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Charging arrangements for transmission infrastructure assets local to generation connections

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Target audience: Transmission system users and all other relevant stakeholders

Overview:

National Grid Electricity Transmission plc has proposed a modification to its use of system charging methodology. The proposed modification relates to the charging arrangements for transmission infrastructure assets which are local to generation connections. The proposal is intended to provide a more cost-reflective charging signal for transmission infrastructure assets. The aim is to enable users to assess more effectively the cost and charging implications of alternative connection designs and therefore to make efficient and economic choices.

The Authority is required to assess any proposed modification to the use of system charging methodology and to decide whether to approve or veto such a change. The Authority's decision is based on a consideration of whether the modification would better facilitate the relevant methodology objectives and our statutory duties. To inform its assessment, the Authority has decided it is appropriate to undertake an impact assessment and to consult on the proposed modification.

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Context

Standard condition C5 of National Grid Electricity Transmission plc's (NGET's) electricity transmission licence requires it to keep its use of system charging methodology under review at all times. NGET is also required to make proposals to modify that methodology where it considers a modification would better achieve the relevant objectives: (a) in relation to competition, (b) in relation to cost-reflectivity and (c) taking account of developments in its transmission business.

NGET has proposed a modification which it considers will better facilitate achievement of the use of system charging methodology relevant objectives (b) and (c). NGET considers the modification improves the cost reflectivity of charging for transmission assets which are local to generation connections by splitting out the Transmission Network Use of System (TNUoS) charge to more accurately defined local and wider locational components. On 15 September it submitted this modification proposal to the Gas and Electricity Markets Authority (the 'Authority')[1] for assessment.

The Authority is required to assess proposed modifications to the use of system charging methodology and to decide whether or not to veto any proposal. Under Section 5A of the Utilities Act 2000 the Authority is required to carry out an impact assessment where it considers a proposal is important, within the meaning set out in section 5A. On 23 September 2008, we published a letter confirming that it was our intention to undertake an impact assessment before making a decision on this proposal. This document sets out that impact assessment and consultation on the proposed modification.

Associated Documents

- GB ECM-11 Pre-consultation document: Charging arrangements for local generator assets, February 2008. http://www.nationalgrid.com/NR/rdonlyres/E3F5A7DA-5010-4C11-8044-9D0328EDC152/23838/PreconsultationonLocalChargesGBECM11.pdf

- GB ECM-11 Consultation document: Charging arrangements for generator local assets, 1 August 2008. http://www.nationalgrid.com/NR/rdonlyres/224F15A5-E4BA-45D3-B5B6-FC0CB2641554/27416/ECM11LocalChargingFinal.pdf

- GB ECM-11 Conclusions report: For the charging arrangements for local generator assets, 15 September 2008. http://www.nationalgrid.com/NR/rdonlyres/27F920CA-C678-4D91-A3D1-701E909BDAFB/28281/GBECM11ConcReport_final_HR.pdf

[1] Ofgem is the office of the Authority. The terms 'Ofgem' and 'the Authority' are used interchangeably in this document.

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Summary

On 15 September 2008 National Grid Electricity Transmission plc (NGET) submitted Use of System Methodology modification proposal GB ECM-11 to the Authority for a decision. The proposal seeks to provide a more cost-reflective charging signal for Transmission Network Use of System (TNUoS) charges which relate to transmission infrastructure assets local to generation connections. The aim of the proposal is that TNUoS charges will more accurately reflect the costs of local transmission infrastructure costs resulting from individual generators' choice of the design and location of their connection.

Currently, TNUoS charges have two parts:

- ***Locational charge.*** This element of the TNUoS charge for generators is calculated on a zonal average basis, reflecting the long-run forward-looking incremental costs which would result from connecting an additional incremental Megawatt (MW) of generation within each zone. NGET adopted a shallow connection boundary across Great Britain (GB) at the implementation of British Electricity Trading and Transmission Arrangements (BETTA). At the time, it was recognised that with the inclusion of local infrastructure assets in TNUoS charges, the zonal average approach might reduce the cost reflectivity of the TNUoS charging signals which relate to assets which are local to the generation connection relative to the actual costs imposed. It was considered that this might send inappropriate signals to generators when they are choosing the location and design of their connection to the transmission network.

- ***Residual charge.*** This ensures that the total income from TNUoS charges recover the relevant allowed revenue for the Transmission Owners (TOs) as determined by their price control. It allows the recovery of the efficient costs that cannot be attributed to the use of the network at particular locations.

Under the modification proposed by NGET, a boundary between local and wider infrastructure will be identified at Main Interconnected Transmission System (MITS) substations. These are substations which either are connected with at least four transmission circuits or are Grid Supply Points (GSPs) connected with at least two transmission circuits. TNUoS charges for all generators will be split into four components:

- ***'Local' circuit charge.*** This component relates to the cost of transmission infrastructure assets used by generators to connect to the main interconnected network. This charge is derived with reference to the incremental power flows along "local" transmission infrastructure circuit assets between the generation node and the next Main Interconnected Transmission System (MITS) substation, together with generic unit costs for relevant design and type of circuit for each generation connection.

- ***'Local' substation charge.*** This element of the TNUoS charge is derived from the generic unit costs of the relevant design and type of local infrastructure substation assets which are required for each generation connection.

- ***'Wider' locational charge.*** This charge component will be calculated consistent with the existing methodology, based on the existing zonal averaging approaches and the generic cost base of the current charging model. To avoid double counting, the incremental costs along the local circuits (which will be addressed through the 'local' locational charge) will be subtracted from the wider zonal generation cost weighted average on which the wider zonal tariff is based.

- ***Residual charge.*** This element serves the same purpose as the current residual charges, but will take different values since the reallocation of costs under different components.

NGET believes that this change, if implemented, would enable generators to make more efficient decisions on the location and design of their connection by signalling the costs of different locations and designs.

Purpose of this document

Ofgem considers that modification proposal GB ECM-11 meets the "importance criteria" set out in section 5A the Utilities Act and is therefore carrying out an assessment of the likely impact of implementing the proposal. We published a letter on 25 September 2008 confirming our intention to undertake an impact assessment before making a decision on whether to approve or veto this proposal. The purpose of this document is to set out a summary of the impacts of the proposed change and provide an opportunity for parties to comment on those impacts.

Way forward

In line with our published guidance on impact assessments[2], this document provides six weeks for respondents to submit any comments. The Authority will take responses, and any other relevant information, into account in making its decision as to whether or not to veto the proposal. We are currently planning to make that decision by 15 December 2008.

If the Authority decision is not to veto the proposal, NGET is seeking to implement the modification proposal from 1 April 2009 in order to allow the local charging arrangements to be reflected in the 2009/10 charging year.

[2]http://www.ofgem.gov.uk/About%20us/BetterReg/IA/Documents1/GUIDANCE%20ON%20IMPACT%20ASSESSMENTS.pdf

1. Introduction

Chapter Summary

This chapter provides a brief summary of the current arrangements for generators connecting to and using the electricity transmission system and the background to this document.

Overview of the electricity charging arrangements

Recovery of Transmission Owners' costs via Connection and TNUoS charges

1.1. There is a single electricity transmission licence relating to the Great Britain (GB) transmission system. This licence consists of two sections: one relevant to transmission System Operation (SO) activities, and the other to Transmission Owner (TO) activities. The SO function, including the balancing of electricity generation and demand, is carried out for the whole of GB by National Grid Electricity Transmission plc (NGET). The TO activity function, currently performed by three licensees within GB[3], involves the provision of transmission network services to the SO, enabling NGET to fulfil its SO licence obligations.

1.2. The provision of network services is linked to providing transmission capability at different locations and is facilitated by the TOs building, operating and maintaining their transmission assets. The costs associated with providing this capability are recovered by NGET as SO, who has contracts with users for connection to and use of the GB transmission system. The revenue recovered by NGET is then passed through to the relevant TO.

1.3. The size of the costs to be recovered for each TO's activities is set by Ofgem as part of the price control process.

1.4. The sum of the total TO revenue to be collected via Transmission Network Use of System (TNUoS) charges is distributed between generators and demand users such that 73% is collected from demand customers and 27% from generators.

Connection and TNUoS charges

1.5. Under the current connection charging methodology, the boundary between assets charged under Connection and TNUoS is set by the principle of "single user connection assets", known as the "plugs" methodology. Under this methodology, "connection assets" are defined as those assets solely required to connect an individual user to the GB transmission system, which are not and would not normally

[3] Each licence contains special conditions that limit the area in which the licensee is authorised to carry out TO activities to a defined area within GB. NGET's transmission area is England and Wales, Scottish Power Transmission Limited's transmission area is the south of Scotland, and Scottish Hydro Electric Transmission Limited area is the north of Scotland.

be used by any other connected party. The costs of these assets are recovered directly from the generator via connection charges. The charge itself is calculated as the cost of providing and operating those assets, including a reasonable rate of return on the capital employed.

1.6. All other transmission assets which are shared, or could be potentially shared, by more than one user are defined as transmission infrastructure assets. The costs incurred by the TOs in building, owning and maintaining these assets are recovered from all users of the GB transmission system via TNUoS charges. A generator's TNUoS charges are based on its Transmission Entry Capacity (TEC), which represents the maximum contractual amount that the generator can flow power onto the transmission system at a specified location.

1.7. TNUoS charges reflect the cost of installing, operating and maintaining the system owned by each transmission licensee. Currently, the charge has a dual function, it:

- Provides a signal to new generation (and demand) concerning the impact their connection will have on transmission network costs, and
- Recovers the sum of the TO's allowed revenues as determined by the transmission price control.

1.8. To fulfil these functions, TNUoS charges have two parts:

- A locationally varying element reflecting the zonal average long-run forward-looking costs of connecting an incremental (or decremental) Megawatt (MW) of generation or demand at a given point on the transmission network, and
- A residual non-locational element that ensures that TO's can recover their total allowed revenue determined by their price control.

1.9. The locational element varies to reflect the costs imposed by users of the network, averaged within a set of defined zones for generator users and another set of zones for demand users. Demand TNUoS and Generation TNUoS (GTNUoS) charges are approximately equal and opposite to each other at the same geographic location. The residual element is a non-locational charge, i.e. one uniform value for all generation, and with another uniform value for all demand. These residual elements are set such that the total income from TNUoS charges recover the relevant maximum allowed revenues for each TO as set by their price control and that the ratio between the total generation and demand TNUoS charges is equal to that described above in paragraph 1.4.

Existing access and charging arrangements

1.10. As SO, NGET has a licence obligation to provide offers to parties seeking connection to and use of the transmission system. Any prospective generator wishing to connect to the GB transmission system must therefore apply to NGET. The SO will in turn contact each TO who may need to upgrade the transmission system to accommodate the connection request.

1.11. If the transmission system needs to be reinforced to accommodate a new connection, these reinforcements must be complete before the generator can connect and export onto the transmission system. Once the necessary reinforcements are complete the generator is allocated a level of TEC that is defined in its bilateral agreement with NGET. TEC provides a generator with a financially firm transmission access right to export power onto the transmission system and sets the maximum level of output which they may not exceed in any period of the coming financial year. At the same time the generator also takes on the obligation to pay transmission charges, including annual TNUoS charges based on their TEC.

1.12. The transmission licensees accord export rights by providing direct connections to the transmission network as well as the deeper transmission infrastructure itself. These are carried out in accordance with the planning criteria for the design of generation or demand connections and the design of the Main Interconnected Transmission System (MITS) respectively, as set out in the GB Security and Quality of Supply Standard (SQSS).

1.13. In terms of the design of the generation connection to the MITS, the generation connection criteria include a set of deterministic requirements which would lead to "secure" connection designs with a certain level of asset redundancy. Onshore, a connection design meeting the minimum "standard" requirements has at least one duplicate element at connection interfaces that can accommodate the full, contracted level of export if one transmission circuit is out of service[4] - e.g. a double circuit design. However, under the provisions of "customer choice" in the SQSS, all generators can choose to have more or less assets in securing their connection above or below the minimum security requirements, provided that the variation does not: reduce the MITS security to below the minimum planning criteria, result in increased costs or reduced security and quality to any particular customer or overall, or compromise the ability of the TO to meet their other licence obligations.

1.14. Typically, this means that a lower security connection design leads to uncompensated access restrictions associated with loss of assets in the relevant local infrastructure. The intention behind the customer choice was to replace the need for regulator-granted derogations; instead, individual users will be able to trade-off: the level of their transmission costs, security of their transmission connection, and the consequence of the varied connection design such as the revenue implications associated with uncompensated access restrictions with the loss of a single transmission circuit.

1.15. The change introduced with "plugs" moved the transmission boundary from a "deep" to a "shallow" connection model. This transferred a substantial proportion of the costs associated with the local transmission infrastructure assets from connection charges funded directly from users to TNUoS charges, which are recovered from all users of the GB transmission system. The TNUoS charges are based on a zonal averaging of long run incremental costs. There is, therefore, no direct reflection in an individual generator's TNUoS charges of the capital costs (or savings) associated with variations to connection designs, as there would be in deep connection charges.

[4] Offshore the minimum requirements of the SQSS will not require an offshore transmission system providing a connection to have full (or partial) network redundancy.

1.16. As a consequence, this reduces the ability to expose individual users to the transmission investment costs and benefits they impose on the local transmission system when they vary the design of their generation connection. The impact of this is that generators are less likely to choose the most economic and efficient level of security with their connection design.

Process to date

1.17. On 15 November 2006, NGET submitted a conclusions report[5] to the Authority for decision on a proposal to modify the use of system charging methodology to address the deficiencies described above. This proposal was vetoed by the Authority in February 2007[6]. This decision was taken on the basis of responses received to an Impact Assessment published in December 2006[7]. The decision recognised that the principle of offering a sharpened charging signal to generators connecting via a single circuit was correct. However, there was a need to address material issues raised by respondents on the size and cost reflectivity of the proposed circuit discount mechanism. In particular, we had concerns that the discount mechanism could provide inappropriate signals to users to locate in places that are neither economic nor efficient. This in turn would be to the detriment of consumers, who would ultimately bear the costs of higher than necessary levels of transmission infrastructure.

1.18. On 2 November 2007, NGET published a consultation document[8] setting out its revised proposals for modifying the TNUoS charging methodology. However, having considered the responses to the November 2007 consultation and further discussion with the industry, NGET concluded that it was not possible to create a fully cost reflective discount for SQSS design variation connections without first addressing the underlying cost reflectivity of charges for assets local to generators. NGET wrote to Ofgem on 14 December 2007[9] proposing that, instead of submitting a conclusion report for the Authority's consideration, further work should be undertaken to find an enduring charging solution of cost reflective charging for local assets without creating perverse incentives.

