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Impact Assessment on RWE proposal P229 - seasonal zonal transmission losses scheme

Consultation

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Overview:

This document assesses, and seeks views on, the impacts of modification proposal P229 and its Alternative. P229 is a proposal raised by RWE Npower to amend the rules in the Balancing and Settlement Code under which the costs of transmission losses are allocated to users of the electricity transmission system. Transmission losses are the amounts of energy that are lost through the process of transmitting electricity from generators to demand. These are currently allocated to generators and suppliers in uniform proportions of their generation output or consumption intake.

The P229 proposals seek to allocate transmission losses on a locationally varying basis, with the aim of more accurately reflecting parties' impact on the level of losses on the transmission system. This would increase costs for some network users, and reduce costs for others – relative to the current non-locational allocation. The proposal, if implemented, would be expected to reduce the total volume of transmission losses over time, as generators (and to a lesser extent, demand customers) may choose to operate differently in response to the different proportion of losses allocated to them.

Context

The transmission system transfers electricity in bulk at high voltage from generators to large industrial users and to local distribution networks. It also helps provide consumers with reliable and efficient energy supplies. Costs of providing and operating the transmission network are paid by users of the transmission system, such as generators and suppliers, and ultimately by electricity consumers.

The process of transporting energy from generators to end consumers results in a proportion of energy being lost on the transmission network. Greater volumes are lost the further the energy is transported. As a result of transmission losses, more energy must be produced than is supplied to consumers.

Transmission losses have both an environmental cost, since additional energy produced would incur more emissions, and a financial cost, as someone must pay for the lost energy. Under the existing market rules, the costs of this energy, which total around £225 million per annum, are allocated to generators and suppliers on a uniform basis.

This document analyses and consults on the impact of P229 Proposed and P229 Alternative; both proposals would allocate transmission losses to generators and suppliers on a locationally varying basis, ie parties at different locations would be allocated different proportions of transmission losses.

Associated documents

- Final Modification Report, P229: Introduction of a seasonal Zonal Transmission Losses scheme, March 2010 http://www.elexon.co.uk/ELEXON%20Documents/p229_final_modification_report.zip
- Consultants' reports commissioned by Ofgem on P229, March 2011, http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=104&refer=Licensing/ElecCodes/BSCode/BSC
- Zonal Transmission Losses - the Authority's 'minded to' decisions (153/07), June 2007 http://www.ofgem.gov.uk/Licensing/ElecCodes/BSCode/Ias/Documents1/zontranlossminded.pdf
- Project TransmiT publications: http://www.ofgem.gov.uk/Networks/Trans/PT/Pages/ProjectTransmiT.aspx

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Executive Summary

Background

The transmission of electricity results in a proportion of energy being lost as heat. Losses are caused in part by the energisation of equipment (fixed losses) and in part by the distance over which power is transmitted (variable losses). A consequence of transmission losses is that, in order to meet demand, more electricity has to be generated than is consumed. This mismatch is equal to about 2% of annual demand and has a cost of approximately £225 million per annum.

Rules relating to the treatment of transmission losses on Great Britain's National Electricity Transmission System (NETS) are contained in the Balancing and Settlement Code (BSC). Under the existing BSC rules, the costs of transmission losses (both fixed and variable) are recovered from generators and suppliers. This is done by scaling down the metered generation output and scaling up the consumption intake when calculating these parties' energy balance position, such that the transmission losses are counted partly as generation shortfall and partly as consumption excess. Currently the scaling factors are applied on a uniform basis. Losses have been treated on the same basis since privatisation of the GB electricity supply sector in 1990. However, there has long been debate on the appropriate allocation of transmission losses and, in particular, the use of locational losses whereby losses are allocated to generators and suppliers depending on their geographic location. Previous decisions on or relating to proposals to introduce locational losses have been legally challenged on process grounds.

The proposals

P229 is a proposal raised by RWE Npower on 28 November 2008. It proposes to modify the BSC by introducing a seasonal zonal transmission losses scheme. It seeks to allocate costs of variable losses in a more cost reflective manner, ie reflecting the costs imposed on the NETS by individual generators and suppliers.

Two variants of the proposal have been submitted to the Authority:

> **P229 Proposed** would vary the proportion of losses allocated to each generator and supplier according to their location. Under this proposal, the scaling factors applied to the generation output and consumption intake would seek to reflect the level of losses imposed on the system by generators and suppliers, depending on the time of year (ie seasonal) and the part of the network they are located at (ie zonal). These factors would be derived ahead of real time, based on the previous year's system operation data.
>
> **P229 Alternative** is the same as P229 Proposed, except that the locational scaling factors (derived in the same way as under P229 Proposed) would be adjusted such that no user would be allocated negative variable losses.

The proposals would mean that demand customers located close to generation would pay less than under the current arrangements. Conversely generation that is situated further from demand would pay more than under the current arrangements.

The BSC Panel recommended the rejection of both P229 Proposed and P229 Alternative on the basis that they would not better facilitate the BSC objectives. The

P229 proposals were submitted to the Authority on 12 March 2010. We are required to decide on the merit of the proposals and this Impact Assessment welcomes views.

Summary of Impacts

The impacts of the P229 proposals have been considered using the analysis and views of the consultants commissioned by Elexon and the P229 industry modification group. We also extended this analysis to consider further appropriate scenarios. Overall the analysis carried out suggests that P229 Proposed could deliver benefits for consumers. Specifically;

- Transmission losses would be expected to reduce by an average of 211GWh per annum - equating to about £9.1 million saving per year, which could be passed on to consumers by way of lower prices.
- Wholesale prices might be impacted but the nature of the impact would depend on where marginal generation plant is in relation to the locational losses factor. Although wholesale prices were observed to increase and decrease in the different individual time strips modelled, the overall impact for the reference scenario is fairly small.

The analysis suggests there might be some positive impact on competition, specifically:

- The main impact of changes in the allocation of transmission losses would be changes in the relative marginal costs of different generators. This is likely to lead to changes in despatch.
- The P229 proposals are not, however, expected to have a significant impact on siting decisions.
- The P229 proposals would result in redistribution of the costs associated with losses such that in general generators in the north and suppliers in the south would receive increased costs.
- The P229 proposals would reduce benefits received by generators that are embedded ie connected to the distribution system rather than the transmission system, and the reducing impact is uniform across the system.

The impact on sustainable development is likely to be positive, saving annually about 1.4 million tonnes of CO_2, 3.4 kilotonnes of NOx and 12 kilotonnes of SOx, which might deliver savings of £21 million, £8.5 million and £15.8 million respectively (£45 million in total).

The analysis also shows a positive benefit from P229 Alternative of £13.4 million. The impact is lower for P229 Alternative than P229 Proposed because of the additional scaling involved ensuring no party is allocated negative losses.

Given the P229 Proposals interact with other ongoing projects including TransmiT and the Energy Market Review (EMR), we have considered how the impacts of the P229 proposals might vary in light of these projects. The analysis suggests that for the range of changes that could be considered in the short to medium term under Project TransmiT the impact of the P229 proposals would still be positive. The analysis also suggests that since the P229 proposals have a payback period of less than two years, if any longer term changes, for example under EMR, made the P229 proposals ineffective, benefits could still be realised.

1. Introduction

Chapter Summary

In this chapter we set out the purpose of this document, give an overview of the P229 proposals and the legal and assessment framework that applies to our decision making process.

Question box
There are no questions in this chapter.

The purpose of this document

1.1. This document sets out the potential impacts of a proposal to amend the Balancing and Settlement Code (BSC) and seeks views on these. The P229 proposals relate to the allocation of the cost of variable losses between generators and suppliers. Variable transmission losses[1] are energy that is lost during the transmission of electricity and are dependent on the amount of electricity transferred and the distance it is transported.

1.2. This document does not express a view on the merits of P229 or a decision on the proposals. The publication of this impact assessment marks the start of a consultation on the impacts of the P229 proposals and the Authority will make its decision following consideration of, amongst other things, responses to this impact assessment. We would welcome views and additional information from interested parties by ***4 July 2011***.

The proposal

1.3. In November 2008 RWE Npower raised a proposal to change the way losses are paid for by introducing a seasonal zonal transmission losses scheme (P229). Currently transmission losses are allocated pro rata to generation and demand metered volumes, without any locational or seasonal variation. Under P229, the amount of transmission losses allocated to each unit of energy generated or consumed would vary across locational zones. This seeks to reflect the different impact of parties at different locations on the volume of losses that arise. The allocation of losses would also be dependent on the season. In the course of the BSC working group consideration of the original proposal "P229 Proposed", a variation "P229 Alternative" was developed by the Modification Group[2]. P229

1 Throughout this report references to 'losses' mean 'transmission losses'
2 The Modification Group was set up by the BSC Panel to evaluate and define the Modification Proposals. Modification Proposals follow a defined set of procedures and the groups are responsible for providing the necessary reports that the BSC Panel needs in order to make its recommendations

Alternative differs from P229 Proposed by adjusting the allocation method further so that no party is allocated a negative volume of losses. We refer to P229 Proposed and P229 Alternative collectively throughout this document as "the P229 proposals". A more detailed description of the P229 proposals is set out in chapter 3.

1.4. The BSC panel submitted the Final Modification Report (FMR) in respect of the P229 proposals to the Authority for its decision on 12 March 2010. The BSC Panel recommended rejecting both P229 Proposed and P229 Alternative on the basis that they would not better facilitate the BSC objectives. Amongst other things, the Panel considered that predicted benefits might not be realised and that windfall gains and losses may be disproportionate to the overall benefits.

Legal and assessment framework

1.5. In making its decision on P229 Proposed and P229 Alternative, the Authority must assess both against the applicable BSC objectives[3]. In particular, the Authority must ask itself whether either P229 Proposed or P229 Alternative better facilitates the achievement of the BSC objectives as compared with the existing provisions of the BSC. The BSC objectives are:

(a) the efficient discharge by National Grid Electricity Transmission Plc (NGET) of the obligations imposed upon it by its electricity transmission licence[4];
(b) the efficient, economic and co-ordinated operation of the national transmission system;
(c) promoting effective competition in the generation and supply of electricity, and (so far as consistent therewith) promoting such competition in the sale and purchase of electricity; and
(d) promoting efficiency in the implementation and administration of the balancing and settlement arrangements.

