Scotland Gas Networks
LDZ Transportation Charges

Effective from 1 October 2011

Published 1st October 2011

Contents

Page No

1. INTRODUCTION **3**

2. LDZ TRANSPORTATION CHARGES EFFECTIVE FROM 1 OCTOBER 2011 **4**

2.1 INTRODUCTION 4

2.2 LDZ SYSTEM CHARGES 5

2.3 LDZ CUSTOMER CHARGES 7

2.4 OTHER CHARGES 8

2.5 EXAMPLES 9

APPENDIX 2A **12**

ESTIMATION OF PEAK DAY LOAD FOR NON-DAILY METERED SUPPLY POINTS 12

3. APPLICATION OF THE LDZ CHARGES METHODOLOGY **15**

3.1 INTRODUCTION 15

3.2 LDZ SYSTEM CHARGES METHODOLOGY 17

3.3 LDZ CUSTOMER AND OTHER CHARGES METHODOLOGY 21

1. INTRODUCTION

Scotia Gas Networks Limited acquired the Scotland and the South of England gas distribution networks from National Grid Transco on 1 June 2005. SGN is the holding company of Scotland Gas Networks and Southern Gas Networks.

Scotland Gas Networks is responsible for transporting gas safely and reliably to over 1.8 million customers within the Scotland distribution network through 25,000km of gas mains. Gas transportation is carried out to meet the needs of the companies that supply gas to domestic, commercial and industrial consumers and to power stations.

This publication sets out the LDZ transportation charges which apply for the use of the Scotland Gas Networks pipeline network from 1 October 2011. The charges are set to comply with the price control arrangements from 1 April 2008.

The Scotland gas distribution network used to be a Local Distribution Zone (LDZ) under the previous Transco industry structure. The term LDZ is still used in Billing, in the calculation of load factors and in the Network Code with respect to charges. It is therefore still used in this publication with reference to the charges.

Details of Scotland Gas Networks and its activities can be found on its Internet web site at **www.scotlandgasnetworks.co.uk**. An electronic version of this publication can be found on this website.

2. LDZ TRANSPORTATION CHARGES EFFECTIVE FROM 1 OCTOBER 2011

2.1 Introduction

This publication sets out the LDZ transportation charges which apply from 1 October 2011 for the use of Scotland Gas Networks gas distribution network, as required by Standard Special Condition A4 of the Gas Transporter Licence. It is being republished on 1 October 2011 because although the charges for Firm transportation are not changing from those published on 1 April 2011 the discounts previously available for Interruptible transportation cease as from 1 October 2011 and all supply points will pay Firm charges from that date. The document has therefore been amended to show only the Firm transportation charges. This document does not override or vary any of the statutory, licence or Network Code obligations upon Scotland Gas Networks.

For more information on the charges set out in this document, contact via email at **pricingteam@sgn.co.uk**.

2.1.1 Uniform Network Code

The Network Code is supported by an integrated set of computer systems called UK Link. The charges and formulae in this booklet will be used in the calculation of charges within UK Link, which are definitive for billing purposes.

There are a number of areas of the Network Code that impact upon the cost to shippers of using the transportation network, such as imbalance charges, scheduling charges, capacity over-runs and ratchets, top-up neutrality charges and contractual liability. Reference should be made to the Network Code – as modified from time to time – for details of such charges and liabilities. The Uniform Network Code and related documents can be found on the Joint Office of Gas Transporters website **www.gasgovernance.co.uk**

2.1.2 Units

Commodity charges are expressed and billed in pence per kilowatt hour (kWh).

Capacity charges are expressed and billed in pence per peak day kilowatt hour per day.

Fixed charges are expressed and billed in pence per day.

2.1.3 Invoicing

The Xoserve Invoicing team produce and issue the invoices that are derived from the transportation charges shown within this publication. To clarify this link between pricing and invoicing, charge codes and invoice names are included in the tables.

For more information on invoicing, please contact Xoserve, the invoicing service provider, via e-mail at **css.billing@xoserve.com.**

2.1.4 The distribution price control formula

Distribution transportation charges are derived in relation to a price control formula set by Ofgem, the gas and electricity market regulator, for the transportation of gas. This formula dictates the maximum revenue that can be earned from the transportation of gas. Should the DN operator earn more or less than the maximum permitted revenue in any formula year, a compensating adjustment is made in the following year. Under the revised Licences the normal date for changing any of the charges is 1 April.

Within the distribution price control, revenue recovery is split between LDZ system charges and customer charges. The relative level of these charges is based on the relative level of costs of these areas of activity.

2.1.5 Firm transportation

LDZ firm transportation charges comprise LDZ capacity and commodity charges plus customer charges

2.1.6 Theft of Gas

The licensing regime places incentives on transporters, shippers and suppliers to take action in respect of suspected theft of gas. Certain costs associated with individual cases of theft are recovered through transportation charges. The charges reflect these requirements, with the transporter remaining cash neutral in the process.

2.1.7 Isolations and Disconnections

Where a shipper has left a Supply Meter physically connected to the Transporter's network following a UNC Isolation and Withdrawal, 12 months after the effective Withdrawal, the Transporter must take action to disable the flow of gas where the shipper has not undertaken a physical disconnection of the meter. The Transporter is permitted to pass the costs incurred in undertaking the work to the last Registered User. The Transporter will calculate the charge to the shipper on a fully absorbed time and materials basis, consistent with the charging principles set out in the Transporter's 4B Connections Charging Methodology Statement.

