nationalgrid

Overview of Gas Transmission Charging

February 2012

Version 2.0

Version/Revision Number	Date of Issue	Notes
1.0	July 2011	
2.0	February 2012	Updated to reflect Exit Reform charging arrangements.

Summary

This guide aims to provide an overview of the main Transmission charges set by National Grid Transmission as of October 2012. When compiling this document the aim was to make it as concise and simple as possible whilst allowing the reader to gain an overview of Transportation Charges. Therefore, if there is anything within this document which you are unsure about please first look in the section named “Links to Further Detail”. Failing that, please do not hesitate to contact us on 01926654633 or charging.enquiries@uk.ngrid.com. This also applies if you have any other queries or feedback in general regarding the website or information contained within it.

All references to “National Grid” in this document refer to National Grid Gas plc in its role as holder of the Gas Transporter Licence in respect of the NTS (the “Licence”).

National Grid is a regulated company due to its monopoly position. Ofgem carries out this regulation through the issue of statutory licences, which outline the conditions of holding the licence and hence forms the basis of the regulatory controls. These controls govern how much revenue National Grid is allowed to recover for owning and operating the system and, secondly, how we recover this revenue.

The allowed revenue is split into two separate streams;

TO (Transmission Owner), which represents the costs of owning and maintaining the NTS, and SO (System Operator), which represents the costs of operating the NTS and associated commercial arrangements.

We collect TO revenue through a combination of Capacity and Commodity Charges.

The price of capacity is cost reflective and is calculated by National Grid’s NTS Transportation Model.

SO Allowed revenue is made up of a number of different costs and revenue streams. Costs include elements such as purchasing gas to balance the system and run compressors, Internal costs of operating the system i.e. staff, property etc, and holding gas in reserve i.e. operating margins.

Revenue streams include building capacity over and above (incremental) what was calculated in the price control, and is triggered by customers signalling the need for the extra capacity. Ofgem decide how much this extra capacity should cost to build and, subsequently, create a revenue driver.

We recover the SO allowed revenue through a combination of charges.

The SO Commodity Charge recovers all allowed revenue which has not been recovered through the other charges. We calculate how much we need to recover and divide this by forecasted flows in and out of the system.

Therefore users who enter gas into the system pay the following;

TO Entry Capacity Charges
TO Entry Commodity Charge
SO Entry Commodity Charge
St Fergus Compression Charge (if bringing in gas at the Total Oil Marine sub-terminal)

The gas is now at the NBP (National Balancing Point) which essentially means at the centre of the system (commercially not physically).

Users who exit gas from the system pay the following;

TO Exit Capacity Charge
TO Exit Commodity Charge
SO Exit Commodity Charge

If users opt for the **NTS Optional Commodity ("Shorthaul") rate** they pay this rate and do not pay any other entry or exit Commodity Charges.

Gas flowing into and out of Storage does not attract Commodity Charges as it is assumed that this gas will have attracted NTS Commodity charges already on first entering the NTS (before then flowing into and out of Storage), and then will attract NTS Commodity Charges on exiting the system.

We aim on a "best endeavours" basis to change our Commodity Charges twice a year, and base the charges on forecasted costs and any revenue already recovered.

If we recover more or less than we are allowed, this either flows into our following years allowed revenue (through the Licence defined 'K' factor) or is given back to the shipper community via a rebate of the TO Entry Commodity charge.

Charges are changed as costs and forecasts fluctuate throughout the year and these updated forecasts may differ from those which were used to set charges. We are obliged to set charges to aim to not over recover by more than 4% in any formula year or more than 6% over two consecutive formula years, and any under or over recovery flows through to the following formula year.

1 Introduction

National Grid is the owner and operator of the gas National Transmission System (NTS) in Great Britain.

The NTS is a network of pipelines, presently operated at pressures of up to 85 bar, which transports gas safely and efficiently from coastal terminals and storage facilities to exit points from the system. Exit points are predominantly connections to Distribution Networks (DNs) and large consumers but also include storage sites, and direct connections to other systems, such as interconnectors to other countries.

As the Transmission Owner, National Grid Gas plc is subject to regulation by the industry regulator, Ofgem. The rationale being that ownership of the NTS leads to the creation of a 'natural monopoly'. A 'natural monopoly' is where, due to large economies, of scale it is more economically and socially efficient to have a single firm, rather than multiple firms participating and competing within the industry.

However to encourage efficiency and prevent abuse of monopoly power the amount of revenue that can be recovered from owning the NTS is regulated by the Office of Gas and Electricity Markets (Ofgem).

Ofgem carries out this regulation through the issue of statutory licences, which outline the conditions of holding the licence and hence forms the basis of the regulatory controls.

2 What is National Grid allowed to earn and how do they collect this revenue?

National Grid Gas plc is the licensee with relation to the 'Gas Transporter Licence', which outlines the conditions to which the company must comply and provides controls with relation to the charging of users for system usage.

The main control, in terms of the charging process, is the revenue restriction within the price control. The Price Control Review, which sets this restriction, has occurred every 5 years and provides a mechanism to regulate revenue recovery from charges for system usage. The next price control will be set for an eight-year period from 1 April 2013 to 31 March 2021. This will be the first transmission price control to reflect the new RIIO (Revenue = Incentives + Innovation + Outputs) model.

The Charging and Revenue team is responsible for setting charges which recovers revenue matched to the allowances described below.

Transmission Owner (TO)
- TO Maximum Allowed Revenue (TO MAR) defined in Sp C C8B in National Grid Gas, Gas Transporter licence
- Allowed earnings from depreciation, return and opex relating to regulatory asset value (RAV)
- Represents the costs of owning and maintaining the NTS
- Includes some pass through costs

System Operator (SO)
- SO Maximum Allowed Revenue (SO MAR) defined in Sp C C8C
- Allowed earnings from various SO incentive schemes
- Represents the costs of operating the NTS and associated commercial arrangements

A useful document to have a look at now would be our Quarterly Charge Setting Report(s)[1]. This shows the different elements of our allowed revenue and how they all add up.

How does National Grid collect allowed revenue?

National Grid's NTS Licence obliges us to have a network code (UNC) which defines the charges and a Charging Methodology which defines how the charge rates are calculated (Prices).

NTS Charging Methodology seeks to set charges such that Actual Revenue = Maximum Allowed Revenue in a way that is;

- Cost Reflective,
- Non Discriminatory,
- and Promotes Competition

The Charging Methodology is now part of the Uniform Network Code as UNC TPD Section Y[2].

