Zonal Transmission Losses in the GB Electricity Market

A Review of Statements by Ofgem and Others

31 July 2006

Introduction

This document summarises the statements made since Vesting by the Office of Electricity Regulation (OFFER) and the Office of Gas and Electricity Markets (Ofgem) regarding the allocation of losses in the GB electricity market. A number of other reports that have been significant in the debate are also reviewed.

A narrative is given below split into:

(1) the years immediately following Vesting during which the Pool failed to address locational losses;

(2) the November 1995 letter to the Pool from the Director General of Electricity Supply (DGES) up to the Review of Electricity Trading Arrangements; and then

(3) the period including NETA, BETTA and P82 and the associated Balancing & Settlement Code Modification Proposals; and

(4) documents relating to the arrangements in Scotland and BETTA.

The Appendix gives relevant extracts from each document, and remarks about the arguments being made.

1989 - 1995: The Years immediately following Vesting

As of 30 March 1990, the Pooling & Settlement Agreement (P&SA)[1] contained Schedule 12, "Transitional Arrangements" containing the principle to, "*Review and, if agreed, implement changes in the arrangements for allocating the costs of transmission losses on the supergrid, e.g. to reflect: (i) electrical location of generation and demand; and/or (ii) contractual arrangements between Generators, Suppliers and NGC; and/or (iii) incentives for investment in supergrid facilities*". In his first Annual Report (for the period to 31 December 1989)[2], the then Director General of Electricity Supply (DGES) drew attention to the P&SA Transitional Arrangements, saying that, "*locational decisions* [should be] *properly informed*", and noting that P&SA anticipated implementation by the end of 1995.

References in the next few Annual Reports were confined to: observing that locational NGC charges would also have the effect of reducing losses (1991); energy efficiency (although in the context of the distribution price controls) (1993 and 1994); and reference to the November 93 consultation paper[3] regarding transferring responsibility for losses from the Pool to NGC (1993).

[1] See Appendix 1, Section N: 'Non-Ofgem Documents'.

[2] See Appendix 1, Section O: 'Ofgem Annual Reports'.

[3] See Appendix 1, Section CP: "Consultation Papers".

1995 - 1999: Letter to the Pool Chairman to the Review of Electricity Trading Arrangements

In November 1995, the DGES wrote to the Pool Chairman[4] expressing concern at the lack of progress towards an improved[5] allocation of Transmission Losses. Limitations of the existing arrangements were described, including:

(i) the lack of price signals to generators biasing entry and exit decisions;

(ii) the lack of locational signals to demand;

(iii) lower energy efficiency; and

(iv) the increased need for transmission lines and the resultant environmental impact.

The DGES also cited the duties of NGC to develop and maintain an efficient, co-ordinated and economical system of electricity transmission, and of the Public Electricity Suppliers to develop and maintain an efficient, co-ordinated and economical system of electricity supply. The DGES also cited his own duty to protect the interests of consumers. The letter also suggested that, in conjunction with increasing differentials in NGC use of system charges, it should be adequate to reflect average rather than marginal losses.

November 1995 also saw the start of the transmission price control review of NGC. The consultation papers[6] published from November 1995 through to the proposals document in October 1996 referenced the November 1995 letter, and referred to the arguments: concerning energy efficiency; reducing the need for transmission lines; and reducing charges to customers generally. It was stated that distance-related charging for transmission losses had received most support but that there was division of whether NGC or the Pool should be responsible. It was also noted that on 21 March 1996, the Pool Executive Committee has considered proposals for 'scaled marginal loss factors' recovering average losses, and noted that these proposals had been referred to a Pool Members Meeting and that an appeal was anticipated.

The first appeal was made on 22 May 1996, for which the decision was published on 11 July 1996[7]. In upholding decisions to (1) develop a system of differential transmission loss factors, (2) not to restrict such factors to generation only and (3) not to charge losses to NGC, the DGES stated that the proposals would be conducive to greater efficiency, lower costs and environmental benefits. Arguments that contract market liquidity would be reduced were dismissed.