1.19. We responded to NGET's proposal on 19 December 2007[10] agreeing to the proposed way forward and urging NGET to develop an enduring solution which could be considered for implementation from 1 April 2009.

[5] GB ECM-06 available on NGET's website at: http://www.nationalgrid.com/NR/rdonlyres/ED88CECC-7B6C-44AB-9020-345BF4E17FB4/12859/GBECM06ConclusionsReport.pdf
[6] Decision available on NGET's website : http://www.nationalgrid.com/NR/rdonlyres/491F2854-660F-462C-9E0D-BAF41A8B7D7A/15284/GBECM06AuthorityDecisionLetter.pdf
[7] Impact assessment available on Ofgem's website: http://www.ofgem.gov.uk/Networks/Trans/ElecTransPolicy/Charging/Documents1/16499-215_06.pdf
[8] GB ECM-11 consultation available on NGET's website: http://www.nationalgrid.com/NR/rdonlyres/0CA66A3C-2D04-47FD-A6DB-BC7D1E80DC9D/21148/GBECM09DesignVariationDiscount.pdf
[9] Letter available on NGET website at: http://www.nationalgrid.com/NR/rdonlyres/FBC9DAE1-C4D7-4FCA-AE1F-59F4C3520B9A/22249/NationalGridDesignVariationDiscountletter.pdf
[10] Ofgem response available from NGET's website at:

1.20. Discussions relating to the development of an enduring solution were initially held at the various industry charging groups. These were then carried on within the remit of the Transmission Access Review (TAR) Working Group 3, given that the split of the local and wider infrastructure for charging purpose could potentially facilitate some of the changes envisaged for the access arrangements.

1.21. These discussions culminated in NGET publishing a consultation on 1 August 2008[11] which sought views on two options for splitting the locational element of the TNUoS tariff into wider and local components and applying a more specific treatment to the local component. The two options upon which NGET sought industry views were:

- Option A - *Specific Treatment of generation connections* (as set out in this document), and
- Option B - *Distance to zonal hub*: Each TNUoS zone contains a reference marginal cost and the marginal cost differential between each generator and this economic hub is the proposed basis of the local charge.

1.22. Industry support was broadly in favour of option A and as such it was this that was brought forward by NGET and submitted for Authority consideration on 15 September 2008.

1.23. On 25 September 2008, we published an open letter setting out our intention to undertake an impact assessment on NGET's proposed modification and to publish this in October 2008 with a view to making a decision on NGET's proposal by 15 December 2008 in accordance with the requirements of licence condition C5(4) which obliges the Authority to issue its decision within 3 months of receipt.

Structure of the document

1.24. The remainder of the document is structured as follows:

- Chapter 2 sets out a brief description of NGET's proposed modification to the use of system charging methodology.
- Chapter 3 provides an assessment of the impact of the proposal in relation to the relevant objectives.
- Chapter 4 provides an assessment of the proposal in relation to the Authority's wider duties, including those associated with the environment.
- Chapter 5 sets out the way forward.

1.25. A description of the legal framework against which this modification is assessed is set out in appendix 3.

http://www.nationalgrid.com/NR/rdonlyres/B5D4E5E9-1903-443E-AD7F-56629AF5FD67/22250/OfgemSQSSDesignVariationResponseLetter.pdf

[11] Consultation available on NGET's website at: http://www.nationalgrid.com/NR/rdonlyres/224F15A5-E4BA-45D3-B5B6-FC0CB2641554/27416/ECM11LocalChargingFinal.pdf

2. Outline of NGET's modification proposal

Chapter Summary

This chapter briefly summarises NGET's proposed modification to the use of system charging methodology, the principles and its revenue implications.

➔ **Question:** There are no questions in this chapter.

Modification proposal

2.1. NGET's modification proposal GB ECM-11 seeks to provide a more cost-reflective charging signal within TNUoS charges relating to transmission infrastructure assets local to generation connections. For the avoidance of doubt, this proposal applies only to the transmission costs and the resultant TNUoS charges associated with the connection of generation to the transmission network; they do not extend to demand connections.

2.2. Under the proposed modification, a boundary between local and wider infrastructure will be identified at MITS substations. These are substations which either are connected with at least four transmission circuits or are Grid Supply Points (GSPs) and connected with at least two transmission circuits. Once the local and wider infrastructure assets are identified, TNUoS charges for all generators will be split into four components:

- ***'Local' circuit charge.*** This component relates to the cost of transmission infrastructure assets used by generators to connect to the main interconnected network. This charge is derived with reference to the incremental power flows along "local" transmission infrastructure circuit assets between the generation node and the next MITS substation, together with generic unit costs for relevant design and type of circuit for each generation connection.

- ***'Local' substation charge.*** This element of the TNUoS charge is derived from the generic unit costs of the relevant design and type the local infrastructure substation assets required for each generation connection.

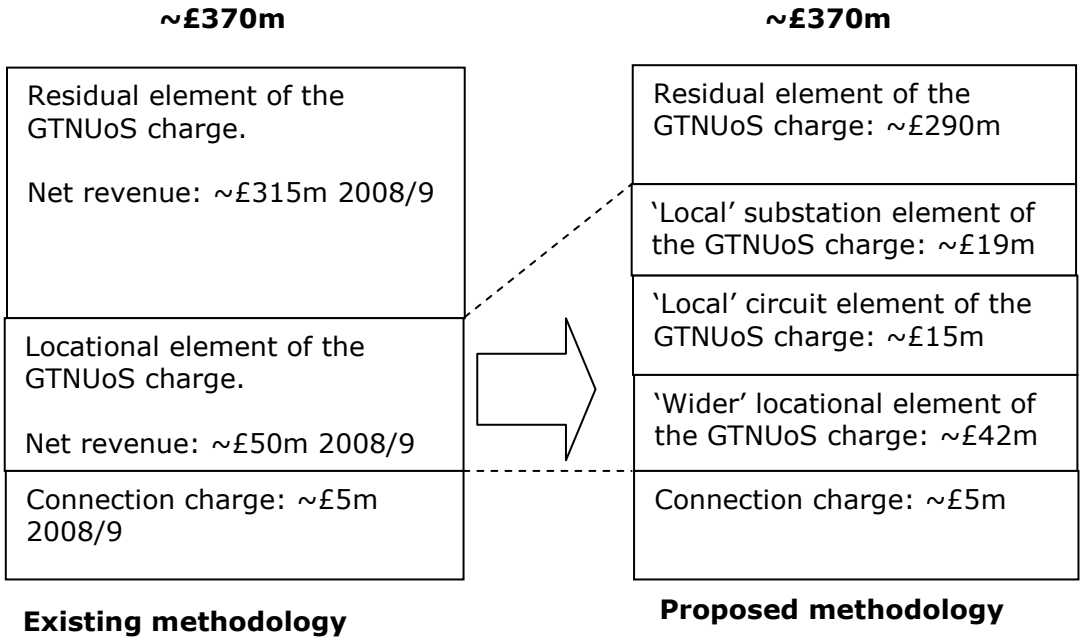
- ***'Wider' locational charge.*** This charge component will be calculated consistent with the existing methodology based on the existing zonal averaging approaches and the generic cost base of the current charging model. To avoid double counting, the incremental costs along the local circuits (which will be addressed through the 'local' charge) will be subtracted from the wider zonal tariff.

- ***Residual charge.*** This element serves the same purpose as the current residual charges, but will take different values since the reallocation of costs under different components.

2.3. A more detailed description of the main features of NGET's proposed modification is given in appendix 4 of this document.

Indicative scales of charging components

2.4. NGET provided in its August 2008 consultation document the indicative scales of total incomes to be recovered from the new GTNUoS charge components in comparison to those from the current charging components. These are replicated in the diagram below.



2.5. As shown in the diagram, the total revenue to be recovered from generation will remain unchanged. However, amounts recovered under both the residual and the wider locational elements are different from the current residual and locational elements.

2.6. Indicative local TNUoS tariffs for 2008/9, including the local substation charge, were published in Appendix 6 of NGET's August 2008 consultation document. These indicative tariffs were calculated for all generation liable for TNUoS tariffs. NGET has since revised these calculations after identifying and correcting a minor modelling error. For ease of reference, NGET's revised indicative tariffs are replicated in appendix 5 of this document. Note that these tariffs are also available from NGET's website within their Use of System Charging Methodology Consultations section[12]. Any further queries on the revised tariffs should be raised with NGET directly.

Implementation date

2.7. Subject to the Authority not vetoing the proposal, NGET has proposed an implementation date for the proposal of 1 April 2009. This would allow the proposal to be reflected in charges for the TNUoS charging year 2009/10.

[12] http://www.nationalgrid.com/uk/Electricity/Charges/modifications/uscmc/

3. Assessment of impacts in relation to the relevant objectives.

Chapter Summary

This chapter sets out an assessment of the impact of the modification proposal in relation to the relevant objectives of NGET's electricity transmission licence. In other words, it considers the relevant impacts in terms of cost reflectivity, competition and reflecting developments in the system.

Question box:

Question 1. Do respondents wish to present any additional quantitative analysis that they consider to be relevant to assessing the proposal?

Question 2. Do respondents consider that there are any aspects of the proposal that have not been fully assessed?

Question 3. Do respondents consider that the key features of the proposal strike an appropriate balance between cost-reflectivity, transparency, complexity and stability? We welcome specific comments on appropriateness of the definition of local/wider boundary, the setting of the four components including the categorising and costing of relevant designs and asset types for local circuit and local substation.

Question 4. Do respondents wish to present any additional views on the different treatment of generation and demand connections, both in general and in terms of the treatment of circuit and substation elements, resulting from this proposal?

Question 5. We welcome further views on both the proposed approach and the effects of not including consideration of partial redundancy in the local charge calculation, particularly on the generators deemed to have partial redundancy.

Question 6. Do respondents wish to present any further analysis on the proposed treatment of spare asset capacity relative to contracted TEC, particularly the effect on the cost signal to adopt the most economic and efficient option available?

Question 7. Do respondents consider that this modification promotes more effective competition by sharpening generators' exposure to the costs they incur and the relative competitive pressures this exerts? Conversely, do respondents wish to provide further detail of any discrimination concerns?

Question 8. Do respondents consider that the proposal complements the changing nature of the transmission network and assists the development of an economic and efficient transmission system?

Impact in relation to relevant objectives

3.1. Ofgem assesses proposed modifications against the relevant objectives of NGET's Use of System charging methodology which is specified in NGET's transmission licence. An assessment of the impact of the proposal in light of each of these objectives is provided below. Where relevant, this assessment draws on views expressed by interested parties in response to NGET's consultations to date.

Cost reflectivity

3.2. NGET states in the conclusions report to its consultation on GB ECM-11 that the primary purpose of the modification is to improve the cost reflectivity of TNUoS charges to generators and, as a result, to sharpen the cost signals provided by the charging methodology to users. There are several aspects of the proposed modification which can be seen to relate to, or impact on, the overall cost reflectivity of the methodology:

- Disaggregating the GTNUoS charge to local and wider locational components - the proposal would provide more accurately defined charging components by allowing charges to reflect more closely users' choices over connection design.
- The method of calculating the circuit charge for local transmission infrastructure assets - the proposal will base the differences in charges on updated cost data, more specific expansion factors and a local security factor.
- The treatment of partial redundancy - the proposal applies a local security factor of 1.0 for single circuit connections, whereas for all other instances the local security factor will be the existing GB average security factor value, currently 1.8.
- The method of calculating the substation element of the local charge - the proposal will base the level of charge on updated cost data and generic design assumptions and three cost determining factors.
- Review of costs - the proposal includes a process for updating the parameters of the local charge to allow for changes in underlying costs by the transmission companies every five years.
- Basis of charging - the proposal maintains the basis for charging as capacity booked rather than that installed.
- Illustration of the cost reflectivity of specific treatment of generation connections.

Each of these areas is considered below.

The introduction of a disaggregated "local" charge

3.3. Currently charges for use of the transmission network do not differentiate between users with different types of connection or access. Any underlying cost differences that result from a user choosing to adopt a less secure connection when they connect to the "local" transmission network, are not reflected in that user's charges. The proposal will introduce such a differentiation in charging treatment for generation connections.

3.4. An impact of the proposal is therefore to provide generation customers with a more cost reflective signal at a local level, than that contained in the TNUoS tariff currently applied across GB.

3.5. The modification defines the boundary between local and wider infrastructure at the MITS substations. For generation connected at non-MITS substations, the proposed approach identifies the "local network" to which a generator is connecting, i.e. those assets whose primary purpose is to facilitate the connection of the generator to the transmission network.

3.6. NGET's proposed split between local and wider infrastructure is based on the consideration that generation connected directly to a MITS substation is normally not allowed a connection design variation. This is mainly due to two reasons. First, the SQSS criteria only allows design variation when other users are not affected, which is often not possible at a MITS substation. Second, the level of interconnectivity of the local network normally around a MITS substation makes it difficult to determine accurately the available power flow paths individual to each generation connection as part of the proposed local charging arrangements. Instead, NGET considers that the transmission costs for such generator connections are more appropriately calculated through the wider TNUoS zonal average charge.

3.7. We would welcome parties' thoughts on whether the local/wider boundary criteria proposed by NGET are based on sound engineering judgement and consistent with the SQSS principles. We are particularly interested on receiving further analysis from anyone who may hold an alternative opinion to NGET.

Method of calculating the level of the local circuit charge

3.8. Under the current charging methodology, the costs relating to the local infrastructure network for the generator connection are subsumed in a generic charging model. This model derives the charges on the basis of:

- The marginal increase of the flows on the transmission infrastructure assets,
- An expansion constant and a number of expansion factors which reflect an average view of the unit costs to accommodate those flows, and
- An average security factor which reflects the amount of additional assets required to provide the redundancy required by the SQSS.

3.9. The current charging methodology therefore does not result in a strong signal in relation to the actual cost savings associated with specific connection designs that impose differing costs on the transmission system. Apart from identifying a more accurate marginal impact on relevant assets by splitting out a local network, the proposed modification would also change the average unit cost and average security factor to parameters more reflective of the local connection design.

3.10. The current expansion factors applied to the transmission costs imposed by generation connections are based on a weighted average of the different line types at that voltage level, based on the most efficient medium (400kV Overhead Line (OHL)); they do not reflect the specific expansion factors which would apply for a single circuit design variation connection. The proposed approach recognises this and introduces a further level of disaggregation to the current 132kV OHL expansion factor to determine a local circuit charge based on the cost of transmission assets

that an individual user imposes on the system. These local expansion factors are set for a number of circuit types with different capacity and the number of circuits per route.

