

# SGN

## LDZ Shrinkage

## Assessment and Adjustment

## For 1 April 2016 - 31 March 2017

July 2017



# SGN

Your gas. Our network.

# Contents

<b>1 Executive Summary .....</b>	<b>3</b>
<b>2 LDZ Shrinkage Quantity Assessment .....</b>	<b>3</b>
2.1 Assessment of 2016/17 Leakage .....	3
2.2 Operational Usage .....	4
2.3 Theft of Gas .....	5
2.4 LDZ Specific Shrinkage Quantities .....	5
<b>3 LDZ Specific Shrinkage Adjustment .....</b>	<b>6</b>
3.1 Introduction.....	6
3.2 LDZ Shrinkage Reconciliation Calculations .....	6
3.3 Financial Adjustment .....	7
<b>4 LDZ Shrinkage Commodity Charge Adjustment.....</b>	<b>Error! Bookmark not defined.8</b>
4.1 Introduction.....	8
4.2 Commodity Charges .....	8
4.3 LDZ Shrinkage Reconciliation Quantities.....	8
4.4 Financial Adjustment.....	9

# LDZ Shrinkage Assessment and Adjustment for the Period 1 April 2016 – 31 March 2017

## 1 Executive Summary

The purpose of this document is to present an assessment of LDZ Shrinkage for the period 1 April 2016 to 31 March 2017, in accordance with Uniform Network Code Section N 3.3.3, 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 License.

In accordance with Uniform Network Code Section N3.3.3 the following information provides an assessment of shrinkage for Scotland, Thurso, Wick, Campbeltown, Oban, Stranraer, South, and South East LDZs. SGNs Final LDZ Shrinkage Proposals for the Formula Year 2016/17 were 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
- Transporter responsible Theft of Gas with a single factor being applied across all LDZs

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

For the 2016/17 shrinkage assessment, SGN has applied V1.4, which has been approved for use. The assessment for the purposes of the 2016/17 shrinkage adjustment has resulted in annual shrinkage for 2016/17 of **732.4 GWh**, which is **4.3 GWh** lower than estimated.

The Leakage Volume (LVt) and Actual Shrinkage Volume (ASVt) to be used for incentive revenue purposes for 2016/17 are 687.8 GWh (LVt) and 733.1 GWh (ASVt). The values relating to each specific LDZ can be found in Table 1. 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 same calorific value assumptions underpinning 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 2016/17 were proposed based on an assessment of leakage for the formula year 2014/15. SGN applied V1.4 of the Leakage Model to carry out the assessment of leakage for the formula Year 2016/17. No further amendments have been made to the methodologies applied within the leakage model.

LDZ	Baseline CV				Actual CV	
	2016/17 Assessed Shrinkage - ASVt (GWh)	2016/17 Assessed Leakage - LVt (GWh)	2016/17 Estimated Leakage (GWh)	2016/17 Estimated Leakage (kWh/Day)	2016/17 Assessed Leakage (GWh)	2016/17 Assessed Leakage (kWh/Day)
South	214.4	202.4	200.9	550,329	203.1	556,472
South East	321.7	303.7	304.7	834,740	305.1	835,969
Scotland	195.9	180.6	186.4	510,767	177.8	487,231
Campbeltown	0.2	0.2	0.2	466	0.2	447
Oban	0.3	0.3	0.3	904	0.3	879
Stranraer	0.3	0.3	0.3	685	0.2	676
Thurso	0.1	0.1	0.1	356	0.1	347
Wick	0.2	0.1	0.2	411	0.1	394
SGN Total	733.1	687.8	693.0	1,898,658	687.1	1,882,416

Estimated and assessed leakage quantities for each LDZ are shown in Table 1;

**Table 1: Estimated and Assessed Energy by LDZ**

As shown in Table 1, above the assessment of leakage has resulted in a decrease in energy of 5.9 GWh.

## 2.2 Operational Usage

Operational Usage is gas, also known as Own Use Gas (OUG), 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, e.g. venting.

Pre-heater fuel is the largest component of OUG and it is determined using the output from a model that utilises the thermodynamic principles of the Joule-Thompson effect and LDZ throughput, calorific value, pressure and temperature data. The OUG factor applied for 2016/17 is 0.0113% which was determined from Advantica's 2006 review of their OUG model.

