Quantities 2011/12	Difference Between Assessed & Applied Quantities
EA	583,431	12,536	22,188	618,156	642,318	-24,162
EM	800,644	17,449	30,883	848,976	886,705	-37,729
NT	872,602	15,918	28,174	916,695	973,931	-57,236
NW	1,076,766	20,300	35,928	1,132,994	1,168,764	-35,770
WM	869,952	13,169	23,308	906,429	952,576	-46,147
National Grid	4,203,395	79,372	140,482	4,423,249	4,624,294	-201,045

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 201,045kWh/day or a 4.3% decrease. This is due to a decrease in leakage equivalent to 177,300kWh per day and actual throughput being lower than the estimated 17-year seasonal normal leading to lower OUG and ToG equivalent to 23,745kWh/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 2011 to 31 March 2012, 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 2011 to 31 March 2012³.

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

LDZ	LDZ Shrinkage Reconciliation Quantity (kWh/day)
EA	-24,162
EM	-37,729
NT	-57,236
NW	-35,770
WM	-46,147
National Grid	-201,045

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 2011 to 31 March 2012

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 2011 to 31 March 2012, 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	-24,162	-£170,496.76
EM	-37,729	-£266,228.60
NT	-57,236	-£403,873.58
NW	-35,770	-£252,405.58
WM	-46,147	-£325,626.71
National Grid	-201,045	-£1,418,631.23

Table 7 LDZ Shrinkage Reconciliation for the period 1 April 2011 to 31 March 2012

The overall financial value for the Energy Adjustment, £1,418,631.23, 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 £1,418,631.23.

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 2011 to 31 March 2012. 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 2011 to 31 March 2012.

Commodity		Period of Application	
		01/04/11 to 30/09/11	01/10/11 to 31/03/12
NTS Commodity		0.0179	0.0246
LDZ System Commodity Charge	EA	0.0196	0.0196
	EM	0.0196	0.0196
	NT	0.0236	0.0236
	NW	0.0213	0.0213
	WM	0.0254	0.0254

Table 8 Applicable Commodity Charges 1 April 2011 to 31 March 2012

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	01/04/11 to 30/09/11	01/10/11 to 31/03/12
EA	-8,843,446	-4,421,723	-4,421,723
EM	-13,808,933	-6,904,466	-6,904,466
NT	-20,948,400	-10,474,200	-10,474,200
NW	-13,091,950	-6,545,975	-6,545,975
WM	-16,889,836	-8,444,918	-8,444,918
National Grid	-73,582,564	-36,791,282	-36,791,282

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:

$$\sum_{EA}^{WM} FA_{cc} (£) = \sum_{1/4/11}^{30/9/11} LRQ(kWh) \times CC_1 (£/kWh) + \sum_{1/10/11}^{31/3/12} LRQ(kWh) \times CC_2 (£/kWh)$$

Where:

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

$LRQ (kWh)$ = LDZ Shrinkage Reconciliation Quantity

$CC_1 (£/kWh)$ = Commodity Charge applicable to the period 1 April 2011 to 30 September 2011

CC₂ (£/kWh) = Commodity Charge applicable to the period 1 October 2011 to 31 March 2012

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
	01/04/11 to 30/09/11	01/10/11 to 31/03/12	01/04/11 to 30/09/11	01/10/11 to 31/03/12	01/04/10 to 31/03/11
	Total Volume (kWh)	Total Volume (kWh)	Total Adjustment	Total Adjustment	Total Adjustment
EA	-4,421,723	-4,421,723	-£1,658.15	-£1,954.40	-£3,612.55
EM	-6,904,466	-6,904,466	-£2,589.17	-£3,051.77	-£5,640.95
NT	-10,474,200	-10,474,200	-£4,346.79	-£5,048.56	-£9,395.36
NW	-6,545,975	-6,545,975	-£2,566.02	-£3,004.60	-£5,570.62
WM	-8,444,918	-8,444,918	-£3,656.65	-£4,222.46	-£7,879.11
National Grid	-36,791,282	-36,791,282	-£14,816.79	-£17,281.80	-£32,098.59

Table 10 Financial Adjustment by LDZ for the period 1 April 2011 to 31 March 2012

The overall financial value for the Commodity Charge Adjustment is therefore £32,098.59, a debit to Domestic Shippers under the RbD process.