

## Pricing Discussion Paper PD20

### NTS Exit Flexible Capacity and Commodity Charges

#### 1. Introduction

The proposed reform of NTS exit arrangements expected in October 2008 would introduce new requirements on Transco with regard to offering for sale annual NTS exit flexible capacity and developing a flexibility regime. In light of the development of a distinct NTS exit flexibility product Transco is required by its licence obligations to consider how the product should be priced and therefore the changes required to the transportation charging methodology. This paper discusses the issues associated with the pricing of a NTS exit flexible capacity product including the auction reserve prices and a price schedule for long-term incremental capacity.

It should be noted that the NTS exit flexible capacity product is still under development, and therefore the issues discussed in this paper may be superseded by new or modified charging issues as the product evolves. Any changes to the charging arrangements as a result of the development of the product will be reflected in any subsequent pricing consultation.

It is envisaged that changes to the charging structure associated with the purchase of NTS exit flexible capacity in long-term auctions would be needed later this year. It is currently expected that any change to the methodology to charge for the use of the product would be applicable from October 2008.

Following the conclusion of this pricing discussion consultation, if Transco intends to bring forward change to its transportation charging methodology, it would raise a proposal and consult formally with the industry, in accordance with Amended Standard Licence Condition 4A.

A number of other transportation charging methodology changes may be required to modify NTS transportation charges. These issues are discussed in related papers numbered PD18<sup>1</sup> and PD19<sup>2</sup>, both of which have a bearing on this pricing consultation. Respondents are therefore requested to review this document in the context of wider transportation charging methodology change discussion.

#### 2. Background

The NTS exit flexible capacity product will provide exit Users with the right to deviate actual gas flow away from the equal hourly rate conferred through holding the revised basic capacity product. Transco will in turn have system management tools that will enable the operational uncertainties created by wide and/or unexpected flow rate variations to be managed.

These issues are currently managed by internal Transco procedures that effectively afford less flexibility to DNs than to other directly connected loads. In the interests of long-term sustainability, proposals for a common NTS exit flexible capacity product have been brought forward. It will then be a matter for participants, particularly those who have to date received a flexibility service as part of a bundled capacity product, to determine their flexible capacity holdings in the light of the various release mechanisms (and specifically the within baseline and incremental release opportunities) as well as trading opportunities, to satisfy their flexibility requirements and to avoid flexibility overrun exposures.

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<sup>1</sup> PD18 NTS Exit Flat Capacity Pricing – March 2005.

<sup>2</sup> PD19 NTS TO and SO Exit Commodity Charging – March 2005.

Flexibility on the NTS has to date been generated as a consequence of variation of within day pressure requirements at LDZ offtakes and designing the NTS to meet the peak aggregate daily demand for gas assuming a constant rate of offtake. It is anticipated that this inherent NTS exit flexibility capability, or baseline, will be offered through market-based processes. Furthermore, the costs of providing incremental flexible capacity on the NTS over the long-term would be signalled through a long-term tender process to enable exit Users to signal whether they would like the supply of flexibility from the NTS to be expanded in the future.

A description of the proposed NTS exit flexible capacity product as currently defined is included within Appendix A.

### **3. Licence Requirements**

The Transmission Licence requires Transco to propose changes to the charging methodology where the resultant charges would achieve the relevant objectives. The relevant objectives are namely that charges 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.

Where prices are established by auction the first objective is replaced by the requirement that reserve prices, if used, should be set at levels best calculated to promote efficiency and avoid undue preference in the supply of transportation services, and promote competition.

With the development of Exit Reform and Network Sales, Transco is required by these conditions to consider what changes to the charging methodology are required. Any proposals must be shown to achieve the relevant objectives.

Transco notes that the Gas Transporter licence arrangements are currently being discussed with the industry as a consequence of changes required to facilitate Network Sales and NTS Exit Reform. As part of this process, Ofgem has proposed a further charging licence obligation on NTS and DN licensees which may restrict the frequency and date upon which charges may be changed by a licensee within any formula year.

In addition to the licence conditions governing the charging arrangements, Transco has licence obligations to use best endeavours to ensure that in setting charges, the revenue derived from the System Operator (SO) and Transportation Owner (TO) activities does not exceed the maximum allowed.

### **4. NTS Exit Flexible Capacity Product Pricing**

#### **4.1 NTS Exit Flexible Capacity**

The volume of NTS exit flexible capacity that can be made available at a supply point is dependent on the diurnal storage capability of the local pipe sub-network and, therefore, baseline and incremental flexible capacity costs at a supply point are not dependent on the distance of the exit point from supply sources. There is therefore no clear argument to support linking the price of the flexible capacity product with exit capacity.