2.18 Relationship of Charges to Price Control Maximum Allowed Revenue

Based on the price control formula for the Formula Year 2011/12 the Maximum Allowed Revenue (MAR) for Scotland Network for 2011/12 is estimated to be **£253.8m** which is 10.2% higher than the MAR for 2010/11.
Of the 10.2% increase 6.6% is due to higher Core Allowed Revenue as a result of the original phasing and the level of inflation at the end of 2010. The balance of the increase is due to higher Repex and Shrinkage allowances and to the level of K brought forward from 2010/11.The transportation charges in place prior to 1 April 2011 were estimated to recover £217.2m during 2011/12. In order to bring the collected revenue into line with the MAR, charges have been increased by 17.5% on average from 1 April 2011.

From 1st April 2011, the distribution transportation charges in respect of a typical domestic load, consuming 16,000 kWh/annum, are estimated to be £112 per annum excl VAT.For the purposes of setting charges, throughput volumes forecast for 2011/12 reflect actual volumes in recent years and capacity (SOQ) forecasts reflect the trend in declining SOQs over recent years.

2.2 LDZ System Charges

The standard LDZ system charges comprise capacity and commodity charges, with separate functions for directly connected supply points and for Connected System Exit Points (CSEPs).

Where the LDZ charges are based on functions, these functions use Supply point Offtake Quantity (SOQ) in the determination of the charges. At Daily Metered (DM) firm supply points the SOQ is the registered supply point capacity. For Non-Daily metered (NDM) supply points, the SOQ is calculated using the supply point End User Category (EUC) and the appropriate load factor. Details of EUCs and load factors are shown in Appendix 2A of this document.

2.2.1 Directly Connected Supply Points

The unit charges and charging functions used to calculate charges to directly connected supply points are set out in Table 2.2.1 below.

Table 2.2.1 Directly connected supply points

Invoice	Charge Code
LDZ Capacity	ZCA
LDZ Commodity	ZCO

	Capacity Firm	Commodity
	pence per pk day kWh per day	pence per kWh
Up to 73,200 kWh per annum	0.1624	0.0214
73,200 to 732,000 kWh per annum	0.1503	0.0197
732,000 kWh per annum and above	$0.7128 \times SOQ^{-0.1806}$	$0.1229 \times SOQ^{-0.2121}$
Subject to a minimum rate of	0.0163	0.0018
Minimum reached at SOQ of	1,215,000,000 kWh	440,000,000 kWh

2.2.2 Connected Systems

A separate charging function for transportation to Connected System Exit Points (CSEPs) was introduced from 1 October 2000. This function reflects the view that transportation to CSEP loads may make less use of the distribution system than to other similar-sized loads. In the calculation of the LDZ charges payable, the unit commodity and capacity charges are based on the supply point capacity equal to the CSEP peak day load for the completed development irrespective of the actual stage of development.

The SOQ used is therefore the estimated SOQ for the completed development as provided in the appropriate Network Exit Agreement (NExA). For any particular CSEP, each shipper will pay identical LDZ unit charges regardless of the proportion of gas shipped. Reference needs to be made to the relevant NExA or CSEP ancillary agreement to determine the completed supply point capacity.

Table 2.2.2 Connected Systems

Invoice	Charge Code
ADC Capacity	891
ADC Commodity	893

	Capacity Firm	Commodity
	pence per pk day kWh	pence per kWh
Up to 73,200 kWh per annum	0.1624	0.0214
73,200 to 732,000 kWh pa	0.1503	0.0197
732,000 kWh pa and above	$0.7542 \times SOQ^{-0.1939}$	$0.1173 \times SOQ^{-0.2131}$
Subject to a minimum rate of	0.0163	0.0018
Minimum reached at SOQ of	387,500,000 kWh	325,000,000 kWh

2.2.3 Optional LDZ Charge

The optional LDZ tariff is available, as a single charge, as an alternative to the standard LDZ system charges. This tariff may be attractive to large loads located close to the NTS. The rationale for the optional tariff is that, for large Network loads located close to the NTS or for potential new Network loads in a similar situation, the standard LDZ tariff can appear to give perverse economic incentives for the construction of new pipelines when Network connections are already available. This could result in an inefficient outcome for all system users.

The charge is calculated using the function below:

Invoice	Charge Code
ADU	881

Pence per peak day kWh per day
$902 \times [(SOQ)^{-0.834}] \times D + 772 \times (SOQ)^{-0.717}$

Where (SOQ) is the Registered Supply Point Capacity, or other appropriate measure, in kWh per day and D is the direct distance, in km, from the site boundary to the nearest point on the NTS. Note that ^ means "to the power of …"

Further information on the optional LDZ tariff can be obtained from the pricing team at **pricingteam@sgn.co.uk**

2.3 LDZ Customer Charges

For supply points with an AQ of less than 73,200 kWh per annum, the customer charge is a capacity charge.

For supply points with an AQ between 73,200 and 732,000 kWh per annum, the customer charge is made up of a fixed charge which depends on the frequency of meter reading, plus a capacity charge based on the registered supply point capacity (SOQ).

For supply points with an AQ of over 732,000 kWh per annum, the customer charge is based on a function related to the registered supply point capacity (SOQ).

