nationalgrid

DISCUSSION DOCUMENT

Modification Proposal to the Gas Transmission Transportation Charging Methodology

NTS GCD 07:
Optional NTS Commodity Tariff

13 November 2009

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Executive Summary

This document is issued by National Grid Gas plc ("National Grid") in its role as holder of the Gas Transporter Licence in respect of the NTS (the "Licence").

This document sets out for discussion options for revising the Gas Transmission Transportation Charging Methodology (the "Charging Methodology") in respect of the Optional NTS Commodity tariff (otherwise known as the NTS "short-haul" tariff).

The Optional NTS Commodity tariff is available to users as an alternative to the standard SO Commodity tariff (both at entry and exit) and the TO commodity tariff at entry.

The charge was introduced in 1998 to seek to avoid inefficient by-pass of the NTS by large sites located near to entry terminals. The present tariff is derived from the estimated cost of laying and operating a dedicated pipeline of NTS specification (i.e. the cost of by-passing the NTS).

Since the introduction of the charge, there have been changes in the underlying costs with construction costs having increased. In addition, the assumptions underlying the methodology may no longer be the most appropriate and National Grid receives many queries associated with the application of the charge, suggesting a lack of transparency. For these reasons a review of the "short-haul" tariff is being undertaken with the aim of reviewing the methodology against the relevant objectives and increasing the clarity and transparency of the methodology and its application.

Following discussion at the Gas Transmission Charging Methodology Forum (TCMF), this discussion paper is being issued to consider the merits of updating the existing methodology (Option One), or introducing a new methodology based on direct SO cost mapping (Option Two). A number of sub-options have been identified.

Option	Methodology	Detail
1a	Update prevailing methodology, based on annuitised construction costs of alternative pipeline and terminal connection, to reflect latest costs.	10 year annuitisation (unchanged)
1b		45 year annuitisation
2a	Revise methodology to reflect SO costs relating to flows over short distances.	SO costs allocated to Distance
2b	As option 2a plus annuitised construction costs of terminal connection (effectively a hybrid of 1 & 2).	10 year annuitisation
2c		45 year annuitisation
2d	As option 2a	SO costs allocated to Distance and number of offtakes

In addition, consideration has given to the appropriate application of the charge and the following issues have been identified.

Issue	View
Removal of Application to Storage Injection (NTS Exit)	NTS Storage can apply for short-haul for injection (to save on Entry Commodity) but already avoids all commodity charges and shorthaul is not available for storage withdrawal; There is no risk of storage by-pass as these sites would lose the benefit of avoiding commodity
ASEP Location - Distance from ASEP to exit point	This is currently the straight line distance (km) from the boundary of the exit point to the ASEP, but a number of new ASEPs have multiple entry points e.g. Milford Haven Currently use the mid point (implied by single ASEP location) but would be more efficient to use the closest entry point
Limit application	Development of the original service implied it should be limited to the nearest ASEP; however, limiting to between the ASEP and upstream of the next compressor is more appropriate
Removal of Alternative Allocation Rules	The default is to prorate when supplies are less than demand for two or more short-haul exit points linked to the same ASEP. Alternative rules can be requested (with NG approval) but would involve systems changes` and would be less equitable. National Grid believes that this option should be removed on the grounds that in undermines cost reflectivity

Respondents are asked for views on these issues and options, for the purposes of developing charging methodology and UNC change proposals.

It is anticipated that any potential methodology change proposals arising from the discussion consultation could be implemented by October 2010. Views are invited on the timing of any methodology change. UNC changes will be progressed through the Transmission Workstream.

The closing date for submission of your responses to this consultation is **Friday 11th December 2009**

1 Introduction

1.1 This document is issued by National Grid Gas plc ("National Grid") in its role as holder of the Gas Transporter Licence in respect of the NTS (the "Licence").

1.2 This document sets out for discussion options for revising the Gas Transmission Transportation Charging Methodology (the "Charging Methodology") in respect of the Optional NTS Commodity tariff (otherwise known as the NTS "short-haul" tariff).

1.3 The Optional NTS Commodity tariff is available to Users as an alternative to the standard SO commodity tariff (both at entry and exit) and the TO commodity tariff (at entry).

1.4 The charge was introduced in 1998 to reflect more accurately the costs of gas transportation from a terminal to a nearby large supply point to seek to avoid inefficient by-pass of the NTS.

1.5 An exit connection that by-passes the NTS, which might otherwise have connected to the NTS with no NTS reinforcement costs, may be economic for the relevant shipper based on prevailing standard NTS charges. This form of by-pass would always be uneconomic for the industry as a whole, and hence not in the interest of end consumers, as non by-pass of the NTS would result in lower charges on average for all shippers and hence consumers due to the utilisation of spare capacity. For this reason, the optional commodity charge seeks to make NTS connection economic for the connecting party while still representing a benefit to the industry as a whole.

2 Background

Current Methodology

2.1 Users can elect to pay the Optional NTS Commodity tariff as an alternative to both the entry and exit NTS commodity charges.

