

CONCLUSIONS REPORT

Modification Proposals to the Gas Transmission Transportation Charging Methodology

**NTS GCM 16R:
Supply and Demand Balancing Rules and Supply
Source Data**

26th May 2009

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Executive Summary

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

This document follows on from discussion paper NTS GCD 06 and consultation paper NTS GCM 16 and sets out final proposals for amending the Gas Transmission Transportation Charging Methodology (the “Charging Methodology”) with respect to the rules applied to achieve a supply and demand flow match in the Transportation Model, and the source of the supply data used.

The Transportation Model is used to set all entry capacity auction reserve prices and exit capacity prices. Like all network analysis models it requires supply to equal demand.

The Charging Methodology states that a supply and demand match is achieved in the Transportation Model by reducing supplies in a merit order to match the modelled demand.

Changes to the supply and demand data in the Transportation Model have the potential to change the direction of the flow of gas and this is likely to noticeably impact capacity prices.

It was noted that changing the supply and demand balancing rules and the source of the supply data used could reduce the impact of supply changes on exit price variation.

Proposals

National Grid proposes that the Charging Methodology is revised in two respects:

Proposal One – Supply and Demand Balancing Options

- National Grid proposes that supplies would be split into six groups¹ as follows:
 - 1) Beach supplies
 - 2) Interconnectors
 - 3) Long-range storage
 - 4) LNG Importation
 - 5) Mid-range storage
 - 6) Short-range storage

Each supply group would be fully utilised in turn and the supplies in the last required group would be scaled by an equal percentage to achieve a supply and demand match.

For those familiar with the Gas TCMF discussions, this is Option Nine, as suggested by British Gas Trading. More detail can be found in Appendix A, Section 3.

¹ See Appendix B for definitions.

Proposal Two – Source of Supply Data

- National Grid proposes that the Ten Year Statement would be used as the source of supply data for the following entry components:
 - Bacton excluding BBL and IUK
 - Barrow
 - Burton Point (also known as “Point of Ayr”)
 - Easington including Langeled, excluding Rough
 - St Fergus
 - Teesside including Excelerate
 - Theddlethorpe
 - Wytch Farm (Onshore field)
- Physical capability would be used for all other supply components.
- ASEPs would be capped at the obligated entry capacity level.
- National Grid believes that it would be appropriate to use Section 4.6 of the Ten Year Statement to identify eligible entry points and the year that they are due to become operational. New entry points would only be included as available supply in future years if they were under construction.

Implementation

Both proposals would be implemented in relation to capacity released from 1st October 2009, supporting the RMTTSEC auction to be held in September 2009 in the first instance.

1 Introduction

1.1 The Transportation Model is used to set all entry capacity auction reserve prices and exit capacity prices. Like all network analysis models it requires supply to equal demand.

1.2 Currently the inputs to the Transportation Model are:

- Forecast 1-in-20 peak day demand data
- Supply data from the Ten Year Statement

With the introduction of Exit Reform from gas year 2012/13 the demand data used in the Transportation Model is proposed to be baseline exit demand with bi-directional sites assumed to be in supply mode i.e. with zero exit flow.

1.3 The Charging Methodology states that a supply and demand match is achieved in the Transportation Model by reducing supplies in a merit order to match the forecast demand.

1.4 Analysis carried out to support consultation paper NTS GCM 05: NTS Exit Flat Capacity Prices, highlighted some exit price volatility in areas close to supply points affected by the balancing rules and the supply merit order.

1.5 Changes to the supply and demand data in the Transportation Model have the potential to change the direction of the flow of gas and this is likely to noticeably impact prices.

1.6 It was noted that changing the supply and demand balancing rules could reduce the impact of supply changes on exit price variation.

1.7 Analysis on supply and demand balancing in the Transportation Model was presented at the July 2008, November 2008, January 2009, March 2009 and April 2009 TCMF meetings². Discussion paper NTS GCD 06: Supply and Demand Balancing Rules in the Transportation Model, was released on the 23rd February 2009³.

² Presentations given at TCMF meetings can be accessed via the following link:
<http://www.nationalgrid.com/uk/Gas/Charges/TCMF/>

³ Discussion paper NTS GCD 06 can be accessed via the following link:
<http://www.nationalgrid.com/uk/Gas/Charges/consultations/>

2 Terms of the Original Proposal

Through consultation paper NTS GCM 16 National Grid proposed two changes to the Charging Methodology with respect to the rules applied to achieve a supply and demand flow match in the Transportation Model, and the source of the supply data used.

Proposal One – Supply and Demand Balancing Options

2.1 National Grid proposed that supplies would be split into six groups as follows:

- 1) Beach supplies
- 2) Interconnectors
- 3) Long-range storage
- 4) LNG Importation
- 5) Mid-range storage
- 6) Short-range storage

Each supply group would be fully utilised in turn and the supplies in the last required group would be scaled by an equal percentage to achieve a supply and demand match.

Proposal Two – Source of Supply Data

2.2 National Grid proposed that the Ten Year Statement would be used as the source of supply data for the following entry components:

- Bacton excluding BBL and IUK
- Barrow
- Burton Point (also known as “Point of Ayr”)
- Easington including Langeled, excluding Rough
- St Fergus
- Teesside including Excelerate
- Theddlethorpe
- Wytch Farm (Onshore field)

2.3 Physical capability would be used for all other storage and importation points.

2.4 Each ASEP would be capped at the obligated entry capacity level

2.5 New entry points would only be included as available supply in future years if they were under construction. National Grid believes that it would be appropriate to use Section 4.6 of the Ten Year Statement to identify eligible entry points and the year that they are due to become operational.

Implementation

- 2.6 Both proposals would be implemented in relation to capacity released from 1st October 2009, supporting a September 2009 QSEC in the first instance.
- 2.7 The notice of revised Gas Transmission Transportation Charges would be published from the 1st July 2009 for a September 2009 QSEC and from 1st August 2009 for exit and other entry prices.

Indicative Prices

- 2.8 Indicative entry and exit capacity prices have been used to generate the price ranges included in Appendix D. The accompanying excel spreadsheet includes the indicative prices by entry and exit point.

3 Representations Made

National Grid received eight responses to consultation paper NTS GCM 16: Supply and Demand Balancing Rules and Supply Source Data. None of the responses were marked as confidential and copies of the responses have been published on the Gas Charging section of the National Grid website⁴.

Support for the Proposal (Summary)

Respondent	Abbreviation	View Part 1	View Part 2
Association of Electricity Producers	AEP	Support	Support
British Gas Trading (Centrica)	BGT	Support	Support
EDF Energy	EDF	Support	Support
E.ON UK	EON	Support	Support
National Grid Gas Distribution	NGD	Support for alternative option 3.	Do Not Support
RWE npower	RWE	Support	Support
Scotia Gas Networks	SGN	Comments	Support
Scottish and Southern Energy	SSE	Support	Support

⁴ Responses to Consultation Paper NTS GCM 16 can be found at:
<http://www.nationalgrid.com/uk/Gas/Charges/consultations/CurrentPapers/>

Support for the Proposal (In Detail)

Question	AEP	BGT	EDF	EON	NGD	RWE	SGN	SSE	
Q1: The proposed option (Option Nine) is the most appropriate methodology for achieving a supply and demand match in the Transportation Model.	Support	Support	Support implementation of the proposal	Support	Support Option 3	Favour Option 3 or Option 6	Support further analysis of Option 6	Supportive of GCM16, based on indicative prices that were published with the consultation document on 16 April 2009	
Q2: The Ten Year Statement is the most appropriate source of supply data for beach supplies.	Support	Support				Support	Support		Support
Q3: Physical capability is the most appropriate source of supply data for all other (importation and storage) entry components.	Support	Support				Support TYS	Support		Support
Q4: ASEPs should be capped at the obligated entry capacity level.	Support	Support				Support	Support		Do not disagree
Q5: It is appropriate to use Section 4.6 of the Ten Year Statement to identify entry points that are under construction and the year that they are due to become operational.		Noted				Support	Support		Do not disagree
Q6: New entry points should only be included as available supply in future years if they are under construction.	Support	Noted				Support	Support		Do not disagree
Q7: This proposal should be implemented for entry capacity released from 1 st October 2009 i.e. from a September 2009 QSEC in the first instance						Support date consistent with exit	Support		Do not disagree
Q8: This proposal should be implemented for exit capacity from 1 st October 2009						Comments	Support		Do not disagree
Q9: Views are invited on alternate implementation dates									

Summary of Responses by Consultation Question

Q1: The proposed option (Option Nine) is the most appropriate methodology for achieving a supply and demand match in the Transportation Model.

Respondents' Views

AEP comments "At lower demand levels where a supply demand match does not require mid or short range storage option 3 would require that all other supplies including beach are scaled equally, whereas option 9 would only scale the last group. The latter would seem more likely to reflect actual peak day supplies, and be more consistent with NG's planning approach. On this basis we support the proposal to use the groupings as listed and scale the last group by an equal percentage."

BGT "...agrees with Proposal One raised in GCM16..."

EDF "...support implementation of this proposal."

EDF notes that the proposal "to group supplies into six groups and work through these in order appears a lot more appropriate [than the current methodology]. However we would note that the position of interconnectors and LNG importation within the stack are open to question. In particular we would note that these supply sources are subject to global price levels and demand, and so their position in the UK's supply stack could change depending on the price of gas in the UK. We therefore believe that it would be beneficial to keep these under review to ensure that these assumptions remain appropriate."

"E.ON UK supports National Grid's preferred "Option Nine" approach, on the basis of our understanding that it allows Users to more easily replicate charges in the transportation model and that it should, in theory, reduce unexpected fluctuations in charge levels; particularly at Exit."

NGD "...continue to consider that Option 3 is the most appropriate methodology for balancing supply and demand. We consider that, since the supply options other than mid- and short-range storage are grouped so that no explicit view is taken of priority between them, this is likely to result in more stable charges, compared to Option 9, in situations where supply significantly exceeds demand."

RWE comments "...despite Option 9 scaling the last required group by equal percentages we are concerned that the fact it envisages six distinct supply groups (as opposed to three under Option 3) still risks introducing extreme price volatility at exit points close to the supply group sitting on the boundary of where demand and supply is balanced (in much the same way that Option 1 does), albeit the analysis undertaken suggests this appears unlikely. For this reason we still favour Option 3 or Option 6 as these should limit the scope of extreme price volatility still further by (restricting the supply groups to three and two respectively) whilst still being cost reflective and consistent with National Grid's planning approach."

"Under Option 6 supplies are split into only two groups, whereas under Option 9 they are split into 6 groups. Splitting supplies into fewer, larger groups may provide more flexibility in meeting demand which could be reflected in more stable charges and lower costs. In view of this, SGN considers that Option 6 may merit further consideration."

"Based on the indicative prices published on 16 April 2009, which we understand have been produced based on the methodology described below, SSE is supportive of consultation GCM016."