Table 2.3 LDZ Customer charges

Up to 73,200 kWh per annum

Invoice	**Charge Code**
Capacity	CCA

	Pence per peak day kWh per day
Capacity charge	0.0908

73,200 kWh up to 732,000 kWh per annum

Invoice	**Charge Code**
LDZ Capacity	CFI

Fixed charge	**Pence per day**
Non-monthly read supply points	25.0635
Monthly read supply points	26.6872

Invoice	**Charge Code**
LDZ Capacity	CCA

	Pence per peak day kWh per day
Capacity charge	0.0029

732,000 kWh per annum and above

Invoice	**Charge Code**
LDZ Capacity	CCA

	Pence per peak day kWh per day
Charging function	$0.0609 \times SOQ^{-0.2100}$

2.4 Other Charges

Other Charges include administration charges at Connected System Exit Points, Shared Supply Meter Points and charges for Must Reads.

2.4.1 Connected System Exit Points

A CSEP is a system point comprising one or more individual exit points which are not supply meter points. This includes connections to a pipeline system operated by a Gas Transporter other than Scotland Gas Networks.

The calculation of LDZ charges payable for shipping to CSEPs is explained in section 2.2.2.

There is no customer charge payable for connected systems, however separate administration processes are required to manage the daily operations and invoicing associated with CSEPs for which an administration charge is made.

The administration charge which applies to CSEPs containing NDM and DM sites is:

CSEP administration charge

Charge per supply point	0.1020 pence per day (£0.37 per annum)

The invoice and charge codes are:

	Invoice	Charge Code
DM CSEP	ADU	883
NDM CSEP	ADC	894

2.4.2 Shared supply meter point allocation arrangements

An allocation service for daily metered supply points with AQs of more than 58,600 MWh per annum is available. This allows shippers / suppliers to supply gas through a shared supply meter point.

The allocation of daily gas flows between the shippers / suppliers can be done either by an appointed agent or by the transporter.

The administration charges which relate to these arrangements are shown below. Individual charges depend on the type of allocation service nominated and whether the site is telemetered or non-telemetered.

The charges are (expressed as £ per shipper per supply point):

Invoice	Charge Code
ADU	883

Agent Service

	Telemetered	Non-telemetered
Set-up charge	£107.00	£183.00
Shipper-shipper transfer charge	£126.00	£210.00
Daily charge	£2.55	£2.96

Transporter Service

	Telemetered	Non-telemetered
Set-up charge	£107.00	£202.00
Shipper-shipper transfer charge	£126.00	£210.00
Daily charge	£2.55	£3.05

2.5 Examples

Notes

1. Charges produced by UK Link are definitive for charging purposes. Calculations below are subject to rounding and should be regarded as purely illustrative.
2. The commodity charges in these examples are based on the supply point AQ, but the actual charges would vary depending on the actual consumption of the supply point.

Example 1

A shipper has a daily metered customer in Perth, with an annual consumption **(AQ)** of **20,000,000** kWh and a registered supply point capacity **(SOQ)**, booked directly by the shipper of **100,000** kWh per day.

Process	Calculations Used
LDZ Capacity **Invoice:** LDZCapacity (ZCA) **See**: Table 2.2.1 **Basis:** p / peak day kWh / day	**Volume:** 365 days × 100,000 **(SOQ)** = 36,500,000 **Unit Rate**: 0.7128× 100,000 **(SOQ)** ^ -0.1806 = 0.0891p / pdkWh / day **Annual Charge**: **£32,528**
Plus	
LDZ Commodity **Invoice:** Commodity (ZCO) **See**: Table 2.2.1 **Basis:** p / kWh	**Volume**: 20,000,000 **(AQ)** **Unit Rate**: 0.1229 × 100,000 **(SOQ)** ^ -0.2121 = 0.0107p / kWh **Annual Charge**: **£2,138**
Plus	
Customer (Capacity) **Invoice:** LDZCapacity (CCA) **See**: Table 2.3 **Basis:** p / peak day kWh / day	**Volume:** 365 days × 100,000 **(SOQ)** = 36,500,000 **Unit Rate**: 0.0609 × 100,000**(SOQ)** ^ -0.2100 =0.0054p / pdkWh / day **Annual Charge**: **£1,981**
Equals	
Total Network Charge	Total annual network charge =£36,647

Unit Charge: Dividing by the annual load of 20,000,000 kWh gives a unit charge 0.1832pence per kWh.

Example 2

A shipper has a domestic customer in Glasgow. Suppose the load has an **AQ** of **20,000** kWh per annum. Using Table 2A.1, End User Categories, in Appendix 2A, this annual load places the end user in category E1101B. Using the appropriate small NDM supply points table of load factors, it can be seen that the load factor for such a site in the Scotland Gas Networks is 37.3 %.The peak day load **(SOQ)** is therefore 20,000 ÷ (365 × 0.373) =146.9kWh.

Process	Calculations Used
LDZ Capacity **Invoice:** LDZCapacity (ZCA) **See**: Table 2.2.1 **Basis:** p / peak day kWh / day	**Volume**:365 days × 146.9**(SOQ)** = 53,619 **Unit Rate**: 0.1624p / pdkWh / day **Charge**: **£87.08**
Plus	
LDZ Commodity **Invoice:** Commodity (ZCO) **See**: Table 2.2.1 **Basis:** p / kWh	**Volume:** 20,000 **(AQ)** **Unit Rate**: 0.0214 p / kWh **Charge**: **£4.28**
Plus	
Customer capacity **Invoice:** Capacity (CCA) **See**: Table 2.3 **Basis:** p / peak day kWh / day	**Volume**:365 days × 146.9**(SOQ)** = 53.619 **Unit Rate**: 0.0908p / pdkWh / day **Charge**: **£48.69**
Equals	
Total Network Charge	Total annual network charge = £140.05

Unit Charge: Dividing by the annual load of 20,000 kWh gives a unit LDZ charge of 0.7003 pence per kWh.