2.2 The tariff is derived from the estimated cost of laying and operating a dedicated pipeline of NTS specification (i.e. the cost of by-passing the NTS).

2.3 A charging function has been calculated based on flow rate and pipeline distance. The current charge rate is derived from the following function:

Rate(p/kWh) = 1230 x [(EPC) -0.834] x D + 363 x (EPC) -0.654

Where

D is the distance of the exit point from the elected Aggregate System Entry Point (ASEP), and

EPC is the UNC defined Exit Point Capacity[1] and has been previously referred to as the SOQ (supply point offtake quantity) for the purposes of short-haul.

2.4 The charge is available to all daily-metered supply points, including storage exit, although in practice it is only attractive for large supply points situated close to terminals.

[1] The Exit Point Capacity will be defined within the UNC as the Baseline Exit Capacity from October 2012.

Reasons for review of the prevailing methodology

2.5 The current methodology and associated rate was introduced in 1998. Since its introduction there have been changes in the underlying costs, with construction costs having increased over that time period. In addition, the assumptions underlying the methodology may no longer be the most appropriate.

2.6 There have also been many queries associated with the application of the charge under various scenarios.

Considerations for a new methodology

2.7 The aim of the 'short-haul' review is to assess the methodology against the relevant objectives and seek to add clarity and transparency.

2.8 Where it would be inefficient for the industry as a whole for Users to by-pass the NTS, the principle of providing an economic signal to deter exit points close to entry points from by-passing the NTS is considered to be appropriate.

2.9 A more transparent approach could be of benefit.

3 Discussion & Options

3.1 Through the Gas TCMF, the issues associated with the prevailing methodology were raised. At the Gas TCMF held in June, consideration was given to updating the present charge but retaining the same methodology and charge function.

3.2 It was suggested that the charges derived from the prevailing methodology were not reflective of the costs incurred by National Grid and that it may be more appropriate to consider the System Operator costs associated with flows over short distances. The subsequent TCMF held in July covered this alternative approach.

3.3 This discussion paper covers the two alternative cost assignment methodologies; the prevailing by-pass cost methodology and a direct SO cost allocation methodology. In addition, this paper covers a number of rules of application which are independent of the preferred cost assignment methodology.

3.4 Given the potential for the charge to be updated on an annual basis, the annuitisation period for the by-pass costs under option one came into consideration. For this reason, option 1a covers a basic update to the methodology whereas option 1b covers an update with a longer annuitisation period which may be more consistent with annual updating of the charge.

3.5 Option 2a covers the alternative approach of allocating System Operator costs to flows over short distances. Due to concerns over a distance only related charge and the potential for a very small charge where the distance from the exit point to the ASEP was minimal, further options were developed.

3.6 Options 2b and 2c include the SO cost allocation approach of option 2a combined with the avoided connection costs included within options 1a and 1b. Option 2d retains the SO cost allocation approach but allocates cost to both distance and the number of connections. Options 2b, 2c and 2d all result in charges that are a function of both distance and exit point capacity (EPC).

3.7 Under EU regulations, exclusively distance related charges are prohibited. While there are a number of mitigating factors within the short-haul eligibility criteria, this would suggest that option 2a, which is based on distance only, is not appropriate. Options 1a, 1b, 2b, 2c and 2d lead to charges that are a function of both distance and exit point capacity.

Option	Methodology	Detail
1a	Update prevailing methodology, based on annuitised construction costs of alternative pipeline and terminal connection, to reflect latest costs.	10 year annuitisation (unchanged)
1b		45 year annuitisation
2a	Revise methodology to reflect SO costs relating to flows over short distances.	SO costs allocated to Distance
2b	As option 2a plus annuitised construction costs of terminal connection (effectively a hybrid of 1 & 2).	10 year annuitisation
2c		45 year annuitisation
2d	As option 2a	SO costs allocated to Distance and number of offtakes

Option One: Update of existing methodology

3.8 The current methodology derives the cost function by considering the construction costs associated with pipelines of various diameters and lengths. These costs comprise a fixed element, relating only to the pipe diameter (this can be thought of as the “connection cost” to the NTS), and a further element that is distance related (cost per km) for a range of pipe diameters. These combined capital costs are annuitised over a 10 year period to provide annual costs. Commoditised unit costs (in terms of p/kWh) are determined assuming a standard 75% load factor.

Option one is a simple updating of the construction costs underlying the tariff in order to better reflect the current cost levels. More detail is given below along with specific parameters appropriate to this methodology. Details on parameters common to both this option and the alternate described in section 3.11 are covered in section 3.17 below.

Parameters specific to Option One

3.9 The following parameters are relevant for option one:

1. Costs for a minimal pipe distance

The latest capital cost estimate for a ‘connection’ to the NTS is independent of the EPC at approximately £1m per connection (consistent with the Connection Charging Statement) and is lower than the costs underlying the prevailing methodology. If the charge (p/kWh) remained a function of the EPC to recover the annuitised cost, the unit charge (p/kWh) would be lower than at present for typical load sizes on the “short-haul” tariff with minimal distance to the ASEP.