National Grid's View

National Grid believes that Option Nine is the most appropriate methodology for achieving a supply and demand match in the Transportation Model as it is most consistent with National Grid's planning approach. The analysis that has been presented at TCMF meetings, which supports both discussion paper NTS GCD 06 and consultation paper NTS GCM 16, has shown that it is the source of supply data that has the greatest effect on entry and exit capacity prices. Options Three, Six and Nine produce very similar results when the supply source data is based on Ten Year Statement data at the beach and physical capability elsewhere. National Grid therefore believes it is appropriate to implement the supply and demand balancing methodology which most closely reflects National Grid's planning approach, which is Option Nine. National Grid agrees with EDF's response regarding the position of interconnectors and LNG importation within the list of supply groups and will continually review the order and components of the supply list in line with its Licence obligations in respect of the charging methodology.

Q2: The Ten Year Statement is the most appropriate source of supply data for beach supplies.

Q3: Physical capability is the most appropriate source of supply data for all other (importation and storage) entry components.

Q4: ASEPs should be capped at the obligated entry capacity level.

Respondents' Views

NGD "...support the use of TYS data for all supply points since this provides a consistent treatment between all supply point types."

NGD "...support capping of ASEPs at the obligated entry capacity level, if the Physical Capability approach is adopted."

RWE "...agree that the Ten Year Statement is the most appropriate source of supply data for beach supplies and that physical capability is the most appropriate source of supply data for all other importation and storage supply sources, with all ASEPs being capped at the obligated/baseline entry capacity level. Whilst this data can be calculated from data available in the public domain National Grid should, for completeness, state these supply capability assumptions by supply group and update them with each release of the transportation model."

AEP and BGT supported these elements of the proposal.

SGN agreed that the Ten Year Statement is the most appropriate source of supply data for beach terminals and that physical capability is the most appropriate source of supply data for all other entry components, and did not disagree that ASEPs should be capped at the obligated entry capacity level.

National Grid's View

National Grid continues to believe that the Ten Year Statement is the most appropriate source of supply data for beach supplies and that physical capability is the most appropriate source of supply data for all other (importation and storage) entry components. This represents a consistent approach as the Ten Year Statement represents the best estimate of the combined capability of the terminals and connected fields. ASEPs should be capped at the obligated entry capacity level as this is consistent with National Grid's planning assumptions.

Q5: It is appropriate to use Section 4.6 of the Ten Year Statement to identify entry points that are under construction and the year that they are due to become operational.

Q6: New entry points should only be included as available supply in future years if they are under construction.

Respondents' Views

RWE "...agree it is appropriate to use Section 4.6 of the Ten Year Statement to identify importation and storage entry points under construction along with the gas year they are due to become operational, and that only those under construction (as opposed to those that are at a conceptual stage or in the process of gaining consent) be included in the model as available supply sources from the anticipated operational date (which may change over time)."

National Grid's View

No respondents disagreed with these elements of the consultation paper and so it is National Grid's intention to include these rules in the final proposal. Implementation of these elements of the proposal will establish a consistent and transparent basis for identifying entry points for inclusion in the Transportation Model. This will allow users to replicate National Grid's charge setting process more easily.

Q7: This proposal should be implemented for entry capacity released from 1st October 2009 i.e. from a September 2009 QSEC in the first instance.

Q8: This proposal should be implemented for exit capacity from 1st October 2009.

Q9: Views are invited on alternate implementation dates

Respondents' Views

NGD comments "An implementation date consistent with that for exit capacity would seem appropriate. Whichever approach is finally proposed, it is important that users are provided with revised indicative prices consistent with the approach at least two months prior to time when capacity is booked. For exit capacity, we consider that revised indicative charges should be made available by the start of June 2009, prior to the DN booking period in July, to allow appropriate time for analysis of the implications if it is to be implemented for October 2009. Otherwise implementation should be delayed until October 2010."

RWE "...are happy for any proposal resulting from this consultation to take effect from 1st October 2009 such that exit capacity prices effective from 1st October 2009 and entry capacity reserve prices applicable under the next QSEC/AMSEC auctions (the timing of which will be determined by Ofgem's impending decision on Modification Proposals 230 and 230AV) incorporate more appropriate supply and demand balancing rules and supply source data."

National Grid's View

On the basis that improvements in cost reflectivity representing incremental changes to the charging methodology should be implemented as soon as is practicable National Grid believes this proposal should be implemented for entry and exit capacity released from 1st October 2009.

Summary of Responses by Relevant Objectives

Reflect the Cost Incurred by the Licensee

Respondents' View

AEP comment that Option 9 "...would seem more likely to reflect actual peak day supplies, and be more consistent with NG's planning approach. On this basis we support the proposal to use the groupings as listed and scale the last group by an equal percentage."

EDF comments that it "...appears appropriate that NGG moves to physical capability for entry points identified. This is likely to produce more stable prices, and should also reflect the fact that capacity is required to meet peak demand and supplies, and so arguably is more cost reflective."

NGD "...note that National Grid Transmission considers that using the physical capability would reflect the NTS costs incurred in developing the NTS to facilitate the flows, however this argument could also be applied to beach terminals where investment has been made to support higher past flows. For non-beach terminals there may be situations where the state of equipment beyond the NTS or commercial conditions would suggest that peak flows are likely to be lower than the physical capability. We consider that these issues can be taken into account within the TYS forecasts and hence the TYS data provides a more appropriate basis for setting charges."

National Grid's View

By taking into account the physical import capability of non-beach infrastructure and recognising that the Ten Year Statement represents our best forecast for beach supplies, this approach results in a supply picture that is reflective across supply groups. Should information become available to National Grid that the physical import capability of non-beach infrastructure is reduced permanently or for a significant period then this could be taken into account within the proposed methodology.

National Grid is not seeking to reflect historic levels of capacity bookings at entry points but to reflect system costs incurred by mapping these costs on to ongoing entry and exit capacity levels. Going forward it is anticipated that the Ten Year Statement will incorporate a best view of the physical peak capability of import infrastructure.

Take Account of Developments in the Transportation Business

There were no comments with reference to developments in the transportation business; however, National Grid believes that changing the supply and demand balancing rules in light of changes to the planning approach, which has in part been driven by changes to UK supply sources, appropriately takes into account developments in the Transportation business.

Facilitate Effective Competition

Respondents' View

AEP "...agree that a change to the current methodology is appropriate, and would be more transparent to parties seeking to undertake their own modelling and replicate charges."

EDF comment "Under the current Charging Methodology Shippers and consumers experience significant volatility in year on year charges... This causes significant issues for Shippers who are unable to forecast such volatile charges.... We believe that this is unsustainable and so support NGG's proposals to reduce this volatility."

EON "...would like to note that it is not necessarily the fluctuations in transportation charge levels that are the problem, but that these changes are not always predictable. Generally speaking, as a principle we favour predictability of charges over stability."

EON also comment "Although this change may make charges more 'cost-reflective', it is difficult to assess whether this proposal is, on balance, "better" than the prevailing methodology, as it simply demonstrates that there will be a re-distribution of existing charges rather than a change in the sum total of charges payable by Shippers."

National Grid's View

Implementing the proposals presented in consultation paper NTS GCM 16 should reduce the volatility of prices from year to year and allow users to replicate National Grid's charge setting process more easily by setting out a clearly defined and transparent methodology. This should facilitate effective competition by allowing users to undertake their own scenario analysis and forecast charges.

4 Changes to the Original Proposals in the light of Representations Made

National Grid believes that no changes to the proposals are required in light of responses and questions raised throughout the GCM16 consultation process.

Whilst National Grid is not making any changes to the original proposals it has been noted that if implemented for capacity released from 1st October 2009 this would support a September 2009 RMTTSEC in the first instance.

The final proposals are therefore the same as the original proposals and are detailed in Section 5 below.

5 Final Proposals

Through NTS GCM 16 National Grid proposes two changes to the Charging Methodology with respect to the rules applied to achieve a supply and demand flow match in the Transportation Model, and the source of the supply data used.

Proposal One – Supply and Demand Balancing Options

5.1 National Grid proposes that supplies would be split into six groups as follows:

- 1) Beach supplies
- 2) Interconnectors
- 3) Long-range storage
- 4) LNG Importation
- 5) Mid-range storage
- 6) Short-range storage

Each supply group would be fully utilised in turn and the supplies in the last required group would be scaled by an equal percentage to achieve a supply and demand match.

Proposal Two – Source of Supply Data

5.2 National Grid proposes that the Ten Year Statement would be used as the source of supply data for the following entry components:

- Bacton excluding BBL and IUK
- Barrow
- Burton Point (also known as “Point of Ayr”)
- Easington including Langeled, excluding Rough
- St Fergus
- Teesside including Excelerate
- Theddlethorpe
- Wytch Farm (Onshore field)

5.3 Physical capability would be used for all other storage and importation points.

5.4 Each ASEP would be capped at the obligated entry capacity level

5.5 New entry points would only be included as available supply in future years if they were under construction. National Grid believes that it would be appropriate to use Section 4.6 of the Ten Year Statement to identify eligible entry points and the year that they are due to become operational.

Implementation

5.6 Both proposals would be implemented in relation to capacity released from 1st October 2009, supporting the RMTTSEC auction to be held in September 2009 in the first instance.

6 How the Proposed Modification Achieves the Relevant Objectives

Assessment against Licence Objectives

- 6.1 The National Grid plc Gas Transporter Licence in respect of the NTS requires that proposed changes to the NTS Charging Methodology shall achieve the relevant methodology objectives.
- 6.2 Where transportation prices are not established through an auction, prices calculated in accordance with the methodology should:
- 1) Reflect the costs incurred by the licensee in its transportation business;
 - 2) So far as is consistent with (1) properly take account of developments in the transportation business;
 - 3) So far as is consistent with (1) and (2) facilitate effective competition between gas shippers and between gas suppliers.
- 6.3 National Grid believes that NTS GCM 16 would achieve the relevant objectives.
- 6.4 In terms of the supply and demand balancing rules, Option Nine is most consistent with National Grid's planning approach and would be more reflective of actual peak day supplies if supply significantly exceeded demand. The proposed methodology is also more transparent than the prevailing methodology, allowing the Industry to replicate National Grid's charge setting process more easily.
- 6.5 Calculating entry and exit capacity prices using the physical capability of entry facilities reflects the costs incurred in planning the NTS to facilitate current levels of entry and exit capacity. For beach terminals, the likely physical capability would be limited by the connected off-shore fields rather than the terminal and therefore the Ten Year Statement remains the most appropriate source of supply data.
- 6.6 National Grid believes that changing the supply and demand balancing rules in light of changes to its planning approach, which has in part been driven by changes to UK supply sources, appropriately takes into account developments in the Transportation business.
- 6.7 It is National Grid's view that competition can be promoted in terms of the development of the Charging Methodology by making it simple and easy to understand such that prices can be replicated and forecast by Users. More stable prices may lead to greater ease in forecasting.

Assessment against EU Gas Regulations

6.8 EC Regulation 1775/2005 on conditions for access to the natural gas transmission networks (binding from 1 July 2006) are summarised below.

