

# **Shrinkage Assessment & Adjustment**

## **1 April 2017 – 31 March 2018**

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# Table of Contents

1. Executive Summary.....	3
2. Shrinkage Quantity Assessment.....	5
2.1 Leakage.....	5
2.1.1 Assessment of 2017/18 Leakage.....	5
2.1.2 Differences between Estimated and Assessed Leakage.....	5
2.2 Own Use Gas.....	5
2.3 Theft of Gas.....	6
2.4 LDZ Specific Shrinkage Quantities.....	7
2.4.1 Reasons for Differences.....	7
3. Shrinkage Adjustment.....	8
3.1 Introduction.....	8
3.2 LDZ Shrinkage Reconciliation Calculations.....	8
3.3 Energy Financial Adjustment.....	9
4. Shrinkage Commodity Charge.....	10
4.1 Introduction.....	10
4.2 Applicable Commodity Charges.....	10
4.3 LDZ Shrinkage Reconciliation Quantities.....	11
4.4 Financial Adjustment.....	11
5. Leakage Volume (LVt) and Shrinkage Volume (ASVt).....	13
5.1 Introduction.....	13
5.2. LVt and ASVt for the 2017/18 Formula Year.....	13

# Assessment & Adjustment

## 1 April 2017 – 31 March 2018

### 1. Executive Summary

This document presents an assessment of LDZ Shrinkage for the period 1 April 2017 – 31 March 2018, 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 2017/18, issued 1 March 2017, proposed individual LDZ Shrinkage Quantities equating to a total annual Shrinkage Quantity of 1,273 GWh. The Final Proposal for the Formula Year 2017/18 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 2017/18 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 (1,271.9 GWh) is 1.1 GWh (0.1%) lower than the volume of Shrinkage purchased. The leakage assessment resulted in calculated leakage volume of 1,189.8 GWh, which is 1.3 GWh (0.01%) lower than originally estimated.

In addition to a decrease in leakage there was an increase of 0.1 GWh in the assessed volumes for Own Use Gas and Theft of Gas.

The assessed Shrinkage volume is lower than the estimated volume, we will therefore recover monies to the value of £18,846.74 from Shippers and a further amount of £874.27 for Commodity Charges.

The Leakage Volume (LVt) and Actual Shrinkage Volume (ASVt) to be used for incentive revenue purposes for 2017/18 are 1,187.1 GWh and 1,269.2 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.

# Assessment & Adjustment

## 1 April 2017 – 31 March 2018

## 2. Shrinkage Quantity Assessment

### 2.1 Leakage

LDZ specific Shrinkage Quantities for 2017/18 were proposed based on an assessment of leakage with the anticipated mains replacement being taken into account, leading to an assumed procurement of 1,191 GWh for leakage.

#### 2.1.1 Assessment of 2017/18 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 2017/18 proposals by approximately 1.3 GWh.

	ESTIMATED LEAKAGE (GWh)	ASSESSED LEAKAGE (GWh)	DIFFERENCE (GWh)
EAST ANGLIA	192.4	196.1	3.7
EAST MIDLANDS	210.0	212.0	2.1
NORTH THAMES	215.3	211.4	-3.9
NORTH WEST	305.8	303.3	-2.5
WEST MIDLANDS	267.5	266.9	-0.6
CADENT	1,191.1	1,189.8	-1.3

Table 1. Estimated and Assessed Leakage Energy by LDZ for 2017/18

#### 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 2017/18 in respect of Own Use Gas were based on the application of the standard factor (0.0113% of consumption) to our 2017/18 demand forecast. The actual demand in 2017/18 was higher than that used for the forecast calculation, the impact of this is a difference between estimated and assessed volumes of 0.04 GWh.

