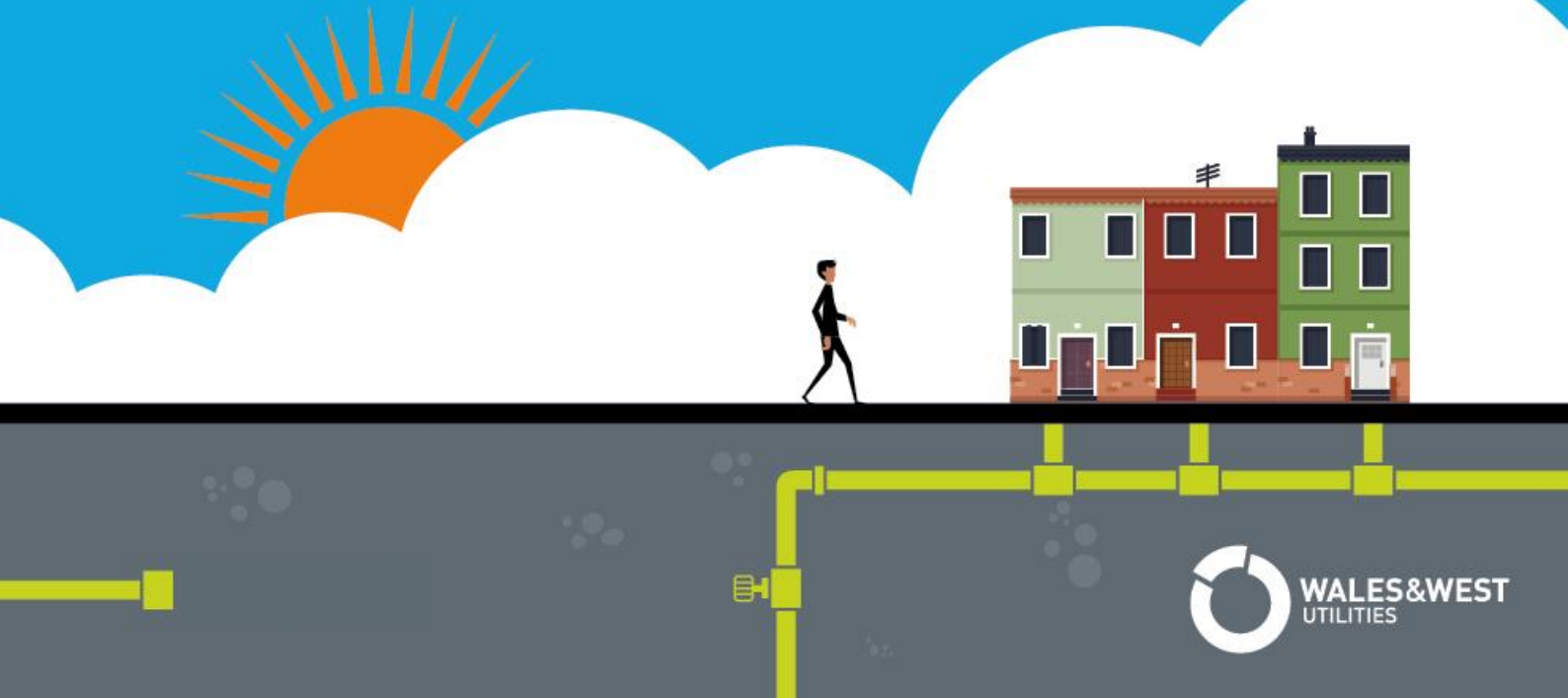
Statement of LDZ Transportation Charges

Effective from 1st April 2017

Published 31st March 2017



WALES&WEST UTILITIES

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LDZ Transportation Charges to apply from 1st April 2017

This publication sets out the LDZ transportation charges which will apply from 1st April 2017 for the use of the Wales & West Distribution Network (DN), as required by Standard Special Condition A4 of the Gas Transporter Licence. This document does not override or vary any of the statutory, licence or Uniform Network Code obligations upon Wales & West Utilities Limited (WWU).

For more information on the charges set out below, contact the Transporter's Pricing team on 02920 278838.

