

**LDZ SHRINKAGE ASSESSMENT AND ADJUSTMENT
FOR 1 April 2012 – 31 March 2013**

National Grid

September 2013

Version 2

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LDZ Shrinkage Assessment and Adjustment for the Period 1 April 2012 – 31 March 2013

1 Executive Summary

The purpose of this document is to present an assessment of LDZ Shrinkage for the period 1 April 2012 to 31 March 2013, in accordance with *Uniform Network Code Section N 3.3*.

National Grid's Final LDZ Shrinkage Quantity Proposal for the Formula Year 2012/13, issued 1 March 2012, proposed individual LDZ Shrinkage Quantities equating to a total annual RDN Shrinkage Quantity of 1,625GWh. The Final Proposal for the Formula Year 2012/13 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 2012/13 detailed within this document provides, where applicable, reasons for significant variance between the estimated and the assessed LDZ Shrinkage Quantities for the period.

The assessment of LDZ Shrinkage for the period 1 April 2012 to 31 March 2013 is 25GWh lower than the volume of Shrinkage purchased for the Formula Year 2012/13.

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 2012/13 of 1,505GWh for the purposes of the Shrinkage Adjustment, which is 32GWh lower than originally estimated, and 1,516GWh¹ 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 an increase of 7GWh in the assessed volumes for Own Use Gas and Theft of Gas. Details of this can be found in Section 2.4 Impact of Throughput Assumptions

The assessed Shrinkage leads to a financial adjustment of £534,020.21 credit to National Grid, and therefore debit to RbD Shippers, and an associated debit of £13,187.61 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 2012/13 were proposed based on an assessment of leakage for the formula year 2012/13 with anticipated mains replacement being taken into account, leading to a procurement requirement of 1,537GWh for leakage.

2.1.1 Assessment of 2012/13 Leakage

National Grid applied V1.3 of the Leakage Model to carry out the assessment of leakage for the Formula Year 2012/13. 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 32GWh.

LDZ	Estimated Leakage (GWh)	Assessed Leakage (GWh)	Assessed Leakage (LV _{t,i}) ² (GWh)
EA	211	206	209
EM	297	294	296
NT	322	302	304
NW	388	389	391
WM	319	315	316
National Grid	1,537	1,505	1,516

Table 1 Estimated and Assessed Leakage Energy by LDZ for 2012/13

2.1.2 Differences Between Estimated and Assessed Leakage in London and East of England

There are two differences between the leakage assessment used for the 2012/13 shrinkage proposals and that used for the assessment:

- Exclusion of Steel Risers – National Grid has improved its asset record systems and as a result of this steel risers that had been incorrectly included within the mains extract in previous years have been excluded from this year's extract leading to a reduction in mains leakage of approximately 7GWh. These risers were already accounted for within the service leakage element of the leakage calculation and so their coincident inclusion within mains leakage overstated the total amount of leakage occurring.
- Interference Damage – The 2012/13 leakage assessment includes the leakage associated with a very large gas release incident due to third party damage equating to approximately 11GWh in East Midlands LDZ. The 2012/13 shrinkage quantities only included 1GWh for Interference Damage in EM. There are only a small number of large gas release incidents in any one year, but the volumes of gas released have a disproportionate affect on the leakage assessment. National Grid believe that it is appropriate for GDNs to have an incentive on the number of incidents, as this can be influenced via industry engagement; however, the scale of any one incident is out of the control of the GDNs and, accordingly, National Grid intend to progress a formal modification to the leakage model to address this issue. Ofgem recognised this as an issue in the RIIO-GD1 Final Proposals (2.26), stating, *"We recognise that revenues under the rolling incentive will be strongly influenced by companies' performance in the last year of RIIO-GD1. This performance could be influenced by*

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.

factors outside GDNs control such as third party damage to gas mains. To mitigate for this, we welcome modifications to the shrinkage model (used by GDNs to calculate and report shrinkage and leakage) which addresses this issue whilst continuing to place the right incentives on companies to manage shrinkage and leakage.”

