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| Issue | Revision |
| 0.4 | DRAFT |

The Entry Capacity Transfer and Trade Methodology Statement

**Effective from [1st July 2007] (in respect of
NTS Entry Capacity available in the
Constrained Period).**

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About this Document¹

This document describes the methodology that National Grid Gas plc's NTS business ("National Grid") will utilise when facilitating the transfer of unsold, or the trade of sold, NTS Firm Entry Capacity from one ASEP to another ASEP. In particular, it defines:

- under what circumstances National Grid will consider such transfers or trades; and
- the process to be undertaken by National Grid to determine the quantities that it will allow to be transferred.

This document is one of a suite of documents that describe the release of obligated and incremental NTS firm capacity by National Grid and the methodologies behind them. The other documents are available on our Charging website at:

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

This statement is effective from [1 July 2007].

This document has been published by National Grid in accordance with [Special Condition C8D Part 1 sections 11 and 12] of National Grid's GT Licence. National Grid believes the content is consistent with its duties under the Gas Act and is consistent with the Standard Conditions, Standard Special Conditions and Special Conditions of its GT Licence.

This statement of the Entry Capacity Transfer and Trade Methodology has been developed in conjunction with related UNC modification proposals and Charging Methodology Statement. It is effective in respect of obligated NTS Entry Capacity previously made available for sale to Users for use in the constrained period (i.e. within investment lead times).

It should be noted that this document does not provide the methodology by which, and from when, NTS Firm Entry Capacity will be made available. Such methodology can be found in the "Incremental Entry Capacity Release Methodology Statement" and the UNC.

If you require further details about any of the information contained within this document or have comments on how this document might be improved please contact our UK Transmission Gas Access and Charging team on **01926 656310** or **01926 656217** or at:

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¹ At the time of drafting this statement agreement has not been reached on the detail of National Grid's Gas Transporters licence for the period starting April 2007. This statement has been drafted on the basis of initial drafts of the licence and hence specific licence references may be subject to amendment. Should the specific conditions relating to capacity transfers and trades be significantly at variance with National Grid's expectations then this statement may be withdrawn or amended.

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GENERAL INTRODUCTION

Background

1. National Grid is the owner and the operator of the gas National Transmission System (NTS) in Great Britain.
2. The NTS is a network of pipelines, presently operated at pressures of up to 85 bar, which transports gas safely and efficiently from coastal terminals and storage facilities to exit points from the system. Exit points are predominantly connections to Distribution Networks (DNs), but also include storage sites, and direct connections to large industrial consumers and other systems, such as interconnectors to other countries.
3. These operations are carried out to meet the needs of the companies that supply gas to domestic, commercial and industrial consumers and to power stations. In 2005/06 1,067 TWh of Gas was transported to these consumers.
4. This publication sets out the methodology that applies for the transfer of unsold, and trading of sold, NTS Firm Entry Capacity between NTS Entry Points for the constrained period. The methodology applicable to the unconstrained period (i.e. beyond investment lead times) can be found in the “Entry Capacity Substitution Methodology Statement”.
5. Details of National Grid and its activities can be found on the company’s internet site at www.nationalgrid.com. An electronic version of this publication, along with the other related statements can be found via the following link [“http://www.nationalgrid.com/uk/Gas/Charges/statements/”](http://www.nationalgrid.com/uk/Gas/Charges/statements/).

National Grid’s Licence Obligations

6. New and existing Users of the NTS are able to request to purchase NTS Entry Capacity products for any ASEP. Such capacity requests will be considered against the provisions of National Grid’s statutory licence obligations and in accordance with its published methodologies.
7. Overriding obligations applicable to this statement set out in the Gas Act and the Standard, Standard Special and Special Conditions of National Grid’s GT Licence in respect of the allocation of NTS Entry Capacity are that it must be:
 - conducted on a non-discriminatory basis – (see Standard Special Condition A6);
 - conducted in an efficient, economic and co-ordinated manner – (see Special Condition C5); and
 - consistent with the safe and efficient operation of National Grid’s pipe-line system and security of supply obligations – (see Standard Special Condition A17 and Standard Special Condition A9).
8. Specific obligations and rights in respect of the transfer and trading of NTS Entry Capacity and applicable to this statement are set out in National Grid’s GT Licence [Special Condition C8D Part 1 sections 11 and 12] and are:

- [Prepare and submit for approval by the Authority a capacity trade methodology statement which shall be prepared in a manner best calculated to meet the capacity trade objectives.]
- [Prepare and submit for approval by the Authority a capacity transfer methodology statement which shall be prepared in a manner best calculated to meet the capacity transfer objectives.]
- [The capacity trade and capacity transfer objectives are to:
 - ensure that the trade/transfer of obligated entry capacity is effected in a manner which is compatible with the physical capability of the National Transmission System (“NTS”);
 - avoid undue increases in cost (including capacity buy-back costs) that are reasonably expected to be incurred as a result of capacity trades/transfers;] and
 - [so far as is consistent with the above two points, to facilitate effective competition between relevant shippers and suppliers.]
- [To provide to the Authority a statement on the application and implementation of the capacity transfer/trade methodologies.]
- [National Grid may make a charge for the provision of relevant information in relation to a capacity trade/transfer request. This charge shall not exceed reasonable costs incurred and shall be refundable to the appropriate User(s) upon completion of such trades/transfers.]
- Due to the high degree of similarity between the trade and transfer methodologies National Grid has prepared this single document to satisfy the licence requirements outlined above.

CHAPTER 1: PRINCIPLES

Purpose of the Methodology Statement

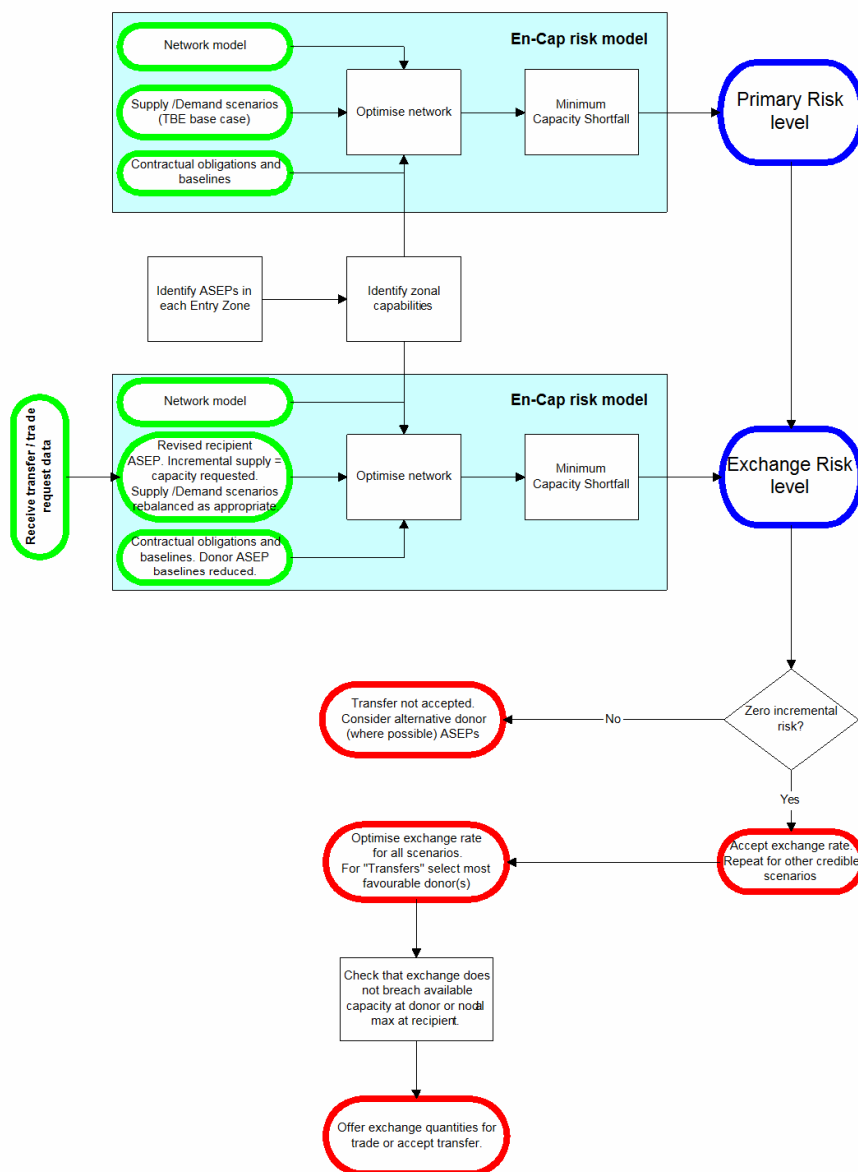
- 9 For the purpose of this document:
- Capacity Trade means the transfer of previously allocated firm entry capacity rights; and
 - Capacity Transfer means the transfer of unsold firm entry capacity rights.
- 10 This Methodology Statement has been produced to meet the requirements of [Special Condition C8D Part 1 sections 11 and 12] of National Grid's GT Licence in respect of the preparation of a statement setting out the methodology by which it will:
- consider requests for capacity trades and transfers: and
 - determine a capacity trade or transfer rate (an "exchange rate");
- in respect of
- the trading of capacity from a specified entry point (the "donor" ASEP) to another specified entry point (the "recipient" ASEP) or
 - the transfer of capacity from an unspecified entry point (the "donor" ASEP) to another specified entry point (the "recipient" ASEP).
- National Grid believes the content is consistent with its duties under the Gas Act and is consistent with the Standard Conditions, Standard Special Conditions and Special Conditions of its GT Licence.
- 11 For the purpose of this statement a capacity "exchange rate" means a rate at which obligated entry capacity rights shall, if the trade or transfer is completed, be reassigned between two different Aggregate System Entry Points ("ASEPs"). In making capacity available at the recipient ASEP, in a quantity determined in accordance with this methodology, National Grid will have complied with its obligation to provide obligated entry capacity at the donor ASEP and such traded or transferred capacity will not be available for sale in future auctions.
- 12 The methodology described in this statement has been developed to best meet the capacity trade and capacity transfer objectives detailed in paragraph 8.
- 13 The rationale for the process described in this statement is to ensure that the NTS is efficiently and economically sized and used. In particular it is intended to ensure that:
- a) the sale of capacity does not create a process whereby sold capacity at a location where it is no longer required prevents the release of capacity elsewhere due to National Grid's on-going commitment in respect of the sold capacity; or
 - b) the application of baselines in the licence does not create a process whereby unsold capacity at a location is effectively sterilised and cannot be used to support incremental demand elsewhere.
- The purpose is, therefore, to maximise the availability of capacity at locations where demand exists. Hence the process applies to capacity available in the constrained period (i.e. within investment lead times) as such capacity requests cannot be satisfied through other measures.
- 14 Consistent with National Grid's GT Licence and Uniform Network Code, entry capacity is a firm commercial right that may be offered on a daily basis or multiples thereof: it does not reflect a commitment or obligation upon National Grid to undertake any investment on its network, including, but not limited to the provision of a physical connection to the NTS.