2. Costs per km of pipeline.

Inflating the existing costs per km by the RPI until 2004, and the steel price index for later years, would be consistent with the derivation of the expansion factor used within the transportation model for deriving NTS capacity charges. This would increase the unit charge (p/kWh) by a factor of 2.26.

3. Annuitisation factor

The current annuitisation factor is calculated for a 10 year period. This was based on the view that project approvals have historically used this assumption. A figure of 45 years might be considered more appropriate going forward as it would be consistent with the figure used in the depreciation of NTS pipelines. This would reduce the unit charge by a factor of 0.69.

4. Minimum Charge

The current minimum charge is related to the exit point capacity. Under Option one National Grid's view is that the concept of a minimum charge is appropriate but that a fixed 'connection cost' rather than one which increases with EPC might better reflect the costs in practice.

5. Load factor

The current load factor is 75% and therefore assumes a high utilisation. Actual data suggests that, in some instances, the load factor is significantly lower with the current average load factor for sites on the short-haul tariff being around 50%. Use of this figure in the derivation of the tariff would imply a 50% increase in the tariff.

In considering a change to the load factor it may be useful to examine the impact on potential new connections that might have a higher load factor. Those with a load factor above that assumed within the tariff calculation would still be encouraged to by-pass the system which would not be in the interests of all Users of the NTS.

In order to avoid complexity in the calculation and application of the tariff a single load factor is preferable to site specific load factors. For the purposes of calculating a revised charge under option one, the current load factor of 75% has been assumed.

3.10 Appendix A details the derivation of the rates under option one. Appendix C.1 shows the prevailing charge and indicative rates using methodology one. Appendix D shows the impact on the standard commodity charge.

Option Two: Revised methodology base on allocation of SO costs.

3.11 This option is based on the allocation of SO costs directly to short distances. The following table covers each of the SO cost components and the arguments for inclusion in, or exclusion from, the derivation of the short-haul charge applicable to this approach.

SO Cost Component	Arguments for Inclusion	Arguments for Exclusion
Shrinkage: Own Use Gas (OUG) ~ Compression		Short-haul flows would not require compression provided that the relevant exit point was upstream of the first NTS compressor.
Shrinkage: Un-accounted for Gas (UAG)	UAG is largely driven by meter error. A share of the metering inaccuracies may have arisen from the relevant meters.	
Internal Costs	The administration of the sites is comparable to other NTS sites.	The majority of System Operator costs are fixed and would not change with a change in short-haul flows.
Operating Margins & Constrained LNG (CLNG)		Short-haul flows, based on their proximity to supply points, do not receive a benefit from these services which are anticipated to be used at times of high system demand to support the system extremities.
Deemed Interruption	These costs are linked to the exit charges that interruptible supply points would otherwise pay.	Acknowledged that NTS Exit Reform will replace this term and associated foregone revenue. This is the cost of having an interruptible service. At times of high demand (when interruption may be necessary) short-haul flows, due to their proximity to entry points, do not benefit from the service.
Outcome of Incentive Schemes	It could be argued that each component of the incentive scheme should be considered to be included/excluded on an individual basis; however, if the optional commodity charge is expressed as a percentage of the standard SO commodity then this will automatically be included but only in proportion to those costs included in the composition of the optional commodity rate.	

SO Cost Component	Arguments for Inclusion	Arguments for Exclusion
Under or over-recovery from previous year ('K')	If the optional commodity charge is expressed as a percentage of the standard SO commodity then this will automatically be included but only in relation to those costs included in the composition of the optional commodity rate.	

3.12 The SO cost component proportions for 2007/8, used for the purposes of generating indicative charges, are shown in the table below. If this option were to be adopted, either annual forecast SO costs could be utilised, or a long term trend could be used.

SO Cost Component (2007/8)	Cost Proportion	National Grid Initial View	Cost Proportion
Shrinkage: Own Use Gas (OUG) ~ Compression	26.4%	Exclude	
Shrinkage: Un-accounted for Gas (UAG)	8.0%	Include	8.0%
Internal Costs	26.6%	Include	26.6%
Operating Margins & Constrained LNG (CLNG)	14.8%	Exclude	
Deemed Interruption	24.2%	Exclude	
Total	100%	-	34.6%

3.13 SO Costs (£m) can be divided by the total length of the NTS (km) to generate a unit cost based on length (£m/km); however, this creates a problem in terms of which flow to use to convert this number (£m/km) into a price (p/kWh).

3.14 This can be overcome by dividing the SO Cost by the peak flow distance (GWhkm) i.e. the sum of (the flow in each pipe multiplied by the length of the pipe) to give a cost in terms of £m/GWhkm which can be converted into a distance based commodity price function (p/kWh/km) based on an assumption of the load factor.

3.15 Appendix B details the derivation of the rates under option two and Appendix C.2 shows indicative rates under option two. Appendix D shows the impact on the standard commodity charge.