The distribution price control formula

Distribution Networks set prices so as to collect the forecast allowed revenue permitted by the regulator, Ofgem, under the relevant price control. 2017/18 is the fifth year of the current price control set by OFGEM, known as the RIIO price control (effective from 2013/14 to 2020/21).

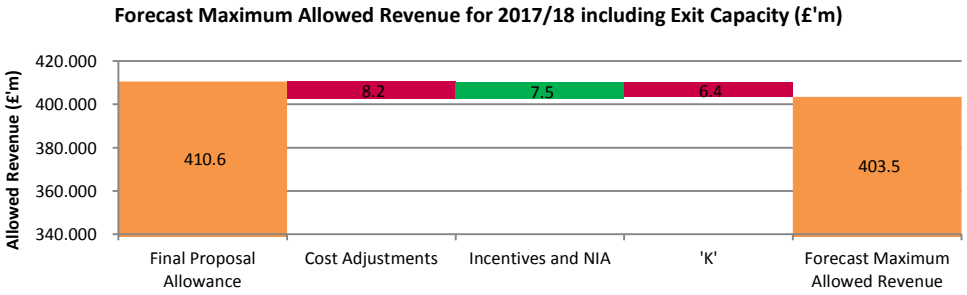
WWU are also required to levy charges for transportation income excluding exit capacity in the proportions set out in the Uniform Network Code Section Y (UNC). Currently charges should seek to recover allowances in the following proportion:

<table>
<tr><td colspan="2">System Charges</td><td>Customer Capacity</td></tr>
<tr><td colspan="2">71.8%</td><td rowspan="3">28.2%</td></tr>
<tr><td>System Capacity (plus any Optional Tariff)</td><td>Commodity</td></tr>
<tr><td>95%</td><td>5%</td></tr>
</table>

Additionally the RIIO price control allows networks to recover the costs incurred from the National Transmission System (NTS) for providing gas off taken at any of the 17 NTS offtakes within the WWU network. This allowance and subsequent recovery is known as Exit Capacity.

Forecast Allowed Revenue for the 2017/18 regulatory year

The forecast revenue allowance of £400.5m for 2017/18 comprises:



Uniform Network Code

The Uniform 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 Uniform 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. The Uniform Network Code and related documents can be found on the Joint Office of Gas Transporters website (www.gasgovernance.co.uk)

Invoicing

Xoserve is the third party service centre responsible for hosting and supporting the UK Link system. Xoserve therefore act as the billing agent for the gas networks, including WWU. Each charge levied has an associated charge code and invoice type which have been included in this statement to aid understanding of the bills received.

The UK Link Replacement programme (Project Nexus) will see some of these charge codes and invoice types being amended. A full list of these amendments can be provided by Xoserve and a mapping of those relevant to this statement is included on page 13.

LDZ System Charges

The standard LDZ system charges consist of capacity and commodity charges.

As set out in DNPC08, with effect from 1 April 2012 the same charges apply to Connected System Entry Points (CSEPs) as to directly connected supply points.

Where the LDZ charges are based on functions, these functions use Supply Point Off take Quantity (SOQ) in the determination of the charges. At daily metered (DM) 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.

Directly Connected Supply Points and CSEPs

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

Charge codes used

Directly Connected Loads		CSEPs	
Invoice	Charge Code	Invoice	Charge Code
LDZ Capacity	ZCA	ADC Capacity	891
LDZ Commodity	ZCO	ADC Commodity	893

LDZ System Charges

Charge Band (kwh/annum)	Capacity p/peak day kWh/day	Commodity p/kwh
Up to 73,200 kWh per annum	0.1874	0.0252
73,200 to 732,000 kWh per annum	0.1626	0.0220
732,000 kWh per annum and above	$1.4559 \times SOQ^{-0.2513}$	$0.2555 \times SOQ^{-0.2775}$
Subject to a minimum rate of	0.0138	0.0018
Minimum reached at SOQ of	112,497,763	56,935,300

CSEP charging

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.

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
$902 \times [(SOQ)^{\wedge -0.834}] \times D + 772 \times (SOQ)^{\wedge -0.717}$

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”.

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).

