

Modification proposal:	Modification Proposals to the Gas Transmission Transportation Charging Methodology NTS GCM01 'Alternative Methodologies for Determination of NTS Entry and Exit Capacity Prices'		
Decision:	The Authority¹ has decided not to veto this proposal²		
Target audience:	NGG and other interested parties		
Date of publication:	24 April 2007	Implementation Date:	1 October 2007

Background to the modification proposal

On 25 January 2007 National Grid Gas (NGG) pursuant to its National Transmission System (NTS) licence submitted to the Authority the conclusions report GCM01: Alternative Methodologies for Determination of NTS Entry and Exit Capacity Prices³. This proposed to modify the gas transmission transportation charging methodology (the "Methodology") under Standard Special Condition (SSC) A5 (Obligations as Regard Charging Methodology) (the "Condition") by replacing the Transcost model with a transportation model.

At present, charges to shippers (e.g. reserve prices in the auctions) are based on Unit Cost Allowances (UCAs) which are determined by Ofgem for revenue driver purposes. The majority of UCAs have been calculated using Transcost, which is an engineering based model. However, economic and technical reviews⁴ of the Transcost model being used uncovered a number of concerns in relation to its robustness.

On 2 December 2005 Ofgem published an open letter⁵ asking NGG to develop an appropriate Methodology going forward with the intention to de-link the setting of entry charges and the determination of revenue drivers. This de-linking would enable revenue drivers to be determined for the duration of the price control thus preserving their incentive properties. It would also enable the reserve prices to be reviewed more frequently which would improve cost reflectivity and hence ensure that reserve prices would provide appropriate locational signal to shippers and developers.

NGG responded by instigating a review of its charging arrangements with the industry via the launch of the Gas Transmission Charging Methodology Forum (Gas TCMF). Through the Gas TCMF and consultations NGG developed and submitted the proposal GCM01.

The modification proposal ("the Proposal")

NGG is proposing the Proposal to amend the Methodology with the main change of replacing the Transcost model, which currently determines the NTS exit capacity and NTS entry capacity baseline reserve prices, with a transportation model. This section gives a

¹ The terms 'the Authority', 'Ofgem' and 'we' are used interchangeably in this document. Ofgem is the Office of the Gas and Electricity Markets Authority.

² This document also constitutes notice of the reasons for this decision as required by section 38A of the Gas Act 1986.

³ <http://www.nationalgrid.com/NR/rdonlyres/5D5AE27F-BD79-4A9E-B9A8-1E6929BF2962/15151/NTSGCM01RCapacityChargingReportV1.pdf>

⁴ http://www.ofgem.gov.uk/Networks/Trans/PriceControls/Transco/Documents1/11387-188_link3.pdf and http://www.ofgem.gov.uk/Networks/Trans/PriceControls/Transco/Documents1/11388-188_link4.pdf

⁵ http://www.ofgem.gov.uk/Networks/Trans/PriceControls/TPCR4/ConsultationDecisionsResponses/Documents1/12209-262_05.pdf

brief description of the current arrangements under the Transcost model and the arrangements that would be in place under the Proposal.

Transcost model

The Transcost model is an engineering based model. It models demand and supply over the network for 10 years and then based on these modelled networks calculates the cost of the additional investment required to support incremental flows of gas along each route based on engineering inputs such as size, length and diameter of pipeline and number of compressors. These costs are then used to produce entry and exit charges. To recover allowed revenues for exit the exit prices are scaled, whilst any shortfall in allowed revenues for entry are recovered by means of the TO commodity charge.

The Transcost model includes spare capacity but it does not incorporate any backhaul benefits. Backhaul is characterised by an incremental flow in the opposite direction to the prevailing flow. The result of the presence of backhaul is a decreased flow in the prevailing direction and ultimately a cost reduction as there is a reduced requirement for NTS reinforcements. The Transcost model also cannot calculate large entry and exit increments.