3.11. In developing this Impact Assessment we sought further clarification from NGET on the transparency of data used in the derivation of the local expansion factors to address respondents' concerns over their representation of actual costs in the majority of situations. In subsequent discussions, NGET has clarified that the 18 OHL construction 'types' were not derived from actual projects but from a complete list of all the feasible 132kV OHL configurations for future connections, as provided by the GB TOs, a process consistent with the calculation of the current expansion factors. NGET note that each of the four local expansion factors was calculated from a simple average of all the OHL configurations that fall into each category. The number of circuit configurations for each local expansion factor is shown below.

Local EF	No. of Designs
<200; single	6
<200; double	2
>200; single	1
>200; double	9

3.12. A general concern raised by respondents to NGET's August 2008 consultation was that NGET had failed to provide sufficient data to users to provide comfort that the local expansion factors, amongst other things, have been calculated in a consistent and verifiable manner. We note that a central benefit promoted by NGET in the development of local asset charging was the improvement in cost reflectivity at voltages where there is a significant cost variance. NGET's February 2008 pre-consultation document published a range of cost variances comparing the specific voltage costs to the zonal expansion factor (e.g. 295% at 132kV OHL).

3.13. NGET has recently submitted additional information on these variance calculations which clarify by how much the overall 132kV OHL cost variance has been reduced within each band by applying the local expansion factors. For the proposed local expansion factors the resultant ranges and maximum and minimum cost variances are shown below.

		Expansion Factor	Actual range	Lowest actual cost compared to EF (%)	Highest actual cost compared to EF (%)
Existing 132kV OHL Expansion Factor		2.80	2.3 - 12.6	-13	+282
Revised 132kV OHL Expansion Factors					
Circuit Capacity	Construction				
<200 MVa	Single	10.00	7.1 - 12.6	-29	+26
	Double	8.32	7.7 - 9.0	-8	+8
=>200 MVa	Single	7.13	7.1 - 7.1	0	0
	Double	4.42	2.3 - 5.8	-47	+31

3.14. Consequently, NGET indicates that the maximum absolute deviation between the applied expansion factor and actual cost has been reduced from 282% to 47% with the introduction of local expansion factors.

3.15. NGET has also clarified, in response to the suggested improvement to their proposal from a respondent, that local expansion factors were calculated on a GB rather than a TO-specific basis, reflecting the need to balance cost reflectivity against factors such as stability and consistency. NGET are of the view that the adoption of an approach based on a TO-specific local expansion factor would be typically based on no more than three OHL constructions and therefore would be less stable. In addition, NGET considers that a GB average approach is consistent with how all the 275kV and 400kV, cable and OHL expansion factors are currently calculated. The table below summarises and compares the local expansion factors derived by NGET under each approach.

Capacity/construction	GB Local Expansion Factors	TO-specific Local Expansion Factors
<200; single	10.0	9.1 & 10.9
<200; double	8.3	7.7 & 9.0
>200; single	7.1	7.1
>200; double	4.4	4.7 & 5.1

3.16. We would welcome views on whether the proposed disaggregation of the 132kV expansion factors is an appropriate approach to improving cost reflectivity of the "local" locational element of the generator TNUoS charge.

3.17. We would also welcome views on the cost assumptions that NGET has used to determine the more disaggregated expansion factors; in particular, whether they are, despite averaging, appropriately representative of the costs that the transmission licensees and developers are incurring in developing transmission networks and generator connections.

3.18. The application of the GB average locational security factor (currently 1.8) infers that the "average" connection has an additional 80% redundancy to achieve approximate consistency with the requirements of the criteria contained in the SQSS. The impact of this average approach means that the level of security assumed for charging purposes is not fully aligned with the actual security of each individual connection design, but instead equates with the global level of security on the system as a whole. Under the proposed modification, the formula for the circuit element of the local charge would reflect the level of security inherent in individual designs. For any connection where a loss of a circuit would result in loss of access, a security factor of 1.0 is applied as opposed to the GB average of 1.8. NGET reasons that this is to take account of the infrastructure redundancy provided in shared local connections which are built to a design standard which is lower than that provided under SQSS. NGET further explains that this is a simplified assumption that takes account of reduced security whilst remaining relatively simple and transparent to apply. We welcome parties' views on this element of the proposed modification.

3.19. We note NGET's explanation that the proposal is limited to charging arrangements for generators, as opposed to demand customers, because the issues in question are explicitly and solely associated with the local generation connection. We welcome views on the different treatment of generation and demand connection.

Partial redundancy

3.20. A number of generation local connections have multiple circuit connections whose export capacity is not sufficient to allow full export during a single circuit outage. Such connections will have commercial arrangements such that their output during such outages will not exceed the physical limit of the remaining circuits. Similar to single circuit connection designs, such arrangements have led to avoidance of additional transmission infrastructure assets when compared to a design that would meet the requirements of the SQSS generation connection criteria. It can be argued that a local charge that more accurately reflects the costs that users impose on the system should produce lower charges that reflect these reduced costs.

3.21. NGET has considered two options for considering security in the local charge: a project-specific local charge that would be able to provide a signal to all types of partially redundant connections utilising the Secure Load Flow (SECULF)[13] model; and the proposed local charge using a generic security factor.

3.22. Under the proposed generic approach, if the loss of the connection circuit would result in loss of access to the network, then a security factor of 1.0 is applied to the local charge calculation, whereas for all other instances the security factor will be the existing GB average security factor used in the existing TNUoS calculation, currently 1.8. This approach does not provide further differentiation for the capacity between the extremes of single circuit and fully compliant designs. It therefore exposes all partially redundant users to the costs of additional redundancy, up to the maximum level represented by the global factor of 1.8.

3.23. One respondent to NGET's consultation made the observation that it appears to be perverse that the cost reflective signal is blunted by applying a generic local security factor. In the first instance, the approach understates the costs of a double circuit connection by application of the global "average" security factor. Further, the proposed approach takes no account of partial redundancy which currently exists in the connections for a subset of generators. We note NGET's response that the application of a global security factor of 1.8 provides a balance between the need to give users a sufficiently cost-reflective signal and a proportionate solution to the number of generator connections involved, the majority of which have either a single circuit variation or have redundancy that more closely equates to a factor of 1.8.

3.24. NGET acknowledges that further work needs to be done in relation to developing enduring arrangements which incorporate the cost implications of partial redundancy in transmission charges. NGET further states that there are operational considerations that will affect the outcome and final form of these arrangements, for

[13] SECULF models nodal marginal costs of a network secured against all SQSS contingencies. The SECULF cost differentials are compared to those derived from the DCLF and the resultant ratios are then used to determine the security factor using the Least Squares Fit method.

example: average or minimum circuit ratings, expected frequency, duration and magnitude of export restrictions. NGET considers that this constitutes a significant development to the existing methodology and will require full industry engagement before such changes are made.

3.25. In developing this Impact Assessment we sought further clarification from NGET on the issue of partial redundancy, in particular we sought detail on the factors hindering the development of a partial security factor. In subsequent discussions, NGET has clarified that 38 generator connections are not directly connected to a MITS node, 25 of which do not have a single circuit connection. Under NGET's proposals the charges for these generators will utilise a security factor of 1.8. NGET has further clarified that 6 of the 25 generators are classified as having 'partial redundancy' and therefore may be required, under certain operating conditions, to constrain their export following the loss of specific parts of their "customer choice" design variation connection. The implication being that the other 19 generators are still able to export to the transmission network in the event of system faults.

3.26. NGET notes that for 3 of the 6 'partial redundancy' designs, the circuit that connects the generator (including transformers) are "sole-use" and therefore charged as connection assets. Consequently, the vast majority of the asset savings that result from the "customer choice" design variations are already wholly reflected in the asset-specific connection charge. Furthermore, NGET notes that the remaining three generators are part of a single hydro cascade scheme which is connected by a 132kV double circuit which is charged as infrastructure. NGET considers that under typical operating conditions full export from two of the generators can still occur during an outage of either of these circuits, although under specific and infrequent conditions (e.g. low wind, high temperature, exporting local distribution network) the SO may be required to partially constrain the total export from the generators.

3.27. NGET is of the view that developing a partial redundancy security factor (from a simple ratio of local circuit capacity to generator export limit)[14] for the above connections is complicated by the following two main factors:

- Determining a capacity for the local circuits is subjective and will vary depending on factors such as time of year. In addition where multiple local circuits exist as parallel paths a more complicated calculation methodology is required, and

- The actual size, frequency and duration of any potential export constraint on a partial redundancy generator are not readily quantifiable. Typically, specific parameters are not quantified within the generator's commercial agreements, such as the Bilateral Connection Agreement. This contractual flexibility allows the SO to take specific real time conditions into account, such as the generation background or weather conditions, to minimise the magnitude and duration of any restriction on the generator.

3.28. In light of the above, NGET concludes that a robust and cost reflective solution must be suitable for all types of connection, including future offshore connections. NGET is of the view that such a solution may need to take into account average or minimum circuit ratings and might need to factor-in the expected frequency,

[14] As introduced in the Conclusion Report GBECM-11.

duration and magnitude of export restrictions. Such a change would be a significant development of the existing Charging Methodology. Full industry engagement and consultation would be required before enduring partial redundancy-specific adjustments are proposed.

3.29. We note the further clarification provided by NGET on the scope of partial redundancy in connection designs and the complications faced in the development of a comprehensive solution. In making our decision on the proposed modification, we need to consider this issue along with the overall improvements to the cost-reflectivity that the proposal is likely to bring. We would welcome further views on both the proposed approach and the effects of not including consideration of partial redundancy in the local charge calculation. We are particularly interested in receiving further clarification on the differentiation between the 6 generators deemed to have 'partially redundant' connections and the remaining 19 generators who either have connection designs that are fully compliant, or have operational conditions that allow for export after credible system faults.

Separating the substation element of the local charge

3.30. NGET's proposal introduces an approach to the treatment of all substation costs which differs from the way they are treated in the wider TNUoS methodology. Within the current methodology, the costs for all non-locational infrastructure assets located at the substation (generation or demand) are contained in the residual element of the overall TNUoS charge and levied to all users on a non-locational flat rate, determined by TEC.

3.31. NGET argues that to truly reflect the infrastructure asset cost savings associated with local generator connections, it must include substation assets within the local charge. As such, the proposal would introduce two differences within NGET's charging methodology:

- The treatment of the infrastructure substation costs associated with demand connections will continue to be contained in the residual element of the overall demand TNUoS charge and levied to all users on a flat rate. This is different from the proposed treatment of generation substation connection costs; and

- Wider system security infrastructure substation asset costs (e.g. protection equipment) will continue to be charged across all users through the residual element of the GTNUoS charge, as these assets are deemed to benefit all users of the transmission system. This is different to from the proposed treatment of infrastructure substation asset costs relative to each local generation connection.

3.32. We recognise the merits of NGET's arguments for introducing a separate substation charge for all generators by splitting out the generic cost of the infrastructure substation assets of each generation substation from the revenue to be recovered via the residual component of the TNUoS charge.

3.33. We note that NGET is not proposing an equivalent arrangement to sharpen the cost-reflective charging signal for substation infrastructure assets associated with demand connections. We further note NGET's explanation that the proposal is limited

to charging arrangements for generation customers because the issues in question are explicitly associated with the local generation connection and not demand.

Calculating the substation element of the local charge

3.34. NGET proposes to disaggregate the relevant capital transmission investment costs, associated with the local substation assets for generation connections, from the wider residual element of the generator TNUoS charge. NGET proposes that the generator's connection substation will be categorised against three cost determining factors to determine its local substation charge: the connection voltage; the sum of all TEC at the connecting substation against a threshold level of 1320MW; and the level of redundancy at the substation. The local substation charge will then be determined by this categorisation.

3.35. A description of the cost factors and NGET's justification for the feasible states are given below.

- *HV connection voltage* - Different voltage levels are applied to mitigate the £/kW cost variance that exists between substation assets at different connection voltages at the boundary between the user's connection assets and the transmission system.
- *Sum of the TEC at the connecting substation* - Substation assets are required to have sufficient levels of asset to protect against power loss that exceeds the infrequent infeed loss risk, which is currently 1320MW under the SQSS. Costs significantly increase when this threshold is breached.[15]
- *Single circuit/redundancy connection* - This reflects the capital savings associated with design variation connections, i.e. a single busbar/single switch mesh connection or a redundancy connection with a double busbar substation design.

3.36. We note the merit of the close linkage between the local substation charge element and the factors affecting the design and costs of the substations. Parties' views are welcome on the appropriateness of the proposed differentiation of substation charges.

3.37. We would also welcome respondents' views on whether it is appropriate for NGET to derive the substation local charge component from the costing of generic connection designs from all three TOs. In particular, we are interested to receive views on: whether the number and type of generic design chosen by NGET are appropriate; reflect the actual level of capital costs of each category; and on the averaging process in general.

[15] There is a review of the 1320MW threshold being considered by a Working Group and is expected to deliver a report to the Authority in July 2009. We note that NGET will have to consider consequential impacts on other documents (including charging methodology) of any change that is proposed to the SQSS when such proposals are developed.

Review of cost data

3.38. To derive the local charge, NGET used revised cost data for a range of connection and substation designs. As discussed above, in terms of the local circuit charge, NGET has proposed the introduction of four additional local expansion factors to replace the existing single 132kV OHL expansion factor, determined not from a sample of actual project costs, but calculated from average generic cost data submitted from all TOs on the 18 theoretical feasible conductor/ tower constructions used for 132kV OHL's (i.e. these costs reflect the TOs assessment of the viable permutations of designs and cost solutions on their respective systems).

3.39. In making our assessment we must ensure that the local charge components are relevant not only to the type of connection that may be offered in the foreseeable future, but also to those that have been offered and built in the past. If the design assumptions and cost data used in the derivation of the local circuit and substation charges are appropriate then the effect should be that users (past, present and future) will face charges which more accurately reflect the costs that they impose on the system. We welcome parties' views on whether they believe these costs to be sufficiently reflective of, and appropriate for, the majority of connection types that have been and are currently being offered to customers.

3.40. In terms of ongoing review, NGET has stated that it intends to annually inflate the expansion constant element of the local circuit in line with the general TNUoS methodology. It is also proposed that the substation charge is inflated annually whilst also periodically being updated in accordance with the cost assumptions which underpin price controls. This is to maintain the cost reflectivity of the discounts going forward. We consider that this is appropriate and consistent with the principles upon which we base the transmission price controls. We would, however, welcome views on whether parties feel this is appropriate in terms of cost reflectivity and the forward-looking stability of the local charging arrangements.