When considering the pricing of the flexible capacity product, the relevant licence objectives must be applied. Where prices are established by auction the reserve prices should be set at levels best calculated to promote efficiency and avoid undue preference in the supply of transportation services and promote competition.

Flexible capacity has historically been provided from the NTS because of integrated investment planning across the NTS/DN interface. It can be shown that flexible capacity exists on the NTS because flexible capacity is required within the DN leading to variation of within day pressure requirements (and is met by sources including NTS exit flexible capacity). As such, deriving separate costs for NTS exit flexible capacity and NTS exit flat capacity would require the unpicking of several years of DN and NTS investment, and the restatement of historical investment plans assuming all flexibility is provided by the DN. Due to the integrated nature of the NTS it is thought that this restatement would result in very slightly decreased investment in the NTS but in significantly increased investment within the DN.

Noting the absence of any supporting cost data to justify a significant baseline price for the NTS exit flexible capacity product, and accepting the merits of a simplified approach, the inherent nature of baseline exit flexible capacity could suggest that this baseline capacity should have a minimal, potentially zero, price. The allocation process might be distorted if zero priced baseline capacity were to be offered, and this would not be consistent with the relevant licence objectives, hence to avoid this outcome, a minimal 0.0001p/kWh/day baseline price could be applied at all locations. Such an approach would provide a disincentive to hoarding.

It is proposed that the reserve price for short-term and medium-term auctions will be the same as the baseline price for long-term auctions due to the perceived lack of market liquidity.

#### **4.2 Incremental NTS Exit Flexible Capacity Pricing**

As part of an NTS exit flexible capacity investment incentive it is anticipated that Transco will be required to produce an incremental exit flexible capacity release methodology statement. In addition to establishing the process for releasing incremental flexible capacity, it would also be necessary to determine the associated pricing methodology.

There is likely to be regional variation between the costs of providing incremental flexible capacity, and therefore the pricing of incremental flexible capacity is expected to be on a zonal basis. Identifying the cost differentials is however a complex exercise, which will feed into the incremental flexibility capacity price schedule and will inform the development of any NTS flexible capacity UCAs.

A proposal for an NTS exit flexible capacity investment incentive price setting methodology is contained in Appendix B, which also includes for illustration an incremental price schedule indicative of average zonal costs. We expect to publish the final incremental pricing methodology as a schedule to the incremental NTS exit flexible capacity release methodology statement.

#### **4.3 NTS Exit Flexible Capacity Usage**

Under the proposed NTS Exit Reform business rules a DNO or the Shipper to a directly connected customer may purchase a quantity of NTS exit flexible capacity, which can be used to allow the profiled offtake of gas i.e. diurnal storage. Once a system User has purchased a quantity of the flexible capacity product then it might use the product every day, resulting in an increase in the frequency and extent of NTS pressure variation. This could:

- Increase the likelihood of compressor trips
- Increase OM requirements & likelihood of usage
- Increase the risk of Capacity & NTS exit flexibility capacity buy-back
- Reduce End of Day (EoD) balancing flexibility and increase EoD balancing costs
- Increase shrinkage costs

Under the prevailing arrangements these costs are recovered via the SO commodity charge and it is Transco's view that the use of the flexibility product would affect these costs. At the extreme, if there was no flow profiling across the NTS, SO costs would be lower. Similarly, if all parties profiled their flows simultaneously across the NTS then there would be an increase in SO costs. It is clear therefore that in order to achieve the relevant licence objective to set charges which reflect the costs incurred, it is appropriate to consider modifying the SO commodity charge to take account of flexible capacity volumes. Furthermore, without a cost reflective charge for the use of the NTS exit flexible capacity product there is the risk that parties will alter their behaviour compared with historical performance, on grounds that may be economic for the individual, but which would introduce significant industry inefficiencies. In such a circumstance, one party's action would increase SO costs, which in part would be born by the wider community.

In addition to addressing the cost reflectivity requirements, the establishment of a new exit flexibility commodity charge would be consistent with existing product and charging structures. For both entry and exit capacity there is a corresponding SO commodity charge. If NTS exit flexible capacity were to be unbundled from exit capacity, then it would seem consistent to identify a separate SO commodity charge element for the use of the product.