Transportation Model

The transport model works by considering each entry and exit point as a node in a network of interconnected pipes (of known length). It then applies NGG's best estimate of the relevant year's 1-in-20 peak base case data in order to derive the shortest total length of network necessary to match this scenario, ie it minimises the total of (flow x distance) for a balanced network. The model assumes that any incremental flow down a line results in a reinforcement requirement, at a standard reinforcement cost. Therefore, the marginal cost of additional capacity at any entry or exit point will be determined by the length of the minimised network that requires reinforcement (in km) multiplied by a standard cost (called the Expansion Constant). The Expansion Constant has been derived as an average of the cost of the most frequently used pipes and the cost of compressors necessary to maintain pressures on the NTS.

Exit capacity charges are calculated by considering the exit node distances from a reference node on the network and their associated demand capacities, then adjusting the sum of the products of these values until the total charge obtained represents 50% of the allowed revenue. The charges are adjusted in an additive manner, so that the locational differentials are maintained. Any negative charges are set to a minimum level of 0.0001p per kWh per day. A single exit capacity price is calculated for each distribution network charging zone as the flow-weighted average of the individually determined exit charge for each node in that zone. Furthermore, the proposal removes the current practice of capping year-on-year changes in exit capacity prices, since they should not be subject to large demand forecasting errors.

Entry capacity charges are calculated in the same manner, with the exceptions that the supply flow is adjusted to the obligated NTS SO Baseline Entry Capacity level at the entry point under consideration (with the overall supply level kept constant by adjusting levels at other entry points on a merit order basis) and there is no scaling of recovered revenues. Any revenue shortfall for entry continues to be recovered by means of the TO commodity charge.

The proposed transportation model does not include spare capacity but incorporates backhaul benefits. Furthermore, the Proposal removes the year-on-year capping of exit prices and employs entry point specific analysis. This model could also be made publicly available and can deal with increments of all sizes, thereby allowing for interested parties to conduct their own analysis of charges for scenario planning purposes.

Justification of the modification proposal

NGG considers that the Methodology is more cost reflective due to the exclusion of spare capacity, the use of only one year forecasts in modelling, inclusion of backhaul benefits, the use of an additive exit charge adjustment factor, the decoupling of revenue drivers and NTS entry capacity baseline reserve prices, the rebalancing of exit capacity tariffs (which has not been done since 2001), the removal of the subjective element in running the Transcost model and removing the exit price capping.

NGG considers that the relevant objective of setting a reserve price that promotes efficiency and avoids undue preference is better facilitated by the Proposal. Its reasons for this centre on the use of a single year in modelling and decoupling of revenue drivers and NTS entry capacity baseline reserve prices, both of which allow those exiting gas from the NTS to make better informed decision regarding timing of their projects. Additionally, NGG states that the use of 1 in 20 demand levels in the Transcost model results in some entry points not being forecast to flow at their baseline level whilst the entry point specific analysis employed in the Methodology would overcome this by generating prices which avoid the undue preference that might result by pricing some entry points based on reduced flows.

NGG also considers that the transportation model furthers the relevant objective of facilitating effective competition through its greater transparency and predictability.

Responses to GCM01

NGG consulted on the proposals in November 2006. It received 13 responses. Ten respondents supported the transportation model (some of which gave qualifications to their support) whilst one supported the Transcost model. Of the other two respondents, one favoured retaining the existing balance of exit charges up to 2010 whilst seeing no reason not to change the methodologies for determining NTS entry capacity charges in the same period. The remaining respondent considered it difficult to support the transportation model given the impact on prices to customers within its network, but recognised the theoretical argument for improved cost reflectivity. Six respondents favoured the exclusion of spare capacity whilst one favoured including spare capacity.

Ofgem impact assessment

Ofgem issued an impact assessment in March 2007 on NGG's proposal. We received 17 responses of which one was confidential. Thirteen respondents support adopting the Proposal (some of which giving qualifications to their support) with two respondents not supporting it. The other three respondents do not express specifically whether they support the Proposal or not. Seven respondents support the exclusion of spare capacity whilst four favour including spare capacity.