1.6. The Authority must also consider whether the proposal is consistent with its wider statutory duties, including those arising under European law.

1.7. The Authority considers that an impact assessment needs to look at the effects of a modification proposal against a counterfactual. We focus our consideration on what would happen if each of the modification proposals (a) was implemented or (b) was not implemented against a counterfactual which holds other factors constant.

1.8. However, in some cases, future developments in the electricity industry that are independent from the modification proposal under consideration may

3 The applicable BSC objectives are set out in standard licence condition C3 of NGET's electricity transmission licence.
4 As System Operator (SO), NGET is responsible for operating the GB transmission system.

alter the impact of implementing the modification proposal. The Authority considers it is appropriate to carry out the impact assessment of a modification proposal against the prevailing status quo, without pre-judging, or speculating unduly about future industry developments. Nonetheless, the Authority recognises that it may also be prudent, in a given case, to consider the sensitivities of such an impact assessment to future industry developments particularly if they may come about within a relatively short time horizon following a decision on, or implementation of, the modification proposal or that are particularly likely to come about.

1.9. Appendix 2 of this document sets out in further detail the legal and assessment framework for the Authority's decision including the requirement to undertake an impact assessment in particular circumstances.

Structure of this document

1.10. The remainder of this document is structured as follows:

- Chapter 2 summarises the background to the issues.
- Chapter 3 summarises the P229 proposals.
- Chapter 4 outlines the potential impact of P229 proposals.
- Chapter 5 looks at the interactions with other ongoing projects.
- Chapter 6 outlines the next steps and the proposed timeline for reaching a decision on the P229 proposals.

2. Background

Chapter Summary

In this chapter we set out what transmission losses are, provide an historic context to the proposals being considered and discuss interactions with other projects.

Question box
There are no questions in this chapter.

Electricity transmission

2.1. The NETS is used to transfer bulk electricity energy from generating power stations to substations near demand (such as population centres). While there are three regional monopoly owners of the onshore part of transmission network and existing and future licensed owners of offshore transmission network[5], the NETS is operated by National Grid Electricity Transmission plc (NGET) as the sole System Operator (SO) (for the onshore and offshore transmission system). The SO has responsibility for making sure that electricity supply and demand stay in balance and the system remains within safe technical and operating limits.

What are transmission losses?

2.2. The transmission of electricity results in a proportion of energy being lost in the process. 'Transmission losses' is the term given to the volume of energy lost and consists of two main elements: 'fixed' losses and 'variable' losses. Fixed losses are the energy lost when electrical equipment is energised regardless of the level of power being transferred. Variable losses are the energy lost which is dependent on the volume of power transferred and the distance over which it travels. The existence of losses on the transmission system means that more electricity has to be generated than consumed, resulting in additional costs to generators and suppliers.

2.3. In 2010/11 NGET estimate total transmission losses of 5.2TWh, approximately 2% of total system demand[6], over the whole of the network. At an electricity price of £40 – 50/MWh, the total cost of losses for 2010/11 was £208 –

[5]Electricity transmission assets are owned and maintained by regional monopoly Transmission Owners (TOs). The onshore TOs are NGET for England and Wales, SP Transmission Limited (SPTL) for southern Scotland and Scottish Hydro-Electric Transmission Limited (SHETL) for northern Scotland. There is currently one offshore TO, TCP Robin Rigg.

[6] Based on February Monthly Balancing Services Summary report

260 million. In terms of emissions, transmission losses comprise around 2.8 MtCO2 (million tonnes carbon dioxide)[7].

How are transmission losses currently paid for?

2.4. There is a cost associated with transmission losses. Someone has to pay for the electricity that is generated but is not subsequently sold to consumers. The BSC sets out the rules for how users of the transmission network pay for transmission losses.

2.5. The BSC sets out the rules and governance arrangements for electricity balancing and settlement in the NETS. The BSC factors in transmission losses to the calculation of imbalance. Both fixed and variable transmission losses are allocated to BSC parties by scaling metered volumes in settlement through the application of transmission loss multipliers (TLMs). The effect of this is that parties must either pay imbalance charges, or for generators to deliver more electricity than they sell, and for suppliers to buy more than they offtake.[8]

2.6. Under the existing rules, the costs of transmission losses are recovered from generators and suppliers on a uniform basis according to the amount of energy they generate or take off the system, ie without taking into account the different extent to which individual parties impact on such losses.

2.7. The formulae in the BSC for calculating TLMs, as reproduced below, include two component variables – Transmission Loss Factors (TLFs) and Transmission Loss Adjustments (TLMOs).

For generators $TLM = 1 + TLF + TLMO_{+}$

For suppliers $TLM = 1 + TLF + TLMO_{-}$

2.8. TLFs can be specified for individual Balancing Mechanism (BM) Units and therefore could allow for TLMs to vary by location. The TLF is currently set to zero so has no practical effect. The TLMOs are currently defined in the BSC such that 45% of losses are recovered from generators and 55% of losses from suppliers, which is effectively achieved by defining the TLMOs as:.

$TLMO_{+} = -(0.45 \times \text{total losses volume}) / (\text{total generation output volume})$

[7] Based on the average carbon price for the analysis period from DECC's 'Updated short term traded carbon values for UK public policy appraisal (June 2010)' http://www.decc.gov.uk/en/content/cms/what we do/lc uk/valuation.aspx

[8] Offshore generators are treated in the same way as onshore generators and the losses on the offshore lines are allocated through the same methodology. Offshore settlement metering is used to calculate losses.

TLM $_{-}$ = (0.55 x total losses volume) / (total demand volume)

History of losses

2.9. Transmission losses have been treated on the same basis since the privatisation of the British energy supply sector in 1990. However, the debate on the appropriate allocation of transmission losses has a long history. Indeed, at the time of privatisation, the Pooling & Settlement Agreement[9] included provision for the review and, if appropriate, implementation of changes to the treatment of losses to reflect locational factors.

2.10. In 2002 three BSC modification proposals (with two alternative proposals) were raised which related to the treatment of losses: P75 (and its alternative) "Introduction of Zonal Transmission Losses", P82 (and its and alternative) "Introduction of Zonal Transmission Losses on an Average Basis" and P105 "Introduction of Zonal Transmission Losses on a Marginal Basis without Phased Implementation"[10]. P82 was approved by the Authority. However, that decision was challenged by way of judicial review on the basis that the decision was procedurally flawed[11] and subsequently the decision was quashed by the court.

2.11. Between December 2005 and July 2006 four BSC modification proposals (with two alternative proposals) were raised: P198 (and its alternative) "Introduction of a Zonal Transmission Losses Scheme", P200 (and its alternative) "Introduction of a Zonal Transmission Losses Scheme with Transitional Scheme", P203 "Introduction of a Seasonal Zonal Transmission Losses Scheme" and P204 "Scaled Zonal Transmission Losses".

2.12. Having considered responses to the IA and its 'minded to approve P203' consultation[12] in June 2007, the Authority set out in an open letter in September 2007 its intention to undertake a further review of the industry's analysis on the proposals in light of concerns raised during our consultation. The aim was to make a decision by spring 2008, which was after the decision date of 20 September 2007 set out in the relevant modification report. This decision to delay the process was successfully challenged by way of judicial review. Subsequently, the Authority was not entitled to make a final decision on any of these proposals as they had been 'timed out'.

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[9] The pooling and settlement agreement was replaced by the BSC under the new electricity trading arrangements.
[10] P109 "A Hedging Scheme for Changes to TLF in Section T of the Code" was raised later in 2002. This proposal was rejected by the Authority since, on balance and without limitation, P109 would be particularly detrimental in relation to Applicable BSC Objective (b).
[11] More information is available in our letter of 30 January 2004: http://www.ofgem.gov.uk/Markets/ad/Documents1/1804.pdf
[12] This consultation document can be found here: http://www.ofgem.gov.uk/Licensing/ElecCodes/BSCode/Ias/Documents1/zontranlossminded.pdf

Interactions

2.13. As set out earlier in this document, the Authority must assess and make a decision on P229 Proposed and P229 Alternative within a prescribed framework. As part of our decision, we will decide whether or not the proposals better facilitate the achievement of the applicable BSC objectives as compared with the current BSC arrangements. It may also be appropriate to take into account interactions of the modification proposals with related industry areas, for example transmission use of system charging, where we have sufficient information to enable us to do so.

2.14. There are ongoing projects which may interact with the change proposed by the P229 proposals, specifically Project TransmiT and the Government's Electricity Market Reform project (EMR).

Project TransmiT

2.15. Project TransmiT is Ofgem's independent and open review of transmission charging and associated connection arrangements. The current transmission charging regime has served consumers well by promoting the efficient use of the networks, and facilitating effective competition in generation and supply. However, as we set out in our call for evidence on TransmiT[13], the time is right for us to step back and consider whether the arrangements are fit to meet the challenges of the future. The aim of the review is to ensure that we have in place arrangements that facilitate the timely move to a low carbon energy sector whilst continuing to provide safe, secure, high quality network services at value for money to existing and future consumers.

2.16. One of the key aspects of TransmiT is a review of the current electricity transmission charging arrangements. Transmission charges are the route by which transmission licensees recover the costs of providing and operating transmission assets. Different elements of transmission costs are inter-related with each other (for example, incremental transmission investment that is incurred in seeking to reduce transmission losses can be recovered through transmission charges). Therefore, the signals provided in the allocation of these cost elements also interact with each other. The consideration of changes to the treatment of one cost element needs to be considered along with the overall arrangement of transmission costs allocation, so as to ensure that coherent and efficient overall cost signals are provided to users. Any changes emerging from TransmiT, even if not directly impacting transmission losses, could have implications for the assessment of the P229 proposals. For example, if one of the P229 proposals were to be implemented, any possible changes under TransmiT may mean that the proposal would be operating under a different transmission charging baseline from the current one, such that impacts may differ from those assessed under the current transmission charging baseline.