CHAPTER 2: METHODOLOGY

Introduction

15 This methodology is intended to explain the step by step approach that National Grid will undertake in order to determine capacity exchange rates in support of requests for the transfer or trade of capacity, made available for use in the constrained period, between ASEPs, so as to maximise the availability of firm Entry Capacity at ASEPs where Users require it. The process is described in diagram 1 below. It does not describe the processes by which a User may request a capacity transfer or trade. Nor does it describe the processes that National Grid will undertake to validate any request or to implement a transfer or trade. These processes are provided in the Uniform Network Code.

Diagram 1:
High Level Process for Capacity Exchange Rate Determination.



Application of Entry Zones

- 16 Where ASEPs utilise sections of common NTS infrastructure and consequently are deemed to be 'interactive' in terms of utilising network capability National Grid will group the ASEPs into zones. Entry Zone groupings are stated in National Grid's Ten Year Statement. For the purpose of this statement these groupings may be changed from time to time to reflect up to date conditions.
- 17 When considering capacity exchanges between two ASEPs in the same entry zone a physical exchange rate of 1:1 will be assumed, subject to physical limitations of individual nodes. However, where commercial arrangements are not aligned to the physical reality (e.g. physical capability may have been developed to meet forecast supplies which may be different to allocated quantities) the acceptable exchange rate will be reduced (i.e. more required by the donor ASEP).
- 18 A capability range for each entry zone will be determined by National Grid. The capability ranges will reflect the network including existing assets and committed investment.