**Table 2: Assessment of Own Use Gas**

LDZ	Consumption 2016/17 (GWh)	Applied OUG Factor 2016/17	Daily OUG Quantity (kWh)
South	38,351	0.0113%	11,873
South East	57,383		17,765
Scotland	48,673		15,069
Campbeltown	37		12
Oban	34		11
Stranraer	125		39
Thurso	52		16
Wick	49		15
SGN Total	144,705		44,799

The assessment of OUG has resulted in an increase in energy of **0.6 GWh** for the 2016/17 Final Proposal position. This is due to an increase consumption.

## 2.3 Theft of Gas

Uniform Network Code Section N1.3.2 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. Unidentified theft was estimated to be 0.0200% of throughput for 2016/17.

**Table 3: Assessment of Theft of Gas**

LDZ	Consumption 2016/17 (GWh)	Applied ToG Factor 2016/17	Daily ToG Quantity (kWh)
South	38,351	0.0200%	21,014
South East	57,383		31,443
Scotland	48,673		26,670
Campbeltown	37		20
Oban	34		19
Stranraer	125		69
Thurso	52		28
Wick	49		27
SGN Total	144,705		79,290

The assessment of TOG has resulted in an increase in energy of **1.0 GWh** for the 2016/17 Final Proposal position. This is due to an increase consumption.

The quantification of the level of theft and proportion attributable to Transporters is under review – both in the Shrinkage Gas Forum and Theft of Gas Forum.

## 2.4 LDZ Specific Shrinkage Quantities

Scotia Gas Networks made their final LDZ specific Shrinkage Quantities proposal for the Formula Year 2016/17 in February 2016. Scotia Gas Network's proposal was not subject to Ofgem disapproval under Licence Condition A11 (18) disapproval, with the proposed LDZ specific Shrinkage Quantities being applied with effect from the 1 April 2015. The proposed/applied LDZ Shrinkage Quantities are shown in Table 4 below, along with the assessed LDZ specific Shrinkage Quantities for 2016/17 produced in the method detailed within this document.

**Table 4: LDZ Specific Shrinkage Quantities (kWh/day)**

LDZ	Leakage	OUG	ToG	Assessed Shrinkage Quantities 2016/17	Applied Shrinkage Quantities 2016/17	Difference Between Assessed & Applied Quantities (kWh/day)
South	556,472	11,873	21,014	589,360	582,698	6,662
South East	835,969	17,765	31,443	885,177	879,485	5,692
Scotland	487,231	15,069	26,670	528,970	553,036	-24,066
Campbeltown	447	12	20	479	491	-12
Oban	879	11	19	908	925	-17
Stranraer	676	39	69	784	801	-17
Thurso	347	16	28	391	399	-8
Wick	394	15	27	436	440	-4
SGN Total	1,882,416	44,799	79,290	2,006,506	2,018,275	-11,769

The difference between Scotia Gas Network's estimated and assessed LDZ Shrinkage Quantities is 11,769Wh per day, as shown in Table 4.

## 3 LDZ Shrinkage Adjustment

### 3.1 Introduction

This document advises Shippers of the Shrinkage Adjustment for Scotia Gas Networks operated LDZs for the period 1 April 2015 to 31 March 2016, as referred to in the *Uniform 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 (SLRQ) is calculated as the difference between the Assessed and Procured LDZ Shrinkage Quantities. This reconciliation quantity is the amount that Scotia Gas Networks has over or under procured.

Therefore, for each LDZ;

$$\begin{array}{ccccc} \text{LDZ Shrinkage} & & & & \\ \text{Reconciliation Quantity} & = & \text{Assessed LDZ} & - & \text{Procured LDZ} \\ \text{(SLRQ)} & & \text{Shrinkage Quantity} & & \text{Shrinkage} \\ & & \text{(SLAQ)} & & \text{Quantity (SLPQ)} \end{array}$$

Table 5 below shows the LDZ Reconciliation Quantities for the Shrinkage Adjustment for the period 1 April 2016 to 31 March 2017.

LDZ	LDZ Shrinkage Reconciliation Quantity (kWh/day)
South	6,662
South East	5,692
Scotland	-24,066
Campbeltown	-12
Oban	-17
Stranraer	-17
Thurso	-8
Wick	-4
SGN Total	-11,769

### 3.3 Financial Adjustment

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

$$FA(\pounds) = \sum_{1/4/15}^{31/3/16} SLRQ(kWh) \times SAP(p / kWh) / 100$$

Where:

FA (£) = Financial Adjustment

SLRQ (kWh) = LDZ Shrinkage Reconciliation Quantity

SAP = Daily System Average Price for the period 1 April 2016 to 31 March 2017

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 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	LDZ Shrinkage Reconciliation Quantity (kWh/day)	Adjustment Value due to Changes to Shrinkage Quantities
South	6,662	£32,112.32
South East	5,692	£27,440.06
Scotland	-24,066	-£116,011.08
Campbeltown	-12	-£56.70
Oban	-17	-£79.87
Stranraer	-17	-£83.76
Thurso	-8	-£36.49
Wick	-4	-£19.74
SGN Total	-11,769	-£56,735.25

The overall financial value for the Energy Adjustment of £56,735.25 is negative and therefore identified as a credit to SGN and a debit to Shippers.