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

6.9 National Grid believes that NTS GCM 16 is consistent with the principles listed above.

Appendix A – The Consultation

1 Background

Current Methodology

- 1.1 The supply data used in the Transportation Model is derived from the data set out in the most recent Ten Year Statement for each gas year for which prices are being set.
- 1.2 A supply and demand match is achieved at peak conditions by reducing supplies, as required, in a merit order to match the forecast demand. Supply points are “turned off” one by one until a match is achieved, starting with the supplies in group 1 from the list below and moving on to the supplies in group 2 when all group 1 supplies have been reduced to zero. Within each group individual entry points are assigned a value in the merit order. The order for reducing supplies is as follows;
 1. Short-range storage facilities (LNG)
 2. Mid-range storage facilities
 3. Long-range storage facilities (Rough)
 4. Interconnectors (BBL and IUK)
 5. LNG importation facilities (Isle of Grain and Milford Haven)
 6. Beach terminals including on-shore fields (Bacton, Barrow, Burton Point, Easington, St Fergus, Teesside, Theddlethorpe, Wytch farm).

In practice the supplies in groups 3 – 6 inclusive have always been fully utilised.

- 1.3 The merit order for the storage sites is determined by National Grid based on the injection and withdrawal rates of the storage facilities. The lower the ratio of injection to withdrawal, the higher up the merit order the facility will be. Supplies will be “turned off” starting from the top of the merit order.
- 1.4 With the introduction of Exit Reform and the proposed use of baseline exit capacity for charge setting, it is possible that the supplies in the Ten Year Statement will not be sufficient to meet demand. This may be due to forecast supplies being less than the relevant entry point capability. Alternate supply data sources are discussed further in section 4.

Key Price Driver

- 1.5 Entry and exit capacity prices are governed by how far gas has to travel through the NTS; the further it travels the higher the price will be.
- 1.6 Using supply data that steadily increases / decreases at storage ASEPs each year (i.e. using an equal percentage of supply from each ASEP) to match an increase / decrease in demand should produce more stable prices.
- 1.7 Changes to the supply and demand data in the Transportation Model have the potential to change the direction of the flow of gas and this is likely to noticeably impact prices.
- 1.8 Using LNG storage will affect prices as the storage sites are located in areas with no or few other supplies. This means “turning on” LNG will impact on how far gas from other supply points flows into the system. For example, if Glenmavis is flowing, gas from St Fergus will not be absorbed by demand points so quickly, and will therefore flow deeper into the system. This will make the St Fergus entry capacity prices more expensive than it would be if Glenmavis was not flowing.

Short Term vs. Long Term Supply Forecasts

- 1.9 Prior to the implementation of the Transportation Model in 2007, entry and exit capacity prices were set using the engineering model Transcost. The supply data that was entered into Transcost was ten years' worth of forecasted supply data.
- 1.10 Consultation Paper NTS GCM 01 proposed that with the implementation of the Transportation Model a single year's forecasted supply and demand data should be used, rather than a ten year forecast. This avoids potential distortions created by inaccurate long term forecasts and avoids the circularity caused by use of supply forecasts to generate prices for long term capacity auctions, which are designed to signal such supply requirements.

Minimum Price

- 1.11 The minimum entry and exit capacity price in the Transportation Model is 0.0001p/kWh as negative capacity prices would give a perverse incentive to Users to book more capacity than would otherwise be required, potentially leading to inefficient development and operation of the NTS.

Planning Process

- 1.12 While National Grid continues to produce a single central case supply forecast within the Ten Year Statement, the planning approach has now moved away from using a strict merit order for generating supply and demand matches and so the merit order may no longer be the most appropriate method of balancing supply and demand in the Transportation Model.

Reasons for moving away from the prevailing methodology

- 1.13 Matching demand by turning on supply points one by one (merit order) can produce variable prices which may not appropriately reflect underlying costs.
- 1.14 When LNG storage is intermittently required to match the demand level it is likely to impact on entry and exit prices in the surrounding area.
- 1.15 Exit prices will vary as a consequence of demand changes (which is appropriate) but changing the supply and demand balancing rules could minimise the impact of supply changes on exit price variation.

Considerations for a new methodology

- 1.16 The methodology should reflect the costs that have been incurred in developing the NTS to facilitate entry and exit capacity.
- 1.17 A more transparent approach could be of benefit.

Cost Reflectivity vs. Price Stability

- 1.18 Prior to the implementation of the Transportation Model, exit capacity price capping rules were employed to forge a level of stability and predictability of prices from year to year; however, these rules eroded genuine cost reflectivity and were therefore removed with the introduction of the Transportation Model. Over time, excessive emphasis on stability could result in a significant departure from cost reflectivity.
- 1.19 It is National Grid's view that competition can be promoted in terms of the development of the Charging Methodology by making it simple and easy to understand such that prices can be replicated and forecast by Users. More stable prices may lead to ease in forecasting.
- 1.20 Charge stability or predictability might be justified with reference to User cost-base planning ability. Users should not experience volatile charges year on year.

- 1.21 In accordance with the NTS Licence relevant charging objectives (as outlined in section six of this document), cost-reflectivity is the dominating objective.

2 Discussion of Supply and Demand Balancing Options

Background

- 2.1 Through the Gas TCMF, alternative supply and demand balancing options were identified and discussed. At the November 2008 TCMF National Grid compared the current merit order approach, used to match supply and demand flows in the Transportation Model, and six alternative approaches.
- 2.2 Options Two, Four and Seven were either identified as operationally unrealistic or as producing volatile entry and exit capacity prices and were subsequently discarded.
- 2.3 Further analysis on Options One, Three, Five and Six was presented at the January 2009 TCMF and discussion paper NTS GCD 06 focussed on these options, which are outlined below.

2.4 Option One: Prevailing Methodology

A supply and demand match is achieved at peak conditions by reducing supplies, as required, in a merit order to match the forecast demand. Supply points are “turned off” one by one until a match is achieved, starting with the supplies in group 1 from the list below and moving on to the supplies in group 2 when all group 1 supplies have been reduced to zero. Within each group, individual entry points are assigned a value in the merit order. The order for reducing supplies is as follows;

1. Short-range storage facilities (LNG)
2. Mid-range storage facilities
3. Long-range storage facilities (Rough)
4. Interconnectors (BBL and IUK)
5. LNG importation facilities (Isle of Grain and Milford Haven)
6. Beach terminals including On-shore Fields (Bacton, Barrow, Burton Point, Easington, St Fergus, Teesside, Theddlethorpe, Wytch Farm).

In practice the supplies in groups 3 – 6 inclusive have always been fully utilised.

2.5 Options Three, Five and Six

Under these options each supply group is fully utilised in turn and the supplies in the last required group are scaled by an equal percentage to achieve a supply and demand match. An example follows Option Three to explain this further.

2.6 Option Three

Supplies are split into three groups:

- 1) Beach, Interconnectors, LNG Importation, Long-range Storage (Rough)
- 2) Mid-range Storage
- 3) Short-range Storage (LNG)

Example

Demand is 6350GWh, available supply is 6709GWh and we need to achieve a supply and demand balance using option three. The breakdown of available supply as given by the Ten Year Statement is:

Group 1: Beach, Interconnectors, LNG Importation, Long-range Storage – 5503GWh

Group 2: Mid-range Storage – 682GWh

Group 3: Short-range Storage – 524GWh

To meet demand we need to fully utilise the supplies in Group 1 and Group 2 and use a percentage of the supplies in Group 3:

Group 1 + Group 2 = 5503GWh + 682GWh = 6185GWh

Shortfall = 6350GWh - 6185GWh = 165GWh

Percentage required from each supply point in Group 3 = 165GWh / 524GWh = 31%

2.7 Option Five

Supplies are split into two groups:

- 1) Beach, Interconnectors, Long-range Storage (Rough)
- 2) Mid-range Storage, LNG Importation, Short-range Storage (LNG)

2.8 Option Six

Supplies are split into two groups:

- 1) Beach, Interconnectors, LNG Importation, Long-range Storage (Rough)
- 2) Mid-range Storage, Short-range Storage (LNG)

Alternative Options Suggested in Responses to NTS GCD 06

2.9 Responses to discussion paper NTS GCD 06 included three suggestions of alternative supply and demand balancing rules, which are detailed below.

2.10 Option Eight – suggested by British Gas Trading (BGT)

Supplies are split into six groups as follows:

- 1) Beach supplies
- 2) Interconnectors
- 3) Long-range storage
- 4) LNG Importation
- 5) Mid-range storage
- 6) Short-range storage

Under Option Eight, the balancing group and all lower priority groups are scaled i.e. if LNG Importation was the balancing group, then groups 4, 5 and 6 would be scaled by an equal percentage to achieve a supply and demand match.

2.11 Option Nine – suggested by BGT

Supplies are split into the same six groups as Option Eight. As with options three, five and six, each supply group is fully utilised in turn and the supplies in the last required group are scaled by an equal percentage to achieve a supply and demand match

2.12 Option Ten – suggested by Scottish and Southern Energy (SSE)

Supplies are split into four groups as follows:

- 1) Beach supplies
- 2) Interconnectors, LNG Importation
- 3) Long-range storage and mid-range storage
- 4) Short-range storage (LNG)

Again, each group is fully utilised in turn and the supplies in the last required group are scaled by an equal percentage to achieve a supply and demand match.

National Grid's View

2.13 National Grid's views on the options presented in NTS GCD 06 and the additional options suggested in responses received to the discussion paper are summarised in the table below. National Grid considers Options Three, Six and Nine appropriate for achieving a supply and demand match in the Transportation Model.

Note that a summary of the responses received to discussion paper NTS GCD 06 and National Grid's accompanying views can be found in Appendix C.

Option	National Grid's View	
One	No longer an appropriate method for balancing supply and demand flow levels in the Transportation Model as it does not appropriately reflect the planning and development of the NTS.	Discarded
Three	More consistent with planning approach and transparent, allowing the Industry to replicate National Grid's charge setting process more accurately.	Consultation Option
Five	May not appropriately reflect the interaction between storage and LNG importation by grouping these supply types together.	Discarded
Six	More consistent with planning approach and transparent, allowing the Industry to replicate National Grid's charge setting process more accurately.	Consultation Option
Eight	The dynamic grouping could produce significant changes in prices from year to year if a group changed from being fully utilised one year to being part of the balancing group the following year.	Discarded
Nine	Consistent with Rule Three at higher demand levels and may be more appropriate at lower demand levels or where available supply is significantly higher than demand.	Consultation Option
Ten	LNG Importation would be used before Rough, which is not consistent with historical behaviour or planning scenarios and hence is not cost reflective.	Discarded

3 Discussion of Source of Supply Data

- 3.1 Discussions with the Industry at recent Gas TCMF meetings have focussed on the source of the supply data used to match demand in the Transportation Model. Analysis presented at these meetings has shown that fluctuations in the Ten Year Statement from year to year play a large role in the volatility of entry and exit capacity prices.
- 3.2 Four alternative options for the source of supply data were included in NTS GCD 06 and are outlined below.