Risk Assessment Model

- 19 The most significant constraint on capacity exchange rate is the requirement for National Grid to avoid increases in the costs that can reasonably be expected to be incurred as a result of capacity being reassigned. This includes, but is not limited to, capacity buy-back costs. Hence, an assessment of incremental buyback risk arising from capacity transfers and trades is critical to determining appropriate capacity exchange rates. It is a measure of this risk that is the primary factor in the determination of the capacity that can be transferred to the recipient ASEP.
- 20 National Grid has developed a model, "EnCap", to forecast buyback risk. Risk is assessed in terms of the total quantity, over all affected days in the period considered, of capacity that is calculated as potentially being needed to be bought back. The model is the basis on which National Grid has:
- accepted proposals for buyback incentive parameters;
 - assessed operational risk; and
 - evaluated risk mitigation options.
- The model simulates flexibility of network capability to best accommodate changing supply patterns. This is of particular relevance to the determination of exchange rates where any capacity reassignment could facilitate more extreme supply patterns. This is the model which National Grid will use to determine the incremental risk created by capacity transfers and trades and hence the applicable exchange rate.
- 21 There are three basic inputs to the risk model. These are:
- a) Contractual obligations;
 - i) Contractual obligations include obligated firm capacity at each ASEP and the amount of allocated (sold) firm entry capacity.
 - b) Network Capability Data Model
 - i) The Network Data Model represents the physical nature of the NTS and incorporates critical parameters such as system pressures from known or assumed flow patterns. Capabilities are determined by locating forecast

supplies and demands on the Network. Supply patterns are subject to greatest volatility so various scenarios can be considered, but this assessment utilises the base network supply / demand forecast, as developed through National Grid's "Transporting Britain's Energy" ("TBE") process.

- ii) The basis of the model is the identification of the outer envelope of system capabilities (i.e. best and worst case) for an entry zone. This analysis is undertaken annually.
- iii) The TBE base scenario can be "flexed" to calculate two sets of possible entry capabilities at each entry zone. In both cases the aim is to identify the maximum capability of the zone being assessed.
 - The best case scenario defines the greatest capability that might be expected if the pattern of supplies elsewhere is favourable. In this case gas supplies at ASEPs in neighbouring zones (i.e. those that rely on similar parts of the network to get supplies into the system) are set at the minimum forecast. This increases the capability of the zone being analysed to transport additional supplies away from that zone; and
 - The worst case scenario defines the greatest capability that might be expected if the pattern of supplies elsewhere is unfavourable. In this case gas supplies in ASEPs in neighbouring zones will be set to their maximum forecast, hence inhibiting the ability to remove gas out of the zone being analysed.

This system capability window will be determined through analysis undertaken for a peak day scenario and at additional points along the load duration curve. This enables, through interpolation, the range of maximum capability to be determined for varying demand levels, i.e. throughout the year.

- iv) These zonal capability models define a series of limiting valid networks (i.e. network configurations of compressor operation, gas flow paths etc) without breaching critical parameters.
- v) In addition, National Grid will determine the nodal maximum for each ASEP (i.e. the maximum deliverability of an individual ASEP). The nodal maximum will be subject to limits placed on that ASEP by the capability of the specific connecting infrastructure including, but not limited to the connecting pipeline, "minimum connection" and/or gas flow and quality measurement equipment.

c) Supply / Demand Scenarios.

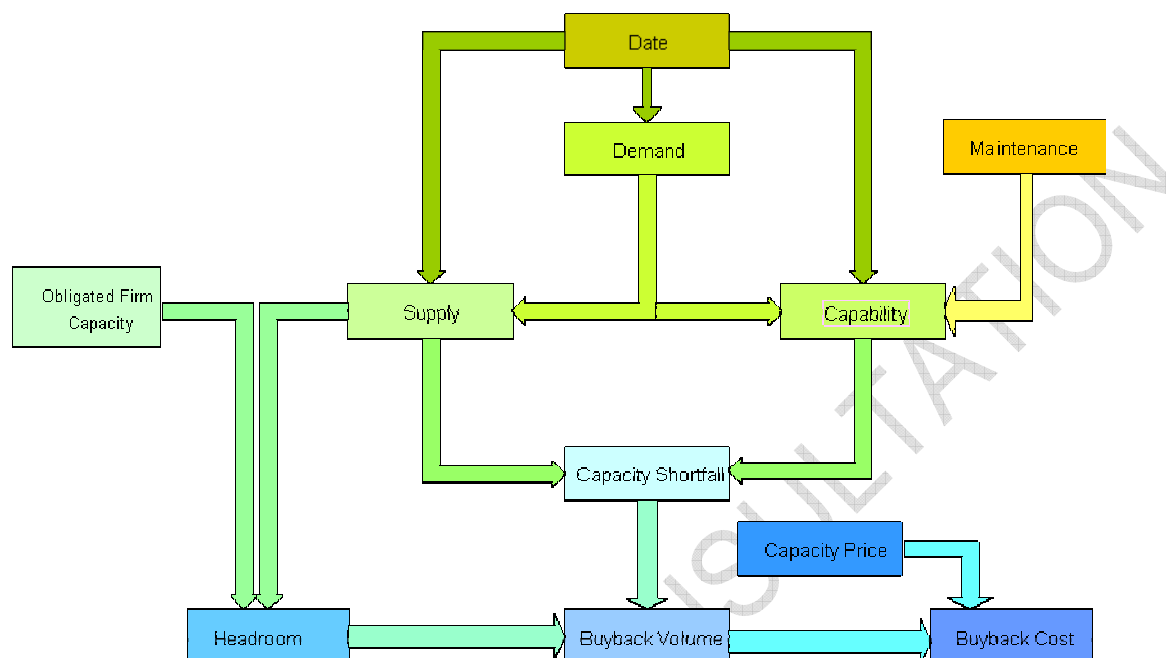
- i) The risk model requires a prediction of the supply / demand picture for the period to be modelled. Scenarios considered cover the range of TBE supply uncertainties developed through industry consultation. The outputs from the model are weighted according to assigned scenario probabilities centred on the TBE base case.