Example 3

Suppose that instead of supplying just one domestic customer in Glasgow (as in Example 2) the shipper actually supplies a connected system presently comprising 100 domestic customers and the completed connected system will comprise 150 domestic premises. Suppose that each of these premises has the same (AQ) of 20,000 kWh per annum.

Prevailing AQ (pre AQ)	100 houses × 20,000 (AQ) = 2,000,000 kWh
Maximum AQ (max AQ)	150 houses × 20,000 (AQ) = 3,000,000 kWh
Prevailing SOQ (pre SOQ)	2,000,000 ÷ (365 × 0.373) =14,690 kWh
Maximum SOQ (max SOQ)	3,000,000 ÷ (365 × 0.373) =22,035 kWh

Note that the prevailing annual and peak day loads of the connected system in effect would change over the year however, for simplicity; these have been assumed as constant in this example.

Process	Calculations Used
LDZ Capacity Invoice: ADC (891) See: Table 2.2.2 Basis: p / peak day kWh / day	**Volume:** 365 days × 14,690**(pre SOQ)** =5,361,850 **Unit Rate**: 0.7542×22,035(max SOQ) ^ $^{-0.1939}$ =0.1085p / pdkWh / day **Charge**: **£5,817.6**
Plus	
LDZ Commodity **Invoice:** ADC (893) **See**: Table 2.2.2 **Basis:** p / kWh	**Volume:** 2,000,000 **(pre AQ)** **Unit Rate**: 0.1173×22,035 **(max SOQ)** ^ $^{-0.2131}$ =0.0139 p/ kWh **Charge**: **£278.0**
Plus	
CSEP Administration Invoice: ADC (894) See: Section 2.4.1 Basis: p / supply point / day	**Volume:** 100 houses × 365 days = 36,500 **Unit Rate**: Standard tariff = 0.1020p /supply point /day **Charge:** **£37.23**
Equals	
Total Network Charge	Total annual LDZ charge £6,132.83

Unit Charge: Dividing by the annual load of 2,000,000 kWh gives a unit LDZ charge of 0.3066 pence per kWh.

Appendix 2A

Estimation of peak day load for non-daily metered supply points

For non-daily metered (NDM) supply points, the peak day load is estimated using a set of End User Categories (EUCs). Each NDM supply point is allocated to an EUC. In each LDZ each EUC has an associated load factor. For Scotland Gas Networks the relevant load factors are shown in Tables 2A.2 and 2A.3. The data in these tables applies for the gas year 1 October 2011to 30 September 2012.

These EUCs depend upon the annual quantity (AQ) of the supply point and, in the case of monthly read sites, the ratio of winter to annual consumption where available.

Monthly read sites

It is mandatory for supply points with an annual consumption greater than 293 MWh to be monthly read, however, at the shipper's request, sites below this consumption may also be classified as monthly read.

For monthly read sites where the relevant meter reading history is available, the winter: annual ratio is the consumption from December to March divided by the annual quantity. If the required meter reading information is not available, the supply point is allocated to an EUC simply on the basis of its annual quantity.

The peak load for an NDM supply point may then be calculated as:

$$\frac{AQ \times 100}{365 \times LoadFactor}$$

Example

For a supply point in Scotland Gas Networks with an annual consumption of 1,000 MWh per annum.

Assume consumption December to March inclusive is 500 MWh, hence
Winter: annual ratio = 500 ÷ 1000 = 0.5

For a site with an annual consumption of 1,000 MWh, a ratio of 0.5 falls within winter: annual ratio band WO2 and the site is thus within End User Category SC:E1104W02.
For a site in this category, the load factor is 42.8%and the peak day load is therefore

$$\frac{1000 \times 100}{365 \times 42.8} = 6.40\text{MWh}$$

If the required meter reading information is not available to calculate the winter: annual ratio, the supply point is allocated to an EUC simply on the basis of its annual quantity, in this case SC:E1104B.

For a site in this category, the load factor is 40.3% and the peak day load is therefore

$$\frac{1000 \times 100}{365 \times 40.3} = 6.80\text{MWh}$$

Six monthly read sites

In the case of six monthly read sites, the supply point is allocated to an EUC simply on the basis of its annual quantity.

Example

For a supply point in Scotland Gas Networks with an annual consumption of 200 MWh per annum, the EUC will be SC:E1102B.

For a site in this category, the load factor is 39.0% and the peak daily load is therefore

$$\frac{200 \times 100}{365 \times 39.0} = 1.40\text{MWh}$$

Notes

The term LDZ is applied in the context of its usage with reference to the Network Code daily balancing regime.

For supply points whose consumption is over 73,200 kWh and which include one or more NDM supply meter points, an end user category code can be found in the supply point offer generated by UK Link. This code may be correlated with the end user category codes shown in Table 2A.1 by means of a lookup table issued separately to shippers. Copies are available from the xoserve Supply Point Administration Management team by emailing **externalrequests.spa@xoserve.com**

Daily metered supply points

The SOQ of daily metered sites is known and hence no load factor is required.