The NTS Charging Methodology Forum[3] is a UNC Workgroup that debates and develops modifications to the transmission charging methodologies in Section Y of the UNC.

From time to time, National Grid may raise Gas Charging Discussion ("GCD") papers or Gas Charging Methodology ("GCM") papers[4].

[1] http://www.nationalgrid.com/uk/Gas/Charges/Tools/
[2] http://www.gasgovernance.co.uk/sites/default/files/TPD%20Section%20Y%20-%20Charging%20Methodologies_9.pdf
[3] http://www.gasgovernance.co.uk/ntscmf
[4] http://www.nationalgrid.com/uk/Gas/Charges/consultations/

3 NTS Entry/Exit Charge Application

The Charging Methodology describes the different charges which National Grid levy to collect the various allowed revenues.

Summarised below are the main charges which a user will pay when using the NTS.

When a user **enters** gas onto the NTS **(A)** they will pay;

TO Entry Capacity Charges
TO Commodity Charges
SO Commodity Charges

The gas has now got to the centre of the system (commercially not physically). This is called the National Balancing Point.

When a user **exits** gas off the NTS **(B)** to either a LDZ, or a Direct Connect (e.g. Power Station) they will pay;

TO Exit Capacity Charges
TO Commodity Charges
SO Commodity Charges

When a user exits gas from the NTS into a Storage Point **(C)** they will pay;

TO Exit Capacity Charges

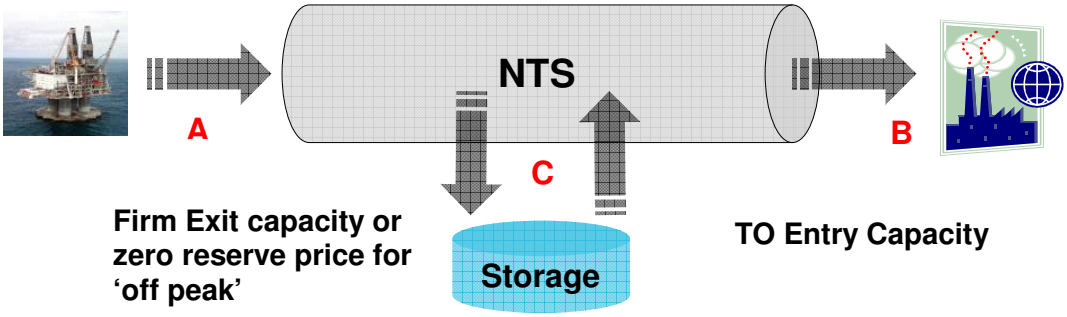
When a user enters gas into the NTS from a Storage Point **(C)** they will pay;

TO Entry Capacity Charges

You will notice that Storage points do not pay Commodity Charges as to get that unit of gas into, and out of, Storage means that it first needed to enter and, eventually, exit the NTS. Therefore, attracting Commodity charges at Storage would lead to double counting.

Non-Storage Entry
TO Entry Capacity (Auctions)*
TO Entry Commodity
SO Commodity

Non-Storage Exit
TO Exit Capacity (Firm)* or zero reserve price for 'off peak'
TO Exit Commodity
SO Commodity

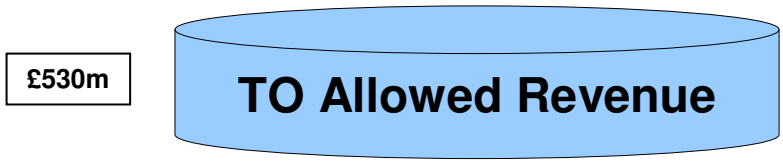


** Currently SO revenue from Incremental capacity i.e. above the obligated capacity level. In RIIO-T1 period this is proposed to be TO.*

Now we'll look at the various charges in more detail to see how they are calculated, why they are at the level they are, and who pays them.

4 TO Charges

TO Allowed revenue represents the costs of owning and maintaining the NTS. (The figures used are purely illustrative. Please read our quarterly charge setting report for more up to date costs and revenues).



We have calculated our TO Allowed Revenue as described in section 3. We now need to recover this revenue.

First of all we deduct

This is because we collect the revenue for these elements from other charges.

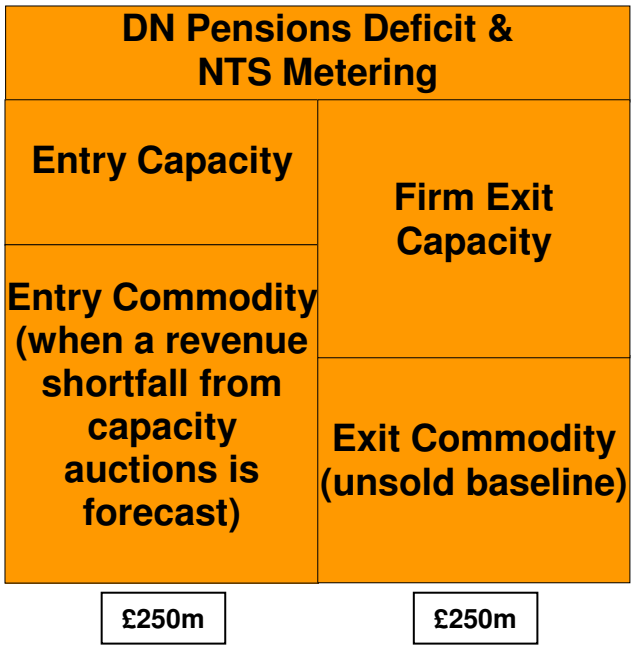
The remaining revenue is collected from the 3 main TO charges as listed below.

TO Main Charges

TO Entry Capacity
TO Exit Capacity
TO Commodity Charge

We have £500m left to collect from TO Charges. The Charging Methodology states that we must aim to recover TO MAR (Transmission Owner maximum allowable revenue) via a 50/50 split between Entry and Exit Charges.

Therefore we will collect £250m from Entry charges and £250m from Exit Charges.



4.0 TO Capacity Charges

Capacity charges apply to users procuring both entry and exit capacity.

This report will not go into the detail of how the various auctions and application windows operate; however, the next sub-section will discuss how the capacity charges are calculated. For more details of the NTS Entry Capacity auction and NTS Exit Capacity application processes please refer to the UNC.

4.1 Setting of TO Capacity prices

Readers may find it useful to refer to UNC TPD Section Y – Charging Methodologies[5] when reading this section as it does go into further advanced detail about the processes involved.