In assessing the pricing arrangements for the use of the flexibility product, all the relevant licence objectives must be considered in addition to cost reflectivity. These include the facilitation of competition between shippers and suppliers, and the requirement to take account of changes in the transportation business. Clearly the introduction of a flexibility commodity charge would impose costs in terms of resource, systems and processes, in addition to the charge itself, on those parties using the product. If the revenue recovery is relatively small, it could be argued that the additional cost to the industry of managing the new charge was not justified by the benefits, and the charge would therefore not facilitate competition. Although this could be argued it should be noted that the requirement for charges to facilitate competition is a second order objective, with cost reflectivity being the primary objective.

An alternative option that may have merit is to recognise the relatively small amounts of revenue concerned and not introduce an NTS exit flexibility commodity charge immediately. However, to address the concerns over changes in behaviour and the associated inefficiencies that would be a consequence, Transco would commit to introduce an appropriately priced flexibility commodity charge in the future if behaviours change significantly, from that experienced to date. This would effectively establish the principle that the cost of the current levels of usage of flexible capacity should be socialised and remain within the standard SO commodity charge.

It is difficult to accurately identify the SO cost of using flexible capacity, however to calculate a cost reflective charge, a sensible and reasonable mechanism is needed for allocating flexible capacity SO costs. Such a mechanism to allocate SO costs between exit capacity and flexible capacity is contained in Appendix C, along with an indication of the impact of such a charge, The approach in Appendix C results in an allocation of 5.2% of SO costs to the use of flexible capacity.

## **5. Proposed method of operation of an NTS SO flexible capacity commodity charge**

If an NTS exit flexibility commodity charge were to be introduced, it would not change the target level of revenue to be recovered through the NTS SO commodity charge. The net revenue to be recovered via the SO exit, entry and flexibility commodity charges would be the total SO allowed revenue less that recovered by the St Fergus compression charge and by the optional commodity charge. We would propose that different levels of charge be applied for entry, exit and exit flexibility such that approximately 50% of the revenue collected is obtained at entry with the remaining 50% recovered from a combination of exit and exit flexibility.

The unit commodity charge rate applicable for exit would therefore be lower than that which would otherwise apply on an entry/exit-only basis. The unit commodity charge rate applicable for entry would equal that which would otherwise apply on an entry/exit-only basis.

We believe an NTS SO exit flexibility commodity charge should be applied on an identical charging base to the NTS SO exit commodity charge but applied to the positive flexible capacity allocated quantity rather than the end-of-day allocated quantity. Both the NTS exit flexible capacity charge and the NTS SO exit flexibility commodity charge would be levied on the parties holding the NTS exit flexible capacity and hence the charges will be levied on DC Shippers in relation to DC exit points and on the DNOs in relation to DN exit points.

Transco would aim to set the NTS SO exit flexibility commodity charges to recover the relevant percentage of the NTS SO target revenue by setting the charge equal to that target revenue divided by forecast flexible capacity usage. The net target revenue to be recovered via the SO exit, entry and flexibility commodity charges would be the total SO allowed revenue less that recovered by the St Fergus compression charge and by the optional commodity charge. In order to maintain the 50%/50% division of the NTS SO commodity charge between entry and exit, the NTS SO Entry commodity charge would be set to recover 50% of the NTS SO target revenue. Once the NTS SO exit flexibility commodity charge has been set to recover the appropriate percentage of SO costs, the NTS SO exit commodity charge would be calculated to recover the remaining SO exit revenue.

Forecast over or under recovery could be managed within-year in a number of ways:

Option	Description	Pros	Cons
<b>Single Target Revenue Ratios</b>	SO Commodity rates would be set for the Entry, Exit and flexibility charges for the beginning of each gas year. If there was a forecast net over or under recovery all prices would be scaled to manage the over or under recovery and hence the initial price ratios would be maintained.	As over or under recovery would be managed at a net level there could be greater price stability and hence greater certainty.  Cost reflective over the longer term as the likelihood of any under or over recovery is likely to be proportional to the individual target revenues for each component.	The revenue collected from the flexibility charge would not necessarily equal the target revenue.  Under or over recovery of SO entry/exit would result in a change to the SO flexibility commodity charge, which would be amplified by the smaller charging base.
<b>Individual Target Revenues</b>	SO Commodity rates would be set for the Entry, Exit and flexibility charges for the beginning of each gas year. If there was a forecast over or under recovery for any component, prices would be scaled independently to manage the over or under recovery and hence the initial price ratios might not be maintained.	The revenue collected from the flexibility commodity charge would approximately equal the target revenue.	As over or under recovery would be managed separately for the entry, exit and flexibility revenue streams there could be greater price variation and hence greater uncertainty.
<b>Fixed Flow Flex</b>	SO Commodity rates would be set for the Entry, Exit and flexibility charges for the beginning of each gas year. If there was a forecast over or under recovery for any component, only SO entry and exit prices would be scaled to manage the over or under recovery and hence the initial price ratios would not be maintained.	Recognises the sensitivity of the small flexible capacity charging base	Less cost reflective, as any under/over recovery caused by flexibility would not be charged to parties causing under/over recovery.