Charging basis - TEC booked v transmission capacity installed

3.41. GB ECM-11 proposes to continue to base all charges, both local and wider, on the capacity that generators book through TEC rather than on the costs of total transmission capacity installed to facilitate connections. NGET's main justification for this is that it will protect generators from the actions of other users and network design decisions made by the TO, which could otherwise increase volatility whilst reducing the transparency of future charges.

3.42. Some parties raised concerns about this approach in their response to NGET's consultations. A particular concern was that users would not see appropriate signals to adopt a less secure connection, even when this was the most economic and efficient option available. This is because the local circuit charge may not take full account of the cost savings realised by the TO when building such a connection because of the inherent difference between transmission capacity purchased (relating to TEC) and actual capacity installed, which may include some headroom. We recognise that the treatment of spare transmission capacity installed for local circuits is internally consistent, i.e. both the additional costs and savings due to user choice are excluded from the local charges calculation. We also note that this treatment is

consistent with that of the overall spare capacity in wider infrastructure, i.e. based on generators TEC and not the actual capacity installed. We would welcome parties' thoughts and further analysis on this, particularly in light of any progress made since the previous charging modification proposals presented to the Authority.

Illustration of the cost reflectivity of specific treatment of generation connections

3.43. NGET's proposal is intended to provide a more cost-reflective charging signal for transmission infrastructure assets local to generation connections. The aim of this is to enable users to assess more effectively the cost and charging implications of alternative connection designs and make the most efficient and economic choice.

3.44. Some parties have raised concerns that the proposed approach does not send out an effective cost reflective locational signal to which generation can respond.

3.45. In subsequent discussions, NGET has provided further worked examples, developing those included in its August 2008 consultation. Appendix 6 reproduces NGET's further analysis which examines the Local Charging tariffs calculated for both a generic a double circuit spur connection and a single circuit spur connection at a connection voltage of 132kV and 275kV. We would welcome respondents' views on this analysis.

Competition

3.46. NGET's charging methodology is required to facilitate effective competition in the generation and supply of electricity. In broad terms, the proposals could impact on competition by:

- Creating an opportunity for generators to benefit from a potential source of competitive advantage which may not be currently available;
- Reducing the costs of entry for a particular class of new entrant seeking a less secure connection;
- Increasing the complexity of the charging methodology;
- Impacting on consistent and non-discriminatory treatment of users;
- The definition and application of local/wider system boundary; and
- The treatment of negative charging areas.

Each of these is considered in turn below.

Competitive advantage

3.47. We support the concept of customer choice and the positive effects it has on competition in markets. By providing choice and adequate information to make that

choice, customers are able to make decisions on the most efficient type of connection that accurately reflect the consequential costs and benefits. We are of the opinion that providing customers with an accurate local generator TNUoS charge promotes these principles.

3.48. NGET's proposal is consistent with this principle because it allows customer to choose the type of connection which is most suitable for their needs.

3.49. We are currently of the view that this modification promotes more effective competition by sharpening generators' exposure to the costs they incur on the system and the relative competitive pressures this exerts. We invite parties to comment further on this.

3.50. Some respondents to NGET's consultation have expressed the concern that the proposal will not apply equally to all generators. For example, respondents noted that some generators, with secure connections will receive a reduction to their TNUoS charge whereas some connecting by less secure designs will see an increase in charges.

3.51. We note the expectation of a reduction in TNUoS charge for generators connected with less secure designs. However, we also note that the splitting out of the local charge components may result in a change (upwards or downwards) from the current zonal average cost factors which may have been higher or lower than the cost reflective level.

Reducing the costs of entry

3.52. We consider that the disaggregation of the local and wider charge has the potential to reduce the costs of entering the market. We recognise that the proposed local charge would not be the determining factor for a generator between choosing to enter the market or not. However, the local charge could be an important factor influencing elements of the connection design and location of generators. By introducing a more cost-reflective signal at a local level, generators are provided with more information on and control over their costs. We would welcome respondents' views on this, in particular the types of generation that would benefit and the possible overall effects this may have on both the transmission network and market for electricity generation.

3.53. The proposed combination of the circuit and substation component of the local charge may be seen to particularly benefit small and intermittent generators (such as renewable generators). This is due to the fact that they may be able to better realise and benefit from the trade-off between the cost of transmission capacity and the level of security of the connection. We would welcome respondents' views on the types and size of generator that may benefit from NGET's proposals.

Complexity and transparency

3.54. A potential barrier to competition is the transparency and complexity of the rules under which generators participate in the electricity wholesale market.

Charging constitutes one element of those arrangements. The ability for customers to make informed decisions and choose their type and location of connection encourages competition and the ability to do so is, to a large extent, dependant on the extent to which the charging regime is both transparent and stable. We note that in developing the proposed modification, NGET has considered the balance between accuracy of cost signals and the potential complexity of the charging rules. We would welcome parties' views on whether the proposed modification strikes an appropriate balance between cost reflectivity, transparency and stability.

3.55. Some respondents to previous consultations voiced the view that the proposal increases the complexity of the charging methodology and introduces subjective engineering criteria to determine the local/wider system boundary. We welcome views on the complexity and transparency of the rationale for the MITS node definition as proposed by NGET, and for views on whether the proposed boundary strikes an appropriate balance between transparency, complexity and stability.

3.56. Respondents to NGET's modification consultation noted that, currently, there is a lack of published information to inform users of the next/nearest MITS substation and detailed constituent of the local circuits. Further, parties raised the concern that it is unclear how existing and prospective generation projects will assess Local Charges as the network changes. It was suggested that NGET should produce a geographic map of the location of the MITS nodes which may aid the judgement of how far prospective projects may be from the MITS. In response, NGET notes that new and future users will continue to be able to calculate TNUoS tariffs (both local and wider components) using the Transport and Tariff model which will be made public along with an associated guidance note (not yet available). In terms of the local charging component, NGET proposed more information on the Local Charge breakdown to be published within the annual Statement of Use of System Charges and that this will confirm whether a User is directly connected to a MITS node and the DCLF model will show which are the adjacent MITS nodes for those generators that are connect to a non-MITS node.

3.57. In developing this Impact Assessment we sought further clarification from NGET on the issue of transparency of data for the purpose of verifying local charges. In subsequent discussions, NGET has indicated that since the publication of the Conclusions report it has initiated development of a series of geographic network schematics (taken from the Seven Year Statement) to show the location of all MITS and non-MITS nodes. NGET intend to develop such diagrams as a future tool to aid potential generation projects in identifying the 'MITS/non-MITS' status of their adjacent connection nodes. The implication is that this information will be published as part of the annual Statement of Use of System Charges.

3.58. It is important to note that NGET acknowledges that supplementary information on the local and wider system construction events (e.g. new transmission circuit) that could have a significant effect on a users TNUoS charge will have to be incorporated within the future annual Condition 5 reports that forecast future trends in TNUoS tariffs.

3.59. We welcome views on whether NGET's explanation of how such an approach is to be updated and communicated in future provides users with adequate

transparency on the proposed local charge arrangements and their exposure to future changes.

Consistency and non-discrimination

3.60. A key consideration in the development of effective competition is that there should not be discrimination between participants in the market and arrangements should be, wherever possible and appropriate, consistent. We are currently of the view that NGET's proposal does not discriminate either in favour or against any class or type of generation user as all appear to be treated consistently. We would like to hear from parties who may hold an alternative opinion on this.

3.61. NGET's criteria for the local/wider system boundary, if deemed to be an accurate engineering representation of the network, may be applied across all users on a consistent, non-discriminatory basis. We note, however, that a number of parties have expressed concerns over the justification provided for the boundary definition and the lack of publicly available network information upon which users may better understand the application of their local/wider system boundary and detailed constituent of the local circuits. We invite respondents to provide further detail of their discrimination concerns and likewise any further justification for definition of the local wider system boundary contained in the modification.

3.62. Competition can be more effectively promoted if the charges for a service better reflect the costs of providing it. In this instance we feel that more effective competition would be encouraged if the levels of the local charge reflect the costs imposed on the transmission system by users and NGET's deterministic criteria to determine the local/wider boundary is well defined. We would particularly welcome views from parties on this point.

3.63. We request parties' thoughts on the view presented by NGET that while the proposal does change the basis on which the locational signal for generation and demand is charged NGET does not consider this to be significant. We are particularly interested in views on any potential competition effects arising from generator customers being exposed to a more cost reflective locational charge relative to demand connections.

Negative charging areas

3.64. An issue raised by parties during the development of the modification proposal related to the treatment of local circuit charges that were negative. We note that NGET's proposal has changed following consultation to allow negative local circuit charges in areas where incremental flows would actually reduce costs on the local system. An alternative approach of collaring any negative local circuit charge at zero was rejected by NGET on the basis that this change would provide signals to users to connect in the most efficient and economic manner and location and is consistent with the treatment of negative generation charging zones in the GB TNUoS charging methodology. We welcome views on the treatment of negative local charging areas.

Reflecting developments

3.65. NGET's transmission charging methodology must also properly take account of developments in the transmission licensees' transmission businesses.

3.66. The GB transmission system and the types of generation connecting to it are changing markedly. In particular, increasing numbers of smaller, more intermittent forms of generation are connecting at the periphery of the system. As a result, the transmission system needs to change and adapt to accommodate these changes. More generation is requiring connection away from the MITS, often by less secure circuit designs which can be built and connected to more easily and more cheaply.

3.67. Although the SQSS specifies minimum design criteria for the transmission system, users are increasingly looking to connect via less secure designs (subject to the criteria within SQSS). This is particularly the case with smaller renewable generators who may not require the security of a fully compliant connection. Within the current transmission charging arrangements, there is no cost signal or benefit for users to adopt these less secure connection designs, even though it would often be more economic and efficient for both them and the TO.

3.68. The current TNUoS charging methodology was identified as being deficient in providing sufficiently cost reflective charges to users considering connections which are not fully secure or distant from the MITS. NGET has responded to this by developing more cost reflective charging arrangements for local transmission infrastructure assets. It is proposed that the arrangements contained in GB ECM-11 will provide more cost reflective signals to generators when making decisions on connection design and location. We are currently of the view that the proposal will complement the changing nature of the transmission network and provide more cost reflective signals to users therefore assisting the development of an economic and efficient transmission system. We would welcome views from parties on this point.

4. Assessment against Authority's wider duties

Chapter Summary

This chapter sets out an assessment of the other key aspects of the proposal that are relevant to the Authority's wider duties. These include consideration of the impacts on consumers, non-discrimination, security of supply and the environment and the interaction with the Transmission Access Review process.

Question box:

Question 1. Do respondents wish to present any additional quantitative or qualitative analysis that they consider would be relevant to assessing this proposal?

Question 2. Do respondents consider that there are any aspects of the proposal that have not been fully assessed against the factors set out in this chapter?

Question 3. Do respondents consider that the exclusion of demand connection by the proposal would appear to discriminate between generation and demand users?

Question 4. We welcome further views on whether the proposals, by providing more cost-reflective charge signals to users choosing less secure connection designs, could have adverse impact on security of supply.

Question 5. Do respondents wish to present any further analysis on the wider implications of the benefit that may ultimately be expected to be passed through to consumers?

Question 6. Do respondents have any views on the interaction of NGET's charging proposal with TAR as set out in this chapter?

Areas for assessment

4.1. This section sets out an assessment of the impact of NGET's modification proposal on factors that the Authority must have regard to when carrying out its functions including its principal objective and statutory duties. This assessment is not intended to be an exhaustive assessment of all general duties but only those we consider are of relevance to the assessment of the impact of NGET's proposal.

Impact on consumers

4.2. It is in the interests of consumers that the transmission charging arrangements facilitate efficient use of and connection to the transmission system, which in turn ensures that the cost of delivery of the transmission infrastructure necessary for the associated transmission networks is not higher than it needs to be. It is these costs which will ultimately be borne by electricity consumers. As an illustration, the examples in Appendix 6 show that for a 150MW generator connected by a 40km 132kV overhead line, a design variation from a double circuit connection to a single circuit connection could reduce the connection costs by about £7m, whereas a

1200MW generator connected by 5km 275kV underground cables could result in a reduction of connection costs around £35m by choosing single circuit connection instead of two circuits.

4.3. To the extent that NGET's proposed discounts could result in some connectees more effectively assessing the cost and charge implications of alternative connection designs and making the most efficient and economic design choice then the total costs of transmission should, over time, be reduced to the benefit of consumers.

4.4. If the cost-reflective charging signal for transmission assets local to generation connections did not accurately reflect the level of cost that a user imposed on the local transmission network then any positive impacts on consumers are likely to be diluted or not realised at all. For example, if the cost reflective signal was not an accurate reflection of the costs imposed or avoided it would be expected that users would not be able to make efficient decisions when choosing connection designs and location. The impact of this is that fewer parties would opt for an efficient single circuit connection and thus the total costs of the transmission system would be at a less economic level, to the detriment of consumers.

4.5. In seeking to quantify the impact on consumers, it is important to assume that all costs and benefits that apply uniformly to all generators will be passed through to consumers. This includes additional wider transmission costs which are socialised through the current Transmission Charging Methodologies, for example constraints costs and reserve costs which are collected via a uniform Balancing Services Use of System (BSUoS) charge. We welcome parties' views on the wider implications of the benefit that may ultimately be expected to be passed through to consumers. Below are some of the impacts that we believe to be relevant:

Potential benefits

- Carbon abatement – savings arising from the fact that transmission investment associated with connecting any form of generation has its own impact on the environment, in terms of the reduced visual impact associated with secure connections, carbon used to produce steel (e.g. for towers) and other materials used to build it, the potential leakage of very harmful greenhouse gases used in the transformers and other equipment used to operate the system.

- Wholesale electricity prices – reducing electricity prices arising from ensuring that the cost of delivering the infrastructure necessary for the associated transmission networks is not higher than it needs to be.

- There are also secondary effects to consider arising from the choice to connect via a less secure connection design such as the potential for speedier connection of renewable generation given the barriers to connect.

Potential costs

- Although not a direct impact of the proposed change to the charging rules, there is a potential negative secondary effect of additional reserve costs – costs associated with increased reserve requirement from conventional plants to make

up sudden shortfalls, due to the increase in connected capacity of intermittent wind generation.

Non discrimination

4.6. Under this proposal, all generation that is currently subject to TNUoS charges will be eligible for a modified TNUoS charge comprising a local locational element, a wider locational element, a local substation element and a residual element.

