

Shrinkage Assessment & Adjustment

1 April 2016 – 31 March 2017

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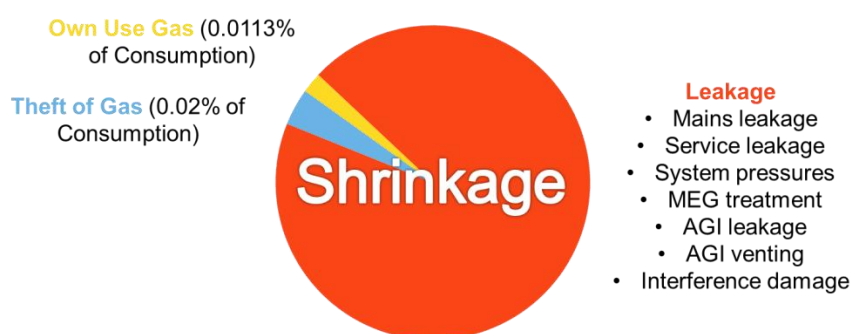
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1. Executive Summary

This document presents an assessment of LDZ Shrinkage for the period 1 April 2016 – 31 March 2017, in accordance with Uniform Network Code Section N 3.3. In addition, this report provides notification of leakage and shrinkage volumes to be used for incentive purposes as required by Special Condition 1F.14 of the Gas Transporter licence.

Cadent's Final LDZ Shrinkage Quantity Proposal for the Formula Year 2016/17, issued 1 March 2016, proposed individual LDZ Shrinkage Quantities equating to a total annual Shrinkage Quantity of 1,282 GWh. The Final Proposal for the Formula Year 2016/17 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 calculated at LDZ level;
- Own Use Gas, with a single factor of forecast annual throughput being applied across all LDZs; and
- Theft of Gas, which is gas stolen upstream of the meter with a single factor of forecast annual throughput being applied across all LDZs.

The assessment of LDZ Shrinkage for the Formula Year 2016/17 detailed within the document provides, where applicable, the reasons for significant variance between the estimated and the assessed LDZ Shrinkage Quantities for the period.

The assessment of LDZ Shrinkage is 28.9 GWh (2.3%) higher than the volume of Shrinkage purchased. The leakage assessment resulted in calculated leakage volume of 1,229 GWh, which is 28.2 GWh (2.3%) higher than originally estimated.

In addition to an increase in leakage there was also an increase of 0.6 GWh in the assessed volumes for Own Use Gas and Theft of Gas.

The assessed Shrinkage volume is greater than the estimated volume, we will therefore recover monies to the value of £382,027.21 from RbD Shippers and a further amount of £17,741.98 for Commodity Charges.

The Leakage Volume (LVt) and Actual Shrinkage Volume (ASVt) to be used for incentive revenue purposes for 2016/17 are 1,225.6 GWh and 1,307.4 GWh, respectively. The values used for incentive purposes 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 values.

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2. Shrinkage Quantity Assessment

2.1 Leakage

LDZ specific Shrinkage Quantities for 2016/17 were proposed based on an assessment of leakage with the anticipated mains replacement being taken into account, leading to an assumed procurement of 1,201.2 GWh for leakage.

2.1.1 Assessment of 2016/17 Leakage

Cadent applied v1.4 of the Leakage Model to carry out the assessment of leakage. Table 1 below shows that assessed leakage varies to the 2016/17 proposals by approximately 28.2 GWh

	ESTIMATED LEAKAGE (GWh)	ASSESSED LEAKAGE (GWh)	DIFFERENCE (GWh)
EAST ANGLIA	185.2	198.5	13.3
EAST MIDLANDS	216.9	220.5	3.5
NORTH THAMES	219.7	223.3	3.7
NORTH WEST	311.9	312.9	1.1
WEST MIDLANDS	267.5	274.1	6.7
CADENT	1,201.2	1,229.4	28.2

Table 1. Estimated and Assessed Leakage Energy by LDZ for 2016/17

2.1.2 Differences between Estimated and Assessed Leakage

The estimation of leakage is based on reasoned forecast expectations for each of the components that determine final assessment volumes. Cadent are committed to ensuring that the forecast is as accurate as possible, this is beneficial to our customers because it reduces the size of two year lagged financial true ups against allowed levels of cost.

2.2 Own Use Gas

Own Use Gas 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.

The volumes procured in 2016/17 in respect of Own Use Gas were based on the application of the standard factor (0.0113% of consumption) to our 2016/17 demand forecast. The actual demand in 2016/17 was higher than that used for the forecast calculation, the impact of this is a difference between estimated and assessed volumes of 0.2 GWh.