Transco believes that the Single Target Revenue approach would be the most appropriate mechanism to deal with any under or over recovery as it is cost reflective and could deliver greater price stability.

Transco would publish changes to the NTS SO exit flexibility commodity charge in accordance with its Licence and code obligations.

## 6. Summary and Questions for Consultation

This paper has discussed the issues and Transco's initial views relating to the pricing implications of the introduction of an NTS exit flexible capacity product. Transco believes that in order to meet our licence obligations, it is necessary to identify a charging methodology that achieves the relevant objectives for both the pricing of flexible capacity and for the use of flexible capacity.

We would be pleased to receive views on the following areas of our Transportation Charging Methodology relating to NTS exit flexible capacity:

- NTS exit flexible capacity charging for baseline and incremental flexible capacity;
- NTS exit flexibility usage (commodity) charging, and the potential impact on Users;
- The derivation of an NTS exit flexibility commodity charge and its relationship with exit commodity prices;
- The parties and flows that NTS exit flexible capacity charges and the NTS SO flexibility commodity charges might be levied on;
- The methods of managing over and under recovery in relation to the operation of an NTS SO flexibility commodity charge;

If, following responses to this discussion paper, Transco intends to propose a change to its methodology for setting NTS transportation charges, it will issue a Pricing Consultation paper on the proposed change.

The closing date for submission of your response is **21<sup>st</sup> April 2005**.

Your response should be emailed to [craig.maloney@ngtuk.com](mailto:craig.maloney@ngtuk.com) or alternatively by post to Craig Maloney, Commercial Frameworks, National Grid Transco, NGT House, Gallows Hill, Warwick, CV34 6DA. If you wish to discuss any matter relating to this charging methodology consultation then please call on 01926 656213.

It would be helpful if your response could be copied to Ofgem by post to Sonia Brown, Director - Transportation, Ofgem, 9 Millbank, London, SW1P 3GE or by e-mail to [sonia.brown@ofgem.gov.uk](mailto:sonia.brown@ofgem.gov.uk).

Responses to this paper will be incorporated either within a Pricing Discussion conclusion report or, if a formal change to the methodology is to be pursued, within the relevant Pricing Consultation paper.

Should you wish your response to be treated as confidential, please mark it clearly to that effect.

## Appendix A: NTS Exit Flexible Capacity Product Definition

### Overview

An NTS exit flexible capacity product will provide Exit Users with the right to deviate actual gas flow away from the equal hourly rate conferred through holding the revised basic capacity product. NTS will in turn have tools specifically designed to enable it to better manage operational uncertainties created by wide and/or unexpected flow rate variations. Prior to network sales these issues were managed by internal management practices that would restrict the degree of flexibility available to networks whilst offering greater freedom to direct connect customers. In the interests of long-term sustainability, proposals for a common flexible capacity product are being brought forward.

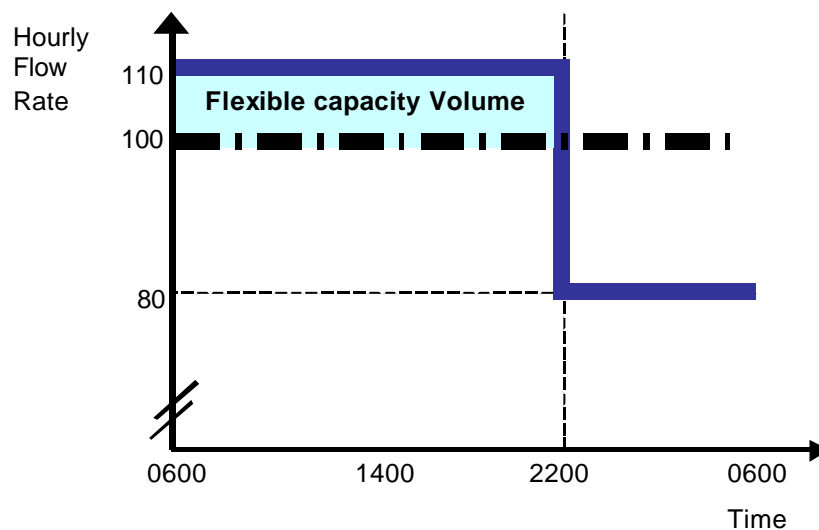
Flexibility on the NTS is generated as a consequence of variation of within day pressure requirements at LDZ offtakes and designing the NTS to meet the peak aggregate daily demand for gas assuming a constant rate of Offtake. It is anticipated that this inherent capability, or baseline, will be offered through market-based processes. Further to this the costs of NTS providing further incremental flexibility over the long-term will be signalled through a long-term auction process to enable Exit Users to signal whether they would like the supply of flexibility from the NTS to be expanded in the future.