4.7. We think it is appropriate to consider whether the proposal raises discrimination issues. NGET agreed with this comment but noted that they believed that the effect is not significant. Indeed, generation and demand are already charged with a differing signal, in particular with regards the infrastructure / connection asset boundary at a GSP. Furthermore, the use of system charge itself is also established on a different basis: TEC for GTNUoS, and metered demand and the values of Triad for demand TNUoS charges. Further views are invited on this issue.

Security of supply

4.8. The key issue in relation to security of supply is the ongoing role of the SQSS. The SQSS sets out a coordinated set of criteria and rules (for example cost-benefit techniques and weather-related operation) that the GB transmission licensees shall use in the planning and operation of the GB transmission system and the connection of generators. The SQSS requirements minimise the risk of a transmission fault compromising the security of the wider transmission system and the ability of the GBSO to discharge its operational responsibilities. The SQSS criteria also ensure that any choice of non-standard connection design has no implication for the security of the MITS or for the security and quality of supply for all customers.

4.9. We are of the initial view that the proposed charging change itself does not impact on the connection design choice available to generators and whether or not generators are allowed to be connected with lower security designs. On this basis, we do not consider there to be any negative security of supply impacts associated with NGET's proposed change. We welcome parties' views on this.

Best regulatory practice

4.10. The modification proposal, and more explicitly Ofgem's approach to assessing the proposal, is relevant to the Authority's obligations regarding best regulatory practice. Our decision to publish this impact assessment and to give six weeks for responses is in line with our published impact assessment guidance. Taking into consideration the need to provide a sufficient period of time to consider respondents' views and noting the extensive consultation process that has already been undertaken on the related topic of specific charging arrangements for SQSS design variation connections; we consider that a six week consultation period is appropriate.

Impacts on sustainable development

4.11. We have considered GB ECM-11 in the context of the five sustainable development themes, set out below, which were identified by the Authority, drawing on the UK Government's Sustainable Development Strategy that set out how Ofgem will contribute to the sustainability agenda[16].

Managing the transition to a low carbon economy

4.12. We consider that the theme of managing the transition to a low carbon economy is particularly relevant to GB ECM-11. Much of the electricity generated in the UK is produced by power stations burning fossil fuels, leading to emissions of greenhouse gases and other pollutants. In recent years electricity generation has accounted for around one third of UK CO2 emissions. There is a clear imperative at EU and domestic level that there needs to be a substantial decrease in the emissions of carbon dioxide from the generation sector. Any proposal which facilitates individual parties to take better account of the relevant costs they incur on the network when making economic and efficient decisions on whether to trade electricity between specific locations will contribute towards the economic development of the transmission system across GB. In doing so, this may help meet the UK's emission reduction commitments under the Kyoto Protocol, and meet the domestic targets of a reduction in CO2 to 20 per cent below 1990 levels by 2010, and 60 per cent below 1990 levels by 2050. More accurately reflecting costs of economic and efficient investment decisions may also better facilitate earlier connection of certain generation connection designs. This could help attain the EU's total target of 20% contribution of renewable energy by 2020. The ability to meet the UK's target of 15% by 2020 could potentially benefit from GB ECM-11.

4.13. From a sustainable development perspective, another relevant consideration is that removing the cost-reflectivity deficiencies of the existing charging approach resulting from the application of averaging approaches will result in users being better placed to take better account of their transmission costs in making more efficient decisions when choosing connection designs and locations. This may enable more timely connection of generation, in particular renewable generation locating at the periphery of the network.

4.14. Other things being equal, the types of generator that are most likely to consider the option of a single circuit connection in light of more cost reflective information on the costs they impose of the system are remotely situated intermittent generators such as wind farms. NGET's proposed local charging arrangements is therefore likely to be positive for the economic connection of intermittent generation which in turn will have a beneficial impact on the environment.

Promoting energy savings

4.15. To the extent that GB ECM-11 increases the volume of electricity generated in the north and peripheral areas of GB, it may lead to an increase in transmission

[16] See Ofgem's second annual Sustainable Development Report, November 2007.

losses, although this is likely to be a second order effect compared to the impact on constraints costs. Our analysis does not quantify the impact on transmission losses.

Eradicating fuel poverty and protecting vulnerable customers

4.16. The Authority has duties in relation to the impact of proposals on the sick, disabled, elderly, those on low incomes and rural customers, as well as to contribute to the achievement of sustainable development. In considering the impact of the proposals, we are required to have regard to UK Government guidance regarding the attainment of social and environmental policies.

4.17. Our initial view is that, further to the issues considered above in relation to sustainable development, the most important consideration from the perspective of social objectives is the overall impact of GB ECM-11 on consumers. We must make sure that measures we need to take to tackle climate change are not any more expensive than they need to be. As we set out elsewhere, under GB ECM-11 we would expect to see no increase in the costs that consumers will be expected to pay as a direct result of this modification, although the effect of consequential factors (i.e. increase in constraint costs as a result of existing wider network reinforcement issues) and an advancement of Renewable Obligation Certificate payments may be relevant secondary effects.

Ensuring a secure and reliable gas and electricity supply

4.18. GB ECM-11 is likely to promote greater diversity in electricity supply by encouraging the development of new renewable generation. Furthermore, the charging rules themselves do not change whether the wider transmission network is SQSS compliant or not. Instead, any potential constraint due to local connection design variation should be borne by the individual user as part of the trade-off decision associated with uncompensated access restrictions.

Supporting improved environmental performance

4.19. To the extent that impacts on the investment decisions of individual users to the transmission network, or impacts on whether or not a given generation connection design is deemed by the users to be economic and efficient, it may also have broader environmental impacts in terms of visual amenity. We believe that GB ECM-11 would have the affect of bringing forward any potential benefits in terms of reduced impact on visual amenity, e.g. less secure connection may have less visual impact, which may not have arisen in the absence of GB ECM-11.

Impacts on health and safety

4.20. We do not consider that this modification proposal will have any impact on health and safety.

Risks and unintended consequences

4.21. Given the Authority's principle objective to protect consumers' interests, one of the key risks associated with GB ECM-11 is that the ability of users to make an efficient decision when choosing connection designs and/or making investment decisions may be restricted. This could occur where:

- The component levels of local charge are either too low or too high, or
- The deterministic boundary criteria are misaligned somehow.

4.22. In such an instance, the local charge would provide insufficient signal of the costs of connecting by various designs of connection. In doing so, competition would be distorted to the detriment of the market. We would particularly welcome views from parties on this point.

4.23. We also note the following potential risks and unintended consequences associated with the GB ECM-11 conclusions on partial redundancy:

- The absence of security factor that recognises partial redundancy may restrict the development of the charging arrangements relevant to offshore networks.
- The application of the existing global security factor of 1.8 to all non-single circuit connections designs (currently 25) will not reflect the actual, or appropriate, level of security associated with these specific connection designs and therefore does not deliver a GTNUoS charge fully reflective of the level of security inherent in these individual designs.

4.24. We would welcome respondents' views on the above concerns; in particular further clarification on the generator export limits of a small subset of the 25 specific generators that do not have sufficient capacity to allow full generation export following a local circuit outage.

Interaction with TAR

4.25. GB ECM-11 is being considered at a time when the industry, Ofgem and Government are developing proposals for a new regime for transmission access under TAR. Ofgem and industry are working hard to ensure that access to the transmission system, and resultant transmission charges, do not act as a barrier to any form of generation technology or connection type. Proposals for the reform include: a fundamental re-design of the existing access arrangements; measures to provide appropriate incentives for the transmission operators to build new infrastructure in a timely and efficient manner; and short term measures to help minimise the current queue for connections.

4.26. The transmission system comprises both assets that form part of the 'wider transmission system' and assets that can be said to be 'local transmission system' assets. The proposed charging modification aims to more accurately define the assets that constitute local and wider transmission system infrastructure in order to

better facilitate the consideration of different connection designs for access to the system. In doing so, the proposed split could potentially better facilitate the delivery of access reform under TAR.

4.27. However, whilst there may be a consequential effect on the ongoing discussions within the TAR process, our consideration of GB ECM-11 is not dependent on the progress of TAR. The aim of the proposed modification is to improve the cost-reflectivity of local infrastructure charges rather than to reform in wider system access rights, the long term aim of the TAR process. We acknowledge that the proposed TAR framework currently being developed by industry (e.g. CAP 165 and CAP 166) may contain some minor elements that do not fully align with all components of GB ECM-11. However, the package of proposals to introduce the enduring TAR arrangements has not yet been agreed and we therefore do not consider that TAR considerations should impact on our consideration of this proposal.

4.28. We consider that, if GB ECM-11 is approved, industry may consider it is appropriate that some of the changes being proposed as part of TAR may be brought forward after GB ECM-11 is implemented. We also consider that any of the proposed TAR changes, if approved, are unlikely to remove the need for users to take into account the cost impact of their individual choice of connection design, or the principle of cost reflective transmission charging to ensure that transmission network costs should be paid by the users of the network that are responsible for imposing those costs.

4.29. We would welcome respondents' views on the interaction with TAR.

5. Process and way forward

Chapter Summary

This chapter sets out the process that we intend to adopt in order to reach a decision on the charging modification proposal and identifies a timetable for the publication of that decision.

Proposed process

5.1. In line with our published guidance on impact assessments, this document provides six weeks for respondents to submit any comments. The Authority will take responses, and any other relevant information, into account in making its decision as to whether or not to veto the proposal.

5.2. SLC C5(4) of NGET's electricity transmission licence sets out that, where the Authority intends to undertake an impact assessment, NGET will not make any modification to the use of system charging methodology within three months of the report being furnished to the Authority. Therefore, we intend to publish our decision on NGET's proposal on or before 15 December 2009.

Proposed implementation timescales

5.3. If the Authority's decision is not to veto, NGET is seeking to implement the modification proposal from 1 April 2009. This would allow the proposal to be reflected in charges for the TNUoS charging year 2009/10.

5.4. In accordance with NGET's transmission licence, NGET are required to provide final TNUOS charges two months before the start of the charging year and produces indicative tariffs one month before then.

Further information

5.5. Appendix 1 sets out both the details for responding to this Impact Assessment and the appropriate contact details should you have any questions. It also sets out a list of all the key areas where we have sought respondents' views in relation to the contents of this document. Respondents' views are welcomed on any other aspect this Impact Assessment.

Appendices

Index

Appendix 1 - Consultation Response and Questions

1.1. Ofgem would like to hear the views of interested parties in relation to any of the issues set out in this document.

1.2. We would especially welcome responses to the specific questions which we have set out at the beginning of each chapter heading and which are replicated below.

1.3. Responses should be received by Friday 5 December 2008 and should be sent to:

Anthony Mungall
Transmission Directorate
Networks
Ofgem
70 West Regent Street
Glasgow, G2 2QZ

Tel: 0141 331 6010

Email: Anthony.mungall@ofgem.gov.uk

1.4. Unless marked confidential, all responses will be published by placing them in Ofgem's library and on its website www.ofgem.gov.uk. Respondents may request that their response is kept confidential. Ofgem shall respect this request, subject to any obligations to disclose information, for example, under the Freedom of Information Act 2000 or the Environmental Information Regulations 2004.

1.5. Respondents who wish to have their responses remain confidential should clearly mark the document/s to that effect and include the reasons for confidentiality. It would be helpful if responses could be submitted both electronically and in writing. Respondents are asked to put any confidential material in the appendices to their responses.

1.6. Having considered the responses to this consultation, Ofgem intends to publish its decision on NGET's proposal by 15 December 2008. Any questions on this document should, in the first instance, be directed to the address above.

CHAPTER: Three

- ➔ Question 1. Do respondents wish to present any additional quantitative analysis that they consider to be relevant to assessing the proposal?
- ➔ Question 2. Do respondents consider that there are any aspects of the proposal that have not been fully assessed?
- ➔ Question 3. Do respondents consider that the key features of the proposal strike an appropriate balance between cost-reflectivity, transparency, complexity and stability? We welcome specific comments on appropriateness of the definition of local/wider boundary, the setting of the four components including the categorising and costing of relevant designs and asset types for local circuit and local substation.
- ➔ Question 4. Do respondents wish to present any additional views on the different treatment of generation and demand connections, both in general and in terms of the treatment of circuit and substation elements, resulting from this proposal?
- ➔ Question 5. We welcome further views on both the proposed approach and the effects of not including consideration of partial redundancy in the local charge calculation, particularly on the generators deemed to have partial redundancy.
- ➔ Question 6. Do respondents wish to present any further analysis on the proposed treatment of spare asset capacity relative to contracted TEC, particularly the effect on the cost signal to adopt the most economic and efficient option available?
- ➔ Question 7. Do respondents consider that this modification promotes more effective competition by sharpening generators' exposure to the costs they incur and the relative competitive pressures this exerts? Conversely, do respondents wish to provide further detail of any discrimination concerns?
- ➔ Question 8. Do respondents consider that the proposal complements the changing nature of the transmission network and assists the development of an economic and efficient transmission system?

CHAPTER: Four

- ➔ Question 1. Do respondents wish to present any additional quantitative or qualitative analysis that they consider would be relevant to assessing this proposal?
- ➔ Question 2. Do respondents consider that there are any aspects of the proposal that have not been fully assessed against the factors set out in this chapter?
- ➔ Question 3. Do respondents consider that the exclusion of demand connection by the proposal would appear to discriminate between generation and demand users?
- ➔ Question 4. We welcome further views on whether the proposals, by providing more cost-reflective charge signals to users choosing less secure connection designs, could have adverse impact on security of supply.
- ➔ Question 5. Do respondents wish to present any further analysis on the wider implications of the benefit that may ultimately be expected to be passed through to consumers?
- ➔ Question 6. Do respondents have any views on the interaction of NGET's charging proposal with TAR as set out in this chapter?

Appendix 2 – The Authority's Powers and Duties

1.1. Ofgem is the Office of Gas and Electricity Markets which supports the Gas and Electricity Markets Authority ("the Authority"), the regulator of the gas and electricity industries in Great Britain. This Appendix summarises the primary powers and duties of the Authority. It is not comprehensive and is not a substitute to reference to the relevant legal instruments (including, but not limited to, those referred to below).

1.2. The Authority's powers and duties are largely provided for in statute, principally the Gas Act 1986, the Electricity Act 1989, the Utilities Act 2000, the Competition Act 1998, the Enterprise Act 2002 and the Energy Act 2004, as well as arising from directly effective European Community legislation. References to the Gas Act and the Electricity Act in this Appendix are to Part 1 of each of those Acts.[17]

1.3. Duties and functions relating to gas are set out in the Gas Act and those relating to electricity are set out in the Electricity Act. This Appendix must be read accordingly[18].

