nationalgrid

LDZ Shrinkage Assessment and Adjustment
1 April 2014 - 31 March 2015

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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*, in addition to providing notification of the leakage and shrinkage volumes to be used for incentive purposes as required by Special Condition 1F.14 of the Gas Transporter licence.

National Grid's Final LDZ Shrinkage Quantity Proposal for the Formula Year 2014/15, issued 1 March 2014 proposed individual LDZ Shrinkage Quantities equating to a total annual Shrinkage Quantity of 1,403GWh. 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
- Gas that is stolen upstream of the meter 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.

The assessment of LDZ Shrinkage for the period 1 April 2014 to 31 March 2015 is 33GWh lower than the volume of Shrinkage purchased for the Formula Year 2014/15.

For this year's leakage assessment, National Grid applied v1.4 of the Leakage Model which received approval from Ofgem in September 2014. The leakage assessment resulted in an annual estimated leakage for 2014/15 of 1,289.1GWh for the purposes of the Shrinkage Adjustment, which is 2.6% (34GWh) lower than originally estimated. LDZ specific values can be found in Table 1.

In addition to the decrease in leakage, there was also an increase of 0.1GWh 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 volume is less than the estimated volume therefore we will recover monies to the value of £538,387.68 from RbD Shippers and a further amount of £21,461.79 for Commodity Charges.

The Leakage Volume (LV_t) and Actual Shrinkage Volume (ASV_t) to be used for incentive revenue purposes for 2014/15 are 1,293GWh and 1,374GWh, respectively; the values for each Distribution Network can be found in Table 12 . The values used for incentive revenue purposes differ from those used to calculate the Shrinkage Adjustment for UNC purposes because they are calculated using the calorific value assumptions that underpin the incentive baseline targets, thus avoiding potential windfall gains or losses arising from variations in outturn calorific value.

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 an assumed procurement requirement of 1,323GWh for leakage.

2.1.1 Assessment of 2014/15 Leakage

National Grid 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.

Table 1 below, shows that assessed leakage varies to the 14/15 proposals by approximately 34GWh.

LDZ	Estimated Leakage (GWh)	Assessed Leakage (GWh)
EA	204	199.4
EM	243	232.7
NT	241	233.1
NW	342	335.0
WM	293	288.9
National Grid	**1,323**	**1,289.1**

Table 1 Estimated and Assessed Leakage Energy by LDZ for 2014/15

2.1.2 Differences Between Estimated and Assessed Leakage

The main difference in our assessed leakage outturn and our estimated leakage comes from the average system pressure reductions we have achieved across all our local distribution zones. For the purpose of the proposals we assumed that system pressure improvements would be difficult to achieve as we were already operating our networks at a high level of efficiency and, coupled with the capacity reductions seen with more mains insertion based replacement, we expected pressures to potentially increase. In the time since the proposals were finalised we have focused on maintaining and refreshing our pressure profiling and clocking equipment and continue to evolve the management of its performance. This has seen another significant improvement in 2014/15 system pressure whilst ensuring we maintain a consistent and uninterrupted supply for our customers.

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 and for other minor operational purposes. Pre-heating is required to counter the impact of gas freezing during pressurisation; this is known as the Joules-Thompson effect.

The factor used for calculation of OUG is 0.0113% of consumption.

LDZ	Consumption 2014/15 (GWh)	OUG Quantity (GWh)
EA	41,435	4.7
EM	55,326	6.3
NT	50,400	5.7
NW	66,695	7.5
WM	43,996	5.0
National Grid	**257,851**	**29.1**

Table 2 Assessment of OUG (0.0113% of Consumption)

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

LDZ	Consumption 2014/15 (GWh)	ToG Quantity (GWh)
EA	41,435	8.3
EM	55,326	11.1
NT	50,400	10.1
NW	66,695	13.3
WM	43,996	8.8
National Grid	**257,851**	**51.6**

Table 3 Assessment of ToG (0.02% of Consumption)

2.4 Impact of Throughput Assumptions

The Shrinkage volumes procured in 2014/15 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 seasonal normal demand for 2014/15 from the 2013 Demand Statements. The actual demand in 2014/15 was marginally higher than seasonal normal. The effect of this is shown in Table 4, below.

LDZ	Est 2014/15 Consumption (2013 Demand Statements) (GWh)	2014/15 Actual Consumption (GWh)	Estimated OUG/ ToG (GWh)	Assessed OUG/ToG (GWh)	Adjustment (GWh)
EA	41,171	41,435	12.9	13.0	0.1
EM	54,260	55,326	17.0	17.3	0.3
NT	50,177	50,400	15.7	15.8	0.1
NW	68,941	66,695	21.6	20.9	-0.7
WM	42,879	43,996	13.4	13.8	0.3
National Grid	**257,429**	**257,851**	**80.6**	**80.7**	**0.1**

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 2014/15 in January 2014, 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 2014. The proposed (applied) LDZ Shrinkage Quantities are shown in Table 5, below, 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	Difference (kWh/day)
EA	199.4	4.7	8.3	212.4	217	-4	-11,285
EM	232.7	6.3	11.1	250.0	260	-10	-27,714
NT	233.1	5.7	10.1	248.9	256	-7	-20,420
NW	335.0	7.5	13.3	355.9	364	-8	-21,307
WM	288.9	5.0	8.8	302.7	307	-4	-11,052
National Grid	1289.1	29.1	51.6	1,369.8	1,403	- 33	-91,778

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 33GWh or a 2.4% decrease. This is due to a decrease in leakage equivalent to 34GWh in addition to actual throughput being higher than the estimated seasonal normal leading to higher OUG and ToG equivalent to 0.1GWh.