Alternative Options

3.3 Historical Data

It was suggested that using historical flow data could provide more stable supply levels from year to year than those forecasted in the Ten Year Statement, however, historical data would be unavailable for new sites and it could be inappropriate to apply to future years for sites where supplies are declining. This could make the data inconsistent and inaccurate.

3.4 Obligated⁵ Entry Capacity

Using obligated entry capacity levels as the source of supply data used to match demand has potential but there is often a significant difference between obligated entry capacity, and actual bookings and anticipated flow levels.

3.5 Physical Capability

Using physical capability to determine available supplies to match demand is an alternative option. While this would be relatively straightforward in terms of storage, LNG importation and interconnectors it would prove difficult for beach terminals. The likely flow capability for beach terminals would be limited by the connected off-shore fields.

3.6 Combinations of Supply Data

It may be possible to overcome some of the issues of obligated entry capacity and physical capability by using a combination of data. One option could be to use Ten Year Statement supply data for beach terminals and either obligated entry capacity or physical capability for other entry points.

National Grid's View

- 3.7 It is National Grid's view that, at this time, the Ten Year Statement remains the most appropriate source of supply data for beach terminals.
- 3.8 Using physical capability capped at the obligated entry capacity level for all other entry points would be appropriate in terms of both stability and cost reflectivity.
- 3.9 National Grid believes that it would be appropriate to use Section 4.6 of the Ten Year Statement to identify eligible entry points and the year that they are due to become operational. New entry points should only be included as available supply in future years if they are under construction.
- 3.10 The option of averaging supply data over a number of years was considered at recent TCMF meetings and in discussion paper NTS GCD 06 but it is National Grid's view that averaging supply data would erode cost reflectivity.

⁵ Obligated Entry Capacity = Baseline Entry Capacity + Incremental Entry Capacity +/- Substituted Entry Capacity

Appendix B – Classification of Supply Points

Beach Supplies

- Bacton excluding BBL and IUK
- Barrow
- Burton Point (also known as “Point of Ayr)
- Easington including Langedale, excluding Rough
- St Fergus
- Teesside including Excelerate
- Theddlethorpe
- Wytch Farm (Onshore field)

Interconnectors

- BBL
- IUK

Long Range Storage

- Rough

LNG Importation (incorporating onshore storage)

- Isle of Grain
- Milford Haven

Mid-range Storage

Existing sites and those currently under construction, due to be operational in the relevant gas year, as outlined in Section 4.6 of the Ten Year Statement

Short-range Storage

- Avonmouth
- Glenmavis
- Partington

Note that on the 10th March 2009 National Grid announced the closure of Dynevor Arms at the end of April 2009.

Appendix C – Responses to Discussion Paper NTS GCD 06

National Grid received seven responses to its discussion paper NTS GCD 06: Supply and Demand balancing in the Transportation Model. None of the responses were marked as confidential and copies of the responses have been published on the Gas Charging section of the National Grid website⁶.

Responses Received

Respondent	Abbreviation
Association of Electricity Producers	AEP
British Gas Trading (Centrica)	BGT
EDF Energy	EDF
National Grid Gas Distribution	NGD
RWE npower	RWE
Scotia Gas Networks	SGN
Scottish and Southern Energy	SSE

Summary of Views on Supply and Demand Balancing Rules

Option	Support	Against	National Grid View	
1		BGT, RWE, EDF	No longer entirely consistent with planning approach – we now look at scenarios for supply types and hence a grouping approach should be more cost reflective	Status quo
3	RWE, NGD		Retains merit order but groups by supply type – more consistent with planning approach	Consult
5		RWE	May not appropriately reflect the interaction between storage and LNG importation by grouping together	Discard
6	RWE		Retains merit order but groups by supply type – more consistent with planning approach	Consult
8	BGT		Dynamic grouping will produce step change when a group becomes part of the balancing group e.g. one year use all of Rough, next year it's in the balancing group and used 10%	Discard
9	BGT		Consistent with rule 3 at high demand - may be more appropriate where baselines are reduced or available supplies are significantly higher than demand.	Consult
10	SSE		LNG Importation used ahead of Rough not consistent with experience or planning scenarios hence arguably not cost reflective	Discard

⁶ Responses to Discussion Paper NTS GCD 06 can be found at:

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

Summary of Views on Sources of Supply Data

Supply Type	Ten Year Statement Forecast	Averaged Ten Year Statement Forecast	Historical Flows	Obligated Entry Capacity	Physical Capability
Beach (UKCS)	BGT, RWE, NGN, SSE, AEP, EDF	NGD – subject to demonstration of cost reflectivity	No Support	SSE	SSE
Interconnectors	BGT, RWE			SSE	NGN, SSE, AEP, EDF
LNG Importation					
Long Range Storage					
Medium Range Storage					
Short range Storage (LNG)					

Supply and Demand Balancing Rules

Q1. Do respondents consider the preferred option, Rule Three, to be transparent and cost reflective?

Respondents' Views

BGT "...agrees that the preferred option has some merit and is transparent but we do not believe that it will necessarily give cost reflective prices."

EDF ..."are not convinced that NGG's analysis has demonstrated that Option 3 is more appropriate than any other Option or that Options Two, Four and Seven are inappropriate."

NGD "...agree that the operation of Rule Three for balancing supply with demand is transparent once supply and demand quantities have been determined.

"In the absence of further information on the actual approach now adopted for NTS planning purposes, we are unable to say whether the use of Rule Three is cost reflective or not."

RWE comments "Based on the analysis presented Option 3 appears to result in the least amount of average variation in entry and exit capacity charges in response to changes in demand assumptions, although whether it is more cost reflective than any of the other options is questionable.

"To the extent that Option 3 retains the structure of the merit order of Option 1, which seems inherently correct, this could be a pragmatic solution. However, the same could be argued of Option 6 and the analysis suggests that there is little to choose between these options in respect of average variation."

"SGN considers that Rule Three does appear to be more transparent and cost reflective than Rules One and Two, but not apparently more so than Rules Four to Seven."

National Grid's View

National Grid believes that the analysis undertaken to date in the investigation of supply and demand balancing in the Transportation Model demonstrates that the source of supply data has a far greater effect on price stability than the rules used to achieve a supply and demand flow match. Therefore it seems appropriate to implement a rule that is consistent with National Grid's planning approach and hence cost reflective, rather than a rule that appears to produce the most stable prices. Rules 3, 6 and 9 (as suggested by BGT and outlined in Question Three) are the most consistent with National Grid's planning approach and will therefore be consulted on.

Q2. Do respondents consider any of the alternative options to be more transparent and cost reflective?

Respondents' Views

AEP "...consider that in general the grouping of supplies may help to dampen the swings in charges that have been seen in the past. This also seems intuitively more appropriate than prescribing a rigid hierarchy which may bear little resemblance to actual peak day supplies. However it is not apparent from the information presented that any of the groupings are particularly better than other groupings."

BGT "agrees that the other options presented in the discussion paper are less likely to give cost reflective prices. "

EDF comments "Options 3-7 appear to be equally cost reflective and transparent."

NGD "...do not consider that any of the alternative options to be more transparent than the Rule Three approach.

"...we are unable to comment on the relative cost reflectivity of the approaches."

RWE comments "The prevailing methodology (Option 1) appears on the face of it to represent a logical merit order of supply deliverability on a peak day and could perhaps be said to be the most cost reflective. However, the experience of this winter, where IUK was exporting gas on days when LRS, MRS and SRS storage facilities were withdrawing gas, demonstrates that assumptions, however logical they may seem at the time, may not transpire in real time.

"...we think there is little to choose between Option 3 and Option 6, both of which retain the structure of the prevailing merit order.

"...we are happy to discount Option 5 at this stage."

SSE "...believe a process where groups of supply are aggregated & a percentage utilisation applied to achieve supply demand balance is preferable to an operational merit order that is subjective. However, the analysis conducted to date is insufficient to enable SSE to commit to a preference at the moment."

National Grid's View

As discussed in National Grid's response to Question One, our analysis has shown that it is the source of supply data used to achieve a supply and demand match in the Transportation Model that has the greatest affect on price stability. We therefore believe that choosing a rule that is most consistent with National Grid's planning process is most appropriate.

Q3. Do respondents consider an option differing from those proposed to be more transparent and cost reflective?

Respondents' Views

BGT has "considered two further options: Method 8 is a dynamic alternative to Methods 5 & 6 and Method 9 is a variation somewhere between the prevailing method and Method 3.

"Methods 8 & 9 are both based on use of six groups of supplies and look to see which group is the balancing group in the order

- 1) Beach supplies
- 2) Interconnectors
- 3) Long-range storage
- 4) LNG Importation
- 5) Mid-range storage
- 6) Short-range storage (LNG)

"Note that groups 3-5 appear in a different order than in the prevailing methodology.

"Method 8 is to scale the balancing group and all lower priority groups i.e. if LNG Importation is the balancing group then this is the same as Method 5 and if Mid-range storage is the balancing group then this is the same as Method 6. This method would also work better in the event that either Long-range storage or Short-range storage became the balancing group in future.

"Method 9 is to only scale the balancing group, all lower priority groups are set to 0.

"We would further suggest that the order of groups in Method 1 could be altered to be the same as that used in our Methods 8 & 9 and that this would give better results than the current order."

EDF "...would question whether there is value in either grouping LNG importation and Interconnectors with SRS storage, or classifying them separately as a price sensitive supply group. However it is not clear whether these should be placed above or below SRS in the supply stack?"

SSE comments "With respect to how to group supply sources for scaling back to meet demand I think the following would be appropriate & should be modelled and results published.

1. beach
2. I/Cs, LNG importation – as these are price sensitive
3. storage -LRS & MRS the difference between LRS & MRS become increasingly blurred with new developments and both types will flow on a 1:20 peak day.
4. LNG storage."

National Grid's View

Rule 8, as suggested by BGT, would produce a step change when a group became part of the balancing group e.g. we might require 100% of Rough in year n but only 10% in year n+1 if it was the balancing group. Rule 9, also suggested by BGT, is consistent with Rule 3 at high demands and may be more appropriate where baselines are reduced or available supplies are significantly higher than demand.

With regard to EDF's suggestion, we do not believe that LNG Importation should be used ahead of Rough as this is not consistent with National Grid's planning scenarios, and mid-range storage should not be used ahead of Interconnectors for the same reason. Therefore to satisfy these conditions the groupings would be largely consistent with Rule 3, dependent on the ratio of available supply to available demand.

SSE suggests that LNG Importation is utilised before Rough and long range storage (Rough) is grouped with mid range storage, which have not been experienced consistently and are not consistent with planning scenarios and hence arguably not cost reflective.

For these reasons National Grid will consult on Rule 9 but discard the other three suggestions.

Supply Availability

Q4: Do respondents consider averaging supply data from a number of Ten Year Statements to be an appropriate approach to dampening entry and exit price volatility?

Respondents' Views

AEP comments "With respect to supply availability we would have reservations over averaging supplies over a number of years as this may be too detrimental on cost reflectivity."