The unit charges and charging functions used to calculate customer charges to directly connected supply points are as follows:

LDZ Customer Capacity Charge

Charge Code	CCA
Charge Band (kWh/annum)	p/peak day kWh/day
Up to 73,200	0.0992
73,200 to 732,000	0.0039
>732,000	$0.0783 \times SOQ^{-0.2100}$

In addition to the above, the following fixed charge applies to supply points with an AQ between 73,200 and 732,000

Charge Code	CFI
Supply Point fixed charge	Fixed Charge pence/day
Non-monthly read	30.8323
Monthly read	32.8297

Other Charges

Other Charges include administration charges at CSEP, Shared Supply Meter Points and Interconnectors.

Connected System Exit Points (CSEPs)

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 within the Wales & West Network but operated by a Gas Transporter other than WWU.

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, including interconnectors, 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	0.0755 pence per day (£0.30 per annum)

The invoice and charge codes are:

	Invoice	Charge Code
NDM CSEP	ADC	894

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 up to four (six for Very Large Daily Metered Customers, those with an AQ of more than 1,465,000 mWh/annum) 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

LDZ System Entry

DN Entry Commodity Charge/credit

DN Entry Commodity charges reflect the costs of receiving gas from an entry point at a lower pressure tier than the NTS. The charge/credit will differ according to the amount of gas entering the network system, the pressure tier at which the gas enters the system and the operational costs resulting from the entry point.

The charge, which comprises the following three elements, is an adjustment to the full transportation charge:

i. **Lower System Usage**: For the gas received from this source the Shippers will get a credit in recognition that the gas has entered the network at a lower pressure tier, thus using less of the network system.
ii. **Avoidance of Exit Capacity**: The Shipper will receive a credit for the avoidance of exit capacity charges as they have not taken gas which has entered the Wales & West network through the National Transmission offtake point.
iii. **Operational Costs:** The Shipper will be charged an operational cost, principally maintenance, relating to the equipment owned and operated by the Gas Distribution Network.

The sum of the above three components may result in either a credit or a debit to the Shipper. The table below gives the entry commodity unit price for all known sites within the Wales & West Network set to operate during 2017/18.

The invoice and charge codes are:

	Invoice	Charge Code
LDZ System Entry Commodity Charge	ADL	LEC

LDZ System Entry Commodity Charge/Credit by DN Entry Point

Site Name	GEMINI Name	Alias	LDZ system entry charge (Debit/Credit)
BROMHAM HOUSE FARM	BROMOS		-0.0679 (Credit)
CANNINGTON BIOMETHANE	CANNOS		-0.0712 (Credit)
BISHOPS CLEEVE BIOMETHANE	CLEEOS	Grundon Landfill / Wingmoor Farm	-0.0539 (Credit)
ENFIELD BIOMETHANE	ENFDOS		-0.0250 (Credit)
FIVE FORDS BIOMETHANE	FIVEOS		0.0086 (Charge)
FRADDON	FRADOS	Penare Farm	-0.0545 (Credit)
FROGMARY BIOMETHANE	FROGOS		-0.0593 (Credit)
GREAT HELE BIOMETHANE	HELEOS	Nadder Lane	-0.0250 (Credit)
HELSCOTT FARM	HELSOS		-0.0679 (Credit)
ROTHERDALE	ROTHOS	Vale Green 2	-0.0361 (Credit)
SPRINGHILL BIOMETHANE	SPNGOS		-0.0250 (Credit)
SPITTLES FARM	SPITOS	Bearley Farm	-0.0679 (Credit)
AVONMOUTH WESSEX	WESXOS	Wessex Water	-0.0779 (Credit)
WILLAND	WILLOS		-0.0679 (Credit)
WYKE FARM	WYKEOS		-0.0712 (Credit)
LORDS MEADOW	TBC	Crediton	-0.0679 (Credit)
PENNANS FARM	TBC		-0.0679 (Credit)

Exit Capacity

Following the implementation of Uniform Network Code Modification 0195AV, industry arrangements for the charging of NTS Exit Capacity costs changed on 1st October 2012. National Grid Transmission will invoice gas DNs for booked NTS Exit Capacity and DNs will invoice shippers in line with DNPC06 ("Proposals for LDZ Charges to Recover NTS Exit Capacity Charges). Ofgem have set an allowance for WWU to recover costs associated with NTS Exit Capacity charges.