1.4. The Authority's principal objective when carrying out certain of its functions under each of the Gas Act and the Electricity Act is to protect the interests of consumers, present and future, wherever appropriate by promoting effective competition between persons engaged in, or in commercial activities connected with, the shipping, transportation or supply of gas conveyed through pipes, and the generation, transmission, distribution or supply of electricity or the provision or use of electricity interconnectors.

1.5. The Authority must when carrying out those functions have regard to:

- The need to secure that, so far as it is economical to meet them, all reasonable demands in Great Britain for gas conveyed through pipes are met;
- The need to secure that all reasonable demands for electricity are met;
- The need to secure that licence holders are able to finance the activities which are the subject of obligations on them[19]; and
- The interests of individuals who are disabled or chronically sick, of pensionable age, with low incomes, or residing in rural areas.[20]

1.6. Subject to the above, the Authority is required to carry out the functions referred to in the manner which it considers is best calculated to:

- Promote efficiency and economy on the part of those licensed[21] under the relevant Act and the efficient use of gas conveyed through pipes and electricity conveyed by distribution systems or transmission systems;

[17] entitled "Gas Supply" and "Electricity Supply" respectively.
[18] However, in exercising a function under the Electricity Act the Authority may have regard to the interests of consumers in relation to gas conveyed through pipes and vice versa in the case of it exercising a function under the Gas Act.
[19] under the Gas Act and the Utilities Act, in the case of Gas Act functions, or the Electricity Act, the Utilities Act and certain parts of the Energy Act in the case of Electricity Act functions.
[20] The Authority may have regard to other descriptions of consumers.

- Protect the public from dangers arising from the conveyance of gas through pipes or the use of gas conveyed through pipes and from the generation, transmission, distribution or supply of electricity;
- Contribute to the achievement of sustainable development; and
- Secure a diverse and viable long-term energy supply.

1.7. In carrying out the functions referred to, the Authority must also have regard, to:

- The effect on the environment of activities connected with the conveyance of gas through pipes or with the generation, transmission, distribution or supply of electricity;
- The principles under which regulatory activities should be transparent, accountable, proportionate, consistent and targeted only at cases in which action is needed and any other principles that appear to it to represent the best regulatory practice; and
- Certain statutory guidance on social and environmental matters issued by the Secretary of State.

1.8. The Authority has powers under the Competition Act to investigate suspected anti-competitive activity and take action for breaches of the prohibitions in the legislation in respect of the gas and electricity sectors in Great Britain and is a designated National Competition Authority under the EC Modernisation Regulation[22] and therefore part of the European Competition Network. The Authority also has concurrent powers with the Office of Fair Trading in respect of market investigation references to the Competition Commission.

[21] or persons authorised by exemptions to carry on any activity.
[22] Council Regulation (EC) 1/2003

Appendix 3 - Legal Framework for decision

Electricity Act 1989

1.1. The Electricity Act 1989 (the "Act") sets down the legislative structure under which the electricity industry operates including the roles and duties of the Authority. Sections 3A to 3C set out the Authority's principal objective and statutory duties.

1.2. The Authority's principal objective is "to protect the interests of consumers … wherever appropriate by promoting effective competition" amongst other things listed. In addition the Act places a number of other duties on the Authority including carrying out its functions in a manner which is best calculated to secure a diverse and viable long term energy supply and having regard to the effect on the environment.

1.3. On 5 October 2004 the Authority became subject to two additional statutory duties under the Energy Act 2004. These relate to contributing to the achievement of sustainable development and having regard to the principles of best regulatory practice. In carrying out its duties the Authority must also have regard to any additional guidance issued by the Secretary of State in relation to social or environmental policies.

1.4. In addition to the regulatory framework set out under the Act, the electricity industry is also subject to European law and competition law. Section 3D of the Act confirms that the obligations imposed on the Authority under Sections 3A to 3C of that Act do not override contradictory duties or obligations under European law including Directive 2003/54/EC concerning common rules for the internal market in electricity and Directive 2001/77/EC concerning the promotion of electricity from renewable sources in the internal market.

Licence obligations

1.5. Standard condition C5 of NGET's electricity transmission licence sets out the relevant licence objectives with which the use of system charging methodology must conform. These are:

a. to facilitate effective competition in the generation and supply of electricity and (so far as is consistent therewith) facilitates competition in the sale, distribution and purchase of electricity;
b. to result in charges which reflect, as far as is reasonably practicable, the costs incurred by the licensee in its transmission business; and that
c. so far as is consistent with sub-paragraphs (a) and (b), the Use of System charging methodology, as far as is reasonably practicable, properly takes account of the developments in the licensee's transmission business.

1.6. In making its decision whether or not to veto the proposed charging methodology the Authority will first consider if the proposals meet the relevant licence objectives.

Impact assessment

1.7. Section 5A of the Utilities Act 2000 (Duty of the Authority to carry out an impact assessment) applies where: (a) the Authority is proposing to do anything for the purposes of, or in connection with, the carrying out of any function exercisable under or by virtue of Part 1 of the Electricity Act or the Gas Act; and (b) it appears to the Authority that the proposal is important within the meaning set out in section 5A, but does not apply where the urgency of the matter makes it impracticable or inappropriate for the Authority to comply with the requirements of section 5A. Where section 5A applies, the Authority must either carry out and publish an impact assessment or publish a statement setting out its reasons for thinking that it is unnecessary for it to carry out an impact assessment.

1.8. Section 5A(2) sets out the matters which determine whether or not a proposal is "important" for the purposes of section 5A. These are where a proposal would be likely to:

d. Involve a major change in the activities carried out by the Authority;
e. Have a significant impact on market participants in the gas or electricity sectors;
f. Have a significant impact upon persons engaged in commercial activities connected to the gas or electricity sectors;
g. Have a significant impact on the general public in GB or in a part of GB; and
h. Have significant effects on the environment.

1.9. The Authority is required to assess a modification proposal and decide whether or not to veto it on the basis of whether it better achieves the relevant objectives set out in NGET's transmission licence and is in accordance with our wider duties and principal objective.

1.10. We consider the proposal to be "important" for the purposes of Section 5A on the basis that it represents a considerable change to the structure of NGET's use of system charging methodology, the derivation of applicable network charges for use of the transmission system and recovery of allowable revenue. In our view, these proposed changes would significantly impact the level of transparency and control over the costs that existing and future market participants in the electricity transmission sector impose on the system and the resultant charges levied on them.

Environmental issues

1.11. In assessing the impact of GB ECM-11 the Authority has taken account of the potential carbon savings which may arise from GB ECM-11. The Authority has also taken account of carbon savings in its preliminary assessment GB ECM-11 in terms of the Authority's wider duties, e.g. in relation to economy and efficiency, the environment and sustainable development, and the Authority's principle objective to protect the interests of current and future consumers.

Appendix 4 - Outline of NGET's modification proposal

1.1. The main features of NGET's current transmission charging structure and transmission charge components after the proposed modification are pictorially represented in Figures 1 and 2 and explained in more detail below.

Identification of the local/wider boundary

1.2. NGET proposes that all generation that is subject to TNUoS and not connected directly to a MITS substation will have a circuit component to their local charge. NGET has defined a MITS substation as:

- A GSP connected with 2 or more transmission circuits; or
- A substation connected with more than 4 transmission circuits;

Where:

- A GSP is defined as a point of supply from the GB transmission system to network operators or non-embedded customers excluding generator or interconnector load alone. For the avoidance of doubt, generators or interconnector load would be subject to the circuit element of its local charge.
- A transmission circuit is defined as being part of the transmission system between two or more circuit-breakers. This includes transformers, cables and overhead lines but excludes busbars and assets owned by generation.

1.3. The above definition aims to identify the typical point or boundary up to which a User may influence its connection design through design variation, under SQSS design variation criteria. Beyond this point NGET considers it not appropriate to target their costs as local transmission infrastructure assets that exist to facilitate the connection of a generator as the nodes defined perform a number of other roles (i.e. supply of demand or interconnection) and design variation is not possible due to the consequential cost impact on other Users.

1.4. NGET considers that the differentiation between wider transmission infrastructure and assets local to generation connections allows a more cost reflective signal to be produced while maintaining the advantages associated with the charging arrangements for the use of shared wider assets for the purpose of the bulk transfer of power.

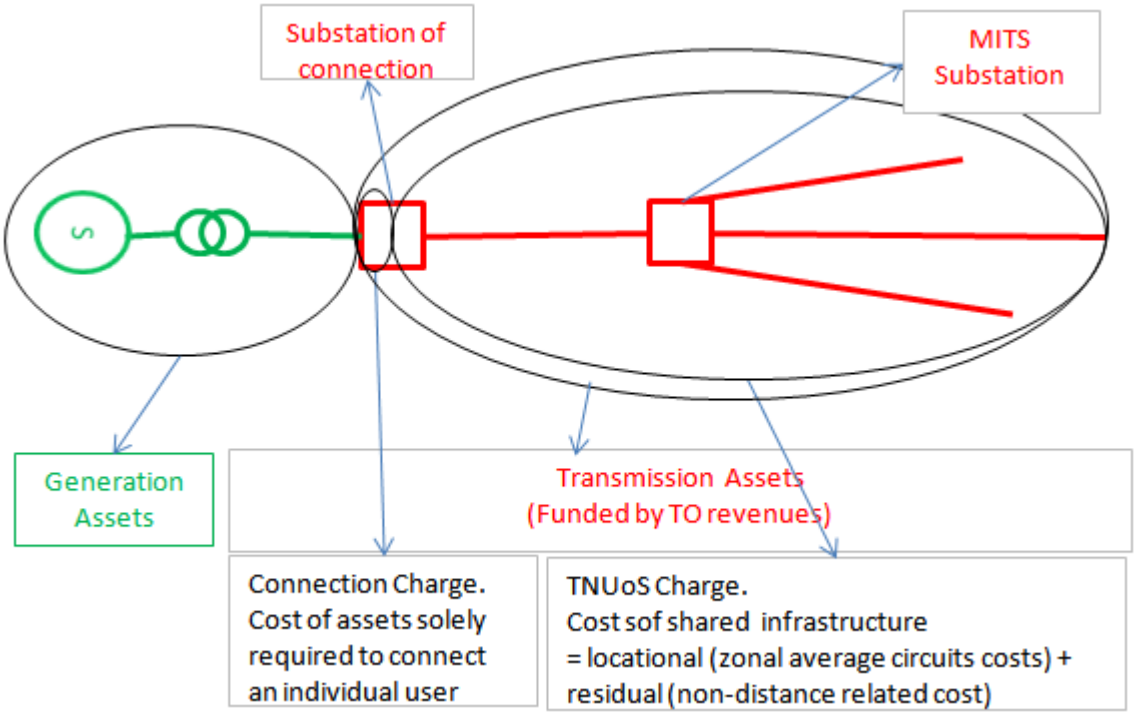


Figure 1. Current transmission charge components

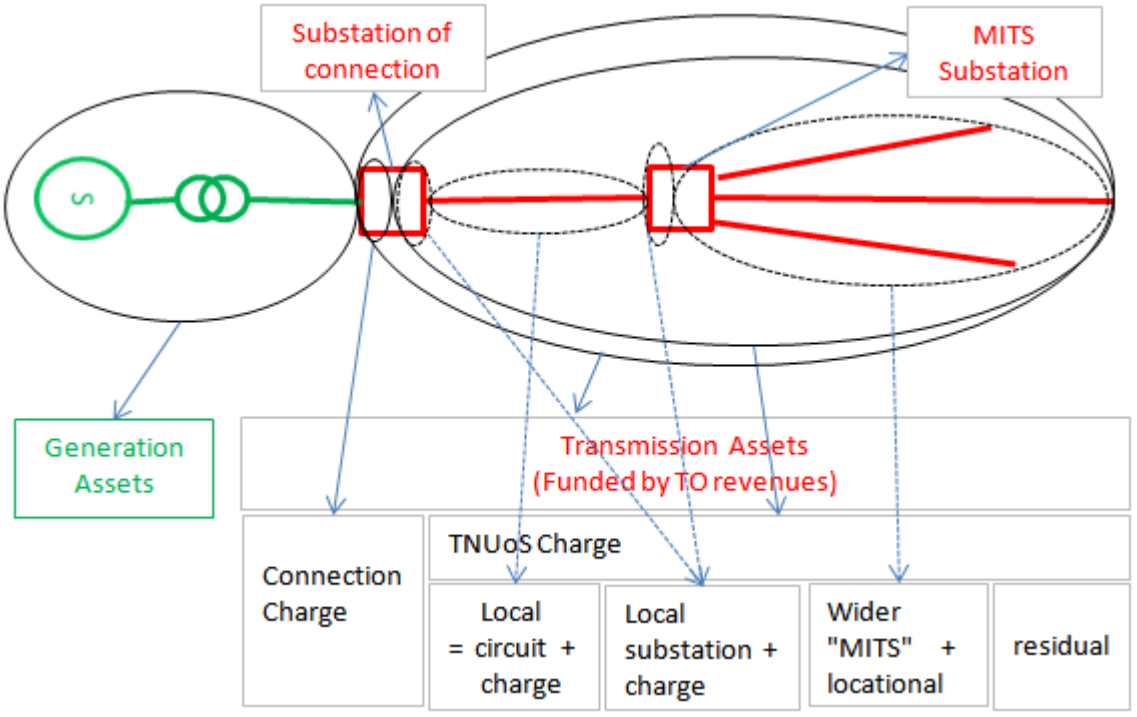
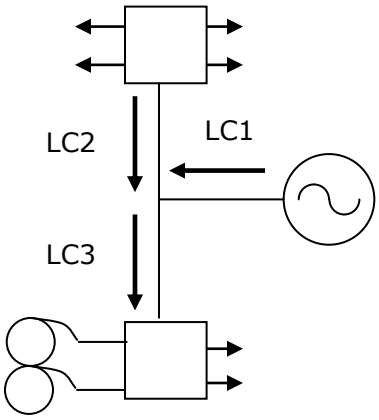


Figure 2. Transmission charge components after the proposed modification

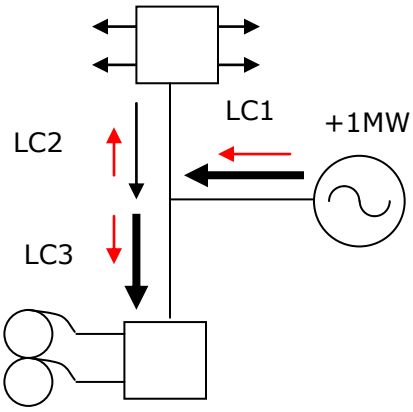
The local circuit charge

1.5. The first part of the local generator charge is intended to more accurately reflect the incremental transmission infrastructure asset costs in order to connect generators to the interconnected network. These costs are based on the incremental flow along identified local transmission infrastructure circuit assets. NGET proposes to derive the local circuit charge by examining the incremental power flows along these assets where the local circuits are all the relevant circuit paths between the generation node and the entry point to the MITS (as determined by NGET) under NGET's charging model. This charge is based on revised cost data received from the three transmission licensees and a more specific treatment of transmission infrastructure assets deemed by NGET to be 'local' circuit infrastructure.