BGT "considers that data should continue to be taken only from the most recent Ten Year Statement."

NGD comments "Averaging supply data from a number of 10 Year Statements should give more stable entry and exit prices from year to year since the impact of the latest 10 Year Statement information will be diminished. However, placing less reliance on the latest 10 Year Statement information would seem likely to make the resulting entry and exit charges less cost-reflective since the information used will vary considerably from that utilised for actual NTS planning purposes as most recently undertaken.

"It may be that, whilst an approach utilising historical 10YS data might appear to be automatically less cost-reflective than one utilising the latest information, if the former approach provides more robust, stable price signals then it may be more usefully cost reflective than the latter approach."

RWE comments "The issue of whether capacity prices should be determined based on average (10 year) or single year supply and demand in the transportation model was raised as part of GCM 01 and overwhelmingly rejected. We do not see any reason therefore why averaging of supply data should be introduced as part of any subsequent proposal relating to the supply merit order used in the transportation model."

"...Scotia would support the use of the latest TYS rather an average of a number of years as the latest TYS should be the best view of the situation when it is created. The proposal to average supply data over a number of TYs would appear to run counter to one of the main reasons for adopting the Transportation Model in the first place, which was to move away from the 10 year averaging used by Transcost."

"SSE do not support an averaging of multi year 10 TYS results. This would be a retrograde step. The transportation model and its assumptions were introduced to move away from averaging and to use 1 year of the most up to date data. Averaging old data that is no longer relevant will dilute the benefits of using current data."

National Grid's View

National Grid agrees with the majority of responses that averaging supply data from a number of Ten Year Statements would not be an appropriate method of dampening entry and exit price volatility.

Q5: For each of the four supply types; Beach, Interconnector, LNG Importation and Storage, which data source do respondents consider to be most appropriate to use for charge setting purposes?

- **Obligated Entry Capacity**
- **Physical Capability**
- **Ten Year Statement**

Respondents' Views

AEP comments "With respect to data sources its may be best to use a combined approach as suggested; utilizing TYS for beach flows but capability for other supply sources. Capability would be difficult to assess for beach flows given declining production levels, whilst using TYS forecasts for other supplies would be prescribing where supplies may be expected to flow from which again may bear little resemblance to actual flows on peak day."

BGT "considers that the Ten Year Statement continues to be the most appropriate source of supply data."

RWE "We believe that the Ten Year Statement is the most appropriate basis for charge setting purposes for all supply sources. National Grid's Ten Year Statement base case peak supply-demand forecast (Figure 4.7.G in the 2008 Ten Year Statement) presumably takes account of obligated entry capacity and physical capability and uses these factors, along with data gathered through the TBE process, to derive its best case view on peak supply availability. It contrasts this with its best case view of peak demand requirements, and the assumptions made about supply merit order in the transportation model should determine the extent to which supply sources are scaled back to match demand for the purposes of setting transportation charges."

"SGN considers that it may be appropriate to use different sources of data for different sources of supply. In particular the TYS may be the best source of data for beach flows, while Physical Capability would be best for storage, LNG Importation and Interconnectors. However, again more information on the implications of using the different sources of data would be helpful in reaching an informed decision."

"...SSE understands that using baseline capacity rather than booked capacity/capability to develop charges is cost reflective. In particular we would note that it is the cost of providing the baseline capacity that NGG is seeking to recover and not the level of booked capacity, which could vary.

"If we were to allocate costs on baselines this may result in more stable prices. Charges would only change when the network changed which would have the added benefit of making charges cost reflective and stable."

National Grid's View

National Grid believes that the most recent Ten Year Statement should be used for Beach flows, and for all other entry points the physical capability, with each ASEP capped at the obligated capacity level, should be used. Note that a breakdown of the entry points included in each supply category can be found in Appendix B.

The UK Continental Shelf will continue to decline in future years and this will be factored into the supply levels listed in the Ten Year Statement. For all other entry points it is cost reflective to model the investment that has been undertaken, which will be achieved by using the physical capability of the entry point.

Q6: Do respondents consider alternative sources of supply data to be more appropriate?Respondents' Views

EDF comments "...for LNG importation and Interconnector flows which are price sensitive, there may be a value in using historical flows to inform the development of potential future flow patterns, however again there is a risk that this will fail to reflect new sources of supply. There may therefore be a benefit in looking to combine the most recent TYS forecast with witnessed historical flows to reduce the impact of any significant step changes."

National Grid's View

National Grid does not consider historical data to be an appropriate source of supply data. Using Ten Year Statement data for beach flows and physical capability for all other entry points should eliminate any swings in supply data from year to year, as discussed in Question Five and shown by the graphs in Appendix D.

General**Q7: What further analysis would respondents like to be included with any future consultation?**Respondents' Views

BGT "would like to see analysis of an amended order in method 1 and also methods 3, 8 & 9 for a single year under a range of supply and demand conditions. "

NGD "...would like to see further information on the stability of individual exit charges under any different approaches considered. Although the current discussion paper provides information on the average and maximum exit price range, and the overall standard deviation, this level of information does not highlight the potential variability at individual offtake points. In addition, if further information was provided on the actual approach utilised in planning the transmission system we would be better placed to give a view on the cost-reflectivity of different potential supply-demand approaches for charge-setting purposes. "

RWE comments "...further analysis grouping individual supply sources together based on their price sensitivity (where they exclusively land gas at an entry terminal) may have some merit. For example IUK could possibly be grouped with SRS storage and Teesside LNG, although there is a danger that this might introduce too much complexity.

"It may also be worthwhile publishing more data about the variability of charges under each option, for example by indicating how many exit points fall within bands of positive or negative rate variation or the extent to which sites experience positive variation one year and negative variation the next. This would enable shippers to better gauge the extent to which the exit community as a whole would be affected by each of the various options.

"Finally it may also be worthwhile artificially increasing demand such that all supply sources are needed, or carrying out sensitivity analysis based on non base case supply and demand scenarios developed as part of the TBE/Ten Year Statement analysis."

SGN comments "Where a number of Rules appear to be roughly equivalent in terms of transparency and cost reflectivity then Scotia would prefer the Rules which appears to give the greatest degree of price stability in the Exit Capacity charges. From the evidence presented in this paper this does appear to be Rule Three. However Scotia would like to see further analysis presented of the impact of the different options on different entry and exit points."

National Grid's View


In response to BGT's comment, National Grid considers using a merit order for each individual supply point, as under the current methodology, no longer consistent with the planning process, regardless of the order of supplies. As discussed in previous answers, in all analysis to date, Rules 3 and 9 have been identical and both options will be included in the consultation paper. Rule 8 could produce large step changes in prices when a different balancing group is required to that used the previous year and therefore National Grid will not explore this option.

Further information relating to National Grid's planning process can be found in the National Grid Transmission Planning Code which can be found on National Grid's website alongside the ten Year Statement⁷.

We have published a breakdown of entry and exit capacity prices produced under the options included in this consultation paper on the Gas Charging area of the National Grid website. This information is published in an Excel file to allow interested parties to extract the data the relevant data.

⁷ <http://www.nationalgrid.com/uk/Gas/TYS/>

Appendix D – Analysis Presented at January 2009 TCMF



Capacity Prices and Supply & Demand Balancing Options

Gas TCMF
8th January 2009

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Introduction

At the 6th November 2008 Gas TCMF we presented analysis that compared the NTS entry and exit capacity prices generated under the current merit order approach for balancing supply & demand within the Transportation Model and six potential alternative approaches.

Issues discussed included whether we are seeking to find the approach that produces the least volatile entry and exit prices or that which most closely reflects operational reality.

Three options were discarded.

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Introduction

Entry and exit capacity prices are governed by how far gas has to travel through the NTS; the further it travels the higher the price will be.

The most effective way of maintaining stable prices would be to ensure the location and volume of supplies did not change from year to year – this is obviously unrealistic.

Using supply data that steadily increases / decreases at storage ASEPs each year (i.e. using an equal percentage of supply from each ASEP) to match an increase / decrease in demand should produce more stable prices.

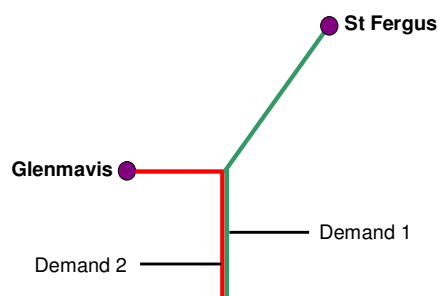
However, changes to the supply and demand data in the Transportation Model have the potential to change the direction of the flow of gas and this is likely to noticeably impact prices.

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Introduction

Using LNG storage will affect prices as the storage sites are located in areas with no / few other supplies. This means ‘turning on’ LNG will impact on how far gas from other supply points flows into the system. For example, if Glenmavis is flowing, gas from St Fergus will not be absorbed by demand points so quickly, and will therefore flow deeper into the system. This will make the St Fergus gas more expensive than it would be if Glenmavis wasn’t flowing.



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Supply and Demand Scenarios

November '08
Analysis

- ◆ **GCM05 Demand Scenarios - 2012/13 Transportation Model**

- ◆ **Demand scenarios**

- As-is (Firm only)
- Demand Scenario 1 (forecast firm demand plus DC interruptible)
- Demand Scenario 2 (forecast firm demand plus DC & DN interruptible)

N.B. Demand Scenario 3 from GCM05 not used in this analysis as it used the same supply and demand information as scenario 2 but with a higher IUK booked capacity

- ◆ **Supply data taken from 2007 Ten Year Statement**

- ◆ **Current merit order approach and six alternative approaches considered**

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Supply and Demand Balancing Rules - Options

Rule 1: Supplies ranked by Merit Order as per prevailing methodology

Under Rules 3, 5 & 6, each supply group is fully utilised in order. Each of the supplies in the last required group is scaled down by an equal percentage.