To set capacity prices both Entry and Exit we use National Grid's NTS Transportation Model. The Transportation Model is comprised of two models, the Transport Model and the Tariff Model.

The Transport model calculates the marginal costs of investment in the transmission system that would be required as a consequence of an increase in demand or supply at each connection point or node on the transmission system, based on analysis of peak conditions on the transmission system. This approach is called the Long Run Marginal Cost (LRMC) methodology.

The measure of the investment costs is in terms of £/GWhkm, a concept used to calculate marginal costs, hence marginal changes in flow distances based on increases at entry and exit points are estimated initially in terms of increases or decreases in units of kilometres of the transmission system for a small energy injection to the system.

If users bring gas onto the system a long way from demand (or greater than local demand) this gas flows further into the system and utilises more of the system. This increased usage is reflected in the capacity charge. Capacity charges are therefore locational specific.

To run the model requires the following inputs;

- Demand and Supply Forecasts
- Updates to the Network and any future projects
- Expansion Constant (How much does it cost to build a km of pipeline and associated compression)
- Revenue amount to be recovered from Exit Capacity
- New supply points
- Baselines (how much capacity we are obligated to offer) set within our Licence
- Any requests for incremental (over and above our obligations) capacity

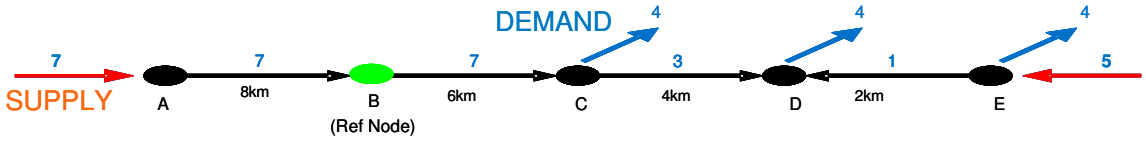
In the model we build the network to represent how it will look for the year we are generating capacity prices, other than for the Quarterly System Entry Capacity (QSEC) where we use the network from the preceding year. This is because the QSEC auction results can trigger incremental capacity and we want to avoid prejudging the results of these auctions. For the QSEC auction held in 2010 we modelled the gas year 2012/13 and for Capacity prices applicable from 1st October 2010 we modelled gas year 2010/11.

As part of modelling the year, we forecast demand and then balance supply to match demand using the merit order as set out in the Charging Methodology.

This gives us an initial Supply and Demand balance as illustrated in section 5.1.1. How do we then calculate a capacity price?

[5] http://www.gasgovernance.co.uk/sites/default/files/TPD%20Section%20Y%20-%20Charging%20Methodologies_9.pdf

4.1.1 Setting of TO Entry Capacity prices



LRMCs (Flow to Ref Node) prior to 50:50 adjustment

A	B	C	D	E
8	0	-6	-10	-8

What you see above is an example of a balanced network and the Entry LRMC's for each node A to E. Note that supply equals demand.

How are Entry LRMC's derived?

- If you add a unit of supply at a node and an equivalent unit of demand at the **Ref node** (to maintain a balance) the Transport model calculates the effect that extra unit of gas has had on flows on the system.
- Node A. Supply increased to 8 and demand at Ref Node B equals 1. This extra unit of gas will travel 8km to meet the demand at Ref Node (B).
- Go back to the initial balance network each time the LRMC is calculated for a node.
- If an extra unit of supply is added at Node E, then 2 units (extra 1 unit) will then flow from E to D (+2km), but will mean that a unit of gas will not have to flow from C to D (-4km) and from B to C (-6km) meaning the LRMC = -8km
- If an extra unit of supply is added at Node D then that will mean that a unit of gas will not have to flow from B to C (-6km) and from C to D (-4km) meaning LRMC = -10

We have now calculated an Entry LRMC for each node on the network and at the same time an Exit LRMC (opposite of Entry).

We now want to achieve a 50/50 split between average Entry and average Exit LRMC's.

The model does this by adding an adjustment to all Entry LRMC's and deducting an adjustment from Exit LRMC's. Three key points to remember here are;

- The adjustment amount is the same for all offtakes
- Exit LRMC's are the exact opposite of Entry LRMC's for a node
- You cannot have a negative capacity price

Entry Nodes equal A and E

Exit Nodes equal C, D and E

Entry Point	**Raw Entry LRMC**		**Adjusted Entry LRMC**	
A	8	8	10.67	10.67
E	-8	0	-5.33	0
	Average Entry Cost	4	Average Entry Cost	**5.33**
Exit Point	**Raw Exit LRMC**		**Adjusted Exit LRMC**	
C	6	6	3.33	3.33
D	10	10	7.33	7.33
E	8	8	5.33	5.33
	Average Exit Cost	8	Average Exit Cost	**5.33**

Now we have calculated Entry Capacity LRMC's based on the initial supply and demand balance. Are these the LRMC's which we use to set reserve prices? Not quite. There are a few more stages to setting TO Entry Capacity prices.

4.1.2 Setting of TO Entry Capacity prices (Reserve Prices)

What you see in section 5.1.1 are Entry LRMC's calculated using the initial supply and demand balance.

Entry Capacity reserve prices are based on what we are obligated to provide for sale and not on what is forecasted to flow in the initial supply and demand balance.

What does this actually mean in practice?

Stage 1

For node A forecasted supply is 7. Say, however, the baseline (what we are obligated to offer for sale) for node A is 9. We therefore calculate the LRMC for node A based on it flowing at 9 and not 7.

If node A flows at 9 this means that the model is out of balance (more supply than demand). Demand does not move therefore supply has to be decreased at node E. Node A has increased from 7 to 9, therefore the supply at node E decreases from 5 to 3.

Using this adjusted supply and demand balance I now calculate the LRMC for node A.

Stage 2

If the baseline for node E was 7 I would start with the initial supply and demand balance and increase supply at E from 5 to 7 and reduce the supplies at A from 7 to 5 and then calculate the LRMC for node E.

Does this not create a different LRMC for the nodes in Stage 1 and Stage 2? Yes it does. Stage 1 is calculating the Reserve price for Node A which is noted down and fixed. Stage 2 is calculating the reserve price for Node E which is noted down and fixed. Essentially the model resets everything back to the initial balance and calculates the reserve prices for each Entry Point one after the other, based on the baseline for that Entry point.

If there are more than two Entry points (which there is in reality) the model reduces the supplies at the Entry Point furthest away from the point it is calculating at the time to create a balance.