Parameters specific to Option Two

3.16 The following parameters are relevant for option two:

1. Costs for a minimal pipe distance

The minimum pipeline distance is 0.1km. Using this distance to calculate the minimal price implies a zero price for option 2a. This provides no benefit to the industry in terms of avoiding inefficient by-pass as the impact on the industry is exactly the same as if the loads in question had by-passed the NTS. Options 2b and 2c seek to overcome this issue by applying a minimum cost that equates to the avoided connection costs at a terminal, making these options effectively a hybrid of option 1 and 2a. Option 2d seeks to overcome this issue by allocating a proportion of the SO costs to distance and the remainder to the number of connections.

2. SO Costs Associated with Shorthaul

The SO costs associated with short-haul have been estimated as 34% of total SO costs, excluding incentive performance and 'K' (under or over recovery), for the purposes of calculating the indicative charges. This proportion could be set on an annual basis or fixed, based on a long term trend.

3. Load factor

There are two potential options for the load factor considered so far: either the site specific load factor of 75% or the system average load factor of 40%. National Grid believes that the system average load factor is most appropriate when deriving a charge based on system operator costs as these are total system costs. The rate derived from using the system average load factor of 40% is shown in Appendix B.

Issues common to both Options

3.17 The following parameters are relevant to either option one or option two:

1. Distance from ASEP to exit point

Within the existing methodology this is the straight line distance (km) from the ASEP to the boundary of the exit point. This has been appropriate when all SEPs within an ASEP were effectively at the same location. Recently the situation has arisen where an application for short-haul has been made at an ASEP with more than one SEP, where the SEPs are located some distance apart. A pragmatic approach has been to use the mid point which is consistent with the UNC. This approach does not reflect reality and a risk exists that sites may by-pass when it is not economic or efficient to do so.

National Grid's initial view is that using the closest SEP in such a situation mitigates the risk of inefficient bypass. A UNC change is anticipated to be required to facilitate a change in this area.

2.Minimum charge

National Grid's view is to retain the concept of a minimum charge since, under both methodology options; a zero charge would provide no benefit to other system Users through lower overall transportation charges.

3. Annual Updating of charge

There have been no updates to the charge since it was first introduced. National Grid's initial view is that annual updating of the charge is appropriate going forward.

4. Application to multiple exit points from a single entry point

The present methodology allows for application of the short-haul tariff to more than one exit point from a single entry point. In this situation the default allocation, where there is insufficient entry flow to meet the required exit flow, is to pro rate. This is the most equitable approach. There have been shipper requests to define an alternative allocation in this situation which although potentially allowed under the UNC would require significant system changes. Given that the load factor is used in either option as a parameter to determine the rate, National Grid's initial view is that the present default allocation is most appropriate and allowing alternate allocation rules may undermine the cost reflectivity of the charge.

5. Application at storage exit points

Storage points are not eligible entry points for 'short-haul'; however, storage points are eligible exit points. This may have been an oversight given that 'short-haul' was introduced when commodity only applied to exit.

Storage points currently avoid NTS commodity charges since storage is deemed to be part of the wider system and the charges have already been applied at beach entry and will be applied on exit to the end consumer. In allowing the short-haul rate for storage exit, a unit of gas flowing via a storage site can avoid paying the full entry commodity rate at the beach which might be significantly higher than the short-haul rate. Since this would seem to be undermining the principle that gas travelling via storage would ultimately pay the full commodity charges, National Grid's view is that, going forward, storage exit points should no longer be eligible for the short-haul tariff and that this is consistent with storage sites avoiding commodity charges. A UNC change would be required to facilitate a change in this area.

If storage sites by-passed the NTS (i.e. injected directly from offshore supplies) this would not increase costs for other users. If a storage site by-passed the NTS it would no longer be treated as an NTS storage site and withdrawal flows from storage to the NTS would then attract the full NTS entry commodity charge rate. For this reason it would not be economic for a storage site to partially by-pass the NTS as there would be no avoided NTS costs.

6. Capacity or commodity charge

It has been suggested that the 'short-haul' commodity could be replaced with a capacity charge as it is attempting to reflect fixed costs. This would require system and invoice changes which would add significant cost and complexity for little apparent benefit, therefore, National Grid's view is that the charge should remain a commodity charge.

7. Limits on applicable exit points

Since one of the underlying assumptions in the first approach is that only pipe costs are considered, and in the second approach that there are no compression costs, it may be appropriate that the tariff would only be available for exit points downstream of an entry point and not further than the next NTS compressor[2].

8. Timeline for potential changes to the methodology and future rate updates

Following this discussion consultation, a further consultation is intended to cover firm proposals for changes to the existing methodology. It is National Grid's view that any revised methodology, subject to approval, could be applicable from 1 October 2010. The table below shows an indicative timeline.