Invoice	Invoice Type	Charge Code
Capacity: Directly Connected Supply Points	CAZ	ECN
Capacity: Connected Systems	ADC	C04
Capacity: Unique Sites	ADU	901

Exit Zone	Pence per peak day kWh per day
SW1	0.0119
SW2	0.0177
SW3	0.0256
WA1	0.0172
WA2	0.0068

Xoserve Charge Mapping

Post Nexus Charge Codes

The following sets out the charge codes listed within this charging statement. A full list of invoice and charge types post Nexus Go Live is available through the Xoserve Shared Area.

	Current		Post Nexus Go Live	
	Invoice Type	Charge Type	Invoice Type	Charge Type
LDZ Capacity				
Supply Point LDZ Capacity	CAZ	ZCA	CAZ	ZCA
CSEP LDZ Capacity	ADC	891	CAZ	891
Unique Sites LDZ Capacity Charge	ADU	871	CAZ	871
Unique Sites Optional Tariff	ADU	881	CAZ	881
Customer Capacity				
Customer LDZ Capacity	CAZ	CCA	CAZ	CCA
Customer Capacity fixed Charge	CAZ	CFI	CAZ	CFI
Unique Sites Customer Capacity	ADU	872	CAZ	872
Commodity				
LDZ Commodity	COM	ZCO	COM	ZCO
CSEP Commodity	ADC	893	COM	893
Unique Sites Commodity	ADU	878	COM	878
LDZ System Entry Commodity Charge	ADL	LEC	COM	LEC
Exit Capacity				
LDZ Exit Capacity	CAZ	ECN	CAZ	ECN
CSEP Exit Capacity	ADC	CO4	CAZ	C04
Unique Sites Exit Capacity	ADU	901	CAZ	901
Other Charges				
LDZ Shared Supply Admin Charge	ADU	883	CAZ	883
CSEP Admin Charge	ADC	894	CAZ	894

Examples

This section provides illustrative examples of how transportation prices are used to calculate a bill for different load bands. Charges produced by UK Link are definitive for charging purposes and take precedence to any of the examples listed in this section. Calculations below are subject to rounding and should be regarded as purely illustrative. 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 for that period.

Example 1

A shipper has a daily metered customer in Cardiff, 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.

	Charge Type	Calculation Used
+	LDZ Capacity **Invoice:** LDZ Capacity (ZCA) **See**: Page 5 **Basis:** p / peak day kWh / day	**Volume:** 365 days × 100,000 **(SOQ)** = 36,500,000 **Unit Rate**: 1.4559 × 100,000 **(SOQ)** ^ $^{-0.2513}$ = 0.0807 p / pdkWh / day Annual Charge: Volume x Unit Rate = £29,455.50
+	LDZ Commodity **Invoice:** Commodity (ZCO) **See**: Page 5 **Basis:** p / kWh	**Volume:** 20,000,000 **(AQ)** **Unit Rate**: 0.2555 × 100,000 **(SOQ)** ^ $^{-0.2775}$ = 0.0105p / kWh Annual Charge: Volume x Unit Rate = £2,100.00
+	Customer (Capacity) **Invoice:** LDZ Capacity (CCA) **See**: Page 7 **Basis:** p / peak day kWh / day	**Volume:** 365 days × 100,000 = 36,500,000 **Unit Rate**: 0.0783 × 100,000**(SOQ)** ^ $^{-0.2100}$ = 0.0070p / pdkWh / day Annual Charge: Volume x Unit Rate = £2,555.00
+	Exit Capacity Charges **Invoice:** LDZ Capacity (ECN) **See**: Page 12, for WA2 value **Basis:** p / peak day kWh / day	**Volume:** 365 days × 100,000 = 36,500,000 **Unit Rate**: 0.0068 pdkWh / day Annual Charge: Volume x Unit Rate = £2482.00
=	*Total Network Charge*	*Total annual network charge = £36,592.50*

Unit Charge: Dividing by the annual load of 20,000,000 kWh gives a unit charge 0.1830 pence per kWh.

Example 2

A shipper has a domestic customer in the South West. Suppose the load has an **AQ** of **12,500** kWh per annum. This annual load places the end user in category SW:E1601B. Load factor of 29.1%. The peak daily load **(SOQ)** is therefore 12,500 ÷ (365 × 0.291) = 118 kWh.