[13] http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=1&refer=Networks/Trans/PT

2.17. As part of TransmiT we asked four academic teams to provide us with their independent views on the optimal approach to Transmission charging for GB with particular focus on electricity transmission. These academic reports[14] are only one input to our thinking on the appropriate way forward on electricity transmission charging. We are considering the full range of options.

2.18. As described in Ofgem's TransmiT consultation letter of 22 March 2011[15], the emerging options in the academic reports and from industry responses to our consultations under Project TransmiT range from the adoption of a non-locational transmission charging model that spreads costs across all users through a uniform charge (a "postalised" approach), through improving the current long-term locational signal in transmission asset charging (eg to reflect better the usage pattern of generators), to an approach which would seek to improve short-term locational signals by reflecting transmission costs in locationally varying energy price. We have set out in chapter 5 of this document our initial assessment of how, if any of the range of high-level emerging options under TransmiT were to be implemented, especially those that it is technically feasible to implement in the next few years, may potentially interact with and alter the impacts of P229 Proposals. We will shortly be writing to interested parties to set out our view of the range of options that should be assessed in the next phase of our work on charging.

Electricity Market Reform

2.19. The EMR is a Department of Energy and Climate Change (DECC) led project looking to incentivise elements of the GB generation mix. This can affect the renewable and nuclear capacity installed in GB. The generation mix and the location of the generation plant could affect the impacts of P229 Proposed and P229 Alternative.

2.20. DECC consulted on proposals in December 2010[16]. DECC set out in its consultation that its proposals were designed to ensure that low-carbon technologies become a more attractive choice for investors, and adequately reward back up capacity to ensure security of supply. Specifically the proposals included four elements:

[14] The academic reports are available on our webforum http://www.ofgem.gov.uk/Networks/Trans/PT/WF/Pages/WebForum.aspx

[15] In this letter we invited comments on studies we have commissioned from academic teams on the optimal approach to transmission charging for GB and on a report we commissioned looking specifically at transmission charging issues relevant to renewable generation. A copy of this letter can be found here: http://www.ofgem.gov.uk/Networks/Trans/PT/Documents1/110322_TransmiT_Charging_Update%20for%20publication.pdf

[16] A copy of this consultation can be found here: http://www.decc.gov.uk/en/content/cms/consultations/emr/emr.aspx

- Carbon price support: aimed at providing greater long-term certainty around the additional cost of running polluting plant. Strengthening the carbon price for electricity generators, would increase the cost of fossil fuel generation, making lower-carbon power more attractive.

- Feed-in Tariffs: long term contracts would provide more certainty on the revenue for future low carbon generation making it a more attractive investment. A 'contract for difference' model is proposed – designed to provide stability whilst minimising costs. Specific scheme design and implementation issues still need to be determined.

- Capacity Payments: targeted payments to encourage security of supply through the construction of flexible reserve plants or demand reduction measures.

- Emissions performance standard: a backstop measure to limit how much carbon the most carbon intensive power stations can emit.

2.21. Any of these measures could conceivably affect the impact of the P229 proposals (by affecting the marginal cost of plant and ultimately the generation mix). The consultation on DECC's proposals closed in March 2011 and the next step will be the publication of a White Paper confirming the approach to be taken. We do not have sufficient detail at this stage to consider any interaction between the P229 proposals and EMR.

3. The proposals

Chapter Summary

In this chapter we outline the proposed changes to the Balancing and Settlement Code as set out in P229 Proposed and P229 Alternative.

Question box

There are no questions in this chapter.

P229 proposals

3.1. The current BSC allocates costs associated with transmission losses between parties on a uniform basis regardless of the location of generation or demand customers on the network. The P229 proposals seek to ensure that costs are allocated in a manner which takes into account the extent to which participants give rise to losses. This would be done by allowing the costs associated with variable transmission losses to be allocated on a locational basis. That is, those parties transporting electricity further over the transmission network to centres of demand, and therefore giving rise to a higher level of losses, would pay more. Parties closer to centres of demand would pay less. The P229 proposals do not propose any changes to the treatment of fixed transmission losses which would continue to be allocated on a uniform basis.

Original amendment proposal (P229 Proposed)

3.2. The approach put forward in P229 Proposed can be summarised as follows:

Load Flow Model: An electrical model of the transmission system (Load Flow Model) would be built, containing nodes to represent points where transmission circuits meet or energy flows on or off the transmission system. Each node would be allocated to a specific Transmission Loss Factor (TLF) Zone on the transmission network using a 'Network Mapping Statement'.

TLF Zones: would be set by the Panel based on the geographic areas covered by Grid Supply Point (GSP) Groups. Since there are currently 14 GSP Groups, there would be 14 TLF Zones. For offshore nodes, the onshore GSP group to which the network is connected would be the basis for allocating nodes to TLF zones.[17] Each BM Unit

[17] In the case of offshore networks connected via a distribution system , these will be allocated a TLF zone by effectively removing the DNO network and linking the offshore transmission network to the nearest GSP on the onshore transmission system,

would be allocated to a TLF Zone. All BM Units in a zone would receive the same TLF value for every Settlement Period in a BSC Season[18].

TLF calculation: Marginal TLFs would be calculated on an ex-ante basis for each BSC Year, using Metered Volumes and Network Data for Sample Settlement Periods from a preceding 12-month period.

Transmission Loss Factor Agent: Prior to the start of each BSC Year (1 April – 31 March), the Load Flow Model would be run by a Transmission Loss Factor Agent (TLFA). The TLFA would calculate how an incremental increase in power injection at each node would affect the total variable losses on the Transmission System. Positive TLF values would be produced for nodes where an incremental increase in generation (or reduction in demand) had the effect of decreasing variable losses. Negative TLF values would be produced for nodes where an incremental increase in generation (or reduction in demand) had the effect of increasing variable losses. The TLFA would convert these Zonal TLF values to Seasonal Zonal TLFs by time-weighted averaging, calculating four Seasonal Zonal TLFs for each TLF Zone – one for each BSC Season.

Adjusting marginal losses factors to average losses factors: The TLFA would adjust the Seasonal Zonal marginal TLFs by a scaling factor of 0.5, such that the net volume of energy allocated via TLFs is comparable to the volume of variable losses calculated by the Load Flow Model. These Adjusted Seasonal Zonal TLFs would be published at least three months prior to their use in the TLM Settlement calculation.

P229 Alternative

3.3. The P229 Alternative developed by the Modification Group is the same as P229 Proposed, except that a scaling factor would be calculated and applied to the TLFs. The Modification Group set out in their report that the aim is that the best result possible for a participant is to be allocated none of the costs of variable losses (instead of it being possible to be allocated negative losses and thereby effectively 'credited' energy, as under the P229 Proposed approach).

3.4. Specifically the P229 Alternative solution differs from P229 Proposed in the following way:

Scaling factor: The fixed scaling factor of 0.5 to account for fixed vs. variable losses is replaced with an annually calculated scaling factor 'β' for each Season. This factor is applied to Seasonal zonal TLF values before they are used in Settlement. The intent of applying the 'β' scaling factor is to avoid BM Units being credited with energy due to the application of Zonal TLFs via their TLM. Each year the TLFA calculates a single average scaling factor for each Season to cover delivering and offtaking BM Units. This calculation would be done ex-ante, similar to the annual process for calculation of zonal TLFs.

[18] There are four BSC seasons. These are defined as: Spring – 1 March to 31 May, Summer 1 June to 31 August, Autumn – 1 September to 30 November and Winter – 1 December to 28/29 February.

Implementation date

3.5. The proposed implementation dates for the P229 proposals as set out in the FMR are:

- 1 October 2011 if the Authority reaches its decision on or before 30 September 2010; or
- 1 April 2012 if the Authority reaches its decision on or before 31 March 2011; or
- 1 October 2012 if the Authority reaches its decision on or before 30 September 2011.

3.6. If P229 Proposed or P229 Alternative is approved, implementation would take full effect from the first settlement period on the implementation date.

4. Impact of proposals

Chapter Summary

In this chapter we summarise the key impacts of the P229 Proposed and P229 Alternative proposals, quantifying these where possible. First we give a summary of the overall impacts, before focusing in more detail on the potential impacts on consumers, competition and sustainable development.

Question box

Question 1: Do respondents consider that we have appropriately identified and, where possible, quantified the impacts of P229 Proposed and P229 Alternative?
Question 2: Do respondents consider that there are additional impacts which we should take into account in the decision making process and, if so, what are these?

4.1. In considering the implications of P229 Proposed and P229 Alternative, we have taken into account, amongst other things, the analysis undertaken by LE/Ventyx on behalf of the BSC Panel (the Panel) as well as the reports we commissioned on the proposals[19]. This chapter assesses the proposals against the current BSC arrangements. The potential for other ongoing projects such as TransmiT to interact with these impacts is discussed in more detail in Chapter 5.

Quantitative analysis

4.2. In this section we summarise the overall quantitative analyses conducted during the industry process and follow-up analyses commissioned by Ofgem on the impact of the P229 proposals.

[19] http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=104&refer=Licensing/ElecCodes/BSCode/BSC

LE/Ventyx Analysis

Terms of Reference and Methodology

4.3. The Panel commissioned consultants (London Economics (LE) and Ventyx) to undertake a cost benefit analysis on the proposals[20]. LE/Ventyx were specifically asked to do the following:

- Quantify the upfront implementation costs of the P229 proposals on BSC Parties.
- Quantify the initial distributional impact of the P229 proposals – Parties would be affected differently depending on their location.
- Quantify the impact of the P229 proposals on the overall level of losses.
- Quantify the impact of the P229 proposals on generation, ie how generation might respond to the P229 proposals.
- Quantify the impact of the P229 proposals on demand, ie how demand might respond to the P229 proposals.
- Quantify the impact of the P229 proposals on the transmission system.
- Quantify the environmental impact of the P229 proposals.

