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Explanatory Note on Trade and Transfer Information

in respect of the

Transfer and Trade System Entry Capacity Auction - September 2007

nationalgrid

Contents

BACKGROUND	**3**
MERIT ORDER	**3**
NODAL ALLOCATION MAXIMUM (NAM)	**4**
ZONAL ALLOCATION MAXIMUM (ZAM)	**5**
INTER ZONE EXCHANGE RATES	**6**
SUMMARY	**8**
GLOSSARY	**8**

Background

1 On 25 September 2007, National Grid NTS published the Transfer and Trade System Entry Capacity (TTSEC) Auction invitation. This invitation contained the following key information:

- Merit order of **ASEP**[1]s for relevant and related **zones**
- Nodal allocation maximums for recipient ASEPs
- Zonal allocation maximums for zones that contained a recipient ASEP
- Inter zone exchange rates between the zones sharing a beneficial relationship with those zones containing a recipient ASEP.

Other information provided in the auction invitation was produced in accordance with UNC Modification 169[2] and is not expanded upon in this guide.

2 All of the above data was calculated in accordance with the approved Transfer and Trade Methodology Statement (the "Methodology Statement"). A link to the statement is provided below.

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

3 The Methodology Statement was required to identify applicable exchange rates for the movement of capacity between ASEPs without creating a material increase in costs. This explanatory note is intended as a guide to how the Methodology Statement was applied, providing additional detail to all stakeholders.

4 It should be acknowledged that the methodology was developed in good faith to meet the requirements of the industry whilst satisfying **Licence** obligations. Although alternative methodologies may have been considered National Grid NTS believes that the methodology proposed, and approved by the Authority, represents the best solution obtainable within the time available.

5 The setting of baselines at levels above that which can be simultaneously satisfied means that 1:1 exchange rates are not always possible.

Merit Order

6 The Merit Order is used to rank ASEPs in a zone according to where a reduction in obligated capacity is most likely to lead to a reduction in actual flow. The calculation is performed at each ASEP by dividing "expected daily ASEP flow" for the month in question by the obligated capacity level of the ASEP. ASEPs are ranked in descending order.

7 In determining the "expected daily ASEP flow", National Grid NTS took account of the **TBE** 2006 and winter 2006/07 historical flow data at the expected demand levels for the months in question. This led to a consistent merit order for all months within the auction period, see table below.

1 Key terms, if not defined within the main body of this note are highlighted in bold and described in the glossary.

2 Uniform Network Code modification proposal 169 "Transfer and Trading of Capacity between ASEPs" accessed at the following link: http://www.gasgovernance.com/Code/Modifications/ClosedMods/CM161-170/

Zone	ASEP	Merit Order
Easington	Easington	1
	Hatfield Moor Storage	2
	Hatfield Moor On-shore	3
	Hornsea	4
	Garton	5
South East	Isle of Grain	1
	Bacton	2
Northern Triangle	Teesside	1
	St.Fergus	2
	Barrow	3
	Glenmavis LNG	4
Theddlethorpe	Theddlethorpe	1

Nodal Allocation Maximum (NAM)

8 The published NAM for each recipient ASEP, except the Teesside ASEP, is based on the Nodal Capability data published by National Grid NTS on 6 July 2007. The data was derived via the process detailed in paragraph 20 of the Transfer and Trade Methodology Statement. The information is available on the Joint Office website via the link below.

http://www.gasgovernance.com/Code/Workstreams/TransmissionWorkstream/2007Meetings/

9 The NAM for the Teesside ASEP is based on the highest flows achieved over the past 5 years, rather than the value published on 6 July 2007 by National Grid NTS, due to physical and safety limitations at Teesside (paragraph 20b of the Methodology Statement).

10 The table below details the NAMs published in the auction invitation. The NAMs are constant for every month, except for the Easington ASEP for the month of November. The reason for the lack of monthly variation for all other ASEPs is that the NAM is capped at 150% of the obligated capacity, whereas for the Easington ASEP the NAM varies with demand. November has a lower demand level than all of the other months considered and therefore a slightly lower NAM is applicable.