4.1.3 Setting of TO Entry Capacity Step prices

The QSEC auction allows users to bid for additional capacity above baseline, which is essentially users signalling that they would like more capacity to be made available than National Grid is obligated to provide. This is done via step prices.

QSEC step prices for release of additional (incremental) capacity are calculated with reference to the applicable reserve price and in accordance with the methodology for the determination of incremental step prices as set out in National Grid's Incremental Entry Capacity Release (IECR) methodology statement.

Simplifying the process, the model will calculate what the LRMC's would be for various amounts over and above the baseline. The baseline for node A equals 9. If the step size was 1, the model would calculate what the LRMC would be for flows at 10 (step 1) up to the appropriate number of steps.

We now have the various LRMC's. This is turned into a Capacity price by doing the following

Adjusted LRMC x Expansion Constant x Annuitisation Factor / 10^6 x 100 / 365

The expansion constant turns the LRMC (in terms of distance ~km) into a capital unit cost (£/GWh). The annuitisation factor takes into account that a capital investment is not paid for in one go but over a number of years (life of asset/commitment etc). As it's an annual charge it also needs to take into account inflation and Rate of Return. The remaining figures turn the annuitised capital unit cost into a daily charge p/kWh/day.

4.1.4 Exit Capacity prices

Exit Capacity prices are based on the LRMC at the initial supply and demand balance. This creates initial Exit Capacity prices.

One key difference in setting Exit Capacity prices, compared to Entry Capacity reserve prices, is the model does not use the adjusted Exit LRMC's in 5.1.1. This process is just carried out for setting Entry reserve prices so that the choice of reference node is not relevant.

For the setting of Exit Capacity prices the model takes the Raw Exit LRMC's and makes a separate revenue adjustment to the LRMC's so that Exit baseline flows multiplied by the Capacity charge equals what we need to recover from Exit Capacity charges. This is essentially maintaining the 50/50 revenue split between TO Entry and Exit charges.

4.2 Application of TO Capacity Prices

4.2.1 Entry Capacity Prices

The table on the following page indicates the TO Entry auctions for which we were required to set reserve prices in the calendar year 2010.

The "Capacity year Modelled" column shows the Gas Year which we have to build up within the model.

For QSEC we require data from Commercial and Shippers on any intended incremental bids so we can provide prices to match the amount of capacity they may require.

The Expansion Constant used in the QSEC model remains the same for all other models produced in the year.

Auction	Date Prices Set	Date Auction held	Capacity Allocation		Comments	Capacity Year Modelled
QSEC	Jan-10	Mar-10	1st October 2011	30th September 2027	This auction sells capacity in quarterly blocks. We set reserve prices for purchasing capacity at baseline. This auction also allows users to purchase incremental capacity	2012/13
RMTNTSEC	Jun-10	Sep 2010 to Aug 2011	1st October 2011	30th September 2011	This auction sells capacity in monthly blocks and is held on a rolling monthly basis. Bidders can also bid for previously purchased capacity which other users wish to trade. We set reserve prices	2010/11
DADSEC	Jun-10	30 Sep 2010 to 29 Sep 2011	1st October 2011	30th September 2011	This auction sells capacity a day ahead. Capacity is bought in daily blocks. The reserve prices are the same as RMTNTSEC with a 1/3 discount applied to them	2010/11
WDDSEC	Jun-10	1 Oct 2010 to 30 Sep 2011	1st October 2011	30th September 2011	This auction sells capacity on the day. Capacity is bought in daily blocks. The reserve price is 0 as we have an obligation to sells all baseline available	2010/11
AMSEC	Jun-10	Feb-11	1st April 2011	30th September 2012	This auction sells capacity in monthly blocks for a 18 month period. We set reserve prices	2010/11 & 2011/12

However just because we set prices for an auction held within the year does not mean that the auction sells capacity for the current year and subsequently collects revenue for the current year.

A QSEC auction held in 2010 will sell for capacity from October 2012 and therefore the revenue applies to that year and counts towards revenue recovery for that year.

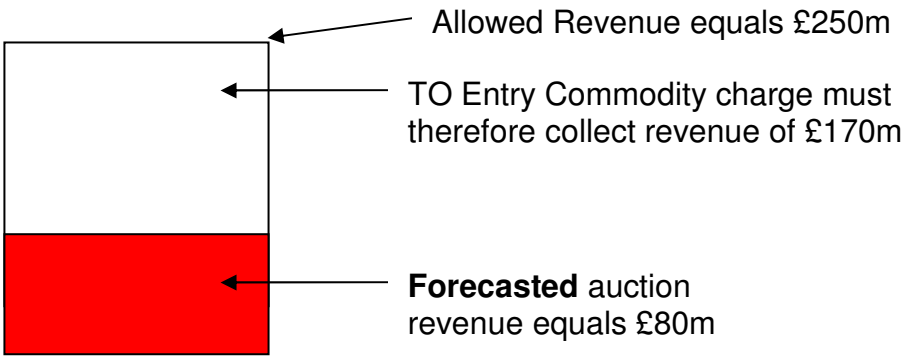
4.2.2 Exit Capacity Prices

We set Exit capacity prices ahead of the gas year (e.g. 1st October 2010 to 30th September 2011). The prices are finalised at the end of July. Exit Capacity prices remain fixed for the whole gas year. What a user will pay on a daily basis is the Exit Capacity price multiplied by the booked capacity.

We are also required to set Indicative Exit Capacity prices to be used in the Application windows held in July. Please see the further information section regarding links to Exit Reform and the Application windows

4.3 TO Entry Commodity Charge

There is no guarantee that TO Entry Capacity charges relating to a formula year will collect allowed revenue. This can be for a number of different factors such as, not all capacity is sold at an Entry point, some is sold at a discount or with a zero reserve price (on the day) etc. This is highlighted in the diagram below.