	ESTIMATED 2016/17 CONSUMPTION (GWh)	2016/17 ACTUAL CONSUMPTION (GWh)	ESTIMATED OUG (GWh)	ASSESSED OUG (GWh)	ADJUSTMENT (GWh)
EAST ANGLIA	42,171	42,338	4.8	4.8	0.0
EAST MIDLANDS	54,549	56,328	6.2	6.4	0.2
NORTH THAMES	51,933	51,922	5.9	5.9	0.0
NORTH WEST	66,818	65,707	7.6	7.4	-0.1
WEST MIDLANDS	43,603	44,817	4.9	5.1	0.1
CADENT	239,074	261,111	29.3	29.5	0.2

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 customer”.

The volumes procured in 2016/17 in respect of Theft of Gas (TOG) were based on the application of the standard factor (0.02% of consumption) to our 2016/17 demand forecast. The impact of the difference in demand between estimated and assessed gives a volume difference of 0.4 GWh.

	ESTIMATED 2016/17 CONSUMPTION (GWh)	2016/17 ACTUAL CONSUMPTION (GWh)	ESTIMATED TOG (GWh)	ASSESSED TOG (GWh)	ADJUSTMENT (GWh)
EAST ANGLIA	42,171	42,338	8.4	8.5	0.0
EAST MIDLANDS	54,549	56,328	10.9	11.3	0.4
NORTH THAMES	51,933	51,922	10.4	10.4	0.0
NORTH WEST	66,818	65,707	13.4	13.1	-0.2
WEST MIDLANDS	43,603	44,817	8.7	9.0	0.2
CADENT	239,074	261,111	51.8	52.2	0.4

Table 3. Assessment of TOG (0.02% of Consumption)

2.4 LDZ Specific Shrinkage Quantities

Cadent initially proposed LDZ specific Shrinkage Quantities for the formula year 2016/17 in January 2016, with the same quantities again being included within the Final Proposal. Cadent'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 2016. The applied LDZ Shrinkage Quantities are shown in table 4 below, along with the Assessed LDZ specific Shrinkage Quantities.

	APPLIED QUANTITIES (GWh)	ASSESSED QUANTITIES (GWh)	DIFFERENCE (GWh)	DIFFERENCE (kWh/day)
EAST ANGLIA	198.2	211.7	13.5	37,084
EAST MIDLANDS	233.9	238.1	4.2	11,392
NORTH THAMES	235.7	239.6	3.9	10,644
NORTH WEST	322.9	333.5	0.6	1,736
WEST MIDLANDS	281.5	288.2	6.7	18,391
CADENT	1,282.2	1,311.1	28.9	79,060

Table 4. LDZ Specific Shrinkage Quantities (GWh)

2.4.1 Reasons for Differences

The main difference between Cadent's forecast projection and the actual outturn volumes is largely down to system pressures being higher than expected. System pressures were assumed to remain at those levels seen within 2015/16, however, a 3% increase in demand contributed to an increase in system pressures of 2.8%.

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3. Shrinkage Adjustment

3.1 Introduction

This section advises Shippers of the Shrinkage Adjustment for Cadent operated LDZs for the period 1 April 2016 to 31 March 2017, as referred to in Network Code Section N3.4.1.

3.2 LDZ Shrinkage Reconciliation Calculations

The LDZ Shrinkage Reconciliation Quantity (SLRQ) 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 April 2016 to 31 March 2017.

	LDZ RECONCILIATION QUANTITY (kWh/day)
EAST ANGLIA	37,084
EAST MIDLANDS	11,392
NORTH THAMES	10,644
NORTH WEST	1,736
WEST MIDLANDS	18,391
CADENT	79,247

Table 5. LDZ Shrinkage Reconciliation Quantity (kWh/day)

3.3 Energy Financial Adjustment

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

$$FA(\pounds) = \sum_{01/04/16}^{31/3/17} S_{LRQ} (kWh) \times SAP(p / kWh) / 100$$

Where $FA(\pounds)$ = Financial Adjustment

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

SAP = Daily System Average Price for the period

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, 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 April 2016 to 31 March 2017, calculated on a daily basis in line with the methodology indicated above.

	LDZ SHRINKAGE DAILY RECONCILIATION QUANTITY (kWh)	ADJUSTMENT VALUE DUE TO CHANGES TO SHRINKAGE QUANTITIES
EAST ANGLIA	37,084	£178,770.09
EAST MIDLANDS	11,392	£54,917.98
NORTH THAMES	10,644	£51,312.78
NORTH WEST	1,736	£8,366.91
WEST MIDLANDS	18,391	£88,659.44
CADENT	79,247	£382,027.21

Table 6. LDZ Shrinkage Reconciliation for the period 1 April 2016 to 31 March 2017

The assessed Shrinkage volume is higher than the estimated volume therefore we will recover monies to the value of £382,027.21 from RbD Shippers and a further amount of £17,741.98 for Commodity Charges.

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4. Shrinkage Commodity Charge

4.1 Introduction

This section advises Shippers of the Commodity Charge associated with the Cadent operated LDZ Shrinkage Adjustment for the period 1 April 2016 to 31 March 2017.