4.4. LE/Ventyx sought to quantify the impacts of the proposals for a range of different scenarios:

- A **reference case** based on business as usual assumptions but with the addition of P229 Proposed seasonal zonal TLFs. This was in effect the 'central scenario'.
- A **high gas price scenario** which assumed gas prices were 30% higher than in the reference case (other assumptions including other fuel costs were unchanged).
- A **low gas price scenario** which assumed gas prices were 30% lower than in the reference case (other assumptions, including other fuel costs, remained unchanged).
- A **volatile fuel price scenario** which used fuel prices which were higher in some years (than the reference case) and lower in others with no consistent pattern (other assumptions remain unchanged).
- An **aggressive offshore wind scenario** which included an additional 1.2GW of offshore wind compared to the reference case.
- An alternative **nuclear scenario** which included additional nuclear capacity (compared to the reference case) from 2017 onward.

4.5. For each scenario, in order to quantify the impact of P229 Proposed, a 'base case' without P229 Proposed, and 'change case' with P229 Proposed were modelled for the period 2011 to 2021. The difference between the change case

[20] The CBA carried out by LE/Ventyx can be found as part of the Final Modification Report. http://www.elexon.co.uk/ELEXON%20Documents/Forms/DispForm.aspx?ID=4070

and the base case gives the impact of the P229 Proposed. A reference case was also produced for P229 Alternative.

Results

4.6. The LE/Ventyx cost benefit analysis found that:

- The main costs of implementing the P229 proposals would relate to IT work required to update BSC IT systems along with those of BSC Parties. They estimated these costs to be approximately £3.8 million across all BSC Parties and central systems. In addition to these costs they estimated that there would be some ongoing costs of £0.2 million per annum reflecting the upkeep and maintenance of the systems.

- Overall the LE/Ventyx analysis suggested that the net benefits of the P229 proposals would be positive. Results varied across the scenarios considered but the reference case for P229 Proposed indicated an overall benefit of £46 million, and for P229 Alternative a benefit of £12.5 million.

- The P229 proposals would reduce the overall level of transmission losses. They estimated this annual reduction in losses to be 203GWh for P229 Proposed and 41GWh for P229 Alternative.

- The P229 proposals could deliver significant environmental benefits, including reductions in CO_2, NOx and SOx emissions. The Carbon benefits of P229 Proposed were estimated to be worth approximately £21 million per annum, and if NOx and SOx benefits were included the overall environmental benefit could be valued at £45.3 million. In the case of P229 Alternative the carbon savings were estimated at £6.1 million per annum, with the overall environmental benefit increasing to £13.8 million if NOx and SOx reductions are included.

4.7. Table 4.1 shows that, taking into account all the costs and benefits identified above, under almost all of the scenarios considered, the P229 proposals are expected to have a positive benefit. Across the scenarios the scale of the benefits for P229 Proposed range from -£17 million to £267 million over 10 years, including the benefits of reducing Nitrogen Oxides (NOx) and Sulphur Oxides (SOx) emissions. P229 Alternative is also expected to have positive benefits of £76 million including NOx and SOx.

Table 4.1: NPV of benefits from the P229 proposals

NPV (£ million, 2011-2021)		Generation Response Benefits		Demand Response Benefits	Total Benefits (including NOx and SOx)
		Excluding NOx and SOx	Including NOx and SOx		
P229 Proposed	Reference Case	46.12	275.16	1.74	276.90
	High Gas Price	97.77	(19.97)	3.23	(16.74)
	Low Gas Price	4.30	73.19	0.36	73.55
	Volatile Fuel Price	46.48	172.82	1.73	174.55
	Aggressive Offshore Wind	52.13	265.94	1.82	267.76
	Alternative Nuclear	38.76	222.36	1.59	223.95
P229 Alternative		12.5	76	0.09	76

4.8. LE/Ventyx's analysis indicated that the overall impacts (identified in Table 4.1) would not be distributed evenly across participants. Indeed under the various scenarios considered there would be a transfer of value between participants. Specifically, value would be transferred from parties in the north of GB to parties in the south of GB (although the net effect would be zero). These distributional effects are summarised in Table 4.2. The figures for supply and generators are the amounts that would be 'paid' collectively by some parties and 'received' by other parties.

Table 4.2: Annual Distributional Impact of the P229 proposals

£ million (2011-12)		Supply (South to North)	Generators (North to South)
P229 Proposed	Reference Case	37	31
	High Gas Price	48	41
	Low Gas Price	15.5	14
	Volatile Fuel Price	43	36
	Aggressive Offshore Wind	39	33
	Alternative Nuclear	37	31
P229 Alternative		16	13

4.9. These distributional impacts represent the value that suppliers in the north and generators in the south might expect to gain, and generators in the north might expect to lose as a result of the P229 proposals. We will discuss the issue in more detail in our section on the impact on competition.

4.10. Overall the LE/Ventyx analysis suggested that losses might reduce by 203GWh per annum under P229 Proposed (or 41GWh under P229 Alternative). This reduction in losses was expected to arise due to changes in the despatch of energy rather than changes in the siting of generation or demand.

Table 4.3: Impact on Transmission Losses

Change in Transmission Losses (2011-12) GWh		2011/12
P229 Proposed	Reference Case	(203)
	High Gas Price	(157)
	Low Gas Price	(69)
	Volatile Fuel Price	(220)
	Aggressive Offshore Wind	(175)
	Alternative Nuclear	(203)
P229 Alternative		(41)

4.11. The overall conclusions reached by LE/Ventyx are that:

- The main benefit of the P229 proposals is delivered through generators' short-term response to the signals given, ie redespatch benefits, which result in lower transmission losses.
- There would not be a disproportionate impact on any particular generation type.
- The transmission system would benefit from a reduction in generation (less congestion).
- The proposals would reduce emissions, including CO_2, as well as sulphur and nitrogen oxides.
- The proposals may impact on marginal costs but any increase in wholesale prices is expected to be small.
- Only in the High Gas Price scenario were the results particularly sensitive to assumption changes.
- The proposals are unlikely to have any real impact on plant location.
- A small demand side benefit could be expected as a result of the proposals.
- Although the potential benefits of locational losses might be reduced by using data from the previous year (as in the P229 proposals), such a scheme would still deliver a benefit.

Further analysis

4.12. In order to aid our assessment of the P229 proposals we commissioned further analysis. These consultants reports, which we published in March 2011, can be summarised as:

- A review of Cost Benefit Analysis (Lot 1) which looks at the work undertaken by LE/Ventyx including the appropriateness of the terms of reference, methodology and assumptions, and the robustness of the results and conclusions.
- An additional Scenario Analysis (Lot 2) models two additional scenarios which we considered to be important, but that were not undertaken in the original LE/Ventyx work.
- Additional Analysis (Lot 3) of the results of both the original LE/Ventyx work and the new scenarios modelled in Lot 2.

4.13. In reviewing the cost benefit analysis carried out by LE/Ventyx, the Lot 1 report sets out that:

- The terms of reference issued by the BSC modification group were reasonable and that LE/Ventyx fulfilled the most important aspects of these terms of reference. Our consultants considered that any areas where the analysis deviated from those terms of reference were insignificant in terms of the overall conclusions.

- The modelling methodology used by LE/Ventyx was appropriate and would reproduce the main features of P229 Proposed and P229 Alternative. However our consultants noted that by assuming that TLFs rather than TLMs would impact on generators' offers, the impact on wholesale prices might be overstated. This issue is discussed in more detail below in the section on impact on consumers.

- The range of assumptions assessed by LE/Ventyx was likely to provide robust results and that, although some further sensitivities (around demand) may have been helpful, they would have been unlikely to alter the conclusions reached. However, our consultants did note that LE/Ventyx made very conservative assumptions regarding the development of renewable energy generation such as wind, and recommended two additional scenarios:

    - 15GW Offshore Wind Scenario – aimed at investigating the impact of adding offshore wind capacity so that the 2020 capacity is consistent with the offshore wind tenders that have taken place[21]. An equivalent volume of conventional energy is 'backed off' the system so that the effective capacity margin is unchanged.

    - RES-E Target Scenario – aimed at investigating the impact of government policy on transmission access[22]. This is likely to mean additional renewable plants will connect to the transmission system before wider reinforcements associated with them are completed.

4.14. The Lot 2 report sets out the analysis that benchmarks the LE/Ventyx analysis (specifically the reference scenario) and examines the potential impacts of P229 Proposed under the two additional scenarios identified in Lot 1. The analysis in the Lot 2 report was based on similar assumptions to those used by LE/Ventyx and their analysis yielded results which were fairly closely matched. Table 4.4 summarises the LE/Ventyx and Lot 2 reference scenarios.

[21] Rounds 1-3
[22] The policy has changed since LE/Ventyx carried out their analysis.

Table 4.4: Comparison of LE/Ventyx and Redpoint scenarios (2011-2021)

£ million (2011-21)	LE/Ventyx	Redpoint
Annual Discounted CBA excluding NOx and SOx	46.12	47.71
Annual Discounted CBA including NOx and SOx	275.16	161.14
Transmission Loss Savings (not discounted) GWh	2,112	2,846
Change in Baseload price (Average) £/mWh	0.26	0.04*
*based on TLM adjusted modelling		

4.15. The most significant difference between the two sets of results relate to the impact on wholesale prices and the inclusion of NOx and SOx emissions. These issues are discussed in more detail in the sections below on impact on consumers and impact on sustainable development respectively.

4.16. Overall the additional scenarios considered in the Lot 2 report yielded results that were broadly in line with the range of results generated by LE/Ventyx.

Table 4.5: Summary of Redpoint Scenarios

£ million (2011-21)	Reference	15GW Offshore Wind	RES-E Target
Annual Discounted CBA excluding NOx and SOx	47.71	36.57	41.33
Annual Discounted CBA including NOx and SOx	161.14	135.59	131.06
Transmission Loss Savings (not discounted)	2,846	2,580	2,630

4.17. The Lot 3 analysis considered a number of issues relating to the P229 proposals in more detail, focusing in particular on P229 Proposed. The main conclusions were that:

- P229 Proposed would deliver benefits to consumers of £155 million over the ten year period 2010 to 2020. These benefits would be achieved because less generation would be needed in order to meet demand, meaning lower prices for consumers. Consumer benefits would however be very sensitive to

changes in wholesale prices. Based on the Lot 2 analysis impacts on wholesale prices would be limited and there would still be an overall benefit to consumers.