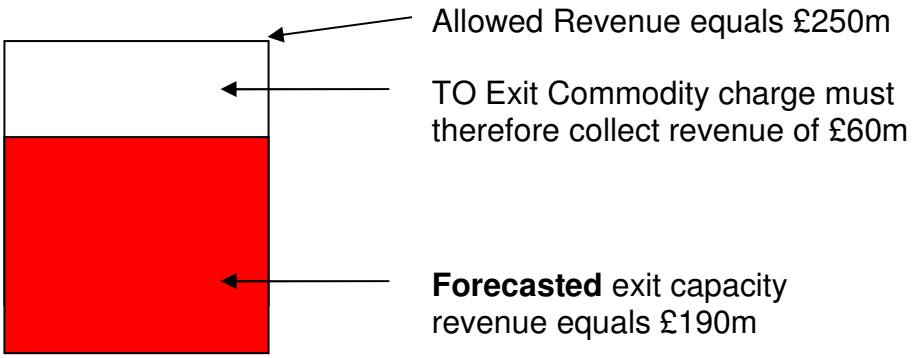
We have forecasted that we need to collect an extra £170m. The Capacity charges cannot be altered so a charge is made on throughput to collect the remaining £170m. We forecast throughput coming onto the system and then work out a charge (A)

1,000,000GWh (throughout) x **A** = £170,000,000

A must = 170. We therefore charge £170 a GWh, 0.00017 £/kWh or as the charge is shown 0.0170 p/kWh for every unit of gas entering the system.

4.4 TO Exit Commodity Charge

Similar to Entry, there is no guarantee that TO Exit Capacity charges relating to a formula year will collect allowed revenue. The main reason for this is not selling all of the available baseline capacity.



We have forecasted that we need to collect an extra £60m. The Capacity charges cannot be altered so a charge is made on throughput to collect the remaining £60m. We forecast throughput coming onto the system and then work out a charge (A)

1,000,000GWh (throughout) x **A** = £60,000,000

A must = 60. We therefore charge £60 a GWh, 0.00006 £/kWh or as the charge is shown 0.0060 p/kWh for every unit of gas entering the system.

For further detail on how we calculate our allowed revenue and turn this into a TO Commodity charge please see our Quarterly Charge setting report[6].

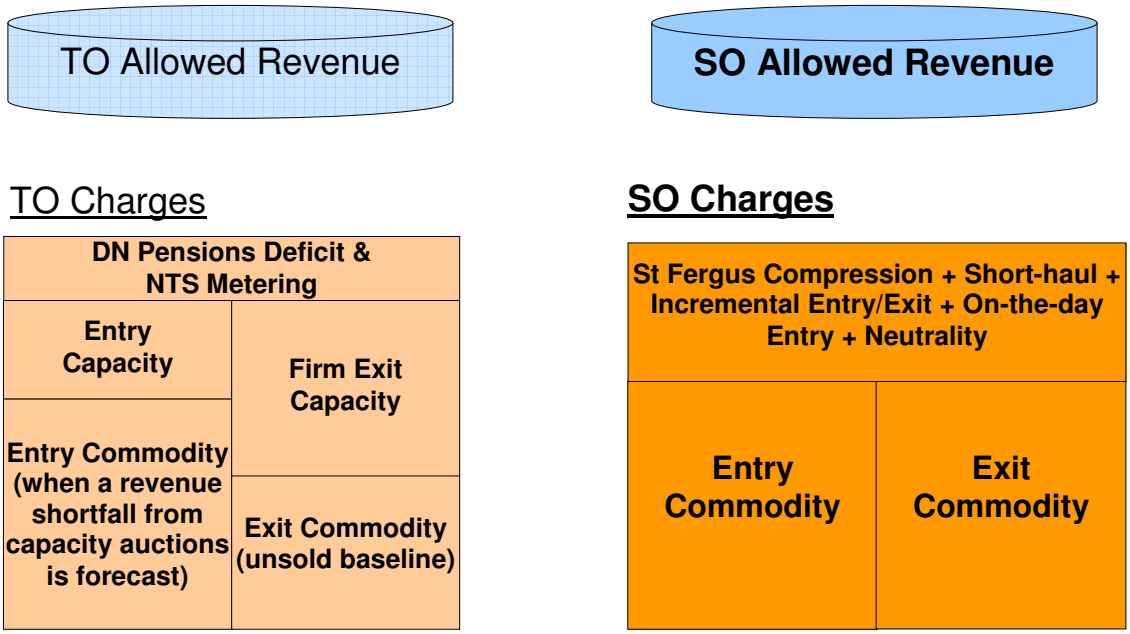
[6] http://www.nationalgrid.com/uk/Gas/Charges/Tools/

5 SO Charges

SO Charges collect revenue to recover forecasted costs of operating the system and some of the costs associated with keeping it in balance.

SO Allowed revenue is recovered via a number of different charges and mechanisms as shown in the diagram below; however, the 2 main charges that we set and adjust on a regular basis are;

SO Commodity Charge
St Fergus Compression



5.0 SO Allowed Revenue Components

There are a number of different components which comprise the SO Allowed Revenue. To understand the various elements in more detail we would recommend reading the quarterly charge setting report, National Grid Gas (NTS) System Operator Incentives documentation, and the NTS Charging Methodology (UNC Section Y)[7].

Whereas with the TO MAR the various components are relatively well known at the start of the year, many of the components within the SO MAR have to be forecasted as they can vary significantly throughout the year and are not fixed until after the end of the formulae year. The following is a brief description of the costs which make up our allowed revenue.

Example of Components

Entry Costs

- Forecasted Buybacks. This is when we have to buyback capacity which a shipper has bought as we may not be able to allow gas to enter the system due to constraints.

[7] http://www.gasgovernance.co.uk/sites/default/files/TPD%20Section%20Y%20-%20Charging%20Methodologies_9.pdf

Exit Costs

- CLNG (Constrained Liquid Natural Gas). This is the cost of purchasing gas and holding it at various sites CLNG sites on the system which are strategically located on the parts of the system where we are more likely to suffer constraints.

External Costs

- Shrinkage Costs. OUG (Own Use Gas). This is gas we use to fuel the compressors which maintain pressures while transporting gas around the system. Also includes UAG (Unaccounted for Gas) which is gas which is lost due to theft, meter errors, and meter calibration.
- Operating Margins. National Grid, under its safety case, has to hold a certain amount of reserve gas in storage facilities strategically situated around the UK. The total costs comprise of costs associated with booking space and buying gas for storage within these facilities. This is done on an annual tender basis.
- Residual Balancing Costs. Residual Balancing Costs are related to the energy balancing trades we take to match supply and demand. In its role as residual balancer, National Grid buys and sells gas on the OCM (On the Day Commodity Market) for energy balancing purposes.

Internal Costs

- These are essentially the Internal Costs of Operating the above i.e. staff, computer systems, control rooms etc.