Rule 3: Supplies split into three groups:

1. Beach, Interconnectors, LNG Importation, Long-Range Storage (Rough)
2. Mid-Range Storage
3. Short-Range Storage (LNG)

Rule 5: Supplies split into two groups and utilised as follows:

1. Beach, Interconnectors, Long-Range Storage
2. LNG Importation, Mid-Range Storage, Short-Range Storage (LNG)

Rule 6: Supplies split into two groups and utilised as follows:

1. Beach, Interconnectors, LNG Importation, Long-Range Storage (Rough)
2. Mid-Range Storage, Short-Range Storage (LNG)

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Analysis

November '08
Analysis

- ◆ Calculated entry and exit prices for the three demand scenarios under each rule
- ◆ Calculated the range of prices across the three demand scenarios for all entry and exit points under each rule
- ◆ The following entry & exit graphs show, across the three demand scenarios under each rule:
 - The average price range across the three demand levels for all entry and exit points
 - The maximum price range for an entry/exit point
 - The standard deviation of price ranges

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Example

November '08
Analysis

The below table contains the exit prices (p/kWh/day) for three example exit points analysed under Rule 1:

	As-Is	Scenario 1	Scenario 2	Price Range
Exit Point 1	0.0046	0.0018	0.0006	0.0040
Exit Point 2	0.0001	0.0001	0.0001	0.0000
Exit Point 3	0.0061	0.0055	0.0073	0.0018

The average price range is 0.0019 p/kWh/day

The maximum price range is 0.0040 p/kWh/day

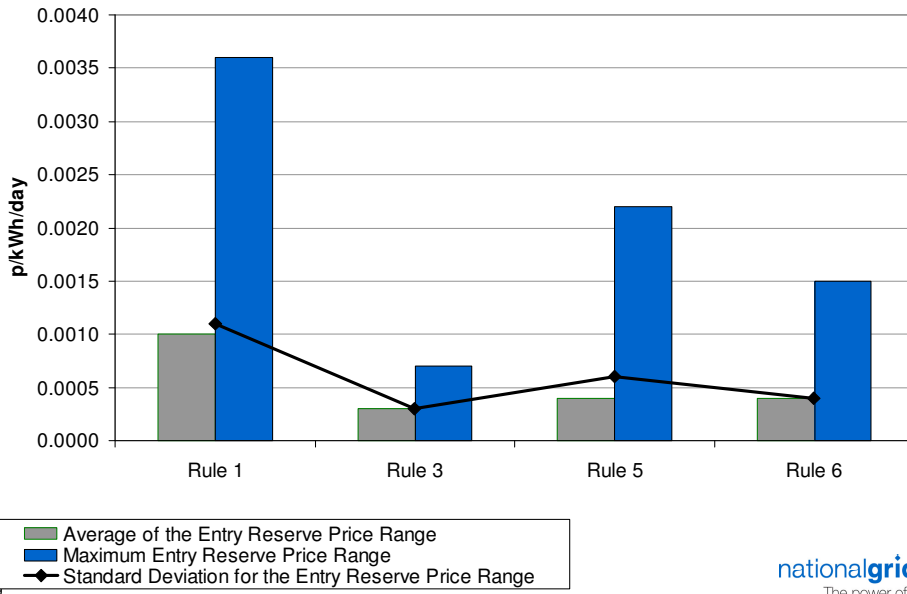
The standard deviation of the price range is 0.0020 p/kWh/day

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Impact of S&D Balancing Options on Entry Price Variation

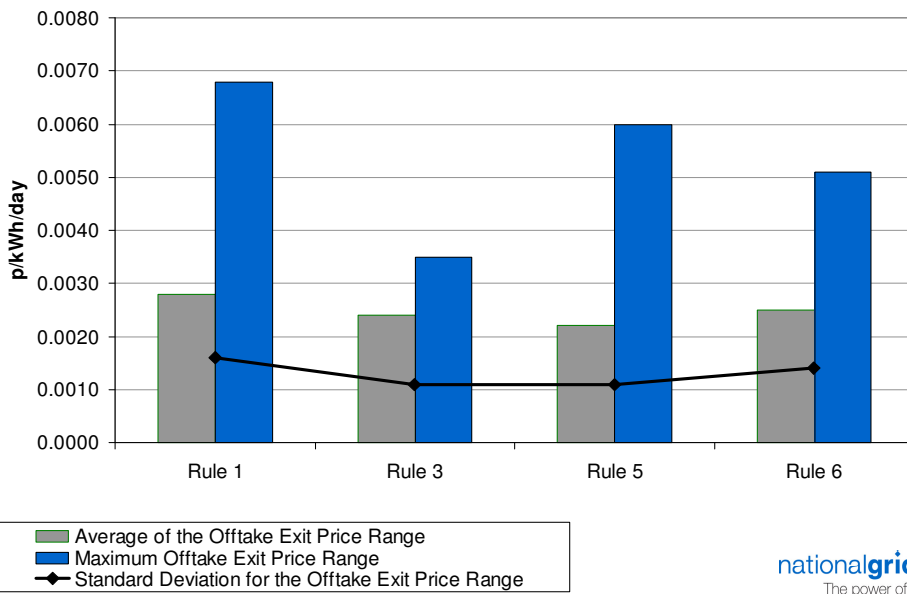
November '08 Analysis



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Impact of S&D Balancing Options on Exit Price Variation

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Results

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Analysis

- **Rule 3 produces the least variable entry and exit prices across the three scenarios.**

- **Rule 3: Supplies split into the following three groups:**

1. Beach, Interconnectors, LNG Importation, Long-Range Storage (Rough)
2. Mid-Range Storage
3. Short-Range Storage (LNG)

However, the supply/demand scenarios used in this analysis have not required the use of LNG Storage under Rule 3.

- **Rule 6 could produce more stable prices in scenarios with more demand variation.**

- **Rule 6: Supplies split into the following two groups:**

1. Beach, Interconnectors, LNG Importation, Long-Range Storage (Rough)
2. Mid-Range Storage, Short-Range Storage (LNG)

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Further Analysis

- ◆ **Following the concerns raised by Ofgem regarding GCM05 and the direction for implementation of UNC 0195AV (to be confirmed) further analysis has been carried out**
- ◆ **The revised GCM05 proposal, where exit prices would be adjusted to collect TO allowed revenue from the baseline (rather than the booked) level of capacity with the costs associated with unsold baseline being commoditised should lead to more stable exit prices as the level of baseline capacity should be more stable (and predictable) than the level of booked capacity.**

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Supply and Demand Scenarios

January '09
Analysis

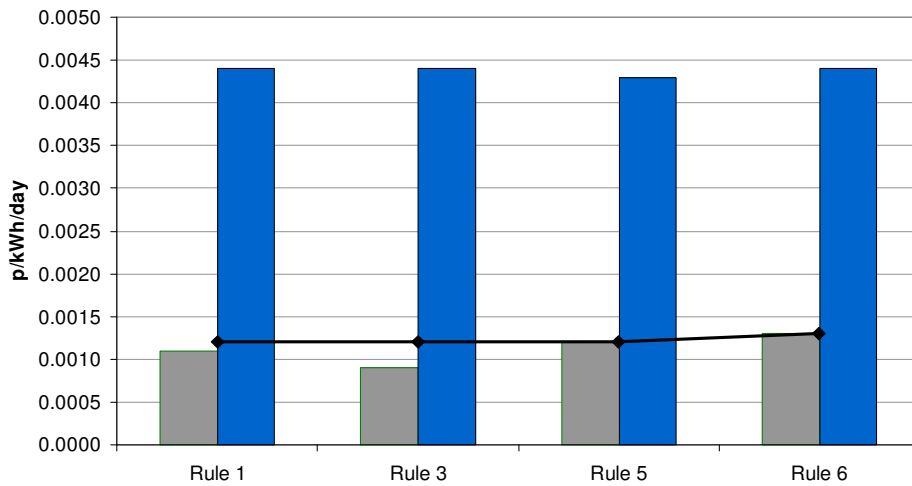
- ◆ Three years modelled – 2012/13, 2013/14, 2014/15
- ◆ Baseline Exit Demand from Licence
- ◆ Supply from December 2008 Ten Year Statement for 2012/13, 2013/14 and 2014/15

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Entry Capacity Price Variation across years 2012/13, 2013/14 and 2014/15 (using 2008 TYS)

January '09
Analysis

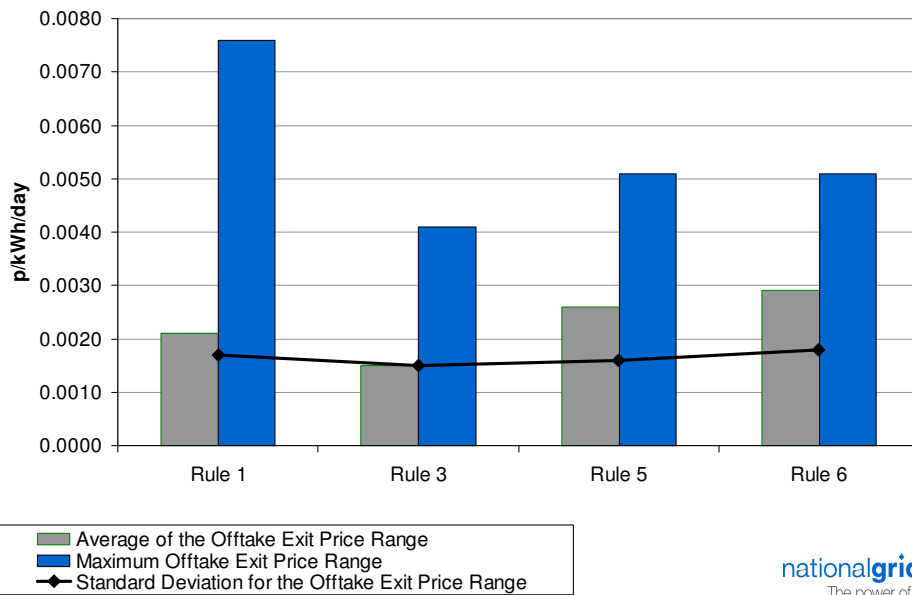


Average of the Entry Reserve Price Range
 Maximum Entry Reserve Price Range
 Standard Deviation for the Entry Reserve Price Range

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Exit Capacity Price Variation across years 2012/13, 2013/14 and 2014/15 (using 2008 TYS)

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Summary

Reasons for moving away from the prevailing methodology:

- ◆ Matching demand by turning on supply points one by one (merit order) can produce variable prices which may not appropriately reflect underlying costs.
- ◆ When LNG storage is required to match the demand level it is likely to impact on entry and exit prices in the surrounding area.
- ◆ Exit Prices will vary as a consequence of demand changes but changing the supply and demand balancing rules could minimise the impact of supply changes on exit price variation

Considerations for a new methodology:

- ◆ The methodology must be cost reflective.
- ◆ Is it more important to have a methodology that is operationally realistic or that produces the lowest price variation?
- ◆ A more transparent approach could be of benefit.

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Next Steps

- ◆ **Discussion Paper or Consultation Paper?**
- ◆ **Potential timeline**
 - Discussion Paper February 2009
 - Discussion Report?
 - Consultation and Indicative prices (150 days notice) 1st May 2009
 - Final Proposals 1st July 2009
 - Prices published 1st August 2009
 - Implement 1st October 2009

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Appendix

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Analysis

The following graphs show the results from comparisons of Rules 1, 3, 5 and 6 when considering the 2008/09, 2009/10 and 2010/11 Transportation Models using supply data from the last three published Ten Year Statements (in 2006, 2007 and 2008)

The first six graphs compare entry and exit prices under each rule when using supply data from each of the three Ten Year Statements i.e. comparing indicative and actual prices.