1.6. This proposed calculation approach is consistent with that currently used to calculate TNUoS locational tariffs. The incremental flow along all local circuits is found by using the Direct Current Load Flow (DCLF) model, currently used to calculate the locational element of the TNUoS charge. The model will compare the total marginal flow (in MWkms) along all the identified local circuits after the addition of an extra 1MW of generation at the connection node and 1 MW of demand at the next MITS substation, i.e. the local reference node[23]. The total marginal flow eligible for inclusion in the local circuit charge is determined on a site-by-site basis. The derivation of this local incremental power flow is pictorially represented below.



Total local circuit flow across balanced system = LC1+LC2+LC3 = X MWkm



Total local circuit flow associated with incremental 1MW = LC1+LC2+LC3 = Y MWkm

Unadjusted incremental local circuit flow = Function of Y - X MWkm

1.7. At a local level, NGET proposes to replace the existing single 132kV OHL expansion factor with four local expansion factors to better reflect the significant variance in 132kV OHL costs. The local expansion factors are applied to this

[23] The local "reference node" is the nearest MITS substation determined by application of NGET's deterministic boundary criteria. For generation the marginal cost is calculated by modelling the impact of adding 1MW at the generation node whilst removing it at the nearest MITS substation.

incremental local circuit flow in order to determine the total incremental flow across the local infrastructure circuits. This calculation is summarised below:

*Adjusted incremental local circuit flow = Unadjusted flow (MWkm) * (relevant) Local Expansion Factor*

1.8. The total incremental local circuit flow can then be converted into a nodal specific circuit component of the local charge using the following formula:

Circuit local charge (£/kW) = Adjusted incremental local circuit flow (MWkm) x Local security factor x Expansion constant (£/MWkm) / 1000

1.9. All generation with wider access rights remain liable for a wider zonal TNUoS locational charge which will continue to relate to the transmission infrastructure circuit asset costs imposed by generators directly connected to a MITS substation. This charge is derived from the incremental power flows along transmission infrastructure assets between the generation node and the system 'slack node'[24] determined by NGET's existing charging model. This charge is calculated consistent with the existing methodology and based on the existing averaging approaches and generic cost base of the current charging model.

1.10. To avoid double counting, the incremental flow cost along the local circuits will be subtracted from the wider zonal generation cost weighted average on which the wider zonal tariff is based.

1.11. For connections where the net incremental flow on the local circuits is negative, i.e. the net flow on the local circuits is decreased by an increase in generator output, the local locational circuit charge component will also be negative. Such payments will be treated in the same manner as existing negative generation TNUoS zones.[25]

1.12. The definition and derivation of the local expansion factors and the Local Security Factors are critical to the cost-reflectivity of the local circuit charges. These are described in more detail in the next section.

1.13. The effect of refining the locational TNUoS charge component in the GB charging model is to reduce the proportion of total revenue recovered across all

[24] The slack node is determined by NGET each year as the notional centre of the network and is used to calculate the marginal cost for each node. For generation the marginal cost is calculated by first modelling a base case to indentify the electrical flows across the network consistent with a balanced system at times of peak demand. This identifies the most interconnected node or central hub of the system. The "balanced" model is then re-run to see how electrical flows would differ if there was an additional 1MW of generation capacity at each node on the network (balanced by 1MW of demand). This gives an incremental flow of electricity around the network from the node inserting power to the "slack node".

[25] The chargeable capacity for power stations with negative local charge tariffs is the average of the capped metered volumes during the following three settlement periods: the highest metered volumes for the power station and the two half hour settlement periods of the next highest metered volumes separated by at least 10 clear days, between November and February of the relevant financial year inclusive.

generation customers from the wider locational element of the TNUoS charge and increase the total revenue to be recovered across all generation customers from the locational component of the TNUoS relative to the existing locational charging arrangements.

The substation charge

1.14. NGET proposes that a local substation component will be levied on all generators. The generator's local connection substation will be categorised against three cost determining factors to determine the substation element of the local charge tariff. A description of the cost factors and the feasible states are given below.

- *HV connection voltage* - The voltage of the first substation at the boundary between the user's connection assets and the transmission system; 400kV, 275kV or 132kV and below.
- *Sum of the TEC at the connecting substation* - The combined TEC of all generation at the connecting substation. Less than 1320MW or greater than 1320MW.
- *Single circuit/redundancy connection* - A single busbar/single switch mesh connection or a redundancy connection which includes a double busbar substation design; single circuit or redundancy connection.

		Substation Local Charge (£/kW)		
		132kV	275kV	400kV
<1320MW	Single	0.129	0.078	0.063
<1320MW	Double	0.291	0.186	0.150
>1320MW	Single	-	0.249	0.201
>1320MW	Double	-	0.404	0.325

1.15. This second part of the local generator charge is intended to more accurately reflect and distribute the costs of infrastructure substation assets required to connect generators to the interconnected network. These costs are not distance related. The effect is to remove these costs from the revenue to be recovered via the residual component of the generator TNUoS charge, based on costs underlying the current price control, and introduce a more specific treatment of substation costs relative to the existing flat value for all generator connection designs.

1.16. The Local Substation Tariffs have been derived from generic cost analysis performed using data received from the three transmission licensees. The cost analysis compared the substation costs associated with six generic substation designs and an assumed capital cost using TO average costs of each substation design. The result is a total charge of £19m per annum for the local substation component. Consequently, the total amount to be collected from the generation residual from generation customers would be reduced by the same amount.

1.17. NGET proposes to review the local substation charge at the beginning of each price control period and will subsequently be subject to annual inflation adjustment by RPI for each subsequent year of the price control period.

Improving the cost reflectivity of the local circuit charge

5.6. The aim of the local circuit charge is to provide a more cost reflective signal through application of local expansion factor and local security factor elements. Each of these factors is summarised in turn below.

Local expansion factor

5.7. NGET proposes to derive applicable local expansion factors from specific costs (submitted by the relevant TOs in 2007). NGET considers these *a*re reflective of most types of circuit connections currently being built by TOs, as well as those proposed in the foreseeable future.

5.8. As noted above, NGET proposes to replace the existing single 132kV expansion factor with four local expansion factors in order to better reflect the OHL costs. The new local expansion factors were calculated taking account of data provided by the three transmission licensees. The level of each new expansion factor was derived by NGET based upon the two cost-determining variables, namely: the number of circuits per route and circuit capacity (based on continuous winter MVA rating). The table below shows each of the four 132kV OHL expansion factors that NGET has proposed, to determine the incremental flow on local circuits.

Circuit Capacity (MVA)	Construction	132kV OHL Expansion Factor
<200	Single	10.000
	Double	8.319
=>200	Single	7.134
	Double	4.423

5.9. The impact of using a more accurate cost base in the derivation of a local expansion factor, for the calculation of the local circuit charge, is that the conversion rate applied to the overhead line used to connect a local user will be higher than the weighted average conversion rate applied currently. The proposed local circuit charge is therefore argued to provide a more cost signal at a local level than that used to derive the wider TNUoS tariff applied across GB.

Local security factor

5.10. The formula to derive the local circuit charge has also been modified to reflect a "local" security factor of 1.0 for those connecting by single circuit rather than the current GB locational security factor of 1.8. The reason for this is set out below.

5.11. The application of the GB average locational security factor (currently 1.8) infers the "average" connection has an additional 80% redundancy to achieve

approximate consistency with the requirements of the criteria contained in the SQSS. The impact of this "average" approach will inevitably mean that the level of security assumed is not fully aligned with the security of each individual connection design. The current TNUoS charge levied on some users will therefore not reflect the actual, or appropriate, level of security associated with its specific connection design.

5.12. To address this issue, NGET proposes to modify the local circuit charge to reflect the local security associated with a connection that does not meet the requirements of the criteria contained in the SQSS. It is proposed that for any eligible local circuit, if the loss of the circuit would result in loss of access to the network, then the local security factor applied is 1.0, whereas for all other instances the local security factor will be charged at the existing GB average locational security factor value, currently 1.8.

5.13. The local security factor approach proposed by NGET assumes that should system conditions subsequently change such that either immediately or in the foreseeable future, the conditions within the SQSS are no longer satisfied (i.e. the connection adversely affects other customers in terms of cost or quality of service), then alternative arrangements must be put in place such that the standard continues to be satisfied. This means that, should a new customer wish to connect with an SQSS compliant design at the same point as one eligible to receive a local circuit charge, then the connection must be upgraded and the local circuit will have to be reassessed against whether it continues to meet the relevant local network criteria. If the node is no longer eligible for the local circuit charge (and the need to apply a local security factor) the generator will have a zero value for the local locational element of the TNUoS charge, reflecting a local circuit length of zero, and be levied a TNUoS charge comprising a wider locational element - based on a global security factor of 1.8 - a substation charge element and a residual element.

Appendix 5 - NGET's revised indicative TNUoS tariffs

The table below shows revised indicative TNUoS tariffs for 2008/9 following the implementation of the Specific Treatment of Generation Local Connections approach (A), following improvements to the accuracy of the model used. The original indicative tariffs were published within Appendix 6 of the Consultation document GB ECM-11[26].

Tariffs have been calculated for all generation liable for TNUoS tariffs. Demand tariffs will not be effected.

Power Station	Option A - Specific Treatment				Current 2008/9 TNUoS Tariff (£/kW)	Change to TNUoS (£/kW)
	Generation Local Charge (£/kW)		Wider TNUoS (£/kW)	Total Tariff (£/kW)		
	Substation	Circuit				
Aberthaw	0.404	0.000	-2.818	-2.414	-2.473	0.059
Aigas	0.129	0.514	15.809	16.453	17.382	-0.929
Baglan Bay	0.186	0.056	-2.818	-2.576	-2.473	-0.103
Barking	0.186	0.000	0.920	1.106	1.220	-0.113
Barry	0.000	0.000	-2.818	-2.818	-2.473	-0.345
Black Law	0.129	2.480	13.924	16.533	14.356	2.177
Brimsdown	0.186	0.000	0.920	1.106	1.220	-0.113
Clunie	0.129	0.000	11.584	11.713	11.863	-0.149
Cockenzie	0.186	0.000	13.093	13.279	13.521	-0.242
Connahs Quay	0.325	0.000	4.150	4.475	4.417	0.058
Corby	0.000	0.000	2.073	2.073	2.317	-0.244
Coryton	0.150	0.241	0.920	1.311	1.220	0.091
Cottam	0.325	0.000	4.150	4.475	4.417	0.058
Cottam Development Centre	0.325	0.000	4.150	4.475	4.417	0.058
Cowes	0.000	0.000	-2.882	-2.882	-2.571	-0.311
Cruachan	0.078	1.834	13.368	15.280	15.061	0.218
Culligran	0.129	1.194	15.809	17.132	17.382	-0.250
Damhead Creek	0.325	0.000	0.920	1.245	1.220	0.026
Deanie	0.129	2.120	15.809	18.058	17.382	0.676
Deeside	0.325	0.000	4.150	4.475	4.417	0.058
Derwent	0.000	0.000	2.073	2.073	2.317	-0.244
Didcot	0.325	0.648	-0.824	0.150	-0.015	0.164
Didcot B	0.325	0.648	-0.824	0.150	-0.015	0.164
Didcot GTs	0.000	0.000	-0.824	-0.824	-0.015	-0.809
Dinorwig	0.201	3.630	5.945	9.777	9.820	-0.043
Drax	0.325	0.000	5.977	6.302	6.316	-0.014

[26] http://www.nationalgrid.com/NR/rdonlyres/224F15A5-E4BA-45D3-B5B6-FC0CB2641554/27416/ECM11LocalChargingFinal.pdf