The Residual Balancing, and forecasted buybacks costs and revenues, are dealt through neutrality mechanisms. Neutrality Charges/revenues are used as a mechanism to help ensure that National Grid NTS does not benefit from any financial gains or incur any losses resulting from any actions. Therefore although they form part of the SO allowed revenue, payments and charges are automatically calculated and invoiced on a monthly basis.

For further information readers may find it useful to look at the following UNC Sections;

Capacity Neutrality arrangements: Section B 2.13

Balancing Neutrality charges: Section F 4

5.0.1 Incremental Capacity

The SO MAR also includes allowed revenues, from releasing Incremental Capacity over and above baseline capacity levels.

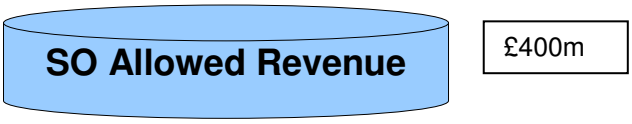
When a requirement for Incremental Capacity is signalled, a revenue driver may be generated and set out in the licence. The revenue driver essentially dictates how much additional revenue National Grid is allowed to earn on releasing this extra capacity, taking into account the forecasted costs of reinforcing the system including a rate of return.

5.1 SO Actual Revenues

Section 6.0 describes the various components which create the SO Maximum Allowed Revenue (SO MAR). Now that we have forecasted our SO MAR, this needs to be recovered.

The diagram in Section 6 highlights the various charges which recover the revenue.

The subsections within section 6.1 each set out how a proportion of the SO MAR is collected. The SO Commodity charge essentially collects the remainder left over after these charge components.



5.1.1 Revenue recovered automatically £30m

The values of the neutrality schemes make up part of the SO MAR. If we forecasted a value of £20m, for charge setting purposes this £20m would be assumed to be automatically collected through the neutrality mechanisms. Essentially for charge setting purposes it does not really matter what this value is, as whatever the actual end of year value, this value would be collected. There are incentive schemes which govern our actions in regard to the costs which are recovered through neutrality thus giving a profit and loss element which is not collected through the neutrality mechanisms but through the SO Commodity Charge.

5.1.2 Revenue recovered through sales of Incremental Capacity £60m

Incremental capacity is purchased through the various auctions and bookings processes. The revenue, although recovered in the same way as TO Capacity Charges, is classed as incremental and therefore SO revenue. TO charges collected from baseline capacity sales = TO, Sales of incremental capacity = SO.

The revenue drivers contribute to SO MAR but the actual revenue is collected via capacity charges.

If the Capacity charges do not equal the revenue driver then the difference (plus or minus) remains to be collected through other means (SO Commodity charge).

5.1.3 Shorthaul (Optional Commodity Charge) £10m

Shorthaul Revenues form part of SO Actual Revenues. As part of charge setting, it is important to forecast the volumes and revenues from users utilising the Shorthaul tariff; however, the tariffs themselves do not alter according to the SO MAR. The formulae to calculate the Shorthaul tariffs remains fixed.

To discourage users to uneconomically bypass the NTS and build a pipeline from an entry point to their exit point, a charge was introduced which incentivised users to use the NTS over short distances by offering a rate on throughput which was a discount on normal Commodity charges.

Users who apply for the Shorthaul rate do not pay standard Commodity charges but pay a rate which is determined using a defined formula with the variable inputs being the distance between the Entry point and the Exit Point, and the capacity of the Exit point. The rate mimics the investment decision a Direct Connect may make. It might appear more economic for the closer, larger exit points to consider building their own pipeline. The further the distance, or the

smaller your exit point, the more expensive the shorthaul charge becomes until it gets to a break even point where it will be cheaper to pay normal commodity charges.

The rate only applies to gas brought in at the nominated entry/exit point combination. You cannot apply for the shorthaul rate from Easington to the nominated Exit point and then receive the benefit of the short-haul rate when bringing your gas in at St Fergus. In terms of setting the rate, we derive the distance between two points and feed this information to Xoserve who generate the rate from the formulae. As Shorthaul is the subject we receive the most queries about, we have created a separate factsheet discussing Shorthaul contained within the following section on our website. http://www.nationalgrid.com/uk/Gas/Charges/Tools/

5.2 Variable SO Charges

The previous SO Actual Revenues have come from charges which are not adjusted and set by National Grid in the charging cycle of April and October. The revenues have to be forecasted and the variability has to be taken into account as part of Commodity charge setting.

The two following charges are adjusted by National Grid to recover total SO forecasted costs.

5.2.1 St Fergus Compression Charge

£10m

Gas which enters the NTS at St Fergus using the Total Oil Marine sub-terminal (TOM) enters the system at a pressure lower than standard requirements. It therefore needs to be compressed. The costs of compression are directly attributable to certain users so these costs are not recovered from all users. The St Fergus Compression Charge is calculated by forecasting flows at the TOM terminal, then forecasting the amount of Own use gas (or electricity when the Compressor is powered by Electricity in the future) which is used by the Compressor to raise these flows to NTS pressure. Now we can estimate the amount of gas needed for Compression for the formula year, we then calculate the cost of this gas which is done by taking the Weighted Average Cost of gas purchased (used in Shrinkage forecasts) on the system as a whole, multiplied by the amount of gas needed. The total cost of compression for TOM gas flows is then divided by the forecasted gas flows to derive a charge i.e. forecasted flows x charge = forecasted Compression costs.

5.2.2 SO Commodity Charge

As you work down through section 6.1 and 6.2 the forecasted revenues from the charges and mechanisms are deducted from the SO MAR. The remaining allowed revenue is collected from the SO Commodity Charge (£290m).

This charge is applied to relevant forecasted Entry and Exit throughput.

To calculate the charge we take the remaining income and forecast total Entry and Exit flows (minus storage flows and flows where shorthaul applies), and smear the target revenue across these flows.

6 Charging Examples

Looking at sections 5 and 6 it may be useful to provide a few different scenarios to understand how the charges work in practice.

For the purposes of this section we have used the charges as per October 2012 Charging Statement.