	Charge Type	Calculation Used
+	LDZ Capacity **Invoice:** LDZ Capacity (ZCA) **See**: Page 5 **Basis:** p / peak day kWh / day	**Volume:** 365 days × 118 **(SOQ)** = 43,070 **Unit Rate**: 0.1874 p / pdkWh / day Charge: Volume x Unit Rate = £80.71
+	LDZ Commodity **Invoice:** Commodity (ZCO) **See**: Page 5 **Basis:** p / kWh	Volume: 12,500 (AQ) **Unit Rate**: 0.0252p / kWh Charge: Volume x Unit Rate = £3.15
+	Customer (Capacity) **Invoice:** Capacity (CCA) **See**: Page 7 **Basis:** p / kWh	**Volume: 365 days x** 118 (SOQ) = 43,070 **Unit Rate**: 0.0992 pdkWh / day Charge: £42.73
+	Exit Capacity Charges **Invoice:** LDZ Capacity (ECN) **See**: Page 12, for SW3 value **Basis:** p / kWh	**Volume: 365 days x** 118(SOQ) = 43,070 **Unit Rate**: 0.0256 pdkWh / day Charge: £11.03
=	*Total Network Charge*	*Total annual network charge = £137.61*

Unit Charge: Dividing by the annual load of 12,500 kWh gives a unit LDZ charge of 1.1009 pence per kWh.

Example 3

Suppose that instead of supplying just one domestic customer in the South West (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 12,5000 kWh per annum.

Prevailing AQ (pre AQ)	100 houses × 20,000 (AQ) = 1,250,000 kWh
Maximum AQ (max AQ)	150 houses × 20,000 (AQ) = 1,875,000 kWh
Prevailing SOQ (pre SOQ)	1,250,000 ÷ (365 × 0.291) = 11,769 kWh
Maximum SOQ (max SOQ)	1,875,000 ÷ (365 × 0.291) = 17,653 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.

	Charge Type	Calculation Used
+	CSEP Capacity **Invoice:** ADC (891) **See:** Page 5 **Basis:** p / peak day kWh / day	**Volume:** 365 days × 11,769 **(pre SOQ)** = 4,295,533 **Unit Rate**: 1.4559× 17,653 (max SOQ) ^ $^{-0.2513}$ = 0.1247 p / pdkWh / day Charge: Volume x Unit Rate = £5,356.53
+	CSEP Commodity **Invoice:** ADC (893) **See**: Page 5 **Basis:** p / kWh	Volume: 1,250,000 (pre AQ) **Unit Rate**: 0.2555 × 17,181 **(max SOQ)** ^ $^{-0.2775}$ = 0.0169p / kWh Charge: Volume x Unit Rate = £211.25
+	CSEP Administration **Invoice**: ADC (894) See: Page 8 Basis: p / supply point / day	**Volume:** 100 houses × 365 days = 36,500 **Unit Rate**: Standard tariff = 0.0755 p /supply point /day Charge: £27.56
+	CSEP Exit Capacity Charges **Invoice**: CSEP Capacity (ECN) See: Page 12 Basis: p / supply point / day	**Volume:** 365 days x 11,769 (pre SOQ) = 4,295,533 **Unit** **Rate**: 0.0256 p / pdkWh/ day Charge: Volume x Unit Rate = £1,099.66
=	Total Network Charge	*Total annual network charge = £6,694.99*

Unit Charge: Dividing by the annual load of 1,250,000 kWh gives a unit LDZ charge of 0.54 pence per kWh.

Supporting information

End User Categories

For non-daily metered (NDM) supply points, the peak daily load is estimated using a set of End User Categories (EUCs). Each NDM supply point is allocated to a EUC. In each LDZ each EUC has an associated load factor. For Wales and the West the relevant load factors are shown in the End User Categories Section. The data in these tables applies for the gas year 1 October 2016 to 30 September 2017.

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.

The EUC Load Factors and the other NDM Parameters are available to all Users electronically via the Xoserve secure internet site, accessed by clicking on UKLink Secured Documentation link on webpage http://www.xoserve.com/index.php/our-systems/extranet-secured-sites/ . Location: 'UK Link Secured Documentation' → 'Folder 18' → '20xx-xx Gas Year'.

