



LDZ SHRINKAGE ASSESSMENT AND ADJUSTMENT

FOR 1 APRIL 2010 – 31 March 2011

Scotia Gas Networks

September 2011

Version 1.1

CONTENTS

| | Page |
|---|------|
| 1 Executive Summary | 1 |
| 2 LDZ Shrinkage Factor Assessment | 1 |
| 2.1 Leakage..... | 1 |
| 2.1.1 Assessment of 2010/11 Leakage | 1 |
| 2.2 Operational Usage | 2 |
| 2.3 Theft of Gas | 3 |
| 2.4 LDZ Specific Shrinkage Quantities | 3 |
| 2.4.1 Reasons for Differences | 4 |
| 3 LDZ Shrinkage Adjustment | 4 |
| 3.1 Introduction..... | 4 |
| 3.2 LDZ Shrinkage Reconciliation Calculations | 4 |
| 3.3 Financial Adjustment..... | 4 |
| 4 LDZ Shrinkage Commodity Charge Adjustment | 5 |
| 4.2 Commodity Charges..... | 6 |
| 4.3 LDZ Shrinkage Reconciliation Quantities..... | 6 |
| 4.4 Financial Adjustment | 7 |

LDZ Shrinkage Assessment and Adjustment for the Period

1 April 2010 – 31 March 2011

1 Executive Summary

The purpose of this document is to present an assessment of LDZ Shrinkage for the period 1 April 2010 to 31 March 2011, in accordance with *Uniform Network Code Section N 3.3.3*.

In accordance with Uniform Network Code Section N3.3.3 the following information provides an assessment of shrinkage for Scotland, Thurso, Wick, Campbletown, Oban, Stranraer, South, and South East LDZs. SGN's final proposals for the Formula Year 2010/11 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
- Transporter responsible Theft of Gas with a single factor being applied across all LDZs

The assessment of LDZ Shrinkage for the Formula Year 2010/11 detailed within this document provides, where applicable, reasons for significant variance between the estimated and the assessed LDZ Shrinkage Quantities for the period.

For this year's leakage assessment, SGN applied v1.3 of the Leakage Model, which includes the changes to the Low Pressure Service methodology approved by Ofgem last year. SGN 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 2010/11 of 878GWh for the purposes of the Shrinkage Adjustment, which is 17GWh lower than original estimated, and 878GWh¹ for the purposes of the Environmental Emissions Incentive (LV_{ti} as defined in Special Condition E9 of the Distribution Gas Transporter Licences). LDZ specific values can be found in Table 1.

2 LDZ Shrinkage Factor Assessment

2.1 Leakage

LDZ specific Shrinkage Quantities for 2010/11 were proposed based on an assessment of leakage for the formula year 2009/10.

2.1.1 Assessment of 2010/11 Leakage

SGN applied V1.3 of the Leakage Model to carry out the assessment of leakage for the formula Year 2010/11. This version includes the new methodology for calculation of leakage from Low Pressure Services, which takes into account the replacement of metallic services with plastic services, which have lower leakage rates. The industry was consulted in April 2009 and there were no representations received from shippers in respect of this consultation. Therefore, Ofgem approved the use of this new methodology.

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

¹ Calculated using the LDZ specific Baseline CVs and reported net of any applicable caps/collars.

Table 1. Estimated and Assessed Leakage Energy by LDZ

| LDZ | 2010/11 Estimated Leakage (GWh) | 2010/11 Assessed Leakage (GWh) | 2010/11 Estimated Leakage (kWh/Day) | 2010/11 Assessed Leakage (kWh/Day) |
|--------------------|---------------------------------|--------------------------------|-------------------------------------|------------------------------------|
| SOUTH | 269 | 253 | 736,986 | 693,587 |
| SOUTH EAST | 378 | 382 | 1,035,616 | 1,045,244 |
| SCOTLAND | 247 | 242 | 676,712 | 662,696 |
| CAMPBELTOWN | 0.26 | 0.24 | 712 | 660 |
| OBAN | 0.38 | 0.37 | 1,041 | 1,001 |
| STRANRAER | 0.39 | 0.31 | 1,068 | 860 |
| THURSO | 0.25 | 0.24 | 685 | 659 |
| WICK | 0.21 | 0.21 | 575 | 586 |
| Total | 895 | 878 | 2,453,397 | 2,405,292 |

As shown in Table 1, above the assessment of leakage has resulted in a decrease in energy of approximately 17GWh.