Zone	Recipient ASEP	Proposed Nodal Allocation maximum (NAM) (kWh/Day)				
		Nov-07	Dec-07	Jan-08	Feb-08	Mar-08
Easington	Easington	1,256,666,667	1,267,500,000	1,267,500,000	1,267,500,000	1,267,500,000
Easington	Hornsea	247,000,000	247,000,000	247,000,000	247,000,000	247,000,000
Easington	Hatfield Moor Onshore	450,000	450,000	450,000	450,000	450,000
Easington	Hatfield Moor Storage	22,350,000	22,350,000	22,350,000	22,350,000	22,350,000
Northern Triangle	Teesside	476,666,667	476,666,667	476,666,667	476,666,667	476,666,667

Zonal Allocation Maximum (ZAM)

11 The ZAM is used for the within zone process. It determines the maximum capacity level (i.e. the aggregate capacity for all ASEPs within the zone) up to which trades and transfers can be undertaken, to and from any ASEP within the zone, on a 1:1 basis without leading to a material increase in costs.

12 Based on the UNC Modification 0169, there were two zones that required a ZAM to be calculated, the Northern Triangle and the Easington zone. The description below describes the key assumptions and analysis for the determination of these two ZAMs.

13 In determining a ZAM for the months in question, the applicable minimum and maximum demands were considered. Within this range two particular demand levels were identified which would be applicable to all months. The demand levels were 350 mcm/d and 400 mcm/d. The reason for selecting these demand levels was that they represent a cold and a typical winter day, therefore they provide a good basis to undertake the risk assessment.

14 At each of the selected demand levels a supply scenario, “test scenario”, was developed based on last year’s historical flow data. The test scenarios considered flows from East Coast terminals at levels that would be anticipated to occur on a coincidental basis for a number of days this coming winter. From experience higher East Coast flows represent a “difficult” supply pattern for the majority of ASEPs where there was an interest in increasing capacity. Only two test scenarios were feasible in the time available.

15 Based on each of the test scenarios, the process as described in paragraph 31 of the Methodology Statement was followed. In summary this involved:

a. increasing the flow at the ASEP being analysed to its NAM
b. reducing the ability of other ASEPs within the zone to flow gas by an amount equal to the above flow increase, starting from their obligated capacity level, with these ASEPs being selected one by one in reverse merit order, i.e. starting with those less likely to see an actual reduction in flows
c. if step b does not fully rebalance the network, further supply rebalancing was undertaken at an out of zone ASEP
d. based on the new supply scenario, test whether the network fails
e. if the network does fail, further reductions to the within zone flow levels are made and steps c & d are repeated
f. if the network still fails the flow increase at the analysed ASEP is incrementally reduced and steps c & d repeated until no failure occurs. This revised ASEP level is termed the WZNAM in the Methodology Statement.
g. where appropriate the process may be repeated for other recipient ASEPs in the zone.

16 In undertaking the above analysis using a limited number of test scenarios based on historical flow patterns, National Grid NTS has taken the view that if the network fails under any of the points tested, this would lead to a material increase in costs, as a constraint would occur and hence buy back action would need to be taken. Hence, after completion of the analysis for the two test scenarios the lowest resultant value was taken.

17 With regard to the ZAM for the Northern Triangle, there was only one valid recipient ASEP, the Teesside ASEP, for the months November through to February. Therefore analysis was only undertaken for Teesside ASEP. Under the test scenarios considered,

it was possible to increase the flow at the Teesside ASEP up to the NAM of 476 GWh/day without causing a system failure. This was achieved by reducing the flow levels within the Northern Triangle zone by an equal amount (in reverse merit order) and rebalancing the network. Therefore the ZAM for the Northern Triangle, before any cross zone check, was the sum of obligated capacity levels i.e. 2362 GWh/day.