Milestone	Date
Charging Methodology Discussion Document issued	Oct/Nov 2009
Discussion Consultation Ends	Nov/Dec 2009
Discussion Report	January 2010
Charging Methodology Document issued. Raise associated UNC Proposals	February 2010
Consultation Ends	March 2010
Consultation report and final proposals to Ofgem UNC Final Modification Report	03 May 2010
Ofgem decision	31 May 2010*
2 months' notice of charges	30 July 2010
Implementation	1 October 2010

* This would allow notice of approved methodology and indicative rates to be issued with 4 months' notice. This could facilitate contract renewals. The final rates which might be dependent on target revenues could be issued by end of July alongside usual charging rate changes.

[2] Appendix E gives information on the location of offtakes relative to compressor stations.

3.18 Following any revision to the methodology, the tariff could be updated in line with other commodity updates, which normally occur in April and October of each year. An implementation date of October 2010 would allow for further discussion at TCMF meetings and might provide sufficient time for Users to negotiate any necessary contracts ahead of proposed changes. An April 2010 implementation date, which had previously been discussed at gas TCMF meetings, is not practicable given the notice periods and the commitment to cover each stage of the development and consultation process within a gas TCMF meeting.

4 Relevant Objectives

Assessment against Licence Objectives

4.1 The Licence requires that proposed changes to the Charging Methodology shall achieve the relevant methodology objectives. Respondents are therefore asked to consider how the different options would best satisfy the relevant objectives as part of their responses to this discussion paper.

4.2 Where transportation prices are not established through an auction, prices calculated in accordance with the methodology should:

- 1) Reflect the costs incurred by the licensee in its transportation business;
- 2) So far as is consistent with (1) properly take account of developments in the transportation business;
- 3) So far as is consistent with (1) and (2) facilitate effective competition between gas shippers and between gas suppliers.

Assessment against EU Gas Regulations

4.3 Proposed changes should also comply with EC Regulation 1775/2005 on conditions for access to the natural gas transmission networks (binding from 1 July 2006). The conditions are summarised below.

- The principles for network access tariffs or the methodologies used to calculate them shall:
  - Be transparent
  - Take into account the need for system integrity and its improvement
  - Reflect actual costs incurred for an efficient and structurally comparable network operator
  - Be applied in a non-discriminatory manner
  - Facilitate efficient gas trade and competition
  - Avoid cross-subsidies between network users
  - Provide incentives for investment and maintaining or creating interoperability for transmission networks
  - Not restrict market liquidity
  - Not distort trade across borders of different transmission systems.

5 Questions for Discussion

National Grid would welcome responses on the following areas discussed in the paper to inform the development of a charging methodology:

Methodology – Cost assignment

- Q1. Do respondents consider the cost assignment under methodology option one or option two, to be most consistent with the relevant objectives? Do the methodologies;
  - Reflect the costs incurred by the licensee?
  - Take account of developments in the transportation business?
  - Facilitate effective competition?
- Q2. Do respondents have any views on the appropriateness of the costs and parameters used in the derivation of the tariff under option one? Specifically;
  - The connection cost approach?
  - The annuitisation period; 10 years, 45 years or other?
  - The load factor?
- Q3. Do respondents have any views on the appropriateness of the costs and parameters used in the derivation of the tariff under option two? Specifically;
  - Whether the minimum cost should be based on a connection cost approach or a proportion of the SO costs related to short-haul?
  - Whether the SO costs associated with short-haul (34% for the indicative charges) should be set on an annual basis or fixed, based on a long term trend?

Issues common to either option

- Q4: Do respondents have any views on the application of the methodology? Specific comments on the following are requested:
  - Distance from the exit point to the ASEP – in the case of ASEPs with more than one SEP is it appropriate to measure the distance to the nearest SEP?
  - Load factor – is it appropriate to use a system load factor or an exit point load factor?
  - Minimum charge – should there remain a minimum charge? If so, what level should this be set at? Should this be related to the exit point capacity (EPC)?
  - Annual updating of charge – should the charge be updated in parallel with other transportation tariffs?
  - Application to multiple exit points from a single entry point – do respondents agree that the present default allocation rule should apply when the input allocations are below the output allocations?
  - Application at storage exit points – do respondents agree that the 'short-haul' tariff should not be applicable at storage exit points?
  - Do respondents agree that the charge should only be applicable to the exit points that are connected between an ASEP and the next downstream compressor?

Implementation

- Q5: Do respondents support either an implementation date of 1st October 2010 or an alternate implementation date?

The closing date for submission of your responses is **Friday 11th December 2009**. Your response should be e-mailed to:

box.transmissioncapacityandcharging@uk.ngrid.com

or alternatively sent by post to:

Debra Hawkin, Regulatory Frameworks, National Grid, National Grid House, Gallows Hill, Warwick, CV34 6DA.

If you wish to discuss any matter relating to this charge methodology consultation then please call Eddie Blackburn ☎ 01926 656022, Debra Hawkin ☎ 01926 656317 or Jemma Spencer ☎ 01926 654212

Responses to this discussion paper may be incorporated within National Grid's subsequent consultation paper. If you wish your response to be treated as confidential then please mark it clearly to that effect.