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 2012/13 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.

LDZ	Consumption 2012/13 (GWh)	Applied OUG Factor 2012/13	OUG Quantity (GWh)
EA	48,867	0.0113%	5.5
EM	65,662		7.4
NT	60,781		6.9
NW	76,987		8.7
WM	52,130		5.9
National Grid	304,427		34.4

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 2012/13 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 2012/13 (GWh)	Applied ToG Factor 2012/13	OUG Quantity (GWh)
EA	48,867	0.020%	9.8
EM	65,662		13.1
NT	60,781		12.2
NW	76,987		15.4
WM	52,130		10.4
National Grid	304,427		60.9

Table 3 Assessment of ToG

2.4 Impact of Throughput Assumptions

The Shrinkage volumes procured in 2012/13 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 2012/13 from the 2011 Demand Statements. The actual demand in 2012/13 was higher than seasonal normal. The affect of this is shown in Table 4, below.

LDZ	Est 2012/13 Consumption (2011 Demand Statements) (GWh)	2012/13 Actual Consumption (GWh)	Combined OUG/ToG Factor	Estimated OUG/ ToG (GWh)	Assessed OUG/ToG (GWh)	Adjustment (GWh)
EA	45,541	48,867	0.0313%	14.3	15.3	1.0
EM	62,554	65,662		19.6	20.6	1.0
NT	56,350	60,781		17.6	19.0	1.4
NW	70,939	76,987		22.2	24.1	1.9
WM	45,776	52,130		14.3	16.3	2.0
National Grid	281,159	304,427		88.0	95.3	7.3

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 2012/13 in January 2012, 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 2012. The proposed (applied) LDZ Shrinkage Quantities are shown in Table 5, below, along with the Assessed LDZ specific Shrinkage Quantities for 2012/13 produced in the method detailed within this document.

LDZ	Leakage	OUG	ToG	Assessed Shrinkage Quantities 2012/13	Applied Shrinkage Quantities 2012/13	Difference Between Assessed & Applied Quantities	Difference (kWh/day)
EA	206	5.5	9.8	221	226	-5	-13,052
EM	294	7.4	13.1	315	317	-2	-5,487
NT	302	6.9	12.2	321	339	-19	-50,966
NW	389	8.7	15.4	413	410	3	7,312
WM	315	5.9	10.4	331	333	-2	-5,570
National Grid	1,505	34.4	60.9	1,600	1,625	-25	-67,762

Table 5 LDZ Specific Shrinkage Quantities (GWh)

2.5.1 Reasons for Differences

The difference between National Grid's estimated and assessed LDZ Shrinkage Quantities is 25GWh or a 1.5% decrease. This is due to a decrease in leakage equivalent to 32GWh being slightly offset by actual throughput being higher than the estimated 17-year seasonal normal leading to higher OUG and ToG equivalent to 7GWh.

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 2012 to 31 March 2013, 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 2012 to 31 March 2013³.

LDZ	LDZ Shrinkage Reconciliation Quantity (kWh/day)
EA	-13,052
EM	-5,487
NT	-50,966
NW	7,312
WM	-5,570
National Grid	-67,762

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:

$$FA(\pounds) = \sum_{01/04/12}^{31/3/13} S_{LRQ}(kWh) \times SAP(p/kWh) / 100$$

Where:

FA (£) = Financial Adjustment

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

SAP = Daily System Average Price for the period 1 April 2012 to 31 March 2013

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 2012 to 31 March 2013, calculated on a daily basis in line with the methodology indicated above.