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 for 2010/11 of 0.0113% was determined from Advantica's 2006 review of their OUG model. The assessed figure remains the same.

| LDZ | Consumption 2010/11 (GWh) | Applied OUG Factor 2010/11 | Daily OUG Quantity (kWh) |
|--------------------|---------------------------|----------------------------|--------------------------|
| SOUTH | 39995.1947 | 0.0113% | 12,382 |
| SOUTH EAST | 63470.2217 | | 19,650 |
| SCOTLAND | 52775.2251 | | 16,339 |
| CAMPBELTOWN | 35.3450 | | 11 |
| OBAN | 34.8194 | | 11 |
| STRANRAER | 145.5396 | | 45 |
| THURSO | 50.7740 | | 16 |
| WICK | 46.1378 | | 14 |
| SGN | 156,553 | | 48,467 |

Table 2. Assessment of OUG

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 0.02% of throughput for 2010/11.

| LDZ | Consumption 2010/11 (GWh) | Applied ToG Factor 2010/11 | Daily ToG Quantity (kWh) |
|--------------------|---------------------------|----------------------------|--------------------------|
| SOUTH | 39995.1947 | 0.020% | 21,915 |
| SOUTH EAST | 63470.2217 | | 34,778 |
| SCOTLAND | 52775.2251 | | 28,918 |
| CAMPBELTOWN | 35.3450 | | 19 |
| OBAN | 34.8194 | | 19 |
| STRANRAER | 145.5396 | | 80 |
| THURSO | 50.7740 | | 28 |
| WICK | 46.1378 | | 25 |
| SGN | 156,553 | | 85,783 |

Table 3. Assessment of ToG

The assessed figure remains the same. 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 2010/11 in March 2010. 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 2010. The proposed/applied LDZ Shrinkage Quantities are shown in Table 4 below, along with the assessed LDZ specific Shrinkage Quantities for 2010/11 produced in the method detailed within this document.

| LDZ | Leakage | OUG | ToG | Assessed Shrinkage Quantities 2010/11 | Applied Shrinkage Quantities 2010/11 | Difference Between Assessed & Applied Quantities |
|--------------------|------------------|---------------|---------------|---------------------------------------|--------------------------------------|--|
| SOUTH | 693,587 | 12,382 | 21,915 | 727,884 | 774,730 | -46,846 |
| SOUTH EAST | 1,045,244 | 19,650 | 34,778 | 1,099,671 | 1,093,700 | 5,971 |
| SCOTLAND | 662,696 | 16,339 | 28,918 | 707,952 | 726,139 | -18,187 |
| CAMPBELTOWN | 660 | 11 | 19 | 690 | 1,079 | -389 |
| OBAN | 1,001 | 11 | 19 | 1,031 | 729 | 302 |
| STRANRAER | 860 | 45 | 80 | 985 | 1,189 | -204 |
| THURSO | 659 | 16 | 28 | 702 | 715 | -13 |
| WICK | 586 | 14 | 25 | 626 | 622 | 4 |
| Total | 2,405,292 | 48,467 | 85,783 | 2,539,542 | 2,598,903 | -59,361 |

Table 4. LDZ Specific Shrinkage Quantities (kWh/day)

2.4.1 Reasons for Differences

The difference between Scotia Gas Network's estimated and assessed LDZ Shrinkage Quantities is 59,712kWh per day, as displayed in table 4 which is primarily due to a leakage reduction.