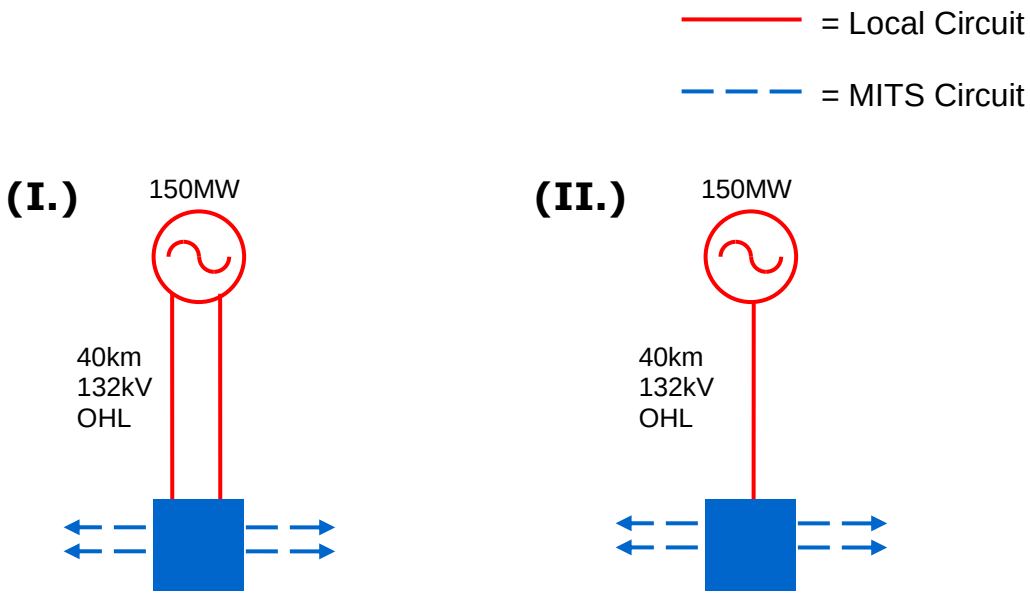
Dungeness B	0.150	0.000	0.920	1.070	1.220	-0.149
Eggborough	0.325	0.000	5.977	6.302	6.316	-0.014
Errochty	0.291	0.000	11.584	11.875	11.863	0.013
Farr Windfarm	0.129	4.630	15.809	20.569	17.382	3.187
Fasnakyle G1 & G3	0.129	0.000	15.308	15.437	15.655	-0.218
Fawley	0.150	0.000	-2.882	-2.732	-2.571	-0.161
Fawley CHP	0.000	0.000	-2.882	-2.882	-2.571	-0.311
Ferrybridge B	0.404	0.000	5.977	6.381	6.316	0.065
Ffestiniogg	0.078	0.185	4.150	4.414	4.417	-0.004
Fiddlers Ferry	0.404	0.000	5.977	6.381	6.316	0.065
Fife	0.291	0.000	13.924	14.215	14.356	-0.140
Finlarig	0.129	0.216	11.584	11.929	11.863	0.067
Foyers	0.078	1.611	20.687	22.377	22.260	0.117
French Interconnector	0.325	0.000	0.920	1.245	1.220	0.026
Glandford Brigg	0.000	0.000	4.150	4.150	4.417	-0.267
Glenmoriston	0.129	0.000	15.308	15.437	15.655	-0.218
Grain	0.325	0.259	0.920	1.505	1.220	0.285
Grangemouth	0.000	0.000	13.924	13.924	14.356	-0.431
Great Yarmouth	0.000	0.000	2.073	2.073	2.317	-0.244
Hadyard Hill	0.129	0.000	13.093	13.222	13.521	-0.299
Hartlepool	0.186	0.407	9.502	10.095	9.949	0.147
Heysham	0.325	0.000	5.977	6.302	6.316	-0.014
Hinkley Point B	0.150	0.000	-2.882	-2.732	-2.571	-0.161
Hunterston	0.063	0.000	13.093	13.156	13.521	-0.365
Immingham	0.000	0.000	5.977	5.977	6.316	-0.339
Indian Queens	0.150	0.000	-8.770	-8.620	-8.526	-0.094
Invergarry	0.129	0.978	15.308	16.414	15.655	0.759
Ironbridge	0.150	0.000	2.073	2.223	2.317	-0.094
Keadby	0.150	0.000	4.150	4.300	4.417	-0.117
Kilbraur	0.078	1.029	20.687	21.794	22.260	-0.465
Killingholme (NP)	0.325	0.407	5.977	6.710	6.316	0.393
Killingholme (Powergen)	0.325	0.407	5.977	6.710	6.316	0.393
Kilmorack	0.129	0.154	15.809	16.093	17.382	-1.289
Kings Lynn A	0.000	0.000	4.150	4.150	4.417	-0.267
Kingsnorth	0.325	0.000	0.920	1.245	1.220	0.026
Langage	0.150	-0.222	-8.770	-8.843	-8.526	-0.317
Little Barford	0.150	0.000	2.073	2.223	2.317	-0.094
Littlebrook D	0.150	0.000	0.920	1.070	1.220	-0.149
Lochay	0.129	0.247	11.584	11.960	11.863	0.098
Longannet	0.404	0.000	13.924	14.328	14.356	-0.027
Luichart	0.129	2.852	15.809	18.791	17.382	1.409
Marchwood	0.150	0.259	-2.882	-2.473	-2.571	0.098
Medway	0.325	0.259	0.920	1.505	1.220	0.285
Millennium Wind	0.129	1.399	15.308	16.836	15.655	1.181
Mossford	0.129	4.667	15.809	20.606	17.382	3.224
Moyle Interconnector	0.078	-0.741	10.733	10.070	10.381	-0.311
Nant	0.129	1.718	8.490	10.337	10.184	0.154

Oldbury-on-Severn	0.129	1.278	-2.818	-1.411	-2.473	1.062
Orrin	0.129	2.074	15.809	18.013	17.382	0.631
Peterborough	0.000	0.000	4.150	4.150	4.417	-0.267
Peterhead	0.404	0.000	19.511	19.915	19.755	0.160
Quoich	0.129	-2.614	15.308	12.823	15.655	-2.832
Ratcliffe-on-Soar	0.325	0.000	2.073	2.398	2.317	0.081
Rocksavage	0.063	0.000	4.150	4.213	4.417	-0.204
Roosecote	0.000	0.000	5.977	5.977	6.316	-0.339
Rugeley B	0.150	0.000	2.073	2.223	2.317	-0.094
Rye House	0.150	0.000	0.920	1.070	1.220	-0.149
Saltend	0.186	0.241	5.977	6.404	6.316	0.087
Seabank	0.150	0.000	-2.818	-2.668	-2.473	-0.195
Sellafield	0.000	0.000	5.977	5.977	6.316	-0.339
Shoreham	0.000	0.000	-0.824	-0.824	-0.015	-0.809
Shotton	0.000	0.000	4.150	4.150	4.417	-0.267
Sizewell B	0.150	0.000	2.073	2.223	2.317	-0.094
Sloy G2 & G3	0.129	0.000	8.490	8.619	10.184	-1.565
South Humber Bank	0.150	0.611	5.977	6.738	6.316	0.422
Spalding	0.150	0.204	4.150	4.504	4.417	0.087
Sutton Bridge	0.150	0.000	4.150	4.300	4.417	-0.117
Taylors Lane	0.000	0.000	-5.902	-5.902	-5.657	-0.244
Teesside	0.404	0.074	9.502	9.980	9.949	0.031
Tilbury B	0.186	0.000	0.920	1.106	1.220	-0.113
Torness	0.150	0.000	13.093	13.243	13.521	-0.278
Uskmouth	0.291	0.000	-2.818	-2.527	-2.473	-0.054
West Burton	0.325	0.000	4.150	4.475	4.417	0.058
Whitelee	0.078	1.379	13.093	14.550	13.521	1.029
Wilton	0.404	0.074	9.502	9.980	9.949	0.031
Wylfa	0.150	0.000	6.584	6.734	6.829	-0.094

Appendix 6 - NGET's charging example

Illustration of the cost reflectivity of Specific Treatment of Generation Connections at 132kV

In order to compare the actual infrastructure capital cost savings between two levels of investment and the economic signal produced under the proposed approach of GB ECM-11, an example has been considered. The actual capital costs and Local Charging tariffs have been calculated below for both a single circuit spur connection (I) and a double circuit spur connection (II)



Circuit data

2 x 175mm^2 ACSR Lynx conductor	1 x 175mm^2 ACSR Lynx conductor
Steel towers	Portal wood pole
2 x 162MVA circuit capacity	1 x162 MVA circuit rating
Actual cost: £350k/km	Actual cost: £200k/km
Connecting into Beauly (zone 1)	Connecting into Beauly (zone 1)

Actual infrastructure cost savings

The absolute and annual infrastructure cost of a single circuit and a double circuit can be calculated (assuming an annuity factor of 6.6% and an overhead factor of 1.98%:

Single circuit cost = (40km x £200k) = £8m = £686.4k p.a.
Double circuit cost = (40km x £350k) = £14m = £1201.2k p.a.

The annual non locational cost for a single and double circuit 132kV substation can also be calculated:

Single circuit non locational cost = £1960k = £168.2k p.a.
Double circuit non locational cost = £3230k = £277.1k p.a.

Therefore the total annual costs are:

Total single circuit design cost = £686.4k+£168.2k = £855k p.a. or £5.70/kW
Total double circuit design cost = £1201k+£277k = £1478k p.a. or £9.85/kW

Therefore the actual cost saving between the two designs is: £4.15/kW

Local Charge Signal

The Local Charges for both examples have been calculated below:

Circuit Local Charge (I)	**Circuit Local Charge (II)**
Expansion Factor for spur circuits: 8.32 Marginal flow along local circuits: 332.8 km	Expansion Factor for spur circuits: 10.00 Marginal flow along local circuits: 400.0 km
Local Charge = Marginal flow x local security factor x Expansion Constant / 1000	Local Charge = Marginal flow x local security factor x Expansion Constant / 1000
Local Security Factor = 1.8	Local Security Factor = 1.0
= 332.8 x 1.8 x 10.29 / 1000	= 400.0 x 1.0 x 10.29 / 1000
= £6.164/kW	= £4.116/kW
Substation Local Charge (I)	**Substation Local Charge (II)**
132kV Double Busbar substation = £0.291/kW	132kV Double Busbar substation = £0.129/kW
Total Local Charge (I) = 0.291 + 6.164 = **£6.455/kW**	**Total Local Charge (II)** = 0.129 + 4.116 = **£4.245/kW**
Wider Charge (I) = £15.77/kW	**Wider Charge (I)** = £15.77/kW
Total TNUoS Charge (I) = 15.77 + 6.46 = £22.23/kW	**Total TNUoS Charge (I)** = 15.77 + 4.25 = £20.02/kW

Consequently the differential between the Local Charges for the single circuit configuration (I) and the double circuit (II) is equal to:

= £22.23 – £20.02 = **£2.21/kW**

Consequently the differential between the Local Charges for the single circuit configuration (I) and the double circuit (II) is equal to:

= £22.23 – £20.02 = £2.21/kW

Appendix 7 - Glossary

A

Access Rights

The rights to flow specified volume of electricity, usually from a specified location (node or zone) to an explicitly or implicitly defined destination (e.g. market hub), and for a defined period. For firm access rights, a failure to deliver access due to insufficient network capacity is associated with financial compensation. For non-firm access rights, the flow is terminated without compensation when capacity is unavailable.

The Authority/ Ofgem

Ofgem is the Office of the Gas and Electricity Markets, which supports the Gas and Electricity Markets Authority (GEMA), the body established by section 1 of the Utilities Act 2000 to regulate the gas and electricity markets in GB.

B

Balancing Mechanism (BM)

The mechanism for the making and acceptance of offers and bids pursuant to the arrangements contained in the BSC.

Bid

In the context of the Balancing Mechanism, a bid is a tool used by the GBSO, whereby a user submits data representing its willingness to reduce generation or increase demand. National Grid then decides whether or not to accept the bid.

British Electricity Trading and Transmission Arrangements (BETTA)

The arrangements for the trading and transmission of electricity across Great Britain which are provided for by Chapter 1 of Part 3 of the Energy Act 2004, which have replaced the separate trading and transmission arrangements which existed prior to 1 April 2005 in Scotland and in England and Wales.

Balancing Services Use of System Charges (BSUoS)

The charges levied by National Grid in respect of the activities it undertakes to keep the transmission system in electrical balance at all time.

C

Connection Entry Capacity (CEC)

A measure of the maximum capability, expressed in MW, of a connection site and the associated generation units' connection to the transmission system.

Connection and Use of System Code (CUSC)

Multi-party document creating contractual obligations among and between all users of the GB transmission system, parties connected to the GB transmission system and National Grid is relation to their connection to and use of the transmission system.

Consents

The process of obtaining Consents for the construction of a new overhead line to serve, for example, a wind farm can essentially be broken down into two distinct areas. Consents to be obtained from the Secretary of State/ Planning authorities etc in relation to permission allowing a line to be built and secondly, and more practically, consent from landowners who will be affected by the construction of the new line. For a new line consent under section 37 of the 1989 Act will be required.

In addition to section 37 consent, the DNO/TO must also obtain consent from the landowners over whose land the line will run. If a voluntary agreement cannot be struck, then either the land will have to be compulsorily purchased, under the provisions of section 10 and Schedule 3 (which is usually used for substations), or a Necessary Wayleave obtained over it, under the provisions of section 10 (Schedule 4 paragraphs 6-8).

Constraints

In the event that the pattern of generation may exceed the safe operational limits of a particular line or transmission system equipment, the GBSO will take actions to reduce the output of generators at specific locations on the system. At present these actions are taken in the Balancing Mechanism in the form of bids, and also via ancillary services, such as Pre-Gate Closure Balancing Mechanism Unit Transactions (PGBTs). Where a user's output is constrained down at a point on the system, the overall balance of energy will need to be retained, and costs will be incurred by the GBSO in bringing replacement energy onto the system.

Contracted background

This is the planning background against which National Grid assesses applications for connection and use of system. The contracted background includes all users that have entered into an (ongoing) agreement with National Grid for connection or use of system.

D

Deep reinforcement

Deep reinforcement refers to the works conducted on the wider transmission system in order to accommodate a change in the generation and demand pattern.

Distributed Generation

A generator directly connected to a distribution system or the system of another user.

G

GB System Operator (GBSO)

The entity responsible for operating the GB transmission system and for entering into contracts with those who want to connect to and/or use the GB transmission system. National Grid is the GB system operator.

GB Transmission System

The system of high voltage electric lines providing for the bulk transfer of electricity across Great Britain.

K

Kilowatt (kW)/Megawatt (MW)/Gigawatt (GW)

A kW is the standard unit of electricity, roughly equivalent to the power output of a one-bar electric fire. A MW is a thousand kilowatts. A GW is a thousand megawatts.

Kilowatt hour (kWh)/Megawatt hour (MWh)/Gigawatt hour (GWh)

One kilowatt hour is the amount of electricity expended by a one kilowatt watt load drawing power for one hour. A MWh is a thousand kilowatt hours. A GWh is a thousand megawatt hours.

L

Long-run marginal costs (LRMC)

In the context of electricity transmission, long-run marginal costs are the marginal costs of establishing and using network capacity. They include, for example, marginal costs for network reinforcement, as well as resulting network losses and residual congestion costs.

Local works

Those works required to provide a generator with a connection to the transmission network that would enable it to export power.

O

Offer

In the context of the Balancing Mechanism, an offer is a tool used by the GBSO, whereby a user submits data parameterising its willingness to increase generation or reduce demand. National Grid then decides whether or not to accept the offer.

S

Short-run marginal costs (SRMC)

In the context of electricity transmission, short-run marginal costs are the marginal costs of using established network capacity. They include, for example, network losses and congestion costs.

Short Term Transmission Entry Capacity (STTEC)

STTEC is a firm capacity provided, provided within-year, in 4, 5 or 6 week blocks.

T

Transmission Asset Owner (TO)

There are three separate transmission systems in Great Britain, owned by three Transmission Asset Owners, National Grid Electricity Transmission plc, Scottish Hydro Electric Transmission Ltd and Scottish Power Transmission Ltd. National Grid also has the role of system across the whole of Great Britain.

Transmission Entry Capacity (TEC)

The contracted maximum amount of electricity that each user is permitted to export on to the GB transmission system at any given time.

Transmission Network Use of System (TNUoS) charges

Charges that allow National Grid to recover the costs of providing and maintaining the assets that constitute the GB transmission system.

Appendix 8 - Feedback Questionnaire

1.1. Ofgem considers that consultation is at the heart of good policy development. We are keen to consider any comments or complaints about the manner in which this consultation has been conducted. In any case we would be keen to get your answers to the following questions:

1. Do you have any comments about the overall process, which was adopted for this consultation?
2. Do you have any comments about the overall tone and content of the report?
3. Was the report easy to read and understand, could it have been better written?
4. To what extent did the report's conclusions provide a balanced view?
5. To what extent did the report make reasoned recommendations for improvement?
6. Please add any further comments?

1.2. Please send your comments to:

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