Supply points with annual consumptions greater than 58,600 MWh should be daily metered. However, a handful of sites remain as non-daily metered as a result of difficulties installing the daily read equipment. In such cases in Scotland the end user category code SC:E1109B is used.

Firm supply points with an AQ above 73.2 MWh pa may, at the shipper's request, be classified as daily metered.

Consultation on end user categories

Section H of the Network Code requires the transporter to publish, * by the end of June each year, its demand estimation proposals for the forthcoming supply year. These proposals comprise end user category definitions, NDM profiling parameters (ALPs and DAFs), and capacity estimation parameters (EUC load factors). Analysis is presented to users and the Demand Estimation Sub-Committee (a sub-committee of the Network Code Committee) is consulted before publication of its proposals.

* NDM Profiling and Capacity Estimation Algorithms for 2011/12, June 2011.

Appendix 2A Tables - Definition of end user categories

Table 2A.1 below defines the end user categories for Scotland Gas Networks by reference to annual consumption and winter:annual ratio, applicable from 1 October 2011 to 30 September 2012.

Table 2A.1 End User Categories

EUC Code	Annual Load (MWh)	Winter:Annual Ratios (WAR)			
		W01	W02	W03	W04
xx:E1101B	0 to 73.2	-	-	-	-
xx:E1102B	73.2 to 293	-	-	-	-
xx:E1103B	293 to 732	0.00 – 0.48	0.48 - 0.57	0.57 - 0.67	0.67 - 1.00
xx:E1104B	732 to 2,196	0.00 – 0.48	0.48 - 0.57	0.57 - 0.67	0.67 - 1.00
xx:E1105B	2,196 to 5,860	0.00 – 0.44	0.44 - 0.52	0.52 - 0.61	0.61 - 1.00
xx:E1106B	5,860 to 14,650	0.00 – 0.38	0.38 - 0.47	0.47 - 0.57	0.57 - 1.00
xx:E1107B	14,650 to 29,300	0.00 – 0.36	0.36 - 0.40	0.40 - 0.53	0.53 - 1.00
xx:E1108B	29,300 to 58,600	0.00 – 0.36	0.36 - 0.39	0.39 - 0.48	0.48 - 1.00
xx:E1109B	> 58,600	-	-	-	-

Table 2A.2 Load Factors for Small NDM Supply Points (Up to 2,196 MWh per annum)

Network	Scotland
SC: E1101B	37.3%
SC: E1102B	39.0%
SC: E1103B	40.0%
SC: E1103W01	57.1%
SC: E1103W02	42.8%
SC: E1103W03	31.4%
SC: E1103W04	25.1%
SC: E1104B	40.3%
SC: E1104W01	57.1%
SC: E1104W02	42.8%
SC: E1104W03	31.4%
SC: E1104W04	25.1%

Table 2A.3 Load Factors for Large NDM Supply Points (2,196 MWh and above per annum)

Network	Scotland
SC: E1105B	42.4%
SC: E1105W01	64.3%
SC: E1105W02	49.1%
SC: E1105W03	35.9%
SC: E1105W04	26.5%
SC: E1106B	47.2%
SC: E1106W01	76.6%
SC: E1106W02	56.7%
SC: E1106W03	41.4%
SC: E1106W04	27.7%
SC: E1107B	52.0%
SC: E1107W01	85.6%
SC: E1107W02	66.8%
SC: E1107W03	48.7%
SC: E1107W04	31.1%
SC: E1108B	62.0%
SC: E1108W01	90.0%
SC: E1108W02	73.8%
SC:E1108W03	59.6%
SC:E1108W04	35.9%
SC:E1109B	63.4%

3. APPLICATION OF THE LDZ CHARGING METHODOLOGY

3.1 Introduction

Standard Special Condition A4 of the Gas Transporter (GT) Licence requires the licensee to establish a methodology showing the methods and principles on which transportation charges are based. The present charging methodology was introduced in 1994 and it has been modified from time to time in accordance with the GT Licence.

3.1.1 Maximum Allowed Revenue

The Maximum Allowed Revenue which a Network is allowed to collect in a Formula Year is determined by the Price Control Formula which includes:-

- The Core Allowed Revenue for 2011/12 as determined by the Price Control Review and inflated by the RPI;
- The impact of a number of Incentives and Pass-Through items;
- Any under- or over-recovery brought forward from the previous formula year (the "K" factor in the formula).

The "K" correction factor is necessary because the level of charges set for any formula year depends on forecasts of some of the above elements. The actual performance against the incentives in particular will differ from the forecasts, causing a variance between the revenue collected from the charges and the revenue allowed under the formula. The K factor enables the allowed revenue in the following formula year to be adjusted to take this variance into account.

3.1.2 Objectives of the Charging Methodology

The transportation charging methodology has to comply with objectives set out in the Licence under Standard Special Condition A5 paragraph 5. These are that:

- Compliance with the charging methodology results in charges which reflect the costs incurred by the licensee in its transportation business, and, so far as is consistent with this,
- That compliance with the charging methodology facilitates effective competition between gas shippers and between gas suppliers; and
- That the charging methodology properly takes account of developments in the transportation business;

In addition to these Licence objectives Scotland Gas Networks has its own objectives for the charging regime. These are that the distribution charging methodology should:

- promote efficient use of the distribution system;
- generate stable charges;
- be easy to understand and implement.