Appendix A – Option One

Assumptions used in updating under option one.

Inflation for Steel price and RPI changes costs by factor of 2.26

Annuitisation over 45 years changes costs by factor of 0.69

Combined factor for cost inflation and annuitisation over 45 years 1.56

Load factor remains at 75%

Minimum connection cost approximately £1m per connection (capital costs excluding uplifts)

The tariff function is made up of two components; a distance related element and an element relating to the connection cost. The tables below detail the formulae under the various updating scenarios. Note that the appropriate distance related element (in Table 1) and the appropriate connection related element (in Table 2) need to be added together to derive the final tariff.

Table 1: distance related element

Distance (pipe) related element		Rate (p/kWh)
Original formula		1203 * (EPC)^-0.834
1a) Update costs	Factor 2.26	2719 * (EPC)^-0.834
1b) plus annuitisation over 45 years	Factor 1.56	1876 * (EPC)^-0.834

Table 2 :connection related element

Connection cost element	Rate (p/kWh)
Original formula	(EPC^-0.654) *363
1a) Update costs & annuitisation over 10 years	(EPC^-0.9094) *16648.91
1b) Update costs & annuitisation over 45 years	(EPC^-0.8836) *8430.404

Appendix B – Option Two

Assumptions used in generating prices under option two.

System load factor of 75%

Minimum connection cost approximately £1m per connection (capital costs excluding uplifts) for 2b & 2c equal to the figures used for 1a & 1b

The tariff function, other than for 2a, is made up of two components; a distance related element and an element relating to the connection cost. The tables below detail the formulae. Note that the appropriate distance related element (in Table 1) and the appropriate connection related element (in Table 2) need to be added together to derive the final tariff.

Table 1: distance related element

Distance related element	Rate (p/kWh)
2a) Short-haul proportion of SO Costs (34.6%)	0.000056
2b) Short-haul proportion of SO Costs (34.6%)	0.000056
2c) Short-haul proportion of SO Costs (34.6%)	0.000056
2d) 50% of Short-haul proportion of SO Costs (34.6%)	0.000029

Table 2 :connection related element

Connection cost element	Rate (p/kWh)
2a) none	0
2b) Connection cost annuitised over 10 years	(EPC^-0.9094) *16648.91
2c) Connection cost annuitised over 45 years	(EPC^-0.8836) *8430.404
2d) 50% of Short-haul proportion of SO Costs (34.6%)	(EPC^-1) *185578

The following table shows the calculation of the option 2a charging function which also represents the distance element of the function for options 2b and 2c. For options 2b & 2c the connection element is the same as options 1a & 1b. The row numbering within this table is consistent with the row numbering in the later table for option 2d.

SO Target Costs	£300.7	million	**1**	
Short-haul Proportion	34.6%		**2**	
Cost	£104.04	£m/annum	**3**	=**1** x **2**
Peak Flow Distance*	1,242,921	GWhkm/day	**4**	
Cost per unit peak flow distance	£0.000000	£m/GWhkm	**6**	= (**3**/365)/**4**
Cost per unit peak flow distance	0.000023	p/kWhkm	**7**	= **6** x 100
System Load Factor	40%	**-**	**12**	
Cost per unit distance	0.000056	p/kWhkm	**13**	= **6**/**12**

The following table shows the calculation of the option 2d charging function. Rows 5 and 9 show a fifty-fifty split of costs between distance and number of connections.

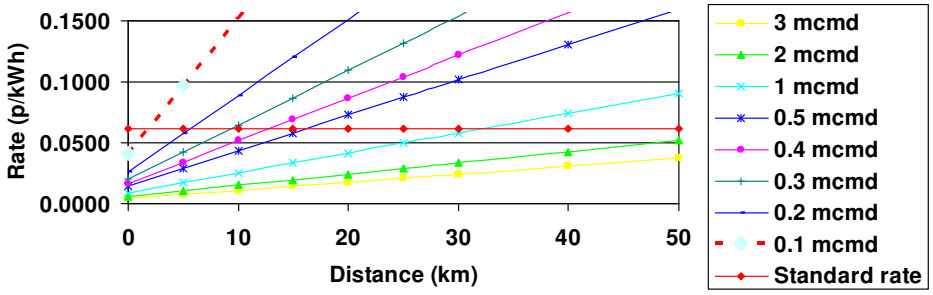
SO Target Costs	£300.7	million	**1**	
Short-haul Proportion	34.6%		**2**	
Cost	£104.04	£m/annum	**3**	=**1** x **2**
Peak Flow Distance*	1,242,921	GWhkm/day	**4**	
Distance Proportion	50%		**5**	
Cost per unit peak flow distance	£0.000000	£m/GWhkm	**6**	= **5** x (**3**/365)/**4**
Cost per unit peak flow distance	0.000011	p/kWhkm	**7**	= **6** x 100
No of Offtakes	192	-	**8**	
Connection Proportion	50%		**9**	= **1**- **5**
Cost per offtake	£0.000742	£m/day	**10**	= **9** x (**1**/365)/**8**
Cost per offtake	74,231.02	p/day	**11**	= **10** x 10^8
System Load Factor	40%	**-**	**12**	
Cost per unit distance	0.000029	p/kWhkm	**13**	= **6**/**12**
Cost per unit SOQ-1	185,578	p/kWh(SOQ)/kWh	**14**	=**11**/**12**