Risk Assessment

- 22 Buyback risk is modelled by a simple algorithm with the 3 primary inputs of capacity rights, network capability (the best and worst case capabilities for each zone are input into the buyback risk model) and expected supply. In addition, any operational constraints e.g. plant unavailability resulting from scheduled maintenance activities, will be included in the assessment. For any day at any ASEP where expected supply

is greater than capability there is a potential buyback requirement at least equal to the physical shortfall (supply – capability) and potentially equal to the full volume risk (obligated capacity – capability) (see diagram 2 below). This potential buy back is the level of risk that National Grid manages in its normal operations.

Diagram 2 – Risk Assessment Process.



- 23 For each potential capacity exchange the **Primary Risk Level** is determined. This is determined for a given demand level (identified from the applicable date) and for each scenario. The network capability will be modelled (i.e. optimising network configuration) to minimise and quantify risk. Using the base network, in terms of capacity rights and obligated capacity levels, determines the primary risk level.
- 24 Any variations in supply patterns (e.g. due to potential capacity exchanges) will be assessed against the zonal capabilities to identify whether the new supply pattern can be accommodated or whether a capacity shortfall occurs. The revised level of risk (the **Exchange Risk Level**) created by a potential capacity exchange will be compared to the primary risk level. If the new risk is no greater than the primary level then the exchange will be acceptable (see diagram 1 above). The maximum acceptable exchange rate will occur where the exchange risk equals the primary risk. Hence an assessed exchange generating incremental risk will be reassessed with a lower exchange rate to identify an exchange rate that does not create additional risk.

Scope of Exchange Rate Calculation Process

- 25 The derivation of an exchange rate is specific to each individual exchange and is based upon the network infrastructure (i.e. existing and planned), commercial rights and obligations (actual and assumed) and the forecast flows based upon these rights and obligations, at the time of analysis. Hence, only one transfer or trade (or one combination) can be assessed at a given time.

- 26 The exchange rate determined by National Grid will be applicable to a transfer or trade quantity (at the recipient ASEP) equal to:
- the maximum capacity that can be made available at the recipient ASEP without creating additional risk (in respect of any part of the network) of the necessity for capacity buy-backs. In the event that sufficient capacity is available without creating incremental risk then the exchange will be limited to;
 - the maximum capacity requested at the recipient ASEP; or
 - the nodal maximum at the recipient ASEP minus any existing allocated capacity; or
 - the maximum capacity available at the donor ASEP multiplied by the exchange rate determined by this process.