1. **I am a shipper. I want to bring gas onto the NTS at a constant rate over the gas year from Bacton Beach terminal. I will purchase Entry Capacity at Bacton through the MSEC auctions. I plan to ship 2,000,000,000kWh over the year to the NBP. What will I pay?**

TO Entry Capacity Charge (Bacton MSEC Reserve Price) = 0.0098 (p/kWh/day)
TO Entry Commodity Charge = 0.0331 (p/kWh)
SO Entry Commodity Charge = 0.0229 (p/kWh)

5,479,452 x 0.0098 x 365 /100 = £196,000 (TO Capacity Charge Bacton)
2,000,000,000 x 0.0331 / 100 = £662,000 (TO Entry Commodity Charge)
2,000,000,000 x 0.0229 / 100 = £458,000 (SO Entry Commodity Charge)

2. **Instead of trading the gas at the NBP I would like to ship the gas to a Power Station. The Power Station does not have a flat profile. It has a peak of 20GWh/d and is located in SW1**

TO Entry Capacity Charge (Bacton MSEC Reserve Price) = 0.0098 (p/kWh/day)
TO Entry Commodity Charge = 0.0331 (p/kWh)
SO Entry Commodity Charge = 0.0229 (p/kWh)

20,000,000 x 0.0098 x 365 /100 = £715,400 (TO Capacity Charge Bacton)
2,000,000,000 x 0.0331 / 100 = £662,000 (TO Entry Commodity Charge)
2,000,000,000 x 0.0229 / 100 = £458,000 (SO Entry Commodity Charge)

The gas is now at the NBP

TO Exit Capacity Charge = 0.0101 (p/kWh/day)
TO Exit Commodity Charge = 0.0094 (p/kWh)
SO Exit Commodity Charge = 0.0229 (p/kWh)

20,000,000 x 0.0101 x 365 / 100 = £737,300 (Exit Capacity Charge)
2,000,000,000 x 0.0094 /100 = £188,000 (TO Exit Commodity Charge)
2,000,000,000 x 0.0229 / 100 = £458,000 (SO Exit Commodity Charge)

3. **What happens if it was located in SC1**

Exit Capacity charge equals 20,000,000 x 0.0001 x 365 / 100 = £7,300

The locational exit Capacity charge is lower to exit gas off the NTS in Scotland than it is in the South West as of October 2012

4. **The Power Station is located 10 km away from Bacton in Exit Zone EA1. They plan to apply for Shorthaul from Bacton to the Power Station.**

Shorthaul rate: Distance=10km SOQ = 20GWh/d

= (1203*20,000,000^-0.834*10) + (363*20,000,000^-0.654*10) = 0.0159 (p/kWh)

The shorthaul rate replaces all Commodity charges. Capacity charges are as normal

20,000,000 x 0.0098 x 365 / 100 = £715,400 (TO Capacity Charge Bacton)
20,000,000 x 0.0073 x 365 / 100 = £532,900 (TO Exit Capacity charge)
2,000,000,000 x 0.0159 / 100 = £318,000 (Shorthaul Charge)

5. It is not possible to source all the Power Stations demand from Bacton. 50% of the gas is purchased at Easington

10,000,000 x 0.0098 x 365 /100 = £357,700 (TO Capacity Charge Bacton)
10,000,000 x 0.0123 x 365 /100 = £448,950 (TO Capacity Charge Easington)

The Shorthaul rate only applies to flows between the nominated Entry and Exit Points

1,000,000,000 x 0.0159 / 100 = £159,000 (Shorthaul Charge)

1,000,000,000 x 0.0331 / 100 = £331,000 (TO Entry Commodity Charge)
1,000,000,000 x 0.0094 / 100 = £94,000 (TO Exit Commodity Charge)

1,000,000,000 x 0.0229 / 100 = £229,000 (SO Entry Commodity Charge)
1,000,000,000 x 0.0229 / 100 = £229,000 (SO Exit Commodity Charge)

20,000,000 x 0.0073 x 365 / 100 = £532,900 (TO Exit Capacity charge)

Look at the example 4 and 5. Only 1,000,000,000 of flows are eligible for the Shorthaul Tariff. The remaining flows pay normal Commodity Charges.

6. I am a shipper. I want to bring gas onto the NTS at a constant rate over the gas year from Bacton Beach terminal. I will purchase Entry Capacity at Bacton through the MSEC auctions. I plan to ship 2,000,000,000kWh over the year to Garton

TO Entry Capacity Charge (Bacton MSEC Reserve Price) = 0.0098 (p/kWh/day)
TO Entry Commodity Charge = 0.0331 (p/kWh)
SO Entry Commodity Charge = 0.0229 (p/kWh)

5,479,452 x 0.0098 x 365 /100 = £196,000 (TO Capacity Charge Bacton)
2,000,000,000 x 0.0331 / 100 = £662,000 (TO Entry Commodity Charge)
2,000,000,000 x 0.0229 / 100 = £458,000 (SO Entry Commodity Charge)

The gas is now at the NBP

Ordinarily to exit gas from the system you would pay SO Exit Commodity Charges and TO Exit Capacity Charges. As Garton is a storage site you do not pay Commodity Charges to enter gas into or exit gas from Storage.

With regards to TO Exit Capacity charges, storage sites historically booked Interruptible exit capacity as a commercial decision to avoid paying firm Exit Capacity charges. Currently, the decision facing storage sites is whether to book firm exit capacity (NTS Exit Flat Capacity) and/or daily off-peak exit capacity. Daily off-peak capacity is made available via an auction process and at a zero reserve price (the price actually paid is dependent on the level of competition for the capacity). In this example we have assumed that Garton is making the commercial decision to rely on daily off-peak capacity and the price paid is zero.

The examples highlight how the charging regime works. If you feel further examples are merited feel free to let us know via the contact details contained within further information.

7 Commodity Charging Timetable and Variances

When setting charges we must take into account the revenue that has already been recovered. We forecast costs for the full year but if charges are fixed for half of that time then we will already have recovered a certain amount of revenue for that period. Therefore when setting charges we deduct forecast revenue recover from forecasted allowed revenues and divide by forecast remaining volumes.

Actual Revenue recovery is crucial for mid formula year (October) charge changes as we must not only know what we are allowed to recover but what we have remaining to recover from the remaining volumes.

Actual revenue recovery up to April (i.e. the end of the formula year) will affect the April price changes as it will be affected by the value of under or over recovery (K) which will roll over from one formula year to the next.

We do not set our charges on an ad hoc basis and we will only reset charges when there are material changes in costs or revenue. This section discusses when and why we change our charges.

When do we set our Commodity Charges?

Charges are reset from 1st April and 1st October for Commodity Charges and 1st October for Exit Capacity Charges. To Entry Capacity reserve prices are set 2 months before the auction is held.

As previously mentioned, we finalise charges two months before the charge is applied. We also have a Licence obligation to give 150 days Indicative Notice of what we think the effect of any charge changes will be.