- At the margin the P229 proposals will make it more likely for plant to locate in the south rather than the north. However, it is likely to delay the retirement of existing oil-fired plant.

- The P229 proposals are unlikely to disproportionately reduce despatch from renewable plant. Renewable generators have higher losses than average (due to the siting of plant) but as they also have almost zero marginal costs they will have an incentive to despatch regardless of changes in losses. The P229 proposals are not expected to change the overall viability of renewable energy.

- The P229 proposals are not expected to impact on overall regulatory risk – cost of capital for projects in the north of GB would increase whilst it would reduce for southern GB projects, but even marginal generating projects in the north of GB would still be creditworthy after the introduction of the P229 proposals.

- The benefit that arises from embedded benefit would be smaller under the P229 proposals than under a uniform losses approach.

Impact on consumers

4.18. In this section we summarise the overall impact of the P229 proposals on consumers and where possible quantify the likely costs and benefits, estimating the potential net impact. We note that there are a range of factors which determine the extent to which these impacts, which appear at a transmission level, are ultimately passed through to consumers.

Change in the level of losses

4.19. The most direct impact on consumers arises from changes in the overall level of losses. Currently losses account for 2% of annual demand. The analysis suggests that P229 Proposed will reduce the level of losses on the GB system. This would mean that the amount of energy that is needed in order to meet demand would reduce. LE/Ventyx estimated that for their Reference Scenario losses would reduce by an average of 211GWh per annum (approximately 5.8% of total losses or 0.1% of annual demand). A similar but smaller reduction would be expected under P229 Alternative as the scaling factors would reduce the locational signals. It is expected that this reduction in losses would be beneficial to consumers, specifically:

- As consumers ultimately bear the cost of producing energy through their bills, an overall reduction in the level of losses would reduce the cost to consumers

of meeting the demand for energy (as less energy would need to be generated in order to meet the same level of demand). The extent to which such benefits would be passed on to consumers might vary depending on the market structure.

- Emissions (such as CO_2) would be reduced in line with the reduction in losses. This is discussed further in the section on sustainable development.

4.20. The reduction in the overall level of losses brought about by **P229 Proposed** would be expected to bring consumer benefits in the order of approximately 211GWh per annum or 5% of existing losses. This could equate to savings of £9.1 million per annum.

4.21. The reduction in the overall level of losses brought about by **P229 Alternative** would be expected to bring consumer benefits in the order of approximately 59GWh (approximately 1.1% of existing losses or less than 0.1% of annual demand). This could equate to savings of £2.5 million per annum.

Changes in wholesale prices

4.22. Consumers will also be affected by the way losses are distributed across generators and suppliers. The P229 proposals would increase the proportion of variable losses allocated to some generators and suppliers (based on their use of the transmission system) and decrease the amount of losses allocated to others. This would change the transmission costs paid by generators and suppliers. This would in turn have an impact on wholesale prices.

4.23. Wholesale prices are determined by the marginal costs of generators. The impact of the P229 proposals on wholesale prices will depend on the exact mix and positioning of generation and demand on the transmission network and, more specifically, the location of the generator that happens to set the marginal costs. If the marginal generator faces lower losses costs under the P229 proposals then it could lead to lower wholesale prices, and vice visa.

4.24. LE/Ventyx's analysis suggested an increase in wholesale prices of an average of £0.30 per MWh across the scenarios they modelled. However we note that for practical purposes the modelling they carried out was based on TLFs not TLMs. As explained in chapter 2 earlier, under the BSC rules the amount of variable losses allocated to a generator would be determined by their TLM. This TLM is in turn made up of the sum of (1+TLF+TLMO+) for the generator. Compared to the current arrangement of TLFs being set to zero and all losses being recovered via TLMOs, under the P229 Proposals:

  - TLFs would be used to allocate variable losses between generators on a seasonal zonal basis (similarly TLFs would be used to allocate losses between suppliers on a seasonal zonal basis).

- TLMOs are used to allocate losses between suppliers and generators according to the agreed 45/55 split. When a large proportion of losses is already recovered from TLFs under the P229 proposals, the effect of TLMOs will be reduced from the levels under the current arrangement so as to ensure correct total recovery.

4.25. By basing their analysis on TLFs alone rather than the whole TLMs, LE/Ventyx have excluded the impact of the reduction of TLMOs, and hence overstated the increase of wholesale prices.

4.26. Further analysis carried out for us as part of the Lot 2 report suggests that using TLMs rather than TLFs, the overall scale of the impact on wholesale prices (based on the transmission system set out in the reference case) is likely to be approximately £0.04 per MWh. This is likely to closer reflect the potential outcome of the P229 proposals.

4.27. It should be noted that any analysis on change in wholesale prices is specific to a set of assumptions about demand and generation. Changes in these assumptions would impact on how wholesale prices are affected by the P229 proposals. As such, the wholesale price change cannot be identified exactly. However, the analysis carried out does give an indication of the potential scale of impact on wholesale prices.

4.28. Overall we consider that it is more appropriate to rely on the Redpoint analysis, which suggests that **P229 Proposed** might have a small impact on wholesale prices of an increase of around £0.04 per MWh. This equates to less than 0.1% of the overall price and therefore it is reasonable to conclude that the impact on wholesale prices is likely to be minimal.

4.29. In **P229 Alternative** the impact of location on the TLM's would be less significant as the proposal involves a scaling factor which results in a weaker locational signal. This would mean that the impact on wholesale prices under P229 Alternative is likely to be lower than under P229 Proposed.

Impact on competition

4.30. In terms of the potential impact of the P229 proposals on competition there are three key issues which we think it is useful to consider further: the impact on competition between generators, the distributional impacts (which could affect competition between generators and between suppliers) and the treatment of embedded generation[23].

[23] The impact on embedded generation could be particularly important for small generators.

Competition between generators

4.31. The introduction of locational allocation for transmission losses would alter, to some extent, the economics of generating electricity for sale in the wholesale market. Therefore it would impact on the terms on which generators compete against each other. The proposals would also introduce an additional factor for participants to take into account when making short and long term decisions in relation to their use of the transmission network.

4.32. For any given level of transmission losses, the proposals would allocate the costs of those losses differently than the existing arrangements. Some generators would see their costs increase whilst others would experience reductions in costs. Therefore we might expect to see changes in the market outcomes, such as the pattern of generation, as a result of the P229 proposals. In the short term, the main impact would be on despatch. In the longer term we need to consider the impact on siting decisions for new entrants. In addition, we consider the impact of allocating costs to users more reflectively of their impact on losses, distributional impacts from the change of allocation method, and the characteristics of the cost signals provided under the proposals.

Impact on despatch

4.33. In the short term[24] the main impact of changes in the allocation of transmission losses would be changes in the relative marginal costs of different generators. Any increase in a generator's TLM would reduce their marginal costs, whilst a reduction in the TLM would increase their marginal costs. The locational signal in the P229 proposals means that typically generators in the north would see their marginal costs increase, whilst generators in the south would see their marginal costs reduce. This is likely to lead to changes in the despatch of energy and therefore the amount of energy produced by generators.

4.34. The overall effect of this change in despatch behaviour is as outlined in the impact on consumers section above.

4.35. Some parties have expressed concern that as much of the existing renewable generation is in the north where the locational impact on losses is higher, the effect of the P229 proposals on renewable generators is likely to be greater. The Lot 3 analysis suggested that conventional generations would on average be credited with 99.8% of the energy they produce (ie experience 0.2% losses), renewable generators would be credited with 97.8% (ie experience 2.2% losses). Over time this gap might be reasonably expected to narrow as offshore wind capacity is expected to be developed off the south coast as well as in the North Sea. However despite the likelihood that renewable generators in the north will face paying more for losses under the P229 proposals this may not have any

[24] At settlement a generator's/supplier's metered volume is adjusted by the TLM to determine the amount of energy that they will be credited with.

real effect on despatch. Many renewable technologies, such as wind, have marginal costs which are close to zero. Therefore, even under the P229 proposals they would be expected to remain incentivised to generate.

4.36. The main impact of changes in the allocation of transmission losses as set out in **P229 Proposed** and **P229 Alternative** would be changes in the relative marginal costs of different generators. This is likely to lead to changes in despatch.

Impact on siting decisions

4.37. In the longer term developers would likely take into account locational losses when making decisions about the siting of new plant. As the P229 proposals would increase the costs borne by generators in the north relative to those in the south, it could be argued that the proposals would make locating in the south more attractive to a generating plant. However, there are many factors which will be taken into account when considering the siting of generation plant including capital costs and ongoing operation costs. The LE/Ventyx report suggested that losses make up only a small proportion of operation costs and would not be expected to have a material impact on the upfront capital costs of generation, and the Lot 3 report broadly agreed with this suggestion. Therefore, the P229 proposals are unlikely to have a significant impact on the decision of where to site plant.

4.38. It is perhaps more likely that P229 could impact on the retiral of plant – as the upfront capital costs are already sunk making the operational costs the determining factor. By reducing marginal costs for plant in the south it could be argued that the P229 proposals could delay the retirement of generating plant in the south. Conversely by increasing marginal costs for generators in the north, the proposals might accelerate the retiral of plant in the north. However we note that this is only likely to impact on plant very close to retiral.

4.39. Some parties have argued that as renewable generation tends to be sited in the north where they would face higher locational losses under the P229 proposals, it might have a more significant impact on the siting decisions of future renewable plant (than for conventional generation). The Lot 3 analysis considers the impact, if any, the P229 proposals would have on renewable generation. It looked at the profitability of various types of renewable energy and examined how the P229 proposals might be expected to impact. It found that with the exception of wave power (which appeared unprofitable with and without the P229 proposals) renewable generation was likely to remain profitable under the P229 proposals.