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 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. 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 2014 to 31 March 2015[1].

LDZ	LDZ Shrinkage Reconciliation Quantity (kWh/day)
EA	-11,285
EM	-27,714
NT	-20,420
NW	-21,307
WM	-11,052
National Grid	**-91,778**

Table 6 LDZ Shrinkage Reconciliation Quantity (kWh/day)

[1] See Table 5 LDZ Specific Shrinkage Quantities (GWh)

3.3 Energy Financial Adjustment

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

$$FA(£) = \sum_{01/04/13}^{31/3/14} S_{LRQ}(kWh) \times SAP(p/kWh)/100$$

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 charge 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, summating 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
EA	-11,285	-£66,201.38
EM	-27,714	-£162,575.59
NT	-20,420	-£119,786.02
NW	-21,307	-£124,993.82
WM	-11,052	-£64,830.88
National Grid	**-91,778**	**-£538,387.68**

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

The assessed Shrinkage volume is less than the estimated volume therefore we will recover monies to the value of £538,387.68 from RbD Shippers and a further amount of £21,461.79 for Commodity Charges.

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 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	
		01/04/2014 to 30/09/2014	01/10/2014 to 31/03/2015
NTS SO Commodity		0.0215	0.0185
NTS TO Exit Commodity		0.0157	0.0200
LDZ System Commodity Charge	EA	0.0246	0.0246
	EM	0.0246	0.0246
	NT	0.0272	0.0272
	NW	0.0268	0.0268
	WM	0.0290	0.0290

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	Total over Period	01/04/2014 to 30/09/2014	01/10/2014 to 31/03/2015
EA	-4,119,093	-2,065,189	-2,053,904
EM	-10,115,560	-5,071,637	-5,043,923
NT	-7,453,165	-3,736,792	-3,716,373
NW	-7,777,198	-3,899,253	-3,877,945
WM	-4,033,820	-2,022,436	-2,011,384
National Grid	**-33,498,835**	**-16,795,307**	**-16,703,529**

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:

$$\sum_{EA}^{WM} FA_{cc}(£) = \sum_{01/04/14}^{30/09/14} LRQ(kWh) \times CC_1(£/kWh) + \sum_{01/10/14}^{31/03/15} LRQ(kWh) \times CC_2(£/kWh)$$

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 2014 to 30 September 2014

CC_2 *(£/kWh)* = Commodity Charge applicable to the period 1 October 2014 to 31 March 2015

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

Transportation Charges					
LDZ	Total Volume (kWh)		Total Adjustment		Assessment Period
	Pricing Period		Pricing Period		
	01/04/2014 to 30/09/2014	01/10/2014 to 31/03/2015	01/04/2014 to 30/09/2014	01/10/2014 to 31/03/2015	1 April 2014 to 31 March 2015
EA	-2,065,189	-2,053,904	-£1,276.29	-£1,296.01	-£2,572.30
EM	-5,071,637	-5,403,923	-£3,134.27	-£3,182.72	-£6,316.99
NT	-3,736,792	-3,716,373	-£2,406.49	-£2,441.66	-£4,848.15
NW	-3,899,253	-3,877,945	-£2,495.52	-£2,532.30	-£5,027.82
WM	-2,022,436	-2,011,384	-£1,338.85	-£1,357.68	-£2,696.54
National Grid	**-16,795,307**	**-16,703,529**	**-£10,651.43**	**-£10,810.37**	**-£21,461.79**

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 £21,461.79, a recovery of monies to Domestic Shippers under the RbD process.

5 Leakage Volume (LV_t) and Actual Shrinkage Volume (ASV_t)

5.1 Introduction

This section provides the LV_t and ASV_t values to be used for revenue incentive calculations.

Special Condition 1F.14 of the Gas Transporter licence requires that "The Licensee must, by 31 July in each Formula Year, make publicly available and provide to the Authority a report that sets out the actual Leakage volume ($LV_{t,i}$) and actual Shrinkage volumes ($ASV_{t,i}$) as calculated in accordance with the Shrinkage and Leakage Model for each Distribution Network for the preceding Formula Year."

Shrinkage and Leakage volumes used for incentive purposes are calculated using the same calorific value assumptions used to determine the Shrinkage and Leakage Incentive volume allowances provided in Appendix 2 and Appendix 3 of Special Condition 1F.14 of the Gas Transporter licence, respectively. This is to avoid potential windfall gains or losses arising as a result of outturn calorific values, which are out of the control of the GDNs, being different from those underpinning the incentive targets.

5.2 LV_t and ASV_t for the 2014/15 formula year

Table 11 below provides the LV_t and ASV_t values for the 2014/15 formula year by LDZ and indicates the calorific value assumptions used to calculate these.

LDZ	Leakage Volume (LV_t)	OUG	ToG	Actual Shrinkage Volume (ASV_t)	Assumed Calorific Value (MJ/m^3)
EA	202	5	8	214	39.41
EM	233	6	11	251	39.48
NT	234	6	10	250	39.35
NW	335	8	13	356	39.20
WM	289	5	9	303	39.30
National Grid	**1,293**	**29**	**52**	**1,374**	

Table 11 2014/15 LDZ LV_t and ASV_t (GWh)

Table 12 below provides the LV_t and ASV_t values for the 2014/15 formula year by Network.

LDZ	Leakage Volume (LV_t)	Actual Shrinkage Volume (ASV_t)
East of England	435	465
London	234	250
North West	335	356
West Midlands	289	303
National Grid	**1,293**	**1,374**

Table 12 2014/15 Network LV_t and ASV_t (GWh)