Capacity Exchange Analysis

- 27 The exchange analysis process described below will be progressed until one of the limits in paragraph 26 is reached.
- 28 The exchange rate will be determined by exchanging capacity from the donor ASEP to the recipient ASEP and re-assessing the level of risk. The process will be as follows.
- a) Each supply scenario will be assessed in turn. There is no relevance to the order of assessment.
 - b) Capacity will be moved from the donor ASEP to the recipient ASEP with an initial exchange rate of 1:1 and quantity equal to that available at the donor ASEP. The donor ASEP will be as specified by the User (for trades) or the ASEP that provides the highest exchange rate (for transfers).
 - c) The risk model will be run for each day of the proposed exchange, with the base data input, to generate the primary risk level.
 - d) For each day, revised data is input to reflect the proposed capacity exchange.
 - (i) The assumed supply at the recipient ASEP will increase in quantity equal to the capacity allocated. This is regardless of where the increment is relative to the baseline.
 - (ii) The level of obligated firm capacity at the donor ASEP will be amended downwards.
 - (iii) Where there is a decrease in the quantity of supply at the donor ASEP a further supply rebalance may need to be performed at other ASEPs. This rebalance will be based on pro-rata by swing factors across all ASEPs. The swing factor of an ASEP is a measure of the variability of supply quantities over a year (peak flows relative to average) and hence its responsiveness to changing supply patterns.
 - e) The risk model will be re-run to determine the optimum network configuration to minimise risk (buy backs). The minimum risk, the exchange risk level, is quantified and compared to the primary risk level.
 - f) If there is no incremental risk then the exchange rate will be accepted and the process repeated for other scenarios.
 - g) If there is an incremental risk then the exchange rate shall be adjusted and the risk re-calculated. An iterative process will be undertaken to determine the exchange rate at which incremental risk commences. The iteration will stop if one of the limits referred to paragraph 26 is reached. The process shall then be repeated for other scenarios.
 - h) When an approved exchange rate has been determined for all scenarios the final “offered” exchange rate will be determined by taking account of the distribution of risks across all scenarios.

- i) The final “offered” exchange rate will be applicable to the specific recipient / donor pair, network infrastructure and determined quantities.

Analysis Output

- 29 An exchange rate is produced for the requested recipient / donor ASEP pair for each month in the assessed period. This will be presented in a format similar to the tables below. Format variations may occur due to differences between trade and transfer processes or in the light of experience of operating trade and transfer processes.

Examples of Output from Entry Capacity Transfer and Trade Processes.

Example 1 – Request satisfied

| Exchange month – Oct 2008 | Available capacity to transfer (Gwh) | Requested capacity (GWh) | Existing booked capacity (GWh) | Risk Free capacity (GWh) | Nodal maxima (GWh) | Transfer Quantity | Exchange rate |
|---------------------------|--------------------------------------|--------------------------|--------------------------------|--------------------------|--------------------|-------------------|---------------|
| Donor ASEP A | 45 | | N/A | 40 | N/A | 30 | 3:1 |
| Recipient ASEP | | 10 | 100 | 15 | 120 | 10 | |

Example 2 – Request limited by availability of incremental-risk free capacity.

| Exchange month – Oct 2008 | Available capacity to trade (Gwh) | Requested capacity (GWh) | Existing booked capacity (GWh) | Risk Free capacity (GWh) | Nodal maximum (GWh) | Transfer Quantity | Exchange rate |
|---------------------------|-----------------------------------|--------------------------|--------------------------------|--------------------------|---------------------|-------------------|---------------|
| Donor ASEP A | 45 | | N/A | 40 | N/A | 40 | 2.7:1 |
| Recipient ASEP | | 18 | 100 | 15 | 120 | 15 | |

Example 3 – Request limited by donor ASEP capacity.

| Exchange month – Oct 2008 | Available capacity to trade (Gwh) | Requested capacity (GWh) | Existing booked capacity (GWh) | Risk Free capacity (GWh) | Nodal maximum (GWh) | Transfer Quantity | Exchange rate |
|---------------------------|-----------------------------------|--------------------------|--------------------------------|--------------------------|---------------------|-------------------|---------------|
| Donor ASEP B | 20 | | N/A | 20 | N/A | 20 | 2:1 |
| Recipient ASEP | | 18 | 100 | 10 | 120 | 10 | |

Example 4 – Request limited by nodal maximum.

| Exchange month – Oct 2008 | Available capacity to trade (Gwh) | Requested capacity (GWh) | Existing booked capacity (GWh) | Risk Free capacity (GWh) | Nodal maximum (GWh) | Transfer Quantity | Exchange rate |
|---------------------------|-----------------------------------|--------------------------|--------------------------------|--------------------------|---------------------|-------------------|---------------|
| Donor ASEP C | 45 | | N/A | 40 | N/A | 35 | 3.5:1 |

| | | | | | | | |
|---------------------------|--|----|-----|----|-----|----|--|
| Recipient ASEP | | 18 | 100 | 15 | 110 | 10 | |
|---------------------------|--|----|-----|----|-----|----|--|

These tables are presented as examples only. They are a simplification of the exchange rate process and should not be taken as being indicative of expected exchange rates or quantities.

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