### Definition

NTS exit flexible capacity would be an annual product defined as the right for a specified Exit User at a specified NTS node to deviate away from a uniform 1/24<sup>th</sup> flow rate without incurring a flexibility overrun charge. The right will be expressed as a volume in kilowatt-hours that can be used to supplement the basic 1/24<sup>th</sup> flow rate entitlement between 06:00hrs and 22:00 hrs on any day. The profile of how a flexible capacity volume would be utilised is for Exit Users to determine. Actual consumption of a flexible capacity volume can be determined by the following calculation for each User and at each node:

- Subtract 2/3 of the total end of day quantity flowed from
- Cumulative volume offtaken between 06:00 and 22:00hrs

In the following example the offtake has flowed at an hourly rate of 110 units for 16 hours and then 80 units for the remaining 8 hours. This equates to an average hourly rate of 100 units as shown. The volume offtaken in the first 16 hours is 1760 unit and the volume offtaken over the day is 2400 units. The calculated flexible capacity volume is therefore  $1760 - (2/3) * 2400 = 160$  units.



**NTS Exit Flexible Capacity product holding**

The release of NTS flexible capacity is anticipated to be on a similar basis to that described for NTS exit flat capacity with the periods and processes also closely following exit flat capacity:

- Annual product (Long term and medium term release)
- Long-term release from 3 to 8 years ahead (8 years coincides with the period of assessment for release of Incremental Entry Capacity in the GT Licence).
- Medium term release up to 3 years ahead.
- Daily product released day-ahead (and within day).



## **Appendix B: NTS Exit Flexible Capacity Investment Incentive Price Setting Methodology for System Exit Points**

### **Introduction**

This methodology has been established to provide a price schedule against which Annual System Flexible Capacity (ASFC) can be demanded. Prices calculated in accordance with this methodology are applicable to the release of aggregate quantities of ASFC that are above the flexible capacity baseline quantities identified as being associated with baseline flexible capacity.

The objective of the methodology is to produce a range of price steps which affords Appropriate Users an opportunity to reveal their demand for flexible capacity, but which also reflects the estimated construction costs potentially incurred by Transco for providing flexible capacity at levels beyond the flexible capacity baseline quantities. The underlying cost assumptions are forward looking and are informed by present day cost estimates for pipe laying and associated activities to provide new capacity. The methodology uses trend analysis to ensure a logical progression of ascending prices.

### **Flexible capacity Long Run Incremental Costs (LRIC) Overview**

Diurnal Storage capability, which facilitates flexible capacity, is dependent on the design pressure variation of the system. The diurnal storage capability can be quantified as the difference between the maximum and minimum linepack quantities that can be achieved at peak flow conditions. Linepack within a pipe section is proportional to the volume of the section and the average pressure and hence the diurnal storage capability is proportional to the volume and the maximum pressure variation. The addition of new pipe sections connected to the existing system will therefore add diurnal storage and hence incremental flexible capacity.

### **Flexible capacity Incremental Cost Calculation**

Incremental flexible capacity is achieved by the construction of either a storage pipe or a pipeline duplication of an existing pipe. The benefit that can be achieved by the construction of a duplicate pipeline is dependent on the diameter of the existing pipeline that is duplicated. Duplicating pipeline with the same diameter as the existing pipeline optimally distributes flows between the two pipes and hence is the optimal cost solution.

Incremental flexible capacity will not be identified from the construction of either additional compression at an existing compressor station or by the construction of a greenfield compressor station in order to preserve the validity of the incremental costs associated with incremental exit capacity. Adding additional compression could provide incremental flexible capacity but only by increasing the pressure cycling of the existing system outside of its design parameters and hence significantly reducing the asset life of the system.

### **Calculation of Incremental NTS Capacity Costs**

Flexible capacity is proportional to the length of additional pipe and zonal pressure variation. As the costs are proportional to the length of additional pipe, it can be seen that incremental flexible capacity can be generated at a zonal unit cost that is largely independent of increment size or offtake location within the zone. The cost of incremental flexibility capacity will be identified from network analysis by calculating the flexibility unit costs generated from adding additional pipelines in each zone.

