

# **Optional Commodity Rate Methodology**

## **National Grid Transmission**

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Chapter 3**

# Optional Commodity Rate Methodology

## Document Revision History

<b>Version / Revision Number</b>	<b>Date of Issue</b>	<b>Notes</b>
V0.1	March 2018	Draft
V0.2	April 2108	Draft for workgroup
V0.3	April 2018	Version to accompany workgroup report for 0636: "Updating the parameters for the NTS Optional Commodity Charge".

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## **PART A: INTRODUCTION**

### **1) Background**

The requirement to have an Optional Commodity Rate Methodology is specified in Section Y chapter 3 of the Transportation Principal Document (TPD) of the Uniform Network Code (UNC). The original methodology was created upon introduction of the Optional Commodity Charge in 1998.

### **2) Purpose of the document**

This document provides a guide to the NTS Optional Commodity Rate and the information that is contained within the tables that provide the source data for the calculations contained within the UNC. The spreadsheet embedded within this document is provided for illustration purposes only and it shows how the formula contained within the Uniform Network Code can be created but does not necessarily exactly replicate the formula.

It provides a breakdown of how these figures have been calculated based on the publically available input data values used for the introduction of the NTS Optional Commodity Charge in 1998.

Section 4 below provides a guide to each step in the calculation of the price function. The values for each step in the spreadsheet (Section 5), are based on those used for the introduction of the NTS Optional Commodity Charge in 1998. The Uniform Network Code Section Y Chapter 3, paragraph 3.5, contains the price function which is made up of two elements both of which are related to load size. The first element is based on those costs which do not vary with distance (e.g. metering, telemetry, terminal connection, volumetric control). The second element is related to the geographical distance from the local terminal to the site. From these two elements four numeric values are derived for the price function.

The UNC Section Y Chapter 3, paragraph 3.5, also sets out:

- Indexation of the 1998 costs used in the model and future indexation provisions;
- How the Maximum NTS Exit Offtake Rate (MNEPOR) is incorporated within the formula.

### **3) Change process**

The information set out in this Methodology is prepared by National Grid Gas Transmission and the Document Control Section records changes which have been made to the document. The document is published on the charging pages of the National Grid Website:

<https://www.nationalgrid.com/uk/gas/charging-and-methodologies/transmission-system-charges>

N.B. This document describes what underpins the formula contained within the UNC and is unlikely to change unless the formula is changed via a modification to the UNC.

For the avoidance of doubt, this Methodology does not form part of the UNC.

## **PART B: METHODOLOGY**

### **4) Guide to the tables contained within the spreadsheet**

There are 11 steps followed to produce the information for the price function. The steps outlined below relate to the corresponding numbered sections in the spreadsheet (embedded in section 5).

There are a number of estimated embedded costs in the model. In aggregate these costs are meant to cover maintenance and they are estimated based on the pipe size and distance.

#### Step 1: Pipeline Diameters for a range of distances and peak-day flowrates

This table shows the pipe diameters in mm required to meet a range of typical peak day flowrates for a range of pipeline distances.

#### Step 2: Pipe-laying Unit Costs

This table contains the unit costs per km (£/km) for laying pipes of different diameter sizes. They are the costs used to produce the NTS Optional Commodity Charge formula in 1998.

#### Step 3: Maintenance costs

This table shows non-distance related costs for each of the peak day flowrates for the different pipe diameters. (Costs included for example: pipeline connection, pig traps, calorimetry, pressure reduction and volumetric control).

#### Step 4: Total Capital Costs for a range of distances and peak-day flowrates

This table calculates the total capital cost for a range of distances and peak day flowrates. This is done by multiplying the pipe laying unit (£/km) cost from step 2 by the distance and adding the non-distance related cost from step 3. Additional costs of £100,000 are included for pipeline distances at 25km and over, with an extra increment £100,000 being added at 50km, to reflect additional costs as distance increases.

#### Step 5: 10 year discount factor

This table shows how the ten year discount factor used in this model is calculated and this discount factor is used to create the annuitised costs in Step 6.

#### Step 6: Annuitised Costs

This table calculates the total project cost per annum made up of annuitised capital costs and ongoing (revenue) costs over a ten year project life using the costs from step 4 and the 10 year discount factor from step 5.

### Step 7: Ongoing Operational Costs

This table calculates the ongoing costs of the hypothetical pipeline based on a number of assumptions and estimates. These costs increase in steps based on flow rates and distances.

The costs included in this table are:

The annuitized costs from step 6 + (plus)

- a) 1% of the pipeline total distance costs (step 4) minus the maintenance costs (from step 3), is added to all the distance and flow rate combinations;
- b) 2.5% of the maintenance costs (from step 3), is added to all the distance and flow rate combinations;
- c) £10,000 Per km is added to all those with a distance greater than 0km
- d) £35,000 is added to all those with a distance greater than 0km
- e) £40,000 is added to all those with a flow rate between 1 and 5 mcmd, inclusive
- f) £80,000 is added to all those with a flow rate between 7 and 15 mcmd, inclusive.

### Step 8: Supply point capacities

This table calculates the supply point capacities using an average load factor of 75% of the SOQ. This is used to calculate the Annual Quantity AQ in GWh that will be used to calculate the cost per kWh.

### Step 9: Cost per kWh

This table divides the annuitised ongoing costs in step 7 by the annual quantities corresponding to the supply point capacities using an average load factor of 75% to generate a matrix of unit cost in step 8 (supply point capacities), expressed in p/kWh for a range of supply point capacities and distances.

### Step 10: Function Calculation

This section calculates the distance and non-distance related parts of the function by means of regression analysis. The functions are expressed as power relationships. The zero distance p/kWh is from step 9. The distance related average p/kWh is calculated by subtracting the 0km cost per kWh value from the 50 km cost per kWh in step 9 and dividing by 50. These are used to create linear equations that represent the non-distance and distance related elements of the NTS Optional Commodity Rate function and can be expressed as within the formula in step 11. The gradient and intercepts from each of the linear equations can be expressed:

	Non Distance	Distance
Gradient	z	x
Intercept	y	w

### Step 11: Optional Commodity Rate Formula

This section contains the NTS Optional Commodity Rate formula that is produced from the previous steps. The formula is made up of the gradient and intercepts values from the two linear equations (non-distance and distance related) described in Step 10.

$$\text{NTS Optional Commodity Rate} = w^*(M^x) * D + y^*(M^z)$$

The values for w,x,y & z are obtained from the linear equations detailed in the function calculations in Step 10.

M and D are defined within the UNC Section Y Chapter 3, paragraph 3.5.

## 5) The Optional Commodity Rate Formula - Illustrative Tables



NTS Optional  
Commodity Rate form