Please note a 'Readme' file has been provided alongside the supporting files to help explain the content.

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 a 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

A supply point in Wales South LDZ with an annual consumption of 1,000 MWh per annum.

Assume consumption December to March inclusive is 500 MWh.

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 WO3 and the site is thus within End User Category WS: E1604W03.

For a site in this category, the load factor is 27.7% and the peak daily load is therefore

$$\frac{1000 \times 100}{365 \times 27.7} = 9.89 MWh$$

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 WS: E1604B.

For a site in this category, the load factor is 31.0% and the peak daily load is therefore

$$\frac{1000 \times 100}{365 \times 31.0} = 8.84 MWh$$

Six monthly read sites

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

Example

For a supply point in Wales & West Network, South West LDZ, with an annual consumption of 200 MWh per annum, the EUC will be SW:E1602B.

For a site in this category, the load factor is 31.0% and the peak daily load is therefore

$$\frac{200 \times 100}{365 \times 31.0} = 1.77 MWh$$

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. Copies are available from the Xoserve Supply Point Administration Management team on 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 the end user category code WW:E1609B is used.

Firm supply points with an AQ above 73.2 MWh per annum 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). The analysis is presented to users and the Demand Estimation Sub-Committee (a sub-committee of the Network Code Committee) is consulted before publication of the proposals.

Application of the LDZ Charging Methodology

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.

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;
- Compliance with the charging methodology facilitates effective competition between gas shippers and between gas suppliers; and
- The charging methodology properly takes account of developments in the transportation business.

In addition to these Licence objectives WWU 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; and
- Be easy to understand and implement.

Before the GT 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.

Structure of charges

The structure of the Network's LDZ charges are split between system related activities and customer related activities.

Whilst total LDZ revenue is determined by the relevant price control, the share of this revenue to be recovered from the LDZ system charges and the LDZ customer charges respectively is based on the relative cost of each area of activity. The current split is shown in the table below.

Table 1 - % Split of LDZ System and LDZ Customer Charges in WWU

Year	System Related (%)	Customer Related (%)	Total (%)
2012 onwards	**71.8**	**28.2**	**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.

LDZ System Charges Methodology

Introduction

The LDZ system charges effective are based on the methodology fully described in consultation paper DNPC08[1]- Review of LDZ Transportation Charges. This methodology is based on an analysis of costs and system usage at a Gas Distribution Network level. The distribution networks contain a series of pipe networks split into four main pressure tiers:

Table 2 - Network 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 comprises the major part of the Network pipeline system. In order to provide a more cost reflective basis for charging, the LPS is sub-divided on the basis of pipe diameter into eight sub-tiers:

1) >600mm
2) 450-600mm
3) 310-450mm
4) 250-310mm
5) 180-250mm
6) 125-180mm
7) 75-125mm
8) <=75mm

The principle underlying the Network 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.

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

[1] http://www.gasgovernance.co.uk/dnpc08
Effective 1st April 2017 until superseded

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 2010.

Determination of Costs

The costs relating to each pressure tier were derived from the DNPC08 analysis. These costs were split into capacity and commodity elements under DNPC08.

Table 3 - Determination of Tier Costs

Pressure Tier	% Total	Cost (£m)	
		Total	Capacity (95%)
LTS	13.0%	28.2	26.8
IPS	7.3%	16.0	15.2
MPS	15.3%	33.3	31.6
LPS	64.4%	140.4	133.4
TOTAL	100.0%	217.9	207.0

The split of LPS costs down to sub-tier level is based on year 2010 DNPC08 analysis.

Table 4 - Determination of LPS Costs

LPS Sub Tier (Diameter Inches)		% Total Cost	Cost (£m)	
			Total	Capacity (95%)
LP8	**>24**	**0.3%**	**0.4**	**0.4**
LP7	**450->18-24**	**2.1%**	**2.9**	**2.8**
LP6	**>12-18**	**3.1%**	**4.3**	**4.1**
LP5	**10-12**	**10.8%**	**15.2**	**14.5**
LP4	**8-9**	**19.1%**	**26.8**	**25.5**
LP3	**6-7**	**15.3%**	**21.5**	**20.4**

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.