### **Calculation of Annuitised Costs**

The zonal cost is annuitised, that is spread evenly over the expected life of the asset taking into account the required rate of return and the 20% of costs that are incurred in the year before an investment project is delivered. The annuity period assumed is 40 years, reflecting the assumption of the average economic life of new NTS pipeline assets. The annuity discount factor is 6.25% per annum, consistent with the cost of capital used to set maximum allowed revenue under NTS TO and SO price controls applicable from 1 April 2002.

### **Calculation of Incremental Price Steps**

The incremental price is calculated by dividing the annuitised cost (annuitised unit cost multiplied by increment volume) by the baseline plus assumed incremental volume (i.e. the 2.0% steps). This incremental price is then added to the baseline price in order to derive the price steps. In most cases, ten price steps will be offered, however, fewer price steps will be specified at the smallest offtakes. The smallest increment size is a minimum of 50,000kWh.

The price steps consistent with this methodology will be published in Transco's Transportation Statement. Where capacity is to be offered at a new Exit Point the prices published will be those for flexible capacity at the nearest suitable point on the NTS, however price schedules for flexible capacity at an alternative connection point may be available if required.

### **New System Exit Points**

From time to time demand may emerge for exit capacity and flexible capacity at new offtakes. When, through its planning process, a requirement for a new system exit point has been demonstrated to Transco's satisfaction, a price schedule will be published for subsequent long-term auctions. Preservation of commercial confidentiality is an important consideration when developing a new exit point and therefore Transco will publish price steps that seek to preserve confidentiality with respect to expected deliverability. The number of price steps will be fixed and the aggregate size will be subject to a range of uncertainty as follows;

- The minimum number of price steps will be 10 increments above the baseline.
- The maximum number of price steps will be 10 increments above the baseline of equal size, which in total are equivalent to 120% of the capacity requirement signalled to Transco through its planning process.

If a new offtake is developed, Transco would expect Ofgem to initiate the process necessary to modify Transco's GT Licence such that the offtake concerned is identified in Transco's Licence.

### **Pricing Recalculation**

From time to time, when Transco believes that there has been a substantial change to cost drivers, it will be appropriate for Transco to recalculate price schedules in light of any change. It is not anticipated that release of non-obligated capacity would normally trigger such a re-calculation unless the release is for a sustained period.

### Indicative Average Zonal Price Schedule

The following table contains an incremental flexible capacity price schedule, indicative of expected average zonal costs, based on an estimated average flexible capacity cost of £50m/mscm.

Price	Volume	p/kWh/day
P0	Baseline	0.0001
P1	2%	0.0022
P2	4%	0.0042
P3	6%	0.0062
P4	8%	0.0080
P5	10%	0.0098
P6	12%	0.0116
P7	14%	0.0133
P8	16%	0.0149
P9	18%	0.0165
P10	20%	0.0180

## **Appendix C: Target Revenue for SO Exit Flexibility Commodity Charge**

The target revenue for the SO exit flexibility commodity charge could be identified based on the forecast applicable percentages of SO cost for each SO cost component for the relevant year and the percentage of the cost component applicable to flexible capacity. The interaction of flexible capacity for each component of SO costs is discussed below.

### **Internal Costs**

Internal costs are driven largely by the volume of data processing and hence are not driven by either changes in the level of flow or flexible capacity. Clearly some internal costs, such as flexible capacity auction costs, will be directly linked to flexibility if a flexible capacity product is implemented. Some internal costs could be linked to the flexible capacity product through the workload generated by Users ability to vary flows within day. Transco believes that the most appropriate allocation of costs would be to pro-rata 50% (i.e. the exit proportion) of internal costs based on the exit and flexible capacity baseline daily volumes as these are the primary products that Transco is making available.

### **System Reserve**

Operating Margins Gas is gas held in storage by Transco that can be withdrawn to maintain system pressures within day in the event of an incident that cannot be managed by the use of market balancing actions. Extremity pressures on the NTS fall as the demand level increases due to pipeline friction effects. Extremity pressures on the NTS are also dependent on linepack and hence fall as flexible capacity usage increases. Network analysis of a 900mm 75 bar pipeline indicates that the impact of one unit of flexible capacity is ten times the impact of a unit of flow as, for a given pressure gradient, the maximum flow is ten times the maximum flexible capacity. Transco believe that the most appropriate allocation of costs would be to pro-rata applicable OM costs based on the impact of the exit and flexible capacity baseline volumes as a proxy for allocating between flow and flexible capacity.