Respondents to the NGG and Ofgem consultations give many reasons why they supported the Proposal, but the main reasons are:

- i. The benefits of including backhaul
- ii. the benefits of excluding spare capacity
- iii. cost reflectivity is improved
- iv. effective competition better facilitated

i. the benefit of including backhaul

A number of respondents consider the inclusion of backhaul to be more cost reflective as the benefits equal to the avoided cost of reinforcement of locating at certain points should produce charges which are more reflective of physical flows. This locational element to the charge is seen as a positive element, since this helps to avoid unnecessary investment. One response noted that backhaul will be more important in the future and so views its inclusion in the model as positive.

ii. the benefits of excluding spare capacity

Several respondents argue that excluding spare capacity would be more cost reflective as users would only pay for the capacity that they actually use. Another argument is that exclusion of spare capacity may not be that significant if the capacity trade and transfer mechanism is implemented. One respondent also supports excluding spare capacity arguing that shippers at a terminal with spare capacity already benefit from their ability to 'catch up' later in the day after system failures which avoids imbalance and scheduling charges. Another argument is that the inclusion of spare capacity results in unstable charges, which does not promote investment, and reduces transparency.

iii. Cost reflectivity is improved

A few respondents note that since the transportation model is based on a single year modelling of demand and supply, it should more accurately reflect the circumstances in that particular year as compared with the current ten year forward projections used by Transcost.

A number of respondents consider that an additive exit tariff adjustment to recover allowed revenue maintains the appropriate cost reflectivity between entry and exit points.

Similarly, some respondents also think that the current cap on year-on-year exit prices constrains the cost reflectivity of the charges and therefore removing this cap should improve cost reflectivity.

iv. effective competition better facilitated

Some respondents note the simplifying characteristics of the transportation model of modelling a single year's supply and demand and using a single expansion factor make it more accessible by users. Therefore, they argue that such a transparent model should allow users to calculate more accurately the economic consequences of their decisions, which is especially important for new users in deciding whether to enter the market, and so should facilitate more effective competition.

Respondents also gave reasons as to why they might not support the Proposal, the main ones being:

- i. the benefits of including spare capacity
- ii. backhaul is better achieved by other means

- iii. the transportation model is over simplistic
- iv. the sharp discontinuity in capacity prices

i. the benefits of including spare capacity

One of the concerns with excluding spare capacity is that it could act as a barrier to new entrants, especially in the case of entry points linked to declining production fields where increased entry costs could deter the development of new producing areas, economically marginal fields or import projects to use the UK as a transportation hub to the continent. Another concern raised by respondents of excluding spare capacity is that it may result in the perverse case whereby new investment is triggered when there is spare capacity not being used at other entry points which result in underutilised assets. This concern is not alleviated even with the prospect of capacity trade and transfer as these proposals are considered not to be fully developed and their effectiveness is questioned. The reasons for excluding spare capacity on the basis of it leading to volatility in prices is challenged by one response which argues that there is currently considerable volatility in prices which include spare capacity, as witnessed during the TPCR and TCMF processes. Furthermore the respondent considers that the NTS is going through a number of changes which are not always easy to predict which will also contribute to considerable volatility.

ii. backhaul is better achieved by other means

One respondent thinks backhaul could be better achieved by granting an exception status than by integration into model. Furthermore, the respondent thinks the impact of backhaul is marginal and so its inclusion in model is not justified.

iii. the transportation model is over simplistic

One respondent thinks that the over simplicity of the transportation model with a single expansion constant and no proper interaction between pressure, pipeline diameter and length, compression and flow results in distortions away from the actual costs incurred, which it argues is to the detriment of cost reflectivity.

iv. the sharp discontinuity in capacity prices

Another concern was the sharp discontinuity in moving from the Transcost to the transportation model and the magnitude of some of the resulting price changes.

In addition to the arguments for and against the Proposal the respondents also raise a number of general concerns. Some respondents are concerned about the proposed implementation date of 1 October 2007 and argue that this should be postponed until either April or October 2008 to allow for full planning of the impact and that there is insufficient time to determine the most economic balance of exit capacity bookings prior to July.

A number of respondents express concern at the number of other industry developments currently being considered e.g. exit reform, capacity trade and transfer, entry capacity baseline changes. They ask for more assessment on how these different reforms may interact with the Proposal. Furthermore, there is concern that all these different areas of industry developments increase the risk to users.