For example, in November 2011 we will/have forecast/ed costs and subsequent charges for April 2012 to March 2013.

Why don't we change charges whenever costs change?

We use reasonable endeavours to only change our charges twice a year for Commodity Charges and once a year for Exit Capacity Charges.

Why do costs and revenues change?

Our costs and revenues are heavily reliant on factors outside of our control such as gas costs, changing weather, shipper behaviour etc.

Due to the notice period between when charges actually apply and when we have to give notice of the actual charges, variances can happen. We simply have to live with these changes, and any variances flow through to the next year as an adjustment to how much revenue we are allowed to recover. This adjustment from the previous year is known as the K mechanism. K can be positive or negative

The actual setting of charges is a relatively quick and simple task. The major work goes into forecasting of costs and understanding/articulating variances.

What happens if forecasts change after we have fixed commodity charges?

We will either recover more or less than our MAR and the K mechanism will make an adjustment to next year. The MAR changes when actual costs change.

What happens if forecasts change after we have fixed capacity charges?

Nothing… Capacity charges are our view of current costs to invest and in and reinforce the system. Users make a commitment based on the charges.

What happens if we over and under recover more than our MAR?

If we forecast that we are going to over/under recover in the first six months of a formulae year we can take this into account when we set charges the next time. If this occurs after October then a term in the licence called K flows this through into the following year, and adjusts the MAR accordingly.

Why don't we fix charges for a year and accept K?

NGG must use best endeavours to ensure that (for each of the TO and SO Controls);

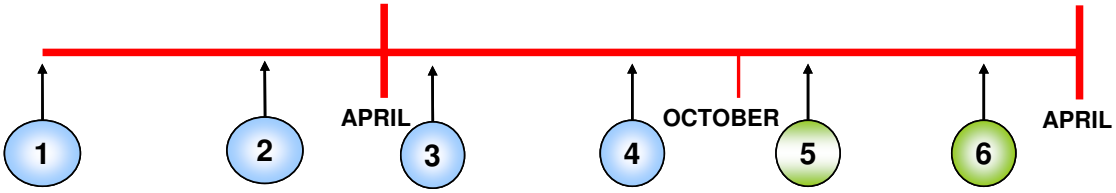
- In any formula year actual revenues are not more than 4% above allowed revenues
- In any two successive formula years, actual revenues over the two years do not exceed the allowed revenues over the two years by more than 6% of the allowed revenue in the second year

Under/Over-recovery can cause large K values which in turn can cause large variability in charges so to try and stabilise charges, large swings in revenue are best avoided.

What happens if there is a fundamental change in costs after we have set charges?

It does depend on the size of the change; however, if it looks like we will significantly under recover or go above our 4 and 6% obligations we can undertake a third price change. This decision is taken as a last resort as this may cause uncertainty in the industry and price variability.

The figure below shows the normal timetable for charge changes applying to Commodity Charges using formulae year 2012/13 as an example.



1.	Indicative Notice of Price Change for Financial Year 13/14 Issued	2 Nov 12
2.	Final Notice of Price Change for Financial Year 13/14 Issued	31 Jan 13
3.	Indicative Notice of 2nd Price Change for October 13 Issued	2 May 13
4.	Final Notice of 2nd Price Change for October 13 Issued	31 Jul 13
5.	Indicative Notice of Price Change for April 14 Issued	2 Nov 13
6.	Final Notice of Price Change for April 14 Issued	31 Jan 14

8 Further Information

Incremental Entry Capacity Release (IECR) Methodology. This document describes the methodology that National Grid employs to determine whether to release entry capacity to Users primarily in the unconstrained period i.e. beyond investment lead times. In particular, it defines under what circumstances National Grid will accept applications for incremental entry capacity from Users received through processes described in the Uniform Network Code, and thereby the level of financial commitment required from Users. As the document is periodically updated the link below will take you to the area of our website where the document is contained

http://www.nationalgrid.com/uk/Gas/Charges/statements/

Exit Capacity Release (ExCR) Methodology. This document describes the methodology that National Grid employs for the release of all exit capacity, i.e. incremental and existing system exit capacity. As the document is periodically updated the link below will take you to the area of our website where the document is contained

http://www.nationalgrid.com/uk/Gas/Charges/statements/

Charging Statements: The suite of documents listed below will indicate current Gas Transmission Charges, as well as the reasoning behind why certain charges may have or will change.

Current Transmission Charges can be found here:

http://www.nationalgrid.com/uk/Gas/Charges/statements/

However, as mentioned, we are required to give 150 days Indicative Notice of our charge changes and 2 months notice of our actual charges. These notices can be found at the following locations;

2 months Notice of Change

http://www.nationalgrid.com/uk/Gas/Charges/NoticeofChange/

150 days Indicative Notice of Change

http://www.nationalgrid.com/uk/Gas/Charges/indicativecharges/

If you like to like to know what future charges may be then please look at the locations above.

How Revenue is turned into charges. This “Overview of Gas Transmission Charging” gives a guide to the different types of charges we levy on users; however, users may be interested in how the specific charges within the Charging Statements and notices above have been calculated, and how forecasted revenue has varied. The Quarterly Charge setting report gives this detail.

http://www.nationalgrid.com/NR/rdonlyres/81DA499F-B8E6-49E2-8844-FE509C02FEBB/55580/NTSChargeSettingSupportingInformationOct12finalJH.pdf

Charging Calculator: This Excel spreadsheet tool allows users to calculate potential Transmission and Distribution charges, based on their own individual usage and location of demand.

http://www.nationalgrid.com/uk/Gas/Charges/Tools/

Ten Year Statement: The Ten Year Statement is published in line with Special Condition C2 of our Gas Transporters' Licence and Section O of the Uniform Network Code. Special Condition C2 requires that the Ten Year Statement, published annually, shall provide a ten-year forecast of transportation system usage and likely system developments that can be used by companies, who are contemplating connecting to our system or entering into transport arrangements, to identify and evaluate opportunities.

http://www.nationalgrid.com/uk/Gas/TYS/

The above list of links is aimed to compliment this guide. However we understand that the Transmission business and associated documents can be complicated, detailed and difficult to locate even to users who have been in the Industry for a number of years. Therefore if you have any questions relating to this guide or in general please feel free to contact us on the mediums below.

01926654633 or charging.enquiries@uk.ngrid.com

We also welcome any feedback in terms of how we may be able to improve our current suite of documents, any extra information users may like to see, as well as feedback on the website in general, especially in terms of locating information.