* Obtained from 2008/9 Transportation Model

Appendix C.1 Indicative rates under option one

'Short-haul' & Standard Commodity Rates - prevailing charges

Prevailing Methodology
(includes a connection element and 10yr depreciation)



Standard Rate of 0.0611 p/kWh (as at 1/10/09) calculated as follows:	
TO Entry Commodity Charge	0.0249 p/kWh
SO Entry Commodity Charge	0.0181 p/kWh
SO Exit Commodity Charge	0.0181 p/kWh
Total Charge	**0.0611 p/kWh**

1

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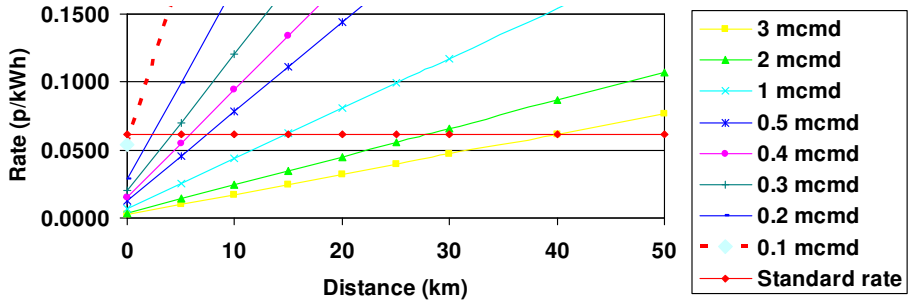
Standard & 'Short-haul' Commodity Rates by Load Size Option 1a

Update costs and min connection £1m,
10yr depreciation



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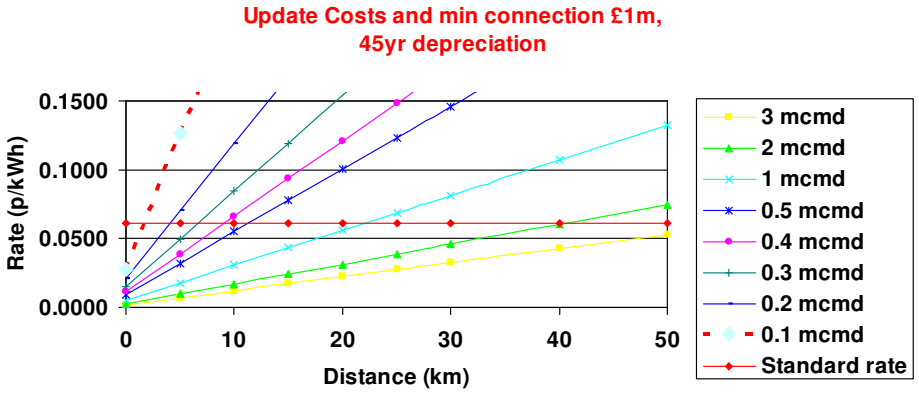
Standard & 'Short-haul' Commodity Rates by Load Size Option 1b



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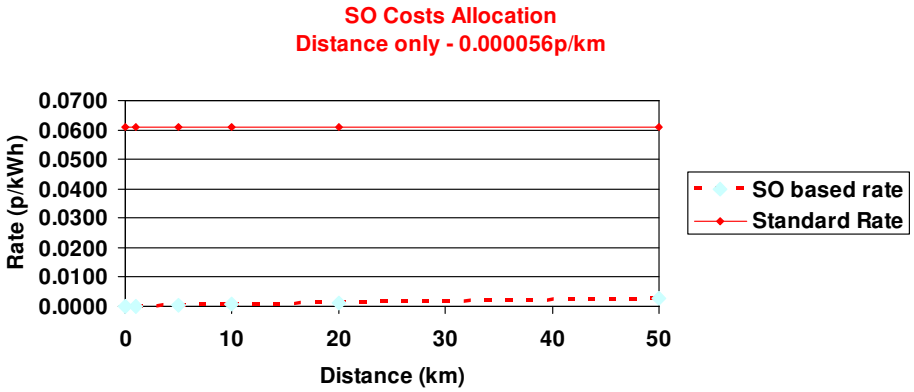
Appendix C.2 Indicative rates under option two