Before the transporter makes any changes to the methodology it consults with the industry in accordance with Standard Special Condition A5 of the Licence. Ofgem has the right to veto any proposed changes to the methodology.

3.1.3 Structure of Charges

Under the existing structure Network LDZ charges are split between charges which reflect system costs and those which reflect customer related costs. Until April 2010 the target split of revenue recovery was 70% system and 30% customer, based on a national analysis of costs done prior to Network Sales by National Grid Transco. This analysis has now been done on a Network basis by Scotia Gas Networks, and following consultation in conjunctionwith the other DNS the revised revenue recovery target split which takes effect from 1 April 2010 is shown below:

Table 3.1.3: Scotland Network Revenue Recovery Target Split

Year	System	Customer	Total
	%	%	%
2011	71.2	28.8	100

Having established the target revenue to be derived from each main category of charge, the next step is to structure the charges within each of these charge categories across the load bands such that they reasonably reflect the costs imposed on the system by different sizes of loads. The methodologies used to do this are described in the following sections.

3.2 LDZ System Charges Methodology

3.2.1 Introduction

The LDZ system charges effective from 1 April 2009 are based on the 95:5 capacity/commodity split which was implemented following the consultation paper DNPC03. The structure of the charging functions is based on the national methodology described in Transco's Pricing Consultation paper PC68 - Review of LDZ Transportation Charges. This methodology is described below and was based on an analysis of national costs and system usage and a 50:50 capacity/commodity split. The methodology is equally applicable to the current 95:5 capacity/commodity split.

Table 3.2.1a Network Pressure Tiers

The distribution networks contain a series of pipe networks split into four main pressure tiers:

Pressure Tier	Operating Pressure
Local Transmission System (LTS)	7 - 38 bar
Intermediate Pressure System (IPS)	2 - 7 bar
Medium Pressure System (MPS)	75 mbar - 2 bar
Low Pressure System (LPS)	Below 75 mbar

Each Network has a similar proportion of LTS, MPS and LPS pipelines but some Networks contain less IPS pipelines. The Low Pressure System itself accounts for 223,000 km out of the total 273,000 km of Network pipeline. In order to provide a more cost reflective basis for charging, the LPS is sub-divided on the basis of pipe diameter into six sub-tiers as shown below.

Table 3.2.1b LPS Sub Tiers

Pipe Diameter
>355mm
250- 355mm
180-250mm
125-250mm
90-125mm
<=90mm
Total

The principle underlying the LDZ charging methodology is that charges should reflect the average use of the network made by customers of a given size, rather than the actual use made by a particular customer. The latter methodology would be too complex to be a practical basis of charging. Analysis has shown that there is a good correlation between customer size and offtake tier. Large customers are typically supplied from higher-pressure tiers and small customers from lower pressure tiers. Such an approach avoids inconsistencies that may arise if neighbouring sites of similar size are actually connected to different pressure tiers.

3.2.2 Outline of Methodology

The methodology calculates the average cost of utilisation for each of the main pressure tiers of the distribution system. Combining this with the probability of loads within a consumption band using that pressure tier generates a tier charge for an average load within that band. The summation of these tier charges gives the total charge for a load within the consumption band to use the distribution system. The methodology uses average costs rather than marginal costs to reflect the total costs of using the system.

The detail below describes the derivation of the capacity charge function and is therefore based on peak daily flows. A similar calculation, based on annual flows, is carried out to determine the commodity charge function. The data used is that from the most recent review carried out in 2001.

3.2.3 Determination of Costs

The costs related to each pressure tier were derived from the Activity Based Cost (ABC) model. These costs are split 50:50 into capacity and commodity elements.

Table 3.2.3a Determination of Tier Costs

Pressure Tier	LPS Sub Tier	% Total ABC	Cost (£M) Total	Capacity (50%)
LTS		15.7%	196.3	98.1
IPS		5.4%	66.9	33.5
MPS		16.2%	201.4	100.7
LPS		62.7%	782.4	391.2
TOTAL		100.0%	1247.0	623.5

The split of LPS costs down to sub-tier level is based on year 2000 replacement cost data.

Table 3.2.3b Determination of LPS Costs

LPS Sub Tier		% Total 2000 Replacement Cost	Cost (£M) Total	Capacity (50%)
LP1	>355mm	12.3%	96.2	48.1
LP2	250-355mm	12.7%	99.4	49.7
LP3	180-250mm	10.5%	82.2	41.1
LP4	125-180mm	15.8%	123.6	61.8
LP5	90-125mm	26.1%	204.2	102.1
LP6	<90mm	22.6%	176.8	88.4
TOTAL		100%	782.4	391.2

3.2.4 Probability of Pressure Tier / Sub Tier Usage

The probability of a unit of gas, supplied to a customer of given size, having passed through the various pressure tiers / sub tiers within the distribution network is estimated. This estimation is based on the results from a survey of the pressure tier / sub tier at which individual supply points are attached to the pipeline system in conjunction with the results of network analysis.