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 2010 to 31 March 2011, 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;

$$\text{LDZ Shrinkage Reconciliation Quantity (SLRQ)} = \text{Assessed LDZ Shrinkage Quantity (SLAQ)} - \text{Procured LDZ Shrinkage Quantity (SLPQ)}$$

Table 5 below shows the LDZ Reconciliation Quantities for the Shrinkage Adjustment for the period 1 April 2010 to 31 March 2011.

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

| LDZ | LDZ Shrinkage Reconciliation Quantity (kWh/day) |
|-------------|---|
| SOUTH | -46,846 |
| SOUTH EAST | 5,971 |
| SCOTLAND | -18,187 |
| CAMPBELTOWN | -389 |
| OBAN | 302 |
| STRANRAER | -204 |
| THURSO | -13 |
| WICK | 4 |
| SGN | -59,361 |

3.3 Financial Adjustment

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

$$FA(\pounds) = \sum_{1/4/10}^{31/3/11} SLRQ(kWh) \times SAP(p/kWh) / 100$$

Where:

FA (£) = Financial Adjustment

SLRQ (kWh) = LDZ Shrinkage Reconciliation Quantity

SAP = Daily System Average Price for the period 1 April 2010 to 31 March 2011

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 6, below, shows the financial adjustment by LDZ for the period 1 April 2010 to 31 March 2011, calculated on a daily basis in line with the methodology indicated above.

Table 6. LDZ Shrinkage Reconciliation for the period 1 April 2010 to 31 March 2011

| LDZ | LDZ Shrinkage Reconciliation Quantity (kWh/day) | Adjustment Value due to Changes to Shrinkage Quantities |
|--------------------|--|--|
| SOUTH | -46,846 | -£277,850.79 |
| SOUTH EAST | 5,971 | £35,417.70 |
| SCOTLAND | -18,187 | -£107,867.15 |
| CAMPBELTOWN | -389 | -£2,306.31 |
| OBAN | 302 | £1,791.80 |
| STRANRAER | -204 | -£1,210.10 |
| THURSO | -13 | -£75.29 |
| WICK | 4 | £22.56 |
| SGN | -59,361 | -£352,077.58 |

The overall financial value for the Energy Adjustment, £352,077.58 is therefore a credit to Scotia Gas Networks. Under the rules of Reconciliation by Difference, this is an adjustment of equal and opposite value to Domestic Shippers, i.e. a debit of £352,077.58.

4 LDZ Shrinkage 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 2010 to 31 March 2011.

4.2 Commodity Charges

The following Commodity Charges (£/kWh) applied over the period 1 April 2010 to 31 March 2011.

Scotland LDZs

| Commodity | Period of Application | | |
|--------------------------------|------------------------|------------------------|-----------------------|
| | 1/04/10 to 30/09/10 | 1/10/10 to 31/01/11 | 1/2/11 to 31/03/11 |
| NTS Commodity | 0.000196 | 0.000192 | 0.000051 |
| LDZ System Commodity Charge | 0.000182 | 0.000182 | 0.000182 |

Table 7.1. Scotland Commodity Charges for the period 1 April 2010 to 31 March 2011

Southern and South-Eastern LDZs

| Commodity | Period of Application | | |
|--------------------------------|------------------------|------------------------|-----------------------|
| | 1/04/10 to 30/09/10 | 1/10/10 to 31/01/11 | 1/2/11 to 31/03/11 |
| NTS Commodity | 0.000196 | 0.000192 | 0.000051 |
| LDZ System Commodity Charge | 0.000227 | 0.000227 | 0.000227 |

Table 7.2. Southern Commodity Charges for the period 1 April 2010 to 31 March 2011

4.3 LDZ Shrinkage Reconciliation Quantities

Table 8, below, shows the LDZ Shrinkage Reconciliation Quantities (LRQ) for each LDZ for each period of differing Commodity Charges.