### **Shrinkage**

Shrinkage can be divided into own use gas (OUG - compressor fuel) and unaccounted for gas (UAG). UAG is largely driven by meter error and hence is not driven by changes in the level of either flow or flexible capacity. Compressor fuel usage and hence compressor fuel is driven by the requirement to maintain system pressures. The volume of compressor fuel is driven by both flow and flexible capacity usage. Transco believes that the most appropriate allocation of shrinkage costs would be to pro-rata 50% (i.e. the exit proportion) of the UAG costs based on the exit and flexible capacity baseline daily volumes as these are the primary products that Transco is making available. Transco believe that the most appropriate allocation of OUG costs would be to pro-rata applicable OM costs based on exit and flexible capacity baseline volumes as a proxy for allocating between flow and flexible capacity.

### **Constrained LNG**

Constrained LNG service represents gas held in storage by Transco to meet firm demand in excess of pipeline transportation capability. The service supports both exit and baseline flexible capacity simultaneously and hence Transco believes that the most appropriate allocation of CLNG costs would be to pro-rata the costs on the exit and flexible capacity baseline volumes as these are the primary products that Transco is making available via the use of the service.

### Cost Allocation Matrix

Using the analysis above, the following table shows the cost allocation calculation based on 2002/3 data; e.g. 2.5% of SO Internal costs are deemed to be applicable to flexible capacity; SO internal costs represent 20% of total internal costs so 0.5% (20% \* 2.5%) of total SO internal costs are applicable to flexible capacity.

SO Cost Component	Percentage of Total SO Cost (A)	Percentage applicable to FF (B)	Percentage of Total SO Cost applicable to FF (AxB)	Comment
Internal Costs	20%	2.5%	0.5%	Auctions & Data processing (Pro-rata 50% on baseline capacity)*
System Reserve (OMG)	8%	34.0%	3.0%	Driven by pressure loss with flexible capacity having ten times the impact compared with flow (based on 10:1 ratio of maximum flow cf FF for a 100km 75bar 900mm pipeline)
Shrinkage UAG/CV	6%	2.5%	0.2%	The main driver is Meter error and is not flow dependent (Pro-rata 50% on baseline capacity)*
Shrinkage OUG	25%	4.9%	1.4%	Compressor fuel (own use gas) maintains Exit Capacity (transmission & FF) equally (Pro-rata on baseline capacity)*
Constrained LNG	3%	4.9%	0.2%	CLNG Maintains Exit Capacity pressures for both Transmission & FF equally. (Pro-rata on baseline capacity)*
<b>TOTAL</b>	100%	-	5.2%	

\* Based on Baselines of FF=31 Mscm, Exit=600Mscm

The net revenue to be recovered via the SO exit, entry and exit flexibility commodity charges will be the total SO allowed revenue less that recovered by the St Fergus compression charge and by the optional commodity charge. The above cost allocation implies that 44.1% of SO revenue would be recovered by the SO exit commodity charge with the remaining 50% recovered via the SO entry commodity charge.

### Indicative SO Flexibility Commodity Prices

Based on 2004/5 data the following prices would apply. The Flexible capacity charge has been based on an annual usage of 30,000 GWh and a cost allocation of £11m.

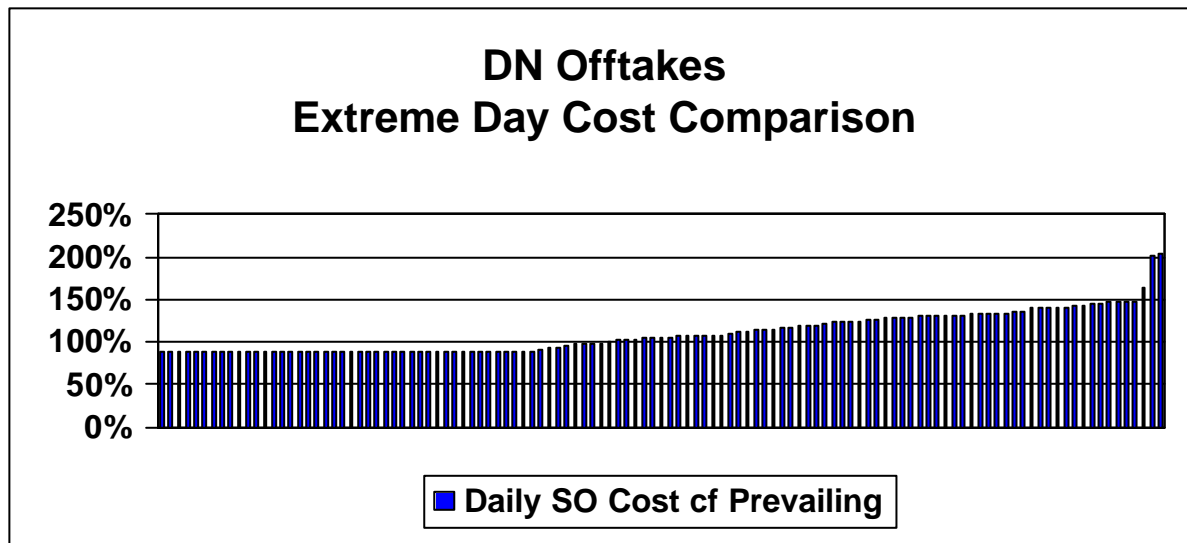
Commodity Rates (p/kWh) {need to update prices and graphs}		
SO Commodity Charge	Prevailing Arrangements	PC84 Change
Entry	0.0088	0.0088
Exit	0.0088	0.0078
Flexibility Commodity	-	0.0324