Table 3.2.4 System Usage Probability Matrix

Consumption Band (MWh)	Network Tiers			LPS Sub Tiers					
	LTS	IPS	MPS	LP1	LP2	LP3	LP4	LP5	LP6
0-73.2	97.8%	44.7%	94.4%	56.3%	76.7%	83.7%	77.5%	54.7%	17.1%
73.2 - 146.5	97.7%	44.6%	94.6%	55.5%	73.7%	76.7%	66.7%	42.7%	15.4%
146.5 – 293	97.8%	44.7%	94.2%	59.0%	78.2%	79.8%	67.8%	43.8%	17.2%
293 – 439	97.6%	45.0%	94.0%	52.8%	70.5%	72.8%	61.4%	40.0%	16.6%
439 – 586	97.6%	44.9%	94.1%	52.9%	70.3%	72.3%	61.4%	40.2%	16.8%
586 – 732	97.7%	44.6%	94.6%	55.0%	73.2%	73.9%	62.3%	43.1%	16.9%
732 - 2,931	97.5%	45.3%	93.7%	50.4%	66.8%	68.3%	57.2%	36.2%	13.4%
2,931 - 14,654	97.2%	44.6%	94.3%	43.1%	56.8%	54.9%	41.4%	20.9%	6.9%
14,654 - 58,614	96.7%	45.7%	91.3%	24.8%	31.8%	26.1%	15.2%	6.8%	0.0%
58,614 - 293,071	96.5%	50.0%	78.0%	10.3%	12.4%	6.5%	6.8%	4.1%	1.4%
>293,071	97.5%	49.1%	41.1%	1.2%	1.7%	1.6%	1.3%	1.0%	1.0%

Table 3.2.4 shows that for the 0-73.2MWh consumption band 97.8% (3,117 GWh from Table 3.2.5) of the total peak offtake for this consumption band (3,191 GWh) goes through the LTS, 44.7% goes through the IPS, and 94.4% through the MPS.

3.2.5 Pressure Tier / Sub Tier Usage Volumes

The application of usage probabilities to the network peak day offtake volumes provides an estimate of the extent to which the different load bands make use of capacity across the pressure tiers.

Table 3.2.5 Peak Daily Capacity Utilisation (GWh)

	Network Tiers			LPS Sub Tiers					
Consumption Band (MWh)	LTS	IPS	MPS	LP1	LP2	LP3	LP4	LP5	LP6
0-73.2	3,117	1,425	3,010	1,794	2,446	2,668	2,472	1,745	545
73.2 - 146.5	178	81	172	101	134	140	122	78	28
146.5 - 293	159	73	153	96	127	130	110	71	28
293 - 439	82	38	79	44	59	61	52	34	14
439 - 586	64	29	62	35	46	47	40	26	11
586 - 732	53	24	51	30	40	40	34	23	9
732 - 2,931	191	89	184	99	131	134	112	71	26
2,931 - 14,654	183	84	177	81	107	103	78	39	13
14,654 - 58,614	123	58	116	32	41	33	19	9	0
58,614 - 293,071	87	45	70	9	11	6	6	4	1
>293,071	69	35	29	1	1	1	1	1	1
Total	4,306	1,981	4,104	2,322	3,143	3,364	3,046	2,101	676

3.2.6 Cost per Unit of Capacity Utilised

The cost of providing capacity utilised on the peak day within each pressure tier / sub tier per unit of capacity is calculated by the division of capacity related costs, set out in section 3.2.2, by the volume of capacity utilised. In these calculations the LPS is not treated as a single entity but rather as individual sub tiers.

Table 3.2.6 Cost per Unit of Capacity Utilised

	Network Tiers			**LPS Sub Tiers**					
	LTS	**ITS**	**MPS**	**LP1**	**LP2**	**LP3**	**LP4**	**LP5**	**LP6**
Capacity Cost (£m)	98.1	33.5	100.7	48.1	49.7	41.1	61.8	102.1	88.4
Capacity Utilised (PD GWhs)	4,306	1,981	4,104	2,322	3,143	3,364	3,046	2,101	676
Unit Cost (p / pdkWh / pa)	2.28	1.69	2.45	2.07	1.58	1.22	2.03	4.86	13.08

3.2.7 Average Cost of Utilisation

The costs calculated in Table 3.2.6 represent the cost per unit of capacity utilised within each pressure tier / sub tier. Charging however is based on the average expected use made of each tier of the pipeline system. The average cost, for customers in each load band, of utilising a particular pressure tier / sub tier, is calculated by multiplying the unit cost of utilising the tier by the probability that the tier is utilised by customers in the load band. This is illustrated in Table 3.2.7a below for the MPS.

Table 3.2.7a Example - Average Cost (pence/pk day kWh /pa) of Utilisation of MPS by Load Band

Consumption Band (MWh)	Utilisation Cost	Probability of Use %	Average Cost
0-73.2	2.45	94.4%	2.32
73.2 – 146.5	2.45	94.6%	2.32
146.5 – 293	2.45	94.2%	2.31
293 – 439	2.45	94.0%	2.31
439 – 586	2.45	94.1%	2.31
586 – 732	2.45	94.6%	2.32
732 - 2,931	2.45	93.7%	2.30
2,931 – 14,654	2.45	94.3%	2.31
14,654 - 58,614	2.45	91.3%	2.24
58,614 - 293,071	2.45	78.0%	1.91
>293,071	2.45	41.1%	1.01

Table 3.2.7b below summarises the average cost, by consumption band, of using the complete network system.