The calculation carried out under DNPC08 were based upon a 95:05 Capacity : Commodity split of LDZ System revenue. The LDZ System Capacity charges are scaled such that 95% of the target revenue will be recovered by the LDZ System Capacity charges and 5% will be recovered from the LDZ System Commodity charges. DNPC03 gives full details of the charging methodology revision.

Table 5 - System Usage Probability Matrix

Consumption Band (MWh)	Network Tiers			LPS Sub Tiers							
	LTS	IPS	MPS	LP8	LP7	LP6	LP5	LP4	LP3	LP2	LP1
0-73.2	92.88%	55.49%	71.07%	1.84%	8.69%	21.22%	53.07%	67.89%	78.07%	63.96%	18.33%
73.2 - 146.5	92.90%	55.28%	71.96%	2.30%	10.67%	24.42%	51.54%	58.83%	62.87%	47.64%	13.67%
146.5 – 293	92.92%	55.07%	72.62%	2.28%	10.43%	23.15%	50.10%	58.25%	61.82%	46.59%	15.61%
293 – 439	92.94%	54.92%	73.25%	2.11%	8.96%	20.96%	48.54%	59.35%	63.86%	48.94%	15.33%
439 – 586	92.93%	54.97%	73.25%	2.19%	9.33%	20.77%	47.87%	59.38%	61.50%	47.93%	10.55%
586 – 732	92.93%	55.02%	73.29%	2.95%	10.57%	21.51%	47.26%	54.10%	57.84%	44.31%	9.24%
732 - 2,931	92.94%	54.87%	74.17%	2.22%	8.81%	19.16%	45.53%	53.99%	57.34%	42.22%	5.47%
2,931 - 14,654	92.83%	55.69%	75.97%	1.00%	4.72%	12.10%	33.70%	39.09%	34.19%	13.85%	0.57%
14,654 - 58,614	92.59%	57.69%	75.98%	0.69%	3.24%	8.28%	14.04%	15.33%	6.03%	4.79%	0.00%
58,614 - 293,071	93.06%	54.58%	54.98%	0.27%	1.31%	3.37%	4.84%	4.30%	3.31%	3.52%	0.00%
>293,071	96.88%	25.42%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Table 5 shows that for example: the 0-73.2MWh consumption band 92.88% total peak offtake goes through the LTS, 55.49% through the IPS and 71.07% though the MPS.

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 6 - Peak Daily Capacity Utilisation (GWh)

	Network Tiers			LPS Sub Tiers							
Consumption Band (MWh)	**LTS**	**IPS**	**MPS**	**LP8**	**LP7**	**LP6**	**LP5**	**LP4**	**LP3**	**LP2**	**LP1**
0-73.2	297.9	178.0	227.9	5.9	27.9	68.1	170.2	217.7	250.4	205.1	58.8
73.2 - 146.5	13.3	7.9	10.3	0.3	1.5	3.5	7.4	8.4	9.0	6.8	2.0
146.5 - 293	13.0	7.7	10.1	0.3	1.5	3.2	7.0	8.1	8.6	6.5	2.2
293 - 439	8.1	4.8	6.4	0.2	0.8	1.8	4.2	5.2	5.6	4.3	1.3
439 - 586	6.3	3.7	5.0	0.1	0.6	1.4	3.2	4.0	4.2	3.2	0.7
586 - 732	5.0	2.9	3.9	0.2	0.6	1.1	2.5	2.9	3.0	2.3	0.5
732 - 2,931	28.8	17.0	23.0	0.7	2.7	5.9	14.1	16.8	17.8	13.1	1.7
2,931 - 14,654	25.2	15.1	20.6	0.3	1.3	3.3	9.2	10.6	9.3	3.8	0.2
14,654 - 58,614	25.4	15.9	20.9	0.2	0.9	2.3	3.9	4.2	1.7	1.3	0.0
58,614 - 293,071	32.6	19.1	19.3	0.1	0.5	1.2	1.7	1.5	1.2	1.2	0.0
>293,071	57.6	15.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	513.2	287.2	347.4	8.3	38.2	91.8	223.4	279.4	310.7	247.7	67.3

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 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 7 - Cost per Unit of Capacity Utilised