4.2 Applicable Commodity Charges

Table 7 below, shows the Commodity Charges that applied over the period 1 April 2016 to 31 March 2017.

		PERIOD OF APPLICATION	
		01/04/2016 to 30/09/2016	01/10/2016 to 31/03/2017
NTS SO EXIT COMMODITY (p/kWh)		0.0147	0.0129
NTS TO EXIT COMMODITY (p/kWh)		0.0223	0.0212
LDZ SYSTEM COMMODITY CHARGE (p/kWh)	EAST ANGLIA	0.0243	0.0243
	EAST MIDLANDS	0.0243	0.0243
	NORTH THAMES	0.0284	0.0284
	NORTH WEST	0.0277	0.0277
	WEST MIDLANDS	0.0280	0.0280

Table 7. Applicable Commodity Charges 1 April 2016 to 31 March 2017

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.

	TOTAL OVER PERIOD	01/04/2016 to 30/09/2016	01/10/2016 to 31/03/2017
EAST ANGLIA	13,535,500	6,786,292	6,749,208
EAST MIDLANDS	4,158,091	2,084,741	2,073,349
NORTH THAMES	3,885,125	1,947,885	1,937,240
NORTH WEST	633,497	317,616	315,881
WEST MIDLANDS	6,712,811	3,365,601	3,347,210
CADENT	28,925,023	14,502,135	14,422,888

Table 8. 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.

$$\sum_{EA}^{WM} FA_{cc} (£) = \sum_{01/04/16}^{30/09/16} LRQ(kWh) \times CC_1 (£/kWh) + \sum_{01/10/16}^{31/03/17} LRQ(kWh) \times CC_2 (£/kWh)$$

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 2016 to 30 September 2016

$CC_2 (£/kWh)$ = Commodity Charge applicable to the period 1 October 2016 to 31 March 2017

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

TRANSPORTATION CHARGES					
	TOTAL VOLUME (kWh)		TOTAL ADJUSTMENT		ASSESSMENT PERIOD
	PRICING PERIOD		PRICING PERIOD		
	01/04/2016 to 30/09/2016	01/10/2016 to 31/03/2017	01/04/2016 to 30/09/2016	01/10/2016 to 31/03/2017	01/04/2016 to 31/03/2017
EAST ANGLIA	6,786,292	6,749,208	£4,160.00	£3,941.54	£8,101.53
EAST MIDLANDS	2,084,741	2,073,349	£1,277.95	£1,210.84	£2,488.78
NORTH THAMES	1,947,885	1,937,240	£1,273.92	£1,210.78	£2,485.69
NORTH WEST	317,616	315,881	£205.50	£195.21	£400.71
WEST MIDLANDS	3,365,601	3,347,210	£2,187.64	£2,078.62	£4,266.26
CADENT	14,502,135	14,422,888	£9,105.00	£8,636.98	£17,741.98

Table 9. Financial Adjustment by LDZ for the period 1 April 2016 to 31 March 2017

The overall financial value for the Commodity Charge Adjustment is therefore £17,741.98, a recovery of monies from Domestic Shippers under the RbD process.

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5. Leakage Volume (LVt) and Shrinkage Volume (ASVt)

5.1 Introduction

This section provides the LVt and ASVt 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 (LVt) and actual Shrinkage volume (ASVt) 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 purpose 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. This is to avoid potential windfall gains and 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. LVt and ASVt for the 2016/17 Formula Year

Table 10 overleaf provides the LVt and ASVt values for the 2016/17 formula year by LDZ and indicates the calorific value assumptions used to calculate these.

	LEAKAGE VOLUME (LVt)	OUG	TOG	SHRINKAGE VOLUME (ASVt)	ASSUMED CALORIFIC VALUE (MJ/m ³)
EAST ANGLIA	198.8	4.8	8.5	212.1	39.35
EAST MIDLANDS	220.0	6.4	11.3	237.7	39.55
NORTH THAMES	222.9	5.9	10.4	239.1	39.43
NORTH WEST	310.6	7.4	13.1	331.2	39.50
WEST MIDLANDS	273.3	5.1	9.0	287.4	39.42
CADENT	1,225.6	29.5	52.2	1,307.4	39.45

Table 10. 2016/17 LDZ LVt and ASVt (GWh)

Table 11 below provides the LVt and ASVt values for the 2016/17 formula year by Network.

	LEAKAGE VOLUME (LVt)	SHRINKAGE VOLUME (ASVt)
EAST of ENGLAND	418.8	449.7
NORTH THAMES	222.9	239.1
NORTH WEST	310.6	331.2
WEST MIDLANDS	273.3	287.4
CADENT	1,225.6	1,307.4

Table 11. 2016/17 Network LVt and ASVt (GWh)