Table 3.2.7b Average Cost of Network Utilisation by Consumption Band

Consumption Band (MWh)	Pence / peak day kWh / Annum									
	LTS	IPS	MPS	LP1	LP2	LP3	LP4	LP5	LP6	Total
0 - 73.2	2.23	0.75	2.32	1.17	1.21	1.02	1.57	2.66	2.23	15.17
73.2 - 146.5	2.23	0.75	2.32	1.15	1.17	0.94	1.35	2.08	2.01	14.00
146.5 - 293	2.23	0.76	2.31	1.22	1.24	0.98	1.38	2.13	2.25	14.49
293 - 439	2.22	0.76	2.31	1.10	1.11	0.89	1.25	1.95	2.18	13.76
439 - 586	2.22	0.76	2.31	1.10	1.11	0.88	1.25	1.95	2.20	13.79
586 - 732	2.23	0.75	2.32	1.14	1.16	0.90	1.26	2.09	2.22	14.07
732 - 2,931	2.22	0.76	2.30	1.04	1.06	0.83	1.16	1.76	1.75	12.89
2,931 - 14,654	2.22	0.75	2.31	0.89	0.90	0.67	0.84	1.02	0.90	10.50
14,654 - 58,614	2.20	0.77	2.24	0.51	0.50	0.32	0.31	0.33	0.00	7.19
58,614 - 293,071	2.20	0.85	1.91	0.21	0.20	0.08	0.14	0.20	0.18	5.96
>293,071	2.22	0.83	1.01	0.02	0.03	0.02	0.03	0.05	0.13	4.33

3.2.8 CSEPs

It has been suggested that CSEPs may use less of the distribution system when compared with standard supply points of the same peak daily consumption, and hence separate charging functions have been generated. CSEP specific connection data is used to compile a CSEP connection probability matrix in place of Table 3.2.4.

The costs calculated earlier in Table 3.2.6 represent the cost per unit of capacity utilised within each pressure tier / sub tier of the network by all loads. CSEP charging is based on the average expected cost, in each consumption band, for a CSEP utilising a particular pressure tier / sub tier. It is calculated by multiplying the unit cost of utilising each tier (Table 3.2.6) by the probability that the tier is utilised by CSEPs within a consumption band (CSEP replacement table for Table 3.2.4). The summation of each of these tier / sub-tier costs gives a total network cost as in Table 3.2.7b.

3.2.9 Setting the Charging Functions

To provide a workable basis for charging individual customers of differing sizes the total average costs of utilising each tier of the distribution network are plotted. For the capacity charges for directly connected supply points these costs are the total costs detailed in 3.2.7b above. Functions are fitted to the data points such that the error term is minimised. The functions found to best fit the underlying average cost data are in the form of a power of the peak daily load (SOQ) with straight-line elements for the domestic (<73.2 MWh / annum) consumption band and the small I&C consumption band (73.2 to 732 MWh / annum). These functions must then be scaled so that when applied to all supply points connected to the distribution network they are expected to generate the desired target revenue. For CSEPs and standard supply points less than 732 MWh / annum, the functions for capacity charges are the same as are the functions for commodity charges.

3.3 LDZ Customer and Other Charges Methodology

Customer charges reflect supply point costs, namely costs relating to service pipes and emergency work relating to supply points.

3.3.1 Customer Charge Methodology

The customer charge methodology is based on an analysis of the extent to which service pipe and emergency service costs vary with supply point size. This analysis is used to determine the allocation of the recovery of the target revenue (based on Table 3.1.3 - Network Cost Breakdown) from supply points grouped in broad load bands. This is described in more detail below.

1. Using ABC cost analysis, the customer cost pool is sub-divided into the following cost pools:
   i. service pipes
   ii. emergency work
2. Each cost pool is then divided among a number of consumption bands based on weighted consumer numbers by consumption band. The consumption bands are based on the annual quantity of gas consumed. The weightings are derived from an analysis of how the costs of providing each of the services listed in 1. above vary with consumption size.
3. For each cost pool, an average cost per consumer is then calculated for each consumption band by dividing by the number of consumers in that consumption band.
4. A total average cost per consumer is then calculated for each consumption band by adding the unit costs of each service, which are service pipes and emergency work.
5. Finally, using regression analysis, functions are developed that best fit the relationship between consumption size and total average cost per consumer.

Since April 2008 charges for supply points consuming below 73,200kWh (mainly domestic) consist of just a capacity-related charge. Charges for smaller I&C supply points, consuming between 73,200 and 732,000 kWh per annum, are based on a capacity-related charge and a fixed charge which varies with meter-reading frequency. Charges for larger I&C supply points are based on a function that varies with supply point capacity.

3.3.2 Charging for Connected Systems (CSEPs)

The standard customer charge is not levied in respect of supply points within CSEPs. However a CSEP administration charge is levied to reflect the administration costs related to servicing these loads.
The methodology for setting this charge was established in 1996 and is based on the same methodology described in 3.3.3 below for setting Other Charges.

3.3.3 Other Charges

There are other charges applied to services which are required by some shippers but not by all, for example special allocation arrangements. It is more equitable to levy specific cost reflective charges for these services on those shippers that require them. Income from these charges is included in the regulated transportation income. These charges include:-

- charges for the administration of allocation arrangements at shared supply meter points and Interconnectors;

The methodology used to calculate the appropriate level of these charges is based on an assessment of the direct costs of the ongoing activities involved in providing the services. The costs are forward looking and take into account anticipated enhancements to the methods and systems used. A percentage uplift based on the methodology described in Transco's background paper "Charging for Specific Services - Cost Assignment Methodology" (May 1999) is added to the direct costs to cover support and sustaining costs. The latest level of the uplift was published in PD16, Section 5, (November 2002).