18 With regard to the ZAM for the Easington zone, there were four valid recipients, with the Easington and Hatfield Moor Storage ASEPs being valid recipients for all the months in question. As Easington ASEP was by far the largest ASEP, according to obligated capacity, and is located at a constrained point within the zone, the analysis to determine the ZAM was based on the Easington ASEP analysis. To explain how the final ZAM of 1105 GWh/day was reached a step by step approach is described below according to the same steps described in paragraph 15 above:

a. For November, the flow at the Easington ASEP was increased to 1257 GWh/day, representing a 195 GWh/day flow increase
b. The maximum permitted flow level at Garton ASEP was reduced by an equal amount i.e.195 GWh/day. Garton ASEP is last in the merit order. However the difference between **maximum permitted flow level** and the assumed flow level on the network was such that this reduction did not impact flows under the test scenario, and so rebalancing was required
c. The network was brought back into balance by reducing flows at the St. Fergus ASEP by 195 GWh/day. St. Fergus ASEP was chosen because this would have least impact on the Easington Zone
d. The network failed under this test scenario
e. Further reductions were made to the maximum permitted flow levels within the Easington zone (but not at Easington ASEP), which resulted in flows within the zone being affected and therefore less rebalancing being required at the St. Fergus ASEP. However under all of these conditions the network still failed. At the end of this step all maximum permitted flow levels at ASEPs within the Easington zone (excluding Easington ASEP) had been reduced to zero
f. The flow was incrementally reduced at the Easington ASEP requiring less rebalancing at St Fergus ASEP. The point at which the network did not fail was with the Easington ASEP flowing at 1105 GWh/day. As all other maximum permitted flow levels had been reduced to zero, the ZAM for the Easington zone equated to the final Easington ASEP flow level of 1105 GWh/day and the WZNAM for Easington ASEP was also set at 1105 GWh/day

19 According to UNC Modification 0169, a within zone allocation process only takes place if the sold level of capacity within the zone minus any capacity surrendered is less than the ZAM. For the Easington zone the sold level minus the capacity surrendered for all months in question was greater than 1105 GWh/day. Therefore as no within zone process would be undertaken for the Easington zone, there was no need to do a cross zone check of the ZAM.

Inter Zone Exchange Rates

20 Inter zone exchange rates are determined for the movement of capacity across entry zones, where there is a beneficial relationship between zones i.e. a reduction in flows within one zone would allow more gas to flow out of another zone.

21 As stated above the Northern Triangle zone and Easington zone were the only two zones where there were recipient ASEPs. According to UNC Modification 0169 this required exchange rates to only be calculated for these two recipient zones.

22 In determining the inter zone exchange rates, the test scenarios developed for the calculation of the ZAMs were used. As stated in paragraph 20, exchange rates would only be calculated where there is a beneficial relationship. For the Northern Triangle and the Easington zones, the zones that could potentially have a beneficial relationship were:

a. Northern Triangle zone
b. Easington zone
c. South East zone
d. Theddlethorpe zone

23 In order to identify whether an inter zone exchange rate would be applicable the flow levels assumed in the test scenarios were compared against the sold capacity levels minus any surrendered capacity. If the flow levels were above the sold capacity levels minus any surrendered capacity an exchange rate would be applicable. The only ASEPs where these conditions existed were the Isle of Grain ASEP (November through to March) and Theddlethorpe ASEP (November only). Therefore inter zone exchange rates were calculated for both the Northern Triangle and the Easington zones from the South East and Theddlethorpe zones for the respective months.

24 The exchange rates, based on each of the test scenarios, were determined through the following method:

a. increase flow at the recipient ASEP, highest in the merit order, within the recipient zone by an amount equal to a selected increment of capacity
b. reduce the ability of ASEPs within the donor zone, by an amount equal to the increment, to flow gas. ASEPs being selected in merit order
c. if the step c does not fully rebalance the network, rebalance at St. Fergus ASEP
d. based on the new supply scenario, test whether the network fails
e. if the network does fail, gradually reduce the flow increase at the recipient ASEP and repeat steps d & e
f. if the network does not fail, the exchange rate is calculated by dividing the increment moved from the donor ASEP by the final flow increase at the recipient ASEP