**Impact on Offtakes**

The following graphs show the impact by offtake of the indicative charges on daily SO costs (exit and flexible capacity) compared to the prevailing arrangements. The analysis is based on offtake profiles for 28<sup>th</sup> January 2003, the day of highest throughput for the winter, and hence represents extreme use of flexible capacity. Over a year there will be winners and losers due to the introduction of the flexible capacity commodity charge as the charge represents a more cost reflective distribution of costs rather than an additional charge. An offtake that utilises less than the average volume of flexible capacity relative to its offtaken volume will attract lower charges compared with the prevailing arrangements

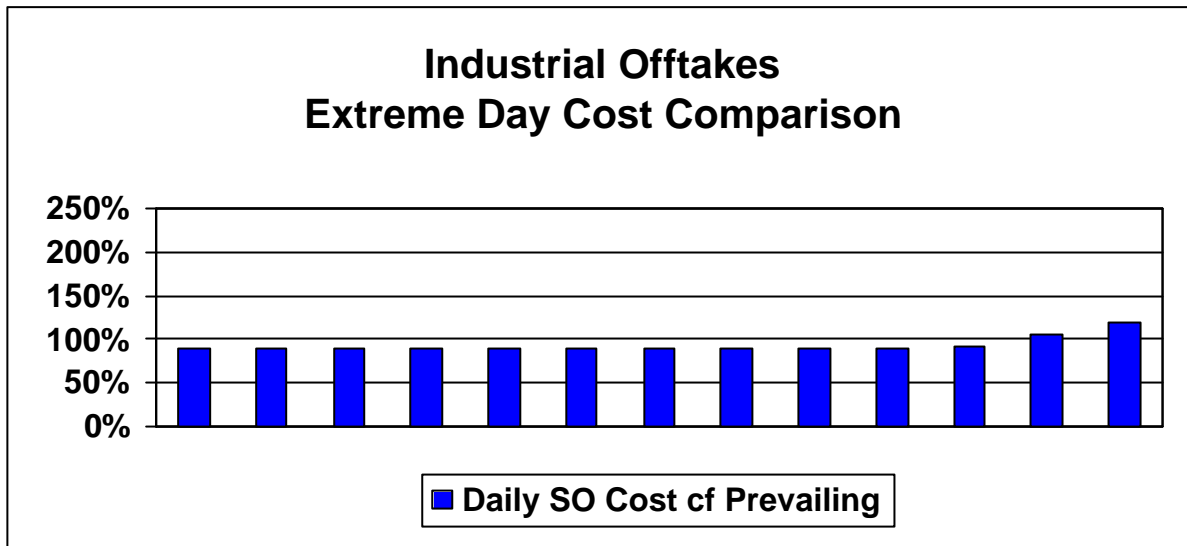
*DN Offtakes*

The following graph shows the potential impact on a peak day (28<sup>th</sup> January 2003) of an SO flexibility commodity charge on DN offtake SO costs. At present DN offtakes do not attract SO Exit Commodity Charges and hence the comparison is based on the charge that would have applied. The data shows a third of offtakes attracting lower charges (<100% of prevailing daily charges) with those offtakes profiling the most, attracting twice the charge.



*Industrial Offtakes*

The following graph shows the potential impact on a peak day (28<sup>th</sup> January 2003) of an SO flexibility commodity charge on NTS directly connected Industrial offtake SO costs. The data shows all but two of the offtakes attracting lower charges (<100% of prevailing daily charges)



*Power Generation Offtakes*

The following graph shows the potential impact on a peak day (28<sup>th</sup> January 2003) of an SO flexibility commodity charge on NTS directly connected power generation offtake SO costs. The data shows a third of offtakes attracting lower charges (<100% of prevailing daily charges) with those offtakes profiling the most attracting twice the charge.