Table 8. LDZ Shrinkage Reconciliation Quantities

| LDZ | Total over Period | 1/04/10 to 30/09/10 | 1/10/10 to 31/01/11 | 1/2/11 to 31/03/11 |
|--------------------|----------------------|------------------------|------------------------|-----------------------|
| SOUTH | -17,098,796 | -8,572,821 | -5,762,060 | -2,763,915 |
| SOUTH EAST | 2,179,587 | 1,092,779 | 734,491 | 352,317 |
| SCOTLAND | -6,638,090 | -3,328,138 | -2,236,945 | -1,073,006 |
| CAMPBELTOWN | -141,929 | -71,159 | -47,828 | -22,942 |
| OBAN | 110,267 | 55,284 | 37,158 | 17,824 |
| STRANRAER | -74,469 | -37,336 | -25,095 | -12,037 |
| THURSO | -4,634 | -2,323 | -1,561 | -749 |
| WICK | 1,388 | 696 | 468 | 224 |
| SGN | -21,666,674 | -10,863,018 | -7,301,372 | -3,502,284 |

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;

$$FA_{cc} (£) = \sum_{1/04/10}^{30/09/10} LRQ(kWh) \times CC_1 (£/kWh) + \sum_{1/10/10}^{31/1/11} LRQ(kWh) \times CC_2 (£/kWh) + \sum_{1/2/11}^{31/3/11} LRQ(kWh) \times CC_2 (£/kWh)$$

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 2010 to 31 March 2011

$CC_2 (£/kWh)$ = SGN LDZ and Customer Commodity Charge applicable to the period 1 April 2010 to 31 March 2011

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

| Transportation Charges - Scotia Gas Networks | | | | | | | |
|--|---------------------|---------------------|--------------------|---------------------|---------------------|--------------------|----------------------|
| | Pricing Period | | | Pricing Period | | | Assessment Period |
| | 1/04/10 to 30/09/10 | 1/10/10 to 31/01/11 | 1/2/11 to 31/03/11 | 1/04/10 to 30/09/10 | 1/10/10 to 31/01/11 | 1/2/11 to 31/03/11 | 01/04/10 to 31/03/11 |
| LDZ | Total Volume (kWh) | Total Volume (kWh) | Total Volume (kWh) | Total Adjustment | Total Adjustment | Total Adjustment | Total Adjustment |
| SOUTH | -8,572,821 | -5,762,060 | -2,763,915 | -£3,626.30 | -£2,414.30 | -£768.37 | -£6,808.97 |
| SOUTH EAST | 1,092,779 | 734,491 | 352,317 | £462.25 | £307.75 | £97.94 | £867.94 |
| SCOTLAND | -3,328,138 | -2,236,945 | -1,073,006 | -£1,258.04 | -£836.62 | -£250.01 | -£2,344.66 |
| CAMPBELTOWN | -71,159 | -47,828 | -22,942 | -£26.90 | -£17.89 | -£5.35 | -£50.13 |
| OBAN | 55,284 | 37,158 | 17,824 | £20.90 | £13.90 | £4.15 | £38.95 |
| STRANRAER | -37,336 | -25,095 | -12,037 | -£14.11 | -£9.39 | -£2.80 | -£26.30 |
| THURSO | -2,323 | -1,561 | -749 | -£0.88 | -£0.58 | -£0.17 | -£1.64 |
| WICK | 696 | 468 | 224 | £0.26 | £0.17 | £0.05 | £0.49 |
| SGN | -10,863,018 | -7,301,372 | -3,502,284 | -£4,442.82 | -£2,956.95 | -£924.55 | -£8,324.33 |

Table 9. Financial Adjustment due to Scotia Gas Networks, by LDZ for the period 1 April 2010 to 31 March 2011

The overall financial value for the LDZ and Commodity Charge Adjustment is therefore £8,324.33, a debit to Domestic Shippers under the RbD Process.