	ESTIMATED 2017/18 CONSUMPTION (GWh)	2017/18 ACTUAL CONSUMPTION (GWh)	ESTIMATED OUG (GWh)	ASSESSED OUG (GWh)	ADJUSTMENT (GWh)
EAST ANGLIA	42,802	42,597	4.8	4.8	-0.02
EAST MIDLANDS	56,475	56,695	6.4	6.4	0.02
NORTH THAMES	51,933	51,479	5.9	5.8	-0.05
NORTH WEST	65,855	66,240	7.4	7.5	0.04
WEST MIDLANDS	44,986	45,416	5.1	5.1	0.05
CADENT	262,051	262,427	29.6	29.7	0.04

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 2017/18 in respect of Theft of Gas (TOG) were based on the application of the standard factor (0.02% of consumption) to our 2017/18 demand forecast. The impact of the difference in demand between estimated and assessed gives a volume difference of 0.08 GWh.

	ESTIMATED 2017/18 CONSUMPTION (GWh)	2017/18 ACTUAL CONSUMPTION (GWh)	ESTIMATED TOG (GWh)	ASSESSED TOG (GWh)	ADJUSTMENT (GWh)
EAST ANGLIA	42,802	42,597	8.6	8.5	-0.04
EAST MIDLANDS	56,475	56,695	11.3	11.3	0.04
NORTH THAMES	51,933	51,479	10.4	10.3	-0.09
NORTH WEST	65,855	66,240	13.2	13.2	0.08
WEST MIDLANDS	44,986	45,416	9.0	9.1	0.09
CADENT	262,051	262,427	52.4	52.5	0.08

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 2017/18 in January 2017, 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 2017. 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	205.8	209.5	3.6	9,951
EAST MIDLANDS	227.7	229.8	2.1	5,834
NORTH THAMES	231.5	227.5	-4.0	-10,952
NORTH WEST	326.5	324.0	-2.4	-6,645
WEST MIDLANDS	281.6	281.1	-0.5	-1,339
CADENT	1,273.1	1,271.9	-1.1	-3,149

**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 are minimal which demonstrates the quality of our forecasting team. There is a marginal impact from higher than forecasted demand levels, which impact Own Use Gas and Theft of Gas. The remaining difference is being impacted by minor differences in forecast assumptions against actual performance in the areas of Mains Replacement, Average System Pressures and MEG Treatment.

# Assessment & Adjustment

## 1s April 2017 – 31st March 2018

### 3. Shrinkage Adjustment

#### 3.1 Introduction

This section advises Shippers of the Shrinkage Adjustment for Cadent operated LDZs for the period 1 April 2017 to 31 March 2018, 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 Cadent 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 2017 to 31 March 2018.

	LDZ RECONCILIATION QUANTITY (kWh/day)
EAST ANGLIA	9,951
EAST MIDLANDS	5,834
NORTH THAMES	-10,952
NORTH WEST	-6,645
WEST MIDLANDS	-1,339
CADENT	-3,149

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



### 3.3 Energy Financial Adjustment

The Financial Adjustment (FA) due to Cadent 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 affected portfolio in each LDZ for each month.

Table 6 below, shows the financial adjustment by LDZ for the period 1 April 2017 to 31 March 2018, 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	9,951	£59,550.59
EAST MIDLANDS	5,834	£34,914.61
NORTH THAMES	-10,952	-£65,538.30
NORTH WEST	-6,645	-£39,763.52
WEST MIDLANDS	-1,339	-£8,010.13
CADENT	-3,149	-£18,846.74

**Table 6. LDZ Shrinkage Reconciliation for the period 1 April 2017 to 31 March 2018**

The assessed Shrinkage volume is higher than the estimated volume therefore we will recover monies to the value of £18,846.74 from Shippers and a further amount of £874.27 for Commodity Charges.

# Assessment & Adjustment

## 1 April 2017 – 31 March 2018

### 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 2017 to 31 March 2018.

#### 4.2 Applicable Commodity Charges

Table 7 below, shows the Commodity Charges that applied over the period 1 April 2017 to 31 March 2018.