4.40. Overall the impact of **P229 Proposed** and **P229 Alternative** on siting decisions is likely to be minimal.

Cost reflectivity

4.41. The introduction of locational losses allocation would be expected to promote further competition by introducing more cost reflective charging arrangements that will facilitate lower prices. In order to be fully cost reflective any scheme would need to ensure that charges were levied on the basis of cost drivers. In terms of transmission losses key drivers are likely to include the volume of losses, the time that energy is transmitted, and the location of generation and supply.

4.42. P229 Proposed makes a number of simplifications in the interests of practicality and stability whilst still maintaining a cost reflective approach. Namely;

- TLFs are based on the settlement periods for the previous year,
- locational signals are given by way of the 14 GSP zones rather than node to which a generator or supplier is connected, and
- seasons are used rather than half hour settlement periods.

4.43. By introducing additional scaling P229 Alternative would lessen the signal given but still be based on cost reflective principles.

4.44. To the extent that proposals promote or further cost reflectivity they could be argued to also ensure non-discrimination. If generators or suppliers are not facing allocations which accurately reflect the costs they impose, then the argument could be made that the existing arrangements result in a more discriminatory outcome.

4.45. If transmission users are not paying allocations that reflect their impact on the transmission network the relative cost position will be skewed, thereby inhibiting effective competition between parties using the network.

Distributional impacts

4.46. Changes to the rules for allocating volumes of losses will have associated distributional impacts. Some generators and suppliers will be faced with a larger allocation of losses than they would be if the rules were not changed, while other generators and suppliers will be faced with a smaller allocation of losses than they would be if the rules were not changed. The costs associated with losses will therefore be redistributed, while the total allocation over all generation and overall suppliers will be unchanged. Table 4.2 showed LE/Ventyx's analysis of the likely distributional impact of the P229 proposals.

4.47. The main points to note from this analysis are:

- Around 31million would be transferred between generators under P229 Proposed and around £13 million under P229 Alternative.

- Generators in Scotland face the largest increase in costs, while generators in southern England see the largest reductions in costs.
- Around £37 million would be transferred between suppliers under P229 Proposed and around £16 million under P229 Alternative
- Suppliers in southern England would face the largest increase in costs, whilst suppliers in the North of Scotland see the largest reductions.

Stability and predictability

4.48. The P229 proposals may impact on competition if they are perceived to introduce a new risk for market participants. However, it could also be argued that any perceived increase in risk is mitigated by the potential for increased predictability and stability. The allocation of losses under the P229 proposals is more complex than the existing arrangements. However the potential for locational losses to be introduced has been the subject of debate since privatisation in 1990. A decision either way on the P229 proposals would provide certainty around this issue. Furthermore, if approved, the P229 Proposed or P229 Alternative methodology has been considered in detail and is transparent.

Embedded generation

4.49. The Lot 3 analysis also considers the impact on embedded generation. We note that overall embedded benefits arise as a consequence of embedded generation being treated as negative demand, rather than generation, within the methodology for allocating costs between demand and generation. The way this works in the context of transmission losses is as follows:

- the volume of losses allocated to a transmission connected generator is the generators output multiplied by (,

- whereas a embedded generator, treated as negative demand, reduces the supplier's charge by its output multiplied by (,

- therefore the losses-related embedded benefit, which is related to the difference in the TLMs, ie TLM_+ - TLM_-, is a consequence of both avoiding the generation allocation and benefiting from the reduction in the supplier allocation.

4.50. The P229 proposals would not change the current arrangements for treating embedded generation as negative demand, although they do impact on the losses charges which can be avoided or reduced through those arrangements.

4.51. While the P229 proposals would each result in TLM values which vary over the country there is only an impact on the losses-related embedded benefit if there is a change in their difference, TLM_+ - TLM_- ("the TLM difference"), at any

given location. Under the P229 proposals, as is the case now, the TLM difference does not vary across the country and is directly proportional to the amount of losses to be recovered non-locationally. The introduction of zonally varying TLFs would recover a certain amount of the losses through the locational component, hence reducing the amount to be recovered by the non-locational element.

4.52. Overall **P229 Proposed** and **P229 Alternative** are likely to reduce the size of the losses related embedded benefit.

Impact on sustainable development

4.53. Any energy generated has an environmental impact. The introduction of P229 Proposed or P229 Alternative would decrease the amount of energy that needs to be generated in order to meet demand, in comparison with the existing arrangements, as losses would be reduced. Thus overall the P229 proposals would have a positive environmental impact. The P229 proposals would be expected to reduce a variety of emissions specifically Carbon Dioxide (CO_2), Nitrogen Oxides (NOx) and Sulphur Oxides (SOx).

4.54. As discussed in the section on the impact on competition, the P229 proposals are unlikely to materially affect the siting of new plant but could have an impact on the retiral of plant which is nearing the end of its useful life. In the case of plant in the south, the P229 proposals could lead to increased incentive for generator to extend the lifespan of their plant in the south, or to shorten the lifespan of plant in the north. This issue was considered in more detail in the Lot 3 report.

4.55. LE/Ventyx estimates that P229 Proposed will reduce CO_2 emissions from GB generators by between 1 million and 3 million tonnes per year. We note that the European Emission Trading Scheme (or ETS) has capped the total amount of emissions for installations that participate in the scheme, including the GB power sector. The reduction in CO_2 emissions from GB generators as a result of the P229 proposals will make more emissions certificates available to other emitters within the ETS. Therefore the P229 proposals does not reduce overall CO_2 emissions in the UK or EU, but rather would lower the price of meeting the target set by the ETS (ie demand for permits would be lower), although we note that the Government has introduced a carbon floor price in the 2011 Budget.

4.56. We also note that any significant reduction in the carbon price could have a knock-on impact on the incentive to invest in renewable plant. Overall, however, it appears that the impact of the P229 proposals on investment and siting decisions are likely to be minimal (as discussed in the section on competition).

4.57. LE/Ventyx estimate that P229 proposed reduces emissions of NOx by between 2,000 and 7,000 tonnes per year, and SOx emissions by between 3,000 and 25,000 tonnes per year. Both NOx and SOx are responsible for a number of undesirable effects, including acid rain and smog. NOx and SOx are two of the pollutants which contribute toward asthma attacks, which over five million people

in the UK suffer from. Therefore the reduction in SOx and NOx emissions should benefit GB consumers by increasing air quality.

4.58. Overall **P229 Proposed** is expected to result in;

- An average reduction of 1.4million tonnes per annum of CO_2 emissions which could be valued at £21 million[25].
- An average reduction of 3.4 kilotonnes per annum of NOx emissions which could be valued at £8.5 million.
- An average reduction of 12 kilotonnes per annum of SOx emissions which could be valued at £15.8million.

4.59. Overall **P229 Alternative** is expected to result in;

- An average reduction of 0.4 million tonnes per annum of CO_2 emissions which could be valued at £6.1 million.
- An average reduction of 0.95 kilotonnes per annum of NOx emissions which could be valued at £2.4 million.
- An average reduction of 3.4 kilotonnes per annum of SOx emissions which could be valued at £5.3 million.

4.60. We do not consider that the P229 proposals would have a significant impact on fuel poverty or vulnerable consumers, other than the general consumer benefits identified above but would welcome views from interested parties.

4.61. We consider that the P229 proposals might help promote energy savings by reducing the overall level of transmission losses.

4.62. We consider that the P229 proposals might help ensure a secure and reliable gas and electricity supply by reducing the pressure on the transmission system.

Other impacts

Impact on health and safety

4.63. We are not aware of any health and safety implications related to the **P229 Proposed** or **P229 Alternative**.

[25] Based on the average carbon price for the analysis period from DECC's 'Updated short term traded carbon values for UK public policy appraisal (June 2010)' http://www.decc.gov.uk/en/content/cms/what we do/lc uk/valuation.aspx

Risks and unintended consequences

4.64. We consider that any risks or unintended consequences resulting from the P229 proposals have been identified elsewhere in this impact assessment. However, we would welcome any parties views on other potential risks and unintended consequences associated with the P229 proposals.

Summary of Impacts

4.65. Table 4.6 summarises the impacts identified in this chapter.

		P229 Proposed	P229 Alternative
Consumers	Cost benefit analysis	Positive NPV over 10 years.	Positive NPV over 10 years but lower than for P229 Proposed.
	Transmission losses	Lower than status quo.	Lower than status quo but higher than for P229 Proposed.
	Wholesale prices	Impact could be positive or negative but is likely to be small.	Impact could be positive or negative but is likely to be smaller than for P229 Proposed.
Competition	Discrimination	No disproportionate effect on any generator.	No disproportionate effect on any generator.
	Siting decisions	Little effect on siting expected.	Little effect on siting expected.
	Distributional impact	Relatively large redistribution of costs between generators and suppliers in the north and south,	Lower redistribution of costs between generators and suppliers in the north and south.
Cost Reflectivity		Increases cost reflectivity.	Increases cost reflectivity but less than for P229 proposed.
Sustainable Development		Decrease in emissions.	Decrease in emissions but less significant than under P229 Proposed.

5. Interactions

Chapter Summary
In this chapter we consider how the P229 proposals might interact with options being considered under Project TransmiT and the Government's Energy Market Review (EMR).

Question Box
1. Do respondents consider that we have appropriately identified the potential interactions of the P229 proposals with TransmiT and the EMR?
2. Do respondents consider that we have appropriately indentified the likely impacts of these interactions?

5.1. As noted in Chapter 2 of this document, the range of options being considered under Ofgem's Project TransmiT[26] and the Government's EMR could potentially have implications for the impact of the P229 proposals. The quantitative analyses supporting our assessment of the impact of the P229 proposals has been conducted against the current treatment of other transmission costs and on the assumption that such treatment would continue into the future. As explained earlier in this document, however, we think that it is appropriate to consider the potential implications of any possible developments in other areas of transmission charging, on the costs and benefits of the P229 proposals identified against the current arrangements. We are, of course, cautious about considering possible future developments due to the uncertainty of such changes as they are subject to development and consideration under TransmiT. We do not have sufficient detail at this stage to consider any potential interaction between the P229 proposals and EMR.