³ See Table 5 LDZ Specific Shrinkage Quantities (GWh)

LDZ	LDZ Shrinkage Reconciliation Quantity (kWh/day)	Adjustment Value due to Changes to Shrinkage Quantities
EA	-13,052	-£102,856.95
EM	-5,487	-£43,243.43
NT	-50,966	-£401,649.36
NW	7,312	£57,623.29
WM	-5,570	-£43,893.76
National Grid	-67,762	-£534,020.21

Table 7 LDZ Shrinkage Reconciliation for the period 1 April 2012 to 31 March 2013

The overall financial value for the Energy Adjustment, £534,020.21, 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 £534,020.21.

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 2012 to 31 March 2013. The Commodity Charge Adjustments have been calculated in accordance with the LDZ Shrinkage Adjustments Methodology Version 2.0.

NB: This document includes a correction to the applicable NTS Exit Commodity rate in respect of the period 1st October 2012 to 31st March 2013. In version 1 of this document, the NTS TO Exit Commodity rate of 0.0094p/kWh had been omitted in error. The NTS Commodity rate of 0.0323 p/kWh is calculated as the sum of the NTS SO Exit Commodity rate of 0.229 p/kWh and the aforementioned NTS TO Exit Commodity Rate.

4.2 Applicable Commodity Charges

Table 8, below, shows the Commodity Charges that applied over the period 1 April 2012 to 31 March 2013.

Commodity		Period of Application	
		01/04/12 to 30/09/12	01/10/12 to 31/03/13
NTS Commodity		0.0242	0.0323
LDZ System Commodity Charge	EA	0.0219	0.0219
	EM	0.0219	0.0219
	NT	0.0258	0.0258
	NW	0.0238	0.0238
	WM	0.0274	0.0274

Table 8 Applicable Commodity Charges 1 April 2012 to 31 March 2013

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	01/04/12 to 30/09/12	01/10/12 to 31/03/13
EA	-4,774,827	-2,388,451	-2,375,399
EM	-1,946,196	-1,004,160	-998,673
NT	-18,640,006	-9,326,737	-9,275,771
NW	2,668,535	1,338,076	1,330,764
WM	-2,033,037	-1,019,261	-1,013,691
National Grid	-24,725,531	-12,400,533	-12,332,771

Table 9 LDZ Shrinkage Reconciliation Quantities (kWh)

4.4 Financial Adjustment

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

$$\sum_{EA}^{WM} FA_{cc}(\pounds) = \sum_{1/4/12}^{30/9/12} LRQ(kWh) \times CC_1(\pounds / kWh) + \sum_{1/10/12}^{31/3/13} LRQ(kWh) \times CC_2(\pounds / kWh)$$

Where:

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

LRQ (kWh) = LDZ Shrinkage Reconciliation Quantity

CC₁ (£/kWh) = Commodity Charge applicable to the period 1 April 2012 to 30 September 2012

CC₂ (£/kWh) = Commodity Charge applicable to the period 1 October 2012 to 31 March 2013

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
	01/04/12 to 30/09/12	01/10/12 to 31/03/13	01/04/12 to 30/09/12	01/10/12 to 31/03/13	01/04/12 to 31/03/13
	Total Volume (kWh)	Total Volume (kWh)	Total Adjustment	Total Adjustment	Total Adjustment
EA	-2,388,451	-2,375,399	-£1,101.08	-£1,287.47	-£2,388.54
EM	-1,004,160	-998,673	-£462.92	-£541.28	-£1,004.20
NT	-9,326,737	-9,275,771	-£4,663.37	-£5,389.22	-£10,052.59
NW	1,338,076	1,330,764	£642.28	£746.56	£1,388.83
WM	-1,019,261	-1,013,691	-£525.94	-£605.17	-£1,131.11
National Grid	-12,400,533	-12,332,771	-£6,111.02	-£7,076.59	-£13,187.61

Table 10 Financial Adjustment by LDZ for the period 1 April 2012 to 31 March 2013

The overall financial value for the Commodity Charge Adjustment is therefore £13,187.61, a debit to Domestic Shippers under the RbD process.