The Authority's decision

The Authority has considered the issues raised by the modification proposal and the Final Modification Report (FMR) dated 25 January 2007. The Authority has considered and taken into account the responses⁶ to NGG's consultation and responses to the impact assessment carried out by Ofgem. The Authority has concluded that:

- 1. implementation of the modification proposal will better facilitate the achievement of the relevant objectives of the Methodology⁷; and**
- 2. deciding not to veto the proposal is consistent with the Authority's principal objective and statutory duties⁸.**

Reasons for the Authority's decision

Compliance with the charging methodology results in charges which reflect the costs incurred by the licensee in its transportation business – SSC A5(5)(a)

Ofgem considers that cost reflective prices are beneficial for a number of reasons. Firstly, they provide strong signals to investors about the relative costs of locating new sources of supply or storage at different points on the network.

The Authority's view is that on balance the Proposal would result in more cost reflective prices than the current prices which are based on the Transcost model. It has been pointed out by a respondent that the simplicity of the transportation model in its use of a single expansion constant relating to the length of pipeline does not fully reflect the costs which it notes as being driven by a number of additional factors including pipeline diameter and number of compression stations. Ofgem has some sympathy with this argument, and we consider that it might be appropriate to further review this issue once the model has had time to bed in, say in one or two years time.

Previous technical and economic analysis has indicated that there are a number of issues with the Transcost model (such as treatment of backhaul flows) and that these issues have not been resolved. For example, it has been noted that small changes in the assumptions can lead to considerably large changes in prices.

Whereas the current Transcost model uses 10 years of forecast data, it is proposed that the transportation model only uses a single year demand and supply forecast data. Especially given the potential major changes to gas flow patterns on the network, reduced reliance on medium to long-run forecasts might be expected to improve the robustness of the outputs of the model.

We note that the current cap on year-on-year changes in exit prices means that those prices which have been subject to the cap are artificially constrained and might not truly reflect costs. Therefore, removing this cap should result in more cost reflective prices.

⁶ NGG modification proposals, modification reports and representations can be viewed on the NGG website at www.nationalgrid.com

⁷ As set out in Standard Special Condition A5(5) of NGG's Gas Transportation Licence, see: http://epr.ofgem.gov.uk/document_fetch.php?documentid=8783

⁸ The Authority's statutory duties are wider than matters which the Panel must take into consideration and are detailed mainly in the Gas Act 1986.

We also note the agreement of some respondents with the proposer that additively adjusting the exit tariffs, as in the Proposal, should better maintain the price differential between two exit points compared with scaling and hence result in better locational signals.

The proposer argues that the exclusion of spare capacity results in charges that are reflective of both the costs that have been incurred in making physical capacity available and the actual marginal costs that would be incurred by capacity release relative to the prevailing system capacity. However, in our view it is counterintuitive to see the largest price increase at an entry terminal which is actually projected to have considerable spare capacity and is projected to have steadily declining gas flows during the next few years. In such a situation we would expect that NGG faces less costs. If flows decline then the gas would not have to flow as deep into the NTS and would therefore be expected to generate lower overall network costs. The same would apply to other entry points which are expected to see reductions in flows in the future.

We agree with the view that it is important that the impact of flows which are beneficial to the network and reduce the need for network reinforcement are taken into account in the charge setting process. Inclusion of backhaul flows might therefore be expected to result in more cost reflective charges.

The Authority notes the concerns that a number of respondents raised about charging stability. The Authority accepts that charging stability is an important criterion when assessing any charging model. However, the Authority recognises that it is also important that the charging model is cost reflective. Where these objectives conflict, the Authority considers that the principle of cost reflectivity should prevail.

A charging model should be subject to sensitivity testing to make sure it is not very sensitive to small changes in the assumed patterns of flows. But concerns about charging stability should not be used to artificially suppress changes in transportation charges from one year to the next where there are sound reasons for those changes - for example if there is a significant change in the patterns of supplies onto the system.

This risk of charges varying should not be dealt with through the charging methodology. This would send the wrong signals about the relative costs of supplying gas at different points on the network and could lead to inefficient investment and increased costs to consumers. Consumers will ultimately bear the difference between NG's actual costs and the charges calculated under any methodology. The Authority understands the concerns that have been raised about the impact of charging volatility on shippers and suppliers. But the current capacity arrangements provide shippers with a means to manage this risk. If they think that changes in the pattern of supply and demand could lead to charging volatility, they can secure entry capacity in the long term auctions and fix their prices for a number of years at current levels.