5.2. We will shortly be writing to interested parties to set out our view of the range of options that should be assessed in the next phase of our work on charging. To the extent that any of the range of emerging options are developed and approved under TransmiT, there are likely to be different implementation timescales associated with the differing options. For example, certain options imply changes that might be put in place relatively quickly, whilst others imply potentially longer implementation timescales.

5.3. For the purposes of our impact assessment for the P229 proposals, we consider that it is prudent for us specifically to focus on the way in which P229

[26] The range of possible options are set out in Ofgem's TransmiT consultation letter of 22 March 2011. A copy of the letter can be found here:
http://www.ofgem.gov.uk/Networks/Trans/PT/Documents1/110322_TransmiT_Charging_Update%20for%20publication.pdf
The academic reports can be found here
http://www.ofgem.gov.uk/Networks/Trans/PT/WF/Pages/WebForum.aspx

proposals might interact with potential changes under TransmiT that would be technically feasible for implementation in the next few years. In this way, we can assess the impact of P229 proposals against a baseline which does not involve an assessment of the impact of EMR, or of more complex market changes. We consider that it is valid to ask whether the P229 proposals would deliver a net benefit over a short timescale, ignoring any future benefits.

5.4. For the avoidance of doubt, we do not intend to prejudge here the outcomes of either TransmiT or the EMR. We accept that there remains uncertainty as to which if any of the options emerging from these projects will be taken forward and how those options may develop going forward. The purpose of this section is to assess how sensitive the cost benefit analysis set out in Chapter 4 might be to the possible range of changes in the transmission charging structure that might feasibly be capable of implementation, if appropriate, in the shorter term under Project TransmiT.

More detailed assessment of the costs and benefits of P229 in the short term

5.5. Given the focus of the examination of the interaction in the next few years, we have looked in more detail at the time profile of the costs and benefits of the P229 proposals, as opposed to the cumulative NPV approach taken in the previous chapter.

Short-term costs of the P229 proposals

5.6. The implementation costs identified by LE/Ventyx predominantly relate to IT work that would be required in order to update BSC IT systems, billing systems and systems linked to metered volumes. LE/Ventyx estimated the costs to BSC parties as well as central costs that would be incurred.

5.7. As set out in the FMR, Elexon had gathered input from BSC parties by way of a questionnaire in order to help determine the likely costs and the time needed for these changes to be made.

- On the issue of implementation time parties views varied, with some suggesting that implementation times would be minimal or a period of days, whilst others suggesting an implementation period of up to 12 months would be needed.

- In terms of costs there was also significant variation in the estimates across parties, although not all respondents provided a cost estimate. The cost estimates varied from less than £10,000 up to £600,000. LE/Ventyx used these industry responses to provide an overall estimate by scaling the average costs provided based on capacity. This resulted in a cost range of £2.8 million to £4.1 million, with a midpoint estimate of £3.4 million.

5.8. In addition, they estimated the cost of changes to central BSC systems to be £0.4 million. Therefore they assumed total implementation costs of £3.8 million would be incurred in the first year of the Cost Benefit Analysis.

5.9. In addition to these upfront costs LE/Ventyx estimated that there would be some ongoing costs related to the upkeep and maintenance of the systems. They estimated these costs to be approximately £0.2 million per annum, and factored these into the CBA accordingly.

5.10. Brattle also considered in the Lot 1 report the implementation cost estimates that were used in the LE/Ventyx CBA. Specifically they noted that:

- Whilst LE/Ventyx used capacity to aggregate the cost estimates provided by BSC parties, it is not clear implementation costs would vary with capacity. Brattle felt it more likely they would be dependent on the number of systems to be changed and the complexity of these systems. However they concluded that the resulting estimate from the LE/Ventyx approach looked prudent when compared with implementation cost estimates from previous similar proposals.

- Implementation costs were treated by LE/Ventyx as if they would be incurred in the first year of the P229 proposals being implemented. However Brattle felt it was more likely that they would be incurred in advance (ie year 0). They estimated that changing the treatment of the implementation costs in this way could reduce the NPV by £0.16 million.

- Overall Brattle didn't believe that either of these issues would materially alter the conclusions of the CBA produced by LE/Ventyx.

5.11. If P229 Proposed or P229 Alternative were approved, implementation costs are likely to be incurred between the decision date and the implementation date in order to allow the new arrangements to operate from 1 October 2012. It is unclear when during that year these costs might be incurred (.e the phasing of spend) and we would welcome parties views on this issue.

5.12. Given an implementation date for the P229 proposals (if either are approved) of 1 October 2012, it is possible that if TransmiT brought about any short term changes in the wider transmission charging methodologies these could potentially precede the implementation of P229 Proposed or P229 Alternative. It is as yet uncertain what changes, if any, under TransmiT may be made in the short term, and as discussed later in this chapter, different potential options for short term change will have different interactions with P229 Proposed or P229 Alternative. Whilst it is not clear at this stage that *any* of the possible short term options emerging under TransmiT would 'undo' P229 Proposed or P229 Alternative it remains a possibility that the changes to parties' systems necessary to implement P229 Proposed or Alternative might no longer be needed. In this potential extreme case, costs would have been incurred unnecessarily but there is likely to have been a signal prior to the full implementation costs being spent.

Therefore the risk is not for the full £3.8 million but a portion of this depending on spend profile.

Short-term benefits of the P229 proposals

5.13. If changes were brought in during the first year of P229 Proposed or P229 Alternative being in place the full implementation costs would have been incurred. However, we would expect some of the benefits to be realised even if P229 Proposed or P229 Alternative was not in place for a full year although these could well be offset by the implementation costs.

5.14. Taking such identified costs into account, the net benefit of implementing P229 Proposed or P229 Alternative for an interim period (ie 1 year, 2 years, 3 years, etc) as calculated by the quantitative analyses are as listed in Table 5.1. We have adjusted the analysis to reflect that the implementation costs are likely to be incurred in the year prior to implementation.

Table 5.1: Short term impacts of P229 proposals

	£ million net cost-benefit(discounted)(cumulative, excl NOx and SOx)	Year 1	Year 2	Year 3	Year 4	Year 5
LE/Ventyx	Reference	2.58	8.93	14.40	18.46	21.32
	High Gas Price	3.53	15.52	24.86	32.27	36.25
	Low Gas Price	(1.79)	0.04	(1.00)	(0.29)	(0.25)
	Volatile Fuel Price	3.60	10.63	12.77	18.81	20.53
	Aggressive Offshore Wind	3.09	9.65	15.42	21.05	25.17
	Alternative Nuclear	2.58	8.93	14.40	18.46	21.32
	P229 Alternative	(2.14)	0.10	1.69	3.27	4.20
Redpoint	Reference	(9.04)	1.68	10.56	16.10	21.67
	15GW offshore wind	(7.58)	1.69	9.07	14.80	19.56
	RES-E Target	(5.30)	0.86	9.59	14.48	19.85

5.15. The LE/Ventyx analysis shows positive results in the first year under most scenarios. Although small these benefits increase steadily the longer P229 Proposed or Alternative would be in place. The exception is the Low Gas Price scenario where results remain negative throughout these initial years.

5.16. The Redpoint analysis shows negative result in the first year for all scenarios. This is largely due to modelling issues as TLFs for the first year of the study, 2011/12, were derived by modelling the prior year with generators not exposed to zonal losses. Taking the first 2 years combined the results are positive. However it is not until year three that more significant benefits are shown. Overall the modelling suggests a benefit could arise even if P229 Proposed or P229 Alternative were only in place for a short period of time.

5.17. Given the positive results shown in the short term CBA we do not think it is appropriate or necessary to repeat the full analysis of the impact on consumers, competition and sustainable development here focusing on the short term impacts. The impacts identified in chapter four would still be relevant in these circumstances albeit to a lesser extent. We would welcome views from interested parties on the short term impacts that we have identified.

Interactions with emerging short-term options under TransmiT

5.18. Consistent with the approach set out above, to focus on the short term impact of the P229 proposals we consider it appropriate to focus here on the impact of P229 Proposed or P229 Alternative against the narrower range of potential changes which could be implemented in the short term. These include the postalisation of TNUoS charges and some improved version of the current TNUoS methodology, such as to improve the reflectivity of generators' usage pattern of the transmission system. Brattle has produced a report (the 'Lot 4' report) considering the interaction of each of such options with the P229 proposals. They conclude that these options are unlikely materially to alter the impacts of P229. In this report Brattle found that :

- "Two of the possible changes to TNUoS charges – flat TNUoS charges and commoditised TNUoS charges – would eliminate the current locational signal in transmission charges. This means that, in the longer run, compared to the current system of zonal TNUoS charges more plants are likely to locate in the north of GB or, equivalently, the retirement of some northern plants will be delayed. The main effect of P229 is to reduce losses by increasing despatch from southern plant and decreasing despatch from northern plant. Flat TNUoS charges could increase this effect in the long-run, since there will be more plant in the north to respond to zonal losses. If there are no locational signals in TNUoS charges, then the role of zonal losses in prompting more efficient despatch becomes more significant. But we expect the effect of such changes to be insignificant mainly because, as discussed in the LE/Ventyx work and our previous 'Lot 3' reports, the effect of zonal TNUoS charges on siting decisions is relatively small. However, if gas exit charges were also to be socialised then long-term locational signals would be significantly reduced and might lead to some changes in where new gas-fired plants chose to locate."

- "Flat TNUoS charges could in theory delay the retirement of coal-fired plant in the north of GB, which would increase the environmental benefits of P229. But the LE/Ventyx report concluded that transmission charges, and therefore changes in transmission charges, would not affect retirement decisions. These decisions would instead be dominated by factors such as the cost of maintenance and overhaul, supply and demand, and the efficiency of new technology. We broadly agreed with these conclusions, and conclude that flat TNUoS charges would not significantly affect retirement decisions and would therefore not change the benefits of P229."