The last two graphs compare entry and exit prices under each rule comparing prices in 2008/09, 2009/10 and 2010/11

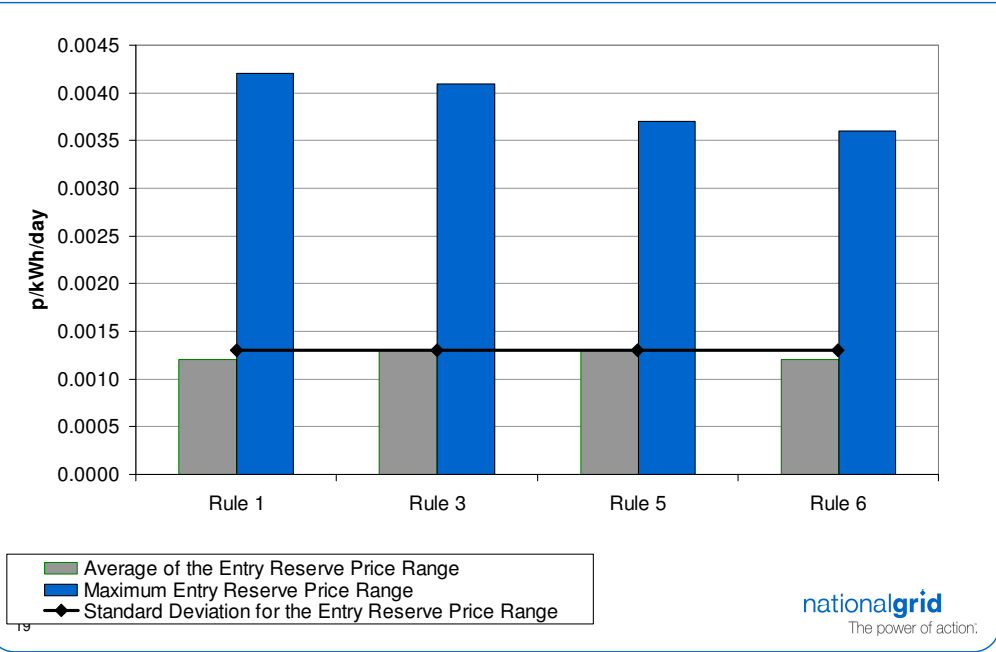


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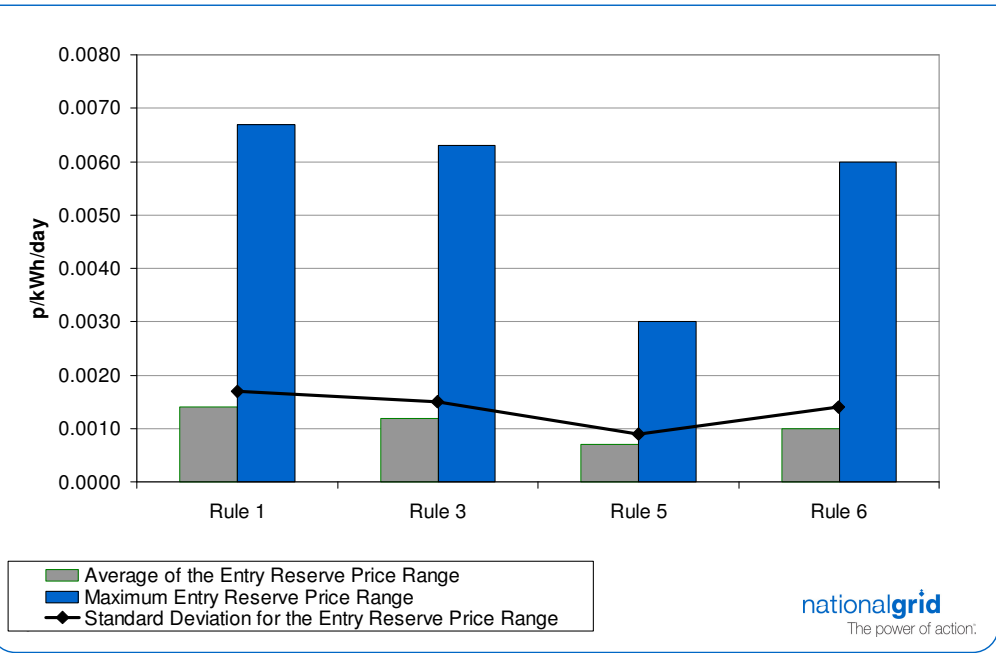
Entry Capacity Price Variation for 2008/09
 across 2006, 2007 and 2008 Ten Year Statements

January '09
 Analysis



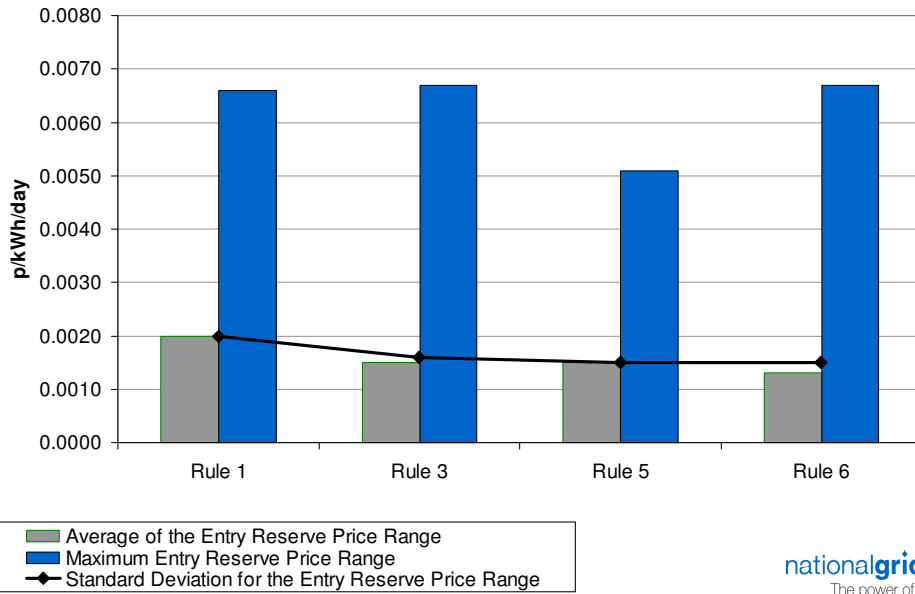
Entry Capacity Price Variation for 2009/10
 across 2006, 2007 and 2008 Ten Year Statements

January '09
 Analysis



Entry Capacity Price Variation for 2010/11
across 2006, 2007 and 2008 Ten Year Statements

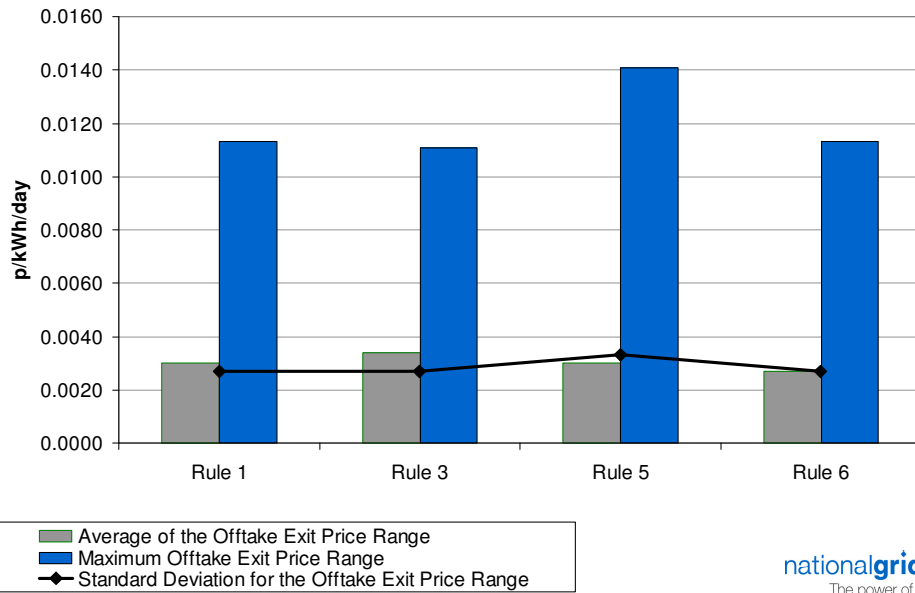
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Exit Capacity Price Variation for 2008/09
across 2006, 2007 and 2008 Ten Year Statements

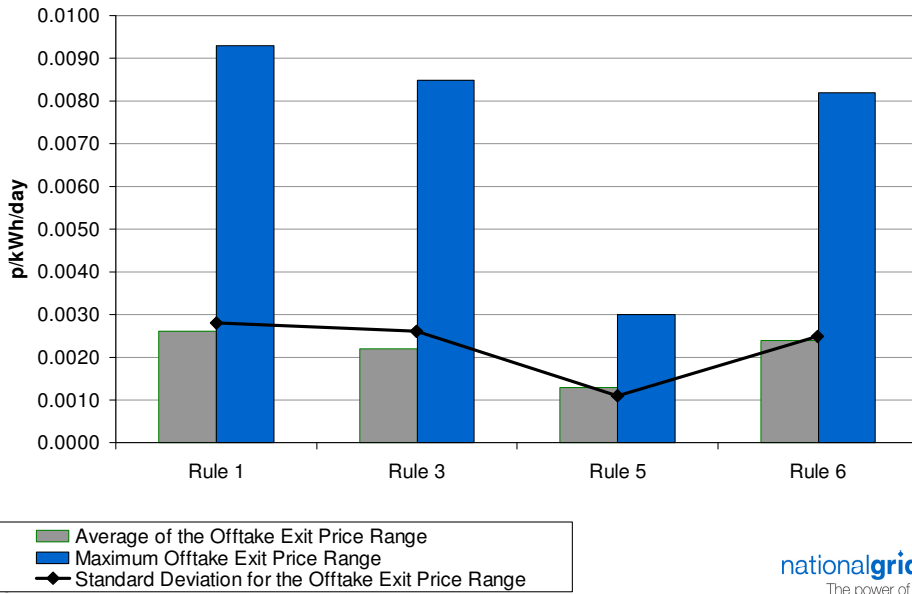
January '09
Analysis



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Exit Capacity Price Variation for 2009/10
 across 2006, 2007 and 2008 Ten Year Statements