Standard & 'Short-haul' Commodity Rates by Load Size Option 2a



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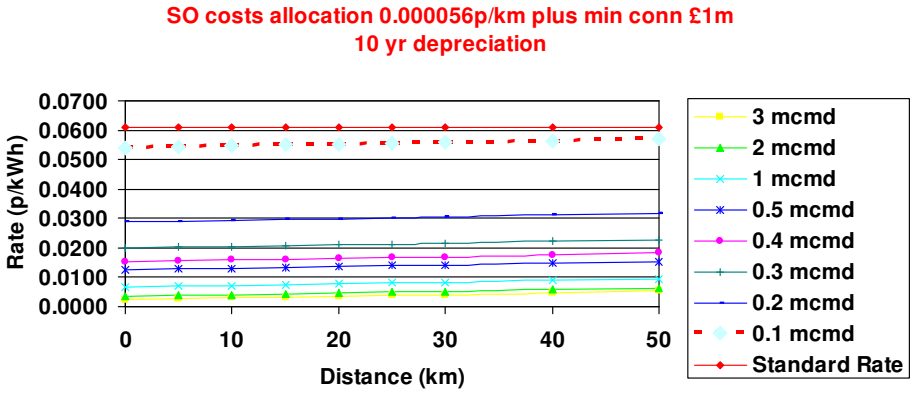
Standard & 'Short-haul' Commodity Rates by Load Size Option 2b



5

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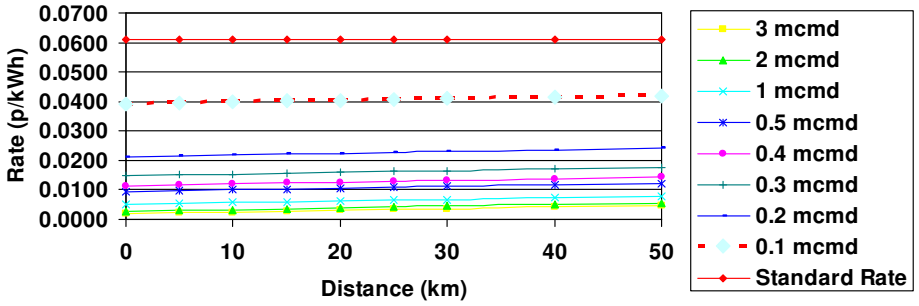
Standard & 'Short-haul' Commodity Rates by Load Size
Option 2c – SO cost apportionment plus min charge

SO costs allocation 0.000056p/km plus min conn £1m
45 yr depreciation



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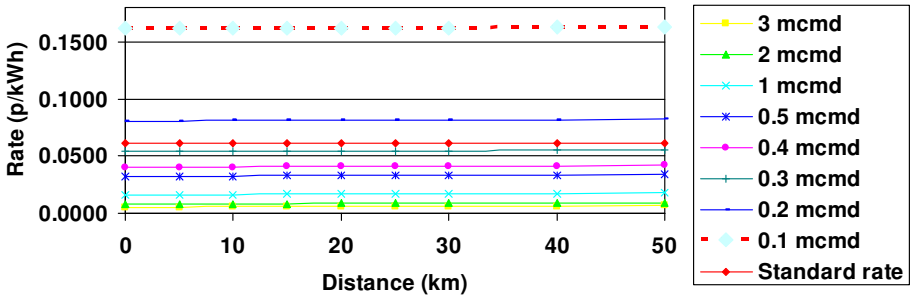
Standard & 'Short-haul' Commodity Rates by Load Size
Option 2d

SO Cost allocation
Costs allocated to Connections & Distance



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Appendix D Impact of Options on Standard Commodity Charge

The following table shows the impact of each of the charge setting options on the standard Commodity charge. The level of target revenue for the standard commodity charge is calculated from the total SO allowed revenue less other SO charge revenue including short-haul. As a consequence, the level of the standard commodity charge increases as the short-haul charge revenue decreases and vice versa. The figures have been calculated based on the sites currently on short-haul and makes no assumptions regarding whether any of the options would lead to more or fewer sites opting for short-haul.

Option	Short-haul Revenue (£M)	Standard Commodity impact (p/kWh)
Prevailing Charge	£6.60	-
Option 1a	£9.56	-0.0002
Option 1b	£6.70	0.0000
Option 2a	£0.54	0.0003
Option 2b	£2.07	0.0002
Option 2c	£1.73	0.0003
Option 2d	£3.62	0.0002

Appendix E – Location of Offtakes Relative to Compressor Stations

ASEP	Next Compressor	Distance km	Offtakes between terminal and next downstream compressor	Offtakes NOT between terminal and next downstream compressor
Bacton	Diss	62.4	2	0
Bacton	Kings Lynn	63.5		
Bacton	Cambridge	123.2		
Barrow	Carnforth	29.1	2	2
Burton Point	Alrewas	102	7	2
Easington	Hatton	49.3	8	2
Isle of Grain	Cambridge	78.9	6	3
Milford Haven	Felindre	75.2	1	5
St Fergus	Aberdeen	58.7	1	2
Teesside	Bishop Auckland	24.8	6	0
Theddlethorpe	Hatton	33.2	0	6
Total			33	22

Notes: the distance is the straight line distance from the terminal to the compressor station. Each offtake has been considered in relation to the nearest terminal.