- "In common with flat TNUoS charges, the proposal to 'commoditise' TNUoS charges without locational variation could potentially shift more capacity to the north of GB in the longer term. Unlike the introduction of flat capacity-based TNUoS charges, the proposal to 'commoditise' TNUoS charges on a uniform basis throughout GB would increase all generators' variable costs by the same amount. This should have no effect on the merit order relative to a situation with the current TNUoS charges. Therefore in the short-term we would expect this proposal to have very little effect on the costs and benefits of P229. If there is an effect it would be a slight increase in the benefits because again the removal of the locational signal could encourage more plants to locate in the north of GB, and so there would be a greater cost-saving from the introduction of zonal losses."

5.19. We would welcome views on the opinions and arguments expressed by Brattle.

5.20. The net benefit of implementing the P229 proposals for the short term (ie 1 year, 2 years, 3 years, etc) as calculated by the quantitative analyses are as listed in Table 5.5.

Interactions with longer-term changes

5.21. As we have mentioned, we cannot assess the impact of the P229 proposals against any wider or deeper changes to transmission charges or market arrangements in the longer term under TransmiT or under EMR until the nature of such options are better known. However, regardless of the exact nature of any such deeper changes, if any, if the effect of these changes were contradictory to the P229 proposals, we consider that they would be limited to effectively undoing the solution implemented by P229 Proposed or P229 Alternative. This would effectively limit the impacts of the P229 proposals to the short term as set out in table 5.1. This would suggest that the P229 proposals could deliver short-term benefits, irrespective of the long-term arrangements.

6. Next steps

Chapter Summary
This chapter sets out the next steps for the P229 proposals.

Question box

There are no questions in this chapter.

6.1. This document marks the start of a six week consultation period (ending 4 July 2011) during which respondents are invited to submit any comments. Details on how to respond to this consultation, including contact details for any queries can be found in Appendix 1. It also gives a complete list of the questions which we are specifically seeking respondents' views on, although we welcome respondents' views on any aspect of this document.

6.2. The Authority will consider any responses to this consultation before reaching its decision on the P229 proposals.

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. 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.

1.2. Responses should be received by 4 July 2011 and should be sent to:

Dena Barasi
Electricity Transmission Policy
Ofgem
9 Millbank
London
SW1P 3GE
0141 331 6019
dena.barasi@ofgem.gov.uk

1.3. 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.

1.4. 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.

1.5. Any questions on this document should, in the first instance, be directed to Dena Barasi (contact details provided above).

CHAPTER: One

There are no questions in this chapter

CHAPTER: Two

There are no questions in this chapter

CHAPTER: Three

There are no questions in this chapter

CHAPTER: Four

Question 1: Do respondents consider that we have appropriately identified and where possible quantified the impacts of P229 Proposed and P229 Alternative?
Question 2: Do respondents consider that there are additional impacts which we should take into account in the decision making process and, if so, what are these?

CHAPTER: Five

Question 1: Do respondents consider that we have appropriately identified the potential interactions of the P229 proposals with TransmiT and the EMR?
Question 2: Do respondents consider that we have appropriately indentified the likely impacts of these interactions?

CHAPTER: Six

There are no questions in this chapter

Appendix 2 - Legal and assessment framework

Introduction

6.1. For any BSC modification proposal to be implemented, the amendment must better facilitate achievement of the applicable BSC objectives (set out in standard condition C3 of NGET's transmission licence and below) and be consistent with the wider statutory and legal framework.

Assessment framework

6.1. The Authority considers whether either of P229 Proposed or P229 Alternative better facilitates the achievement of any one or more of the applicable BSC objectives as compared with the current provisions of the BSC.

6.2. The applicable BSC objectives in relation to P229 Proposed and P229 Alternative are as follows:

(a) the efficient discharge by NGET of the obligations imposed upon it by its electricity transmission licence;
(a) the efficient, economic and co-ordinated operation of the national transmission system;
(b) promoting effective competition in the generation and supply of electricity, and (so far as consistent therewith) promoting such competition in the sale and purchase of electricity; and
(c) promoting efficiency in the implementation and administration of the balancing and settlement arrangements.

6.3. Where the Authority considers that a proposal does better facilitate the applicable BSC objectives, the Authority considers whether that proposal is consistent with its statutory duties, including those arising under European law.

6.4. The Electricity Act 1989, as amended, sets out the Authority's duties. The Authority's principal objective is to protect the interests of existing and future consumers, wherever appropriate by promoting effective competition. Those interests of existing and future consumers are those interests taken as a whole including their interests in the reduction of electricity supply emissions of targeted greenhouse gases and their interests in the security of the supply of electricity to them. In making its decision the Authority also has regard to, amongst other things, the need to secure that all reasonable demands for electricity are met, to secure that licensees are able to fund their activities and to contribute to the achievement of sustainable development.

6.5. The Authority must also have regard to 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.

Impact Assessment

6.6. Where the Authority is proposing to make a decision that is 'important' (within the meaning of section 5A of the Utilities Act 2000[27]) the Authority is required (save where the urgency of the matter makes it impracticable or inappropriate for it to do so) to undertake an impact assessment or to publish a statement setting out why it considers it unnecessary to carry out an impact assessment. An impact assessment must include an assessment of the likely effects on the environment of a proposal.

6.7. Having considered the FMR in respect of P229 Proposed and P229 Alternative we consider that the proposed and alternative modifications are "important" for the purposes of section 5A of the Utilities Act 2000 in terms of the potential significant impact of the proposals on market participants and the potential significant impact on the environment. It is on this basis that the Authority has decided to carry out and publish this impact assessment.

[27] A proposal is "important" for the purposes of section 5A only if its implementation would be likely to do one or more of the following: involve a major change in the activities carried on by the Authority; have a significant impact on persons engaged in the shipping, transportation or supply of gas conveyed through pipes or in the generation, transmission, distribution or supply of electricity; have a significant impact on persons engaged in commercial activities connected with the shipping, transportation or supply of gas conveyed through pipes or with the generation, transmission, distribution or supply of electricity; have a significant impact on the general public in Great Britain or in a part of Great Britain or have significant effects on the environment.

Appendix 3 - Glossary

A

The Authority/Ofgem

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

B

Balancing and Settlement Code (BSC)

A multi-party document governing the wholesale electricity balancing and settlement arrangements for GB

Balancing Mechanism (BM)

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

BM Unit (BMU)

A unit registered as such under the BSC, and metered separately from other BM units for the purposes of balancing and settlement.

BSC Panel

The Panel established pursuant to section B of the BSC. Amongst other things, the BSC Panel is responsible for the implementation of the procedures for modification of the BSC.

BSC Year

Each successive period of 12 months beginning on 1 April in each year

E

Elexon

Elexon Limited fulfils the role of BSCCo as defined in the BSC.

Ex-ante

Calculated beforehand.

F

Final Modification Report (FMR)

The report submitted by the BSC Panel to the Authority in respect of a proposed modification to the BSC. This report contains the Panel's recommendation as to whether the proposed modification or any alternative modification should be made on the basis of whether it better facilitates the achievement of the applicable BSC objectives.

Fixed Losses

The element of transmission losses which is independent of the distance travelled by electricity.

G

Grid Supply Point (GSP)

A system connection point at which the transmission system is connected to a distribution system.

Generator

A person who generates electricity under licence or exemption under the Electricity Act 1989.

I

Imbalance

Imbalances are the difference between a party's contracted position and the actual metered volume of energy generated/consumed by that party.

K

Kilowatt(kW) / Megawatt(MW)

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.

L

Load Flow Model

A model used for estimating the impact of a marginal increase in power at each individual node on the network on total flows on the transmission system. A Load Flow Model can be used to generate Transmission Loss Factor values.

N

National Electricity Transmission System

The national electricity transmission system comprises the onshore transmission system and the offshore transmission systems.

Network Mapping Statement

The document established by Elexon on behalf of the BSC Panel to map power flows on the GB transmission system by node.

Node

A transmission node is a point on a network at which a circuit meets.

O

Ofgem

See definition of the Authority.

Offshore electricity transmission networks

offshore electricity transmission networks will be required to transmit electricity from offshore renewable generators to customers via the onshore transmission and distribution networks.

S

System Operator (SO)

The entity responsible for the day to day operation of the GB transmission system and for entering into contracts with those who want to connect to and/or use the GB transmission system. NGET is the GB SO.

T

Transmission Losses

The amount of energy that is lost through the process of transmitting energy from generators to centres of demand.

Transmission Loss Adjustment (TLMO)

TLMOs are a component of the formulae used to calculate TLMs. TLMOs are used to calibrate the TLMs such that 45% of total actual losses are allocated to generators and 55% of total losses are allocated to suppliers.

Transmission Loss Factor (TLF)

TLFs are a component of the formulae in the BSC which are used to calculate TLMs. TLFs allow for TLMs to vary by location.

Transmission Loss Multiplier (TLM)

TLMs are applied to metered volumes of electricity in order to factor transmission losses into the calculation of imbalances.

Transmission Network Use of System (TNUoS) Charges

Charges levied by NGET on users of the GB electricity transmission network to recover the costs of providing and maintaining the general network infrastructure assets. Existing TNUoS tariffs vary by location on a zonal basis, and are different for generators and for suppliers.

Transmission Owners (TO)

Companies which own and operate transmission assets.

V

Variable Losses

The element of transmission losses which occur through heat and which increase with the distance travelled by electricity.

Appendix 4 - 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:

(a) Do you have any comments about the overall process, which was adopted for this consultation?
(b) Do you have any comments about the overall tone and content of the report?
(c) Was the report easy to read and understand, could it have been better written?
(d) To what extent did the report's conclusions provide a balanced view?
(e) To what extent did the report make reasoned recommendations for improvement?
(f) Please add any further comments?

1.2. Please send your comments to:

Andrew MacFaul
Consultation Co-ordinator
Ofgem
9 Millbank
London
SW1P 3GE
andrew.macfaul@ofgem.gov.uk