The reserve price is set at a level best calculated to promote efficiency and avoid undue preference in the supply of transportation services – SSC A5(5)(aa)(ii)(I)

The inclusion of backhaul benefits should strengthen the locational signals and make prices more intuitive than the Transcost model, so that users would be incentivised to locate where they reduce the need for NTS reinforcements. This should improve efficiency of the NTS whereby more gas is flowed over the NTS without the need for network reinforcements.

However, excluding spare capacity, as in the Proposal, would result in poorer locational signals potentially resulting in an inefficient use of existing assets. Given the lumpiness of investment in network assets and the long asset lives of these assets, we believe that it is in the interests of consumers to ensure that the charging methodology provides appropriate locational signals. Since these assets have already been included in NGG's NTS Regulatory Asset Value (assuming they were deemed efficient by us as part of the capex review at the time of the price control), consumers would ultimately pay for these assets whether they are used or not. Given the decline of the North Sea gas fields, resulting in declining flows at certain terminals, this is likely to become an important issue in the future. Where spare capacity is available users should be incentivised by the price to use this spare capacity rather than triggering investment in increased capacity at other entry points. Appropriate price signals, which recognise the existence of spare capacity, should reduce the risk of underutilised assets on the network.

The charging methodology properly takes account of developments in the transportation business - SSC A5(5)(b)

Since the Transcost model was implemented there have been significant changes in flows on the NTS, and such changes are likely to continue. Historically, the predominant system flows have been from the North and East towards the South and West of the Britain, but with Milford Haven in operation the flow will be reversing from the West of Britain. The inclusion of backhaul in the Proposal should therefore better take account of the developments that are taking place and are likely to take place in the future.

Compliance with the charging methodology facilitates effective competition between gas shippers and between gas suppliers - SSC A5(5)(c)

Increased transparency reduces barriers faced by new entrants and therefore aids competition and ultimately benefits consumers. As many respondents have recognised, one of the key strengths of the transportation model is its greater simplicity and the fact that it would be available in the public domain so that interested parties could replicate the charge setting process. This would also enable users access to the model to perform their own scenarios without being so dependent on NGG. This increased transparency will allow users to base their decisions on better information which should help facilitate new entry as potential entrants have greater confidence in their cost estimates. In addition, shippers have the ability to procure long-term entry capacity through the LTSEC auctions at the fixed prices. Therefore, if the increased transparency as a result of this model leads shippers to expect that prices at a specific entry point might increase in future, they would be able to procure long-term entry capacity at fixed prices.

Security of supply

Some responses to the impact assessment note that security of supply would be harmed if there is no cost reflective pricing which would encourage gas to bypass the UK NTS. As we consider that the Proposal is on balance more cost reflective than the current arrangements then this should allay such concerns.

Another respondent is concerned that the transportation model could make it more difficult for further development of the UKCS and that it could put the UK at a disadvantage in attracting other North Sea supplies. Ofgem notes this argument which could be addressed by the inclusion of spare capacity in the model which would result in lower entry prices where there is spare capacity.

In summary, Ofgem considers that the Proposal better facilitates the achievement of the relevant charging methodology objectives than the current methodology. However, we consider that it would be in the interests of consumers to include spare capacity in the model, as described by option 2a of NGG's consultation document⁹. This would improve cost reflectiveness and better ensure the economic and efficient use of network assets. It would reduce the risk of underutilised assets and inefficient investment elsewhere on the network. This is a significant issue that Ofgem would urge NGG to consider in the immediate future through further modification proposals to the charging methodology. It may be that there are better solutions available which NGG can consider over the longer term, through its duty to review the suitability of the Methodology for achieving the relevant objectives.

Decision notice

In accordance with Standard Special Condition A5 of NGG's Gas Transportation Licence, the Authority has decided not to veto modification proposal GCM01: Alternative Methodology for Determination of NTS Entry and Exit Capacity Prices.



David Gray
Managing Director, Networks

Signed on behalf of the Authority and authorised for that purpose.

⁹ "NTS GCM 01: Alternative Methodologies for Determination of NTS Entry and Exit Capacity Prices", National Grid, 2 November 2006