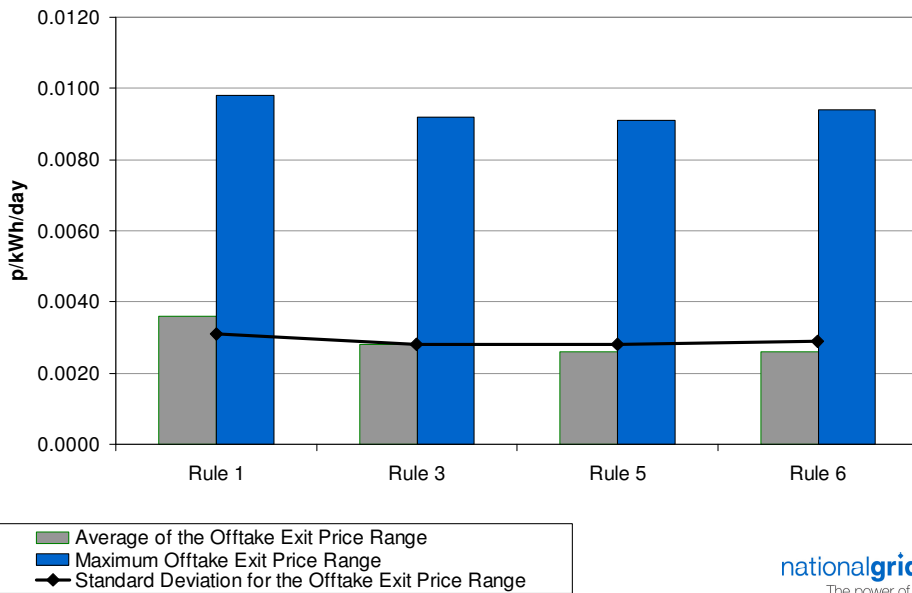
January '09
 Analysis



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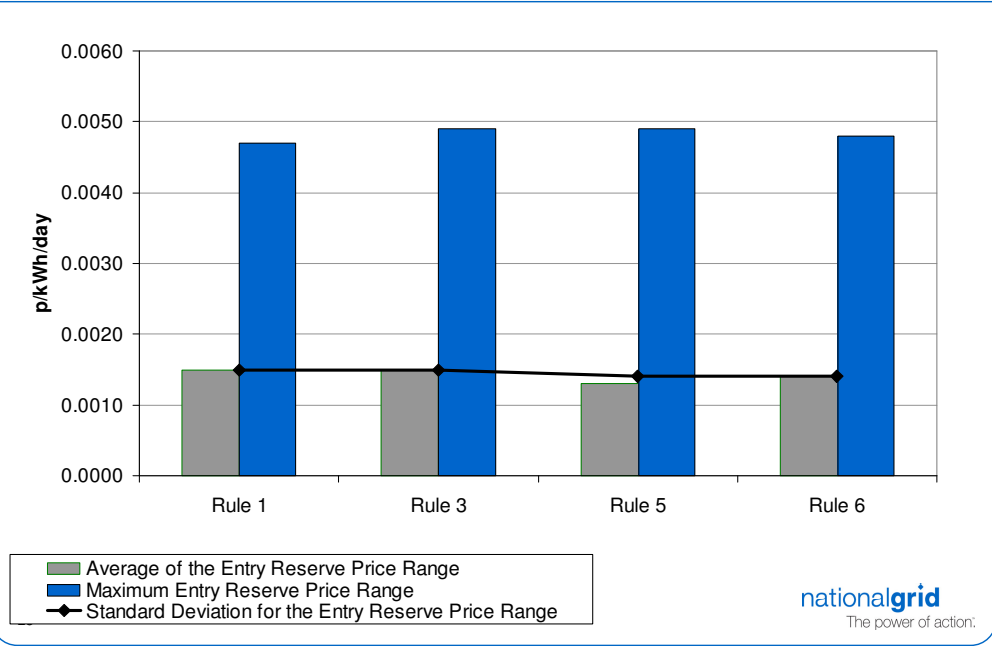
Exit Capacity Price Variation for 2010/11
 across 2006, 2007 and 2008 Ten Year Statements

January '09
 Analysis

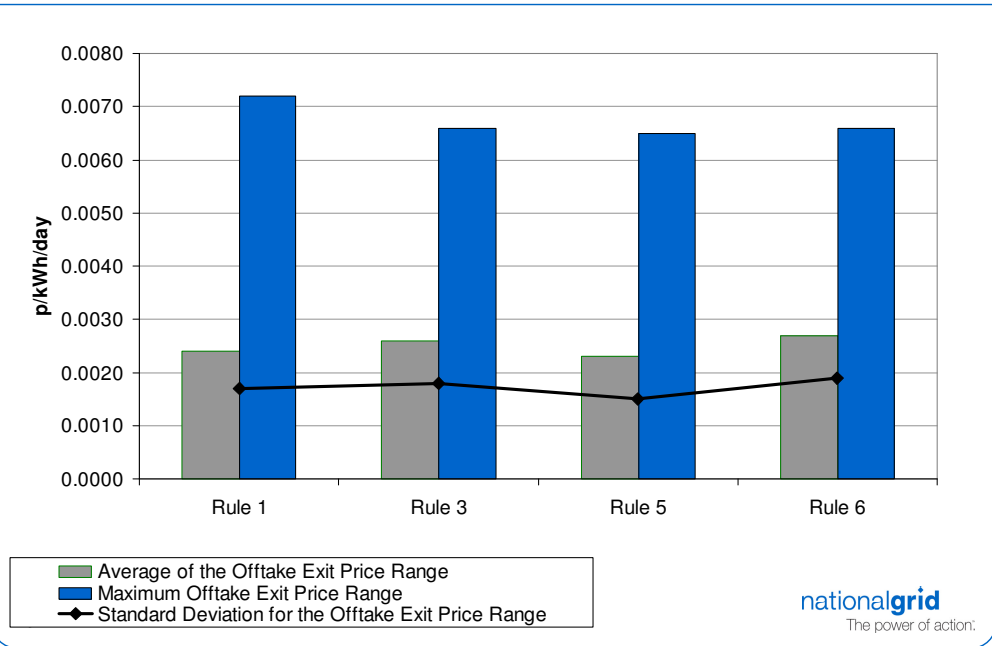


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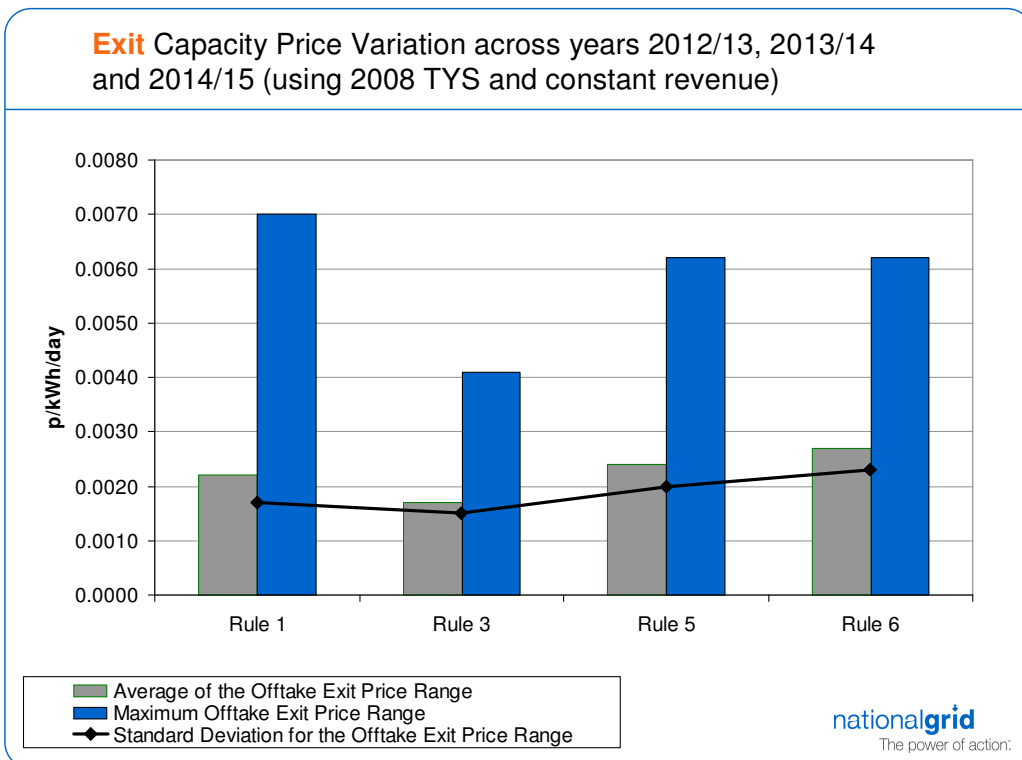
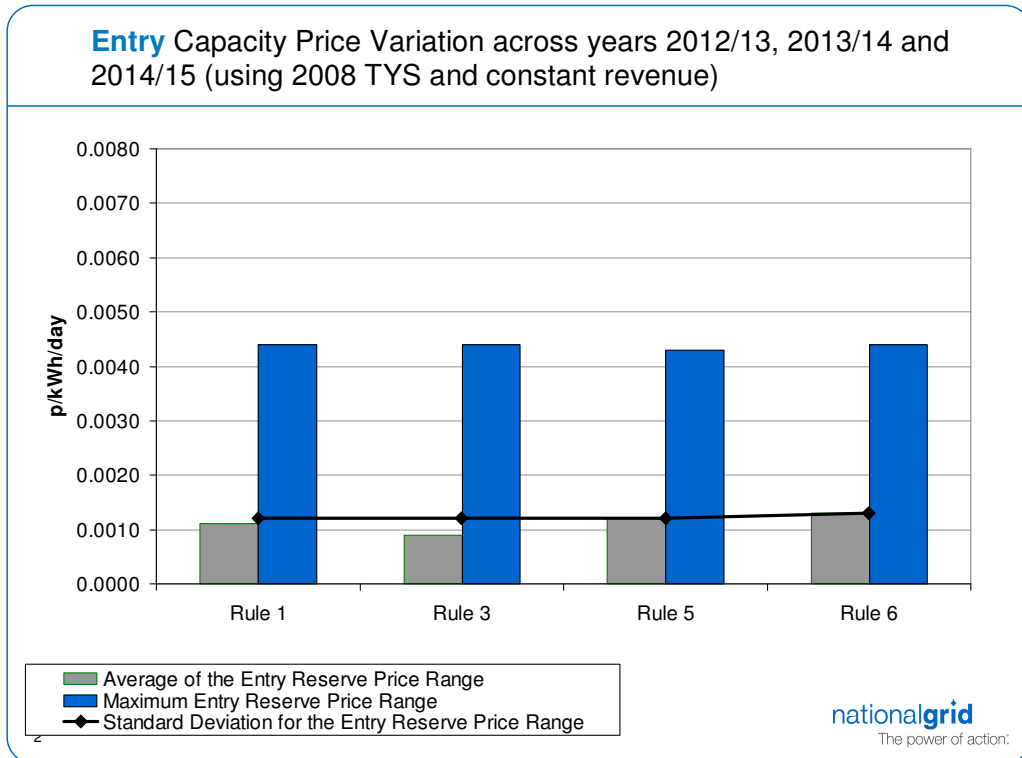
Entry Capacity Price Variation across years 2008/09 (using 2007 TYS), 2009/10 (2008 TYS) and 2010/11 (2008 TYS) Transportation Models January '09 Analysis



Exit Capacity Price Variation across years 2008/09 (using 2007 TYS), 2009/10 (2008 TYS) and 2010/11 (2008 TYS) Transportation Models January '09 Analysis



At the January 2009 TCMF the attendees requested that National Grid show the entry and exit price variation across 2012/13, 2013/14, 2014/15 using the same revenue for the three years. The results of this analysis are presented below.



At the January 2009 TCMF the attendees requested that National Grid extend the analysis to look at 2015/16, 2016/17 and 2017/18 to consider the results when new storage sites begin flowing. The results are presented below.