## 4 LDZ Commodity Charge Adjustment

### 4.1 Introduction

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

### 4.2 Commodity Charges

The following Commodity Charges (£/kWh) applied over the period 1 April 2016 to 31 March 2017.

Commodity	Period of Application	
	01/04/16 to 30/09/16	01/10/16 to 31/03/17
NTS Commodity (=TO+SO)	0.000370	0.000341
LDZ System Commodity Charge	0.000288	0.000288

Table 7: Scotland LDZ Commodity Charges for the 2016/17 period

Commodity	Period of Application	
	01/04/16 to 30/09/16	01/10/16 to 31/03/17
NTS Commodity (=TO+SO)	0.000370	0.000341
LDZ System Commodity Charge	0.000337	0.000337

Table 8: Southern LDZ Commodity Charges for the 2016/17 period

### 4.3 LDZ Shrinkage Reconciliation Quantities

Table 9 below shows the LDZ Shrinkage Reconciliation Quantities (LRQ) for each LDZ for each period of differing Commodity Charges.

Table 9: LDZ Shrinkage Reconciliation Quantities kWh

LDZ	Total over Period	01/04/16 to 30/09/16	01/10/16 to 31/03/17
South	2,431,463	1,219,062	1,212,401
South East	2,077,691	1,041,692	1,036,000
Scotland	-8,784,061	-4,404,064	-4,379,998
Campbeltown	-4,293	-2,153	-2,141
Oban	-6,047	-3,032	-3,015
Stranraer	-6,342	-3,180	-3,162
Thurso	-2,763	-1,385	-1,378
Wick	-1,495	-750	-745
SGN Total	-4,295,848	-2,153,809	-2,142,039

## 4.4 Financial Adjustment

### Scotia Gas Networks

The Financial Adjustment (FA) due to Scotia Gas Networks for Commodity Charge reconciliation is calculated as shown below;

$$FA_{cc} (£) = \sum_{01/04/15}^{30/09/15} LRQ(kWh) \times CC_1 (£/kWh) + \sum_{1/10/15}^{31/03/16} LRQ(kWh) \times CC_2 (£/kWh)$$

Where:

$FA_{cc} (£)$  = Financial Adjustment associated with the SGN LDZ and Customer Commodity Charges

$LRQ (kWh)$  = LDZ Shrinkage Reconciliation Quantity

$CC_1 (£/kWh)$  = SGN LDZ and Customer Commodity Charges applicable to the period 1 April 2016 to 30 September 2016

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

**Table 10 : Financial Adjustment due to Scotia Gas Networks by LDZ for the period 1 April 2016 to 31 March 2017**

Transportation Charges - Scotia Gas Networks					
LDZ	Pricing Period		Pricing Period		Assessment Period
	01/04/16 to 30/09/16	01/10/16 to 31/03/17	01/04/16 to 30/09/16	01/10/16 to 31/01/17	01/04/16 to 31/03/17
	Total Volume (kWh)	Total Volume (kWh)	Total Adjustment	Total Adjustment	Total Adjustment
South	1,219,062	1,212,401	£861.88	£822.01	£1,683.88
South East	1,041,692	1,036,000	£736.48	£702.41	£1,438.88
Scotland	-4,404,064	-4,379,998	-£2,897.87	-£2,755.02	-£5,652.89
Campbeltown	-2,153	-2,141	-£1.42	-£1.35	-£2.76
Oban	-3,032	-3,015	-£2.00	-£1.90	-£3.89
Stranraer	-3,180	-3,162	-£2.09	-£1.99	-£4.08
Thurso	-1,385	-1,378	-£0.91	-£0.87	-£1.78
Wick	-750	-745	-£0.49	-£0.47	-£0.96
SGN Total	-2,153,809	-2,142,039	-£1,306.43	-£1,237.17	-£2,543.60

The overall financial value for the LDZ and Commodity Charge Adjustment is £2,543.60 negative and therefore identified as a credit to SGN and a debit to Shippers.