		PERIOD OF APPLICATION	
		01/04/2017 to 30/09/2017	01/10/2017 to 31/03/2018
NTS SO EXIT COMMODITY (p/kWh)		0.0105	0.0106
NTS TO EXIT COMMODITY (p/kWh)		0.0234	0.0235
LDZ SYSTEM COMMODITY CHARGE (p/kWh)	EAST ANGLIA	0.0287	0.0287
	EAST MIDLANDS	0.0287	0.0287
	NORTH THAMES	0.0309	0.0309
	NORTH WEST	0.0309	0.0309
	WEST MIDLANDS	0.0312	0.0312

Table 7. Applicable Commodity Charges 1 April 2017 to 31 March 2018

### 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	01/04/2017 to 30/09/2017	01/10/2017 to 31/03/2018
EAST ANGLIA	3,632,238	1,821,095	1,811,143
EAST MIDLANDS	2,129,587	1,067,711	1,061,876
NORTH THAMES	-3,997,453	-2,004,203	-1,993,251
NORTH WEST	-2,425,342	-1,215,994	-1,209,349
WEST MIDLANDS	-488,571	-244,955	-243,616
CADENT	-1,149,541	-576,345	-573,196

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.

$$\sum_{EA}^{WM} FA_{cc} (£) = \sum_{01/04/17}^{30/09/17} LRQ(kWh) \times CC_1 (£/kWh) + \sum_{01/10/17}^{31/03/18} LRQ(kWh) \times CC_2 (£/kWh)$$

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 2017 to 30 September 2018

$CC_2 (£/kWh)$  = Commodity Charge applicable to the period 1 October 2017 to 31 March 2018

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		
	01/04/2017 to 30/09/2017	01/10/2017 to 31/03/2018	01/04/2017 to 30/09/2017	01/10/2017 to 31/03/2018	01/04/2017 to 31/03/2018
EAST ANGLIA	1,821,095	1,811,143	£1,140.01	£1,137.40	£2,277.40
EAST MIDLANDS	1,067,711	1,061,876	£668.39	£666.86	£1,335.25
NORTH THAMES	-2,004,203	-1,993,251	-£1,298.72	-£1,295.61	-£2,594.34
NORTH WEST	-1,215,994	-1,209,349	-£787.96	-£786.08	-£1,574.04
WEST MIDLANDS	-244,955	-243,616	-£159.47	-£159.08	-£318.55
CADENT	-576,345	-573,196	-£437.76	-£436.51	-£874.27

**Table 9. Financial Adjustment by LDZ for the period 1 April 2017 to 31 March 2018**

The overall financial value for the Commodity Charge Adjustment is therefore £874.27, a recovery of monies from Domestic Shippers.

# **Assessment & Adjustment**

## **1 April 2017 – 31 March 2018**

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

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#### **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 2017/18 Formula Year**

Table 10 overleaf provides the LVt and ASVt values for the 2017/18 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 <sup>3</sup> )
EAST ANGLIA	196.7	4.8	8.5	210.0	39.30
EAST MIDLANDS	212.2	6.4	11.3	229.9	39.46
NORTH THAMES	211.4	5.8	10.3	227.6	39.34
NORTH WEST	300.8	7.5	13.2	321.5	39.53
WEST MIDLANDS	266.0	5.1	9.1	280.2	39.43
CADENT	1,187.1	29.7	52.5	1,269.2	39.41

Table 10. 2017/18 LDZ LVt and ASVt (GWh)

Table 11 below provides the LVt and ASVt values for the 2017/18 formula year by Network.

	LEAKAGE VOLUME (LVt)	SHRINKAGE VOLUME (ASVt)
EAST of ENGLAND	408.8	439.9
NORTH THAMES	211.4	227.6
NORTH WEST	300.8	321.5
WEST MIDLANDS	266.0	280.2
CADENT	1,187.1	1,269.2

Table 11. 2017/18 Network LVt and ASVt (GWh)