	Network Tiers			LPS Sub Tiers							
	LTS	**IPS**	**MPS**	**LP8**	**LP7**	**LP6**	**LP5**	**LP4**	**LP3**	**LP2**	**LP1**
Capacity Cost (£m)	26.8	15.2	31.6	0.4	2.8	4.1	14.5	25.5	20.4	36.8	28.9
Capacity Utilised (PD GWhs)	513.2	287.2	347.4	8.3	38.2	91.8	223.4	279.4	310.7	247.7	67.3
Unit Cost (p / pdkWh/year)	0.0143	0.0145	0.0249	0.0113	0.0199	0.0122	0.0177	0.0250	0.0180	0.0407	0.1178

Average Cost of Utilisation

The costs calculated in the following table 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 below for the MPS.

Table 8 - Example - Average Cost (p / pd kWh / year) of Utilisation of MPS by Load Band

Consumption Band (MWh)	Utilisation Cost	Probability of Use %	Average Cost
0-73.2	0.0249	71.07%	0.0177
73.2 - 146.5	0.0249	71.96%	0.0179
146.5 - 293	0.0249	72.62%	0.0181
293 - 439	0.0249	73.25%	0.0183
439 - 586	0.0249	73.25%	0.0183
586 - 732	0.0249	73.29%	0.0183
732 - 2,931	0.0249	74.17%	0.0185
2,931 - 14,654	0.0249	75.97%	0.0189
14,654 - 58,614	0.0249	75.98%	0.0189
58,614 - 293,071	0.0249	54.98%	0.0137
>293,071	0.0249	0.01%	0.0000

The table 'Average Cost of Network Utilisation by Consumption Band' summarises the average cost, by consumption band, of using the complete network system.

Table 9 - Average Cost of Network Utilisation by Consumption Band

Consumption Band (MWh)	Pence / peak day kWh / Annum											
	LTS	IPS	MPS	LP8	LP7	LP6	LP5	LP4	LP3	LP2	LP1	Total
0 - 73.2	0.0133	0.0080	0.0177	0.0002	0.0017	0.0026	0.0094	0.0170	0.0141	0.0261	0.0216	0.1317
73.2 - 146.5	0.0133	0.0080	0.0179	0.0003	0.0021	0.0030	0.0091	0.0147	0.0113	0.0194	0.0161	0.1153
146.5 – 293	0.0133	0.0080	0.0181	0.0003	0.0021	0.0028	0.0089	0.0146	0.0111	0.0190	0.0184	0.1165
293 – 439	0.0133	0.0080	0.0183	0.0002	0.0018	0.0026	0.0086	0.0148	0.0115	0.0199	0.0181	0.1171
439 – 586	0.0133	0.0080	0.0183	0.0002	0.0019	0.0025	0.0085	0.0148	0.0111	0.0195	0.0124	0.1106
586 – 732	0.0133	0.0080	0.0183	0.0003	0.0021	0.0026	0.0084	0.0135	0.0104	0.0181	0.0109	0.1059
732 - 2,931	0.0133	0.0079	0.0185	0.0003	0.0018	0.0023	0.0081	0.0135	0.0103	0.0172	0.0064	0.0997
2,931 - 14,654	0.0133	0.0081	0.0189	0.0001	0.0009	0.0015	0.0060	0.0098	0.0062	0.0056	0.0007	0.0711
14,654 - 58,614	0.0133	0.0084	0.0189	0.0001	0.0006	0.0010	0.0025	0.0038	0.0011	0.0020	0.0000	0.0517
58,614 - 293,071	0.0133	0.0079	0.0137	0.0000	0.0003	0.0004	0.0009	0.0011	0.0006	0.0014	0.0000	0.0396
>293,071	0.0133	0.0037	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0176

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 and Cseps these costs are the total costs detailed 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. As is the case for capacity charges, the functions used for commodity charges are the same for CSEPs and directly connected supply points.

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.

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 - 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: service pipes; or emergency works.

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 that is 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.

Charges for supply points consuming below 73.2mWh (mainly domestic) consist of just a capacity related charge. Charges for smaller supply points (mainly industrial and commercial), consuming between 73.2 and 732.0 mWh 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.

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 below for setting Other Charges.

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.

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 the Transporter'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).