25 As an example of how the process worked, considering the exchange rate between the South East zone and Easington zone:

a. the flow at Easington ASEP was increased by 173 GWh/day
b. the maximum permitted flow level at Isle of Grain ASEP was reduced by an equal amount i.e.173 GWh/day. Isle of Grain ASEP is first in the merit order. This resulted in a significant reduction in flows at the Isle of Grain ASEP under the test scenario, but not enough to maintain a system balance
c. the network was brought back into balance by reducing flows at St. Fergus ASEP by a small amount
d. the network failed under this test scenario
e. the flow increase at the Easington ASEP was gradually reduced with commensurate increases at St. Fergus ASEP. The point at which the network did not fail was when the flow increase at the Easington ASEP was 85.8 GWh/day
f. the exchange rate was therefore calculated as 2:1
g. further analysis at incremental levels below 173 GWh/day was undertaken to determine the impact if only some of the available capacity was to be traded

or transferred. This identified differing exchange rates for different capacity bands. The overall exchange rate remained at 2:1

26 In setting the final inter zone exchange rates, it was also necessary to consider the implications of only some of the capacity being transferred and the remainder being retained and flowed against at the donor ASEP. This check was performed for all inter zone exchange rates; however this only impacted upon the exchange rates from Theddlethorpe zone to the Northern Triangle and Easington zones. In these cases the exchange rate was reduced to ensure that a partial allocation would not result in a material increase in risk.

27 The table below details the inter zone exchange rates published in the auction invitation.

For Nov 2007 – Mar 2008

Donor Zone	Recipient Zone	Available Capacity Banding for Allocation in Donor Zone (kWh/Day)	Exchange Rate
South East	Easington	Between 0 & 86,666,667	2.3:1
		Between 86,666,667 & 173,333,333	1.8:1
		>173,333,333	0
South East	Northern Triangle	Between 0 & 86,666,667	2:1
		Between 86,666,667 & 173,333,333	1:1
		>173,333,333	0

For Nov 2007 only

Donor Zone	Recipient Zone	Available Capacity Banding for Allocation in Donor Zone (kWh/Day)	Exchange Rate
Theddlethorpe	Easington	419,359,603	19.5:1
Theddlethorpe	Northern Triangle	419,359,603	7.8:1

Summary

28 This explanatory note has detailed how each of the key pieces of information contained within the TTSEC auction invitation published on the 25 September 2007 was determined.

29 All information was produced in accordance with both the Methodology Statement and UNC Modification 0169.

Glossary

ASEP – Aggregate System Entry Point is a point on the system that comprises one or more entry points, e.g. Bacton ASEP consists of several individual system entry points. This represents the level at which system capacity is sold. A precise definition is provided in Uniform Network Code TPD Section A.2

Licence – National Grid Gas plc's Gas Transporter Licence in respect of the NTS.

Maximum Permitted Flow Level - For the purposes of the analysis the MPFL set a limit on the amount that specific ASEPs within a zone can flow i.e. if the MPFL is 20 units the flow at the ASEP for further analysis was constrained to a maximum of 20 units.

Obligated Capacity - The obligated entry capacity level is the level of capacity that National Grid NTS is obliged to make available. It incorporates the initial baseline Entry Capacity plus incremental capacity that has subsequently been released. A more precise definition is provided in paragraph 58 of National Grid NTS' Incremental Entry Capacity Release Methodology Statement. A link to the statement is provided below

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

TBE - The Transporting Britain's Energy consultation initiates National Grid NTS' annual planning process as set out in the Gas Transportation Ten Year Statement. Questionnaires are designed to gather data relating to influences upon, and current forecasts of, the gas supply and demand placed upon the network and assist in the process of evaluating network capacity requirements.

Zones - Where ASEPs utilise sections of common NTS infrastructure and consequently are deemed to be 'interactive' in terms of utilising network capability National Grid NTS grouped the ASEPs into zones.

The ASEPs that constituted each Entry Zone are provided below.

Zone	ASEP
Easington Zone	Easington terminals (inc Rough) Hornsea Garton / Aldborough Hatfield Moor
Theddlethorpe Zone	Theddlethorpe
South East Zone	Bacton terminals (inc. Continental Interconnector) Grain LNG
Northern Triangle	Barrow terminals Teesside terminals St Fergus terminals Glenmavis
North West Corridor	Fleetwood Partington Burton Point Hole House Farm Byley / Cheshire
West UK Zone	Milford Haven Dynevor Arms
South West UK Zone	Humbley Grove Wytch Farm Avonmouth