A further appeal was made on 17 February 1997 concerning the detailed Works Programme developed following the earlier decisions. Dissentient Pool Members argued that the proposals for scaled marginal loss factors went beyond the allocation of the cost of transmission losses, as required by Schedule 12 of the P&SA, by also causing a wealth transfer from southern generators (having high loss factors) to northern generators (having low loss factors). Dissentient Pool Members also argued: that generators in zones where generation and demand were in balance could be affected by mismatches in other zones; that single site operators would be at a disadvantage to portfolio generators; and that marginal loss factors would cause volatility that would be inconsistent with a competitive market. In the decision published 27 May 1997, the DGES dismissed these arguments on the grounds: that any efficient market would cause cost transfers greater than the cost of transport and affect zones in balance that were in the proximity of unbalanced zones; that single generator sites in the South would be advantaged as much as those in the North would be disadvantaged; and that generators could hedge volatility.

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[4] See Appendix 1, Section O: 'Ofgem Other'.

[5] The word actually used is "approved" but this may be a typographical error.

[6] See Appendix 1, Section CP: 'Consultation Papers'.

[7] See Appendix 1, Section DA: 'Decisions and Appeals'.

The Annual Report for 1995 referred to distortion of competition, in addition to higher losses and higher costs to customers. The 1996, 1997 and 1998 Annual Reports referred to the Pool Members decisions and the subsequent appeals and noted that Teesside Power and Humber Power had sought leave for judicial review. They also cited energy efficiency, environmental benefits, lower costs and cost-reflectivity.

1999 - 2003: NETA to P82 & BETTA

A consultation paper, "New Electricity Trading Arrangements: Volume 1", was published in July 1999. This paper stated that the NETA settlement systems would be capable of implementing locational loss factors pending a review of transmission and access, but that losses would be charged uniformly to demand in the interim. It was stated that such systems would allow the charging of losses to more accurately reflect the extra costs imposed by changes in generation output or demand. The paper also suggested that there might be some merit in NGC purchasing losses and, if there is an incentive for it to do so, recharging the costs to users on a locational basis through use of system charges. The subsequent conclusions document, published in October 1999, stated that locational loss factors should be introduced as soon as possible and reiterated that there was merit in NGC purchasing losses and recovering the costs locationally.

In December 1999, a consultation paper, "NGC System Operator Incentives: Transmission Access and Losses under NETA" was published. This advocated: zonal over nodal loss factors, as improving liquidity of the energy markets; and marginal over average, as giving more efficient economic signals. It also argued for ex-ante over ex-post factors as reducing risk to participants, and that the $TLM0^+/TLM0^-$ "balancing" factors should be abolished as the retention of surplus revenues by NGC would reduce distortionary effects caused by the recovery by NGC of other fixed transmission costs. However, the April 2000 paper, "NGC system operations under NETA: transitional arrangements", argued that a fully marginal scheme would be inappropriate at NETA Go-Live given that the pattern of flows could change under NETA undermining the relevance of any calculation of ex-ante loss factors. Instead losses were to be allocated uniformly, 40% to generators and 60% to demand. The proposed allocation was modified to 45%/55% in the subsequent August 2000 paper.

In May 2001, following NETA Go-Live, a further paper developed the longer-term arrangements for access and losses. Benefits of change were described as being short-run efficiency gains. Professor Richard Green's paper was cited, indicating the cost of uniform pricing (of losses and constraints) at 0.6% of generator revenues or £40m[8]. The paper also dismissed arguments that the introduction of locational loss factors increased regulatory risk, and argued that suggested mitigating arrangements would be discriminatory and arbitrary. Options were described with a preference expressed for marginal loss factors.

The proposals published in February 2002, "Transmission access and losses under NETA", cited distortion of competition as well as environmental obligations and reduced losses and emissions. The paper acknowledged concerns that marginal factors would be "*unduly strong*" and "*potentially unstable*", and suggested that the average loss factor approach of the Pool's scheme should be the starting point for discussion. It also argued that the surplus from a marginal scheme would have to be returned to participants "*via some route*", which would produce discriminatory outcomes.

Authority decisions on P75 and P82 were published by Ofgem in January 2003[9]. Ofgem argued in the case of both Modification Proposals - P75 being marginal, P82 being average -

[8] This is based on the 1998 version of Richard Green's paper; the 2004 version increases this estimate to 1.5%.

[9] See Appendix 1, Section DA: 'Decisions and Appeals'.

that efficiency was increased through more cost-reflective charging. It was also argued that uniform pricing presents a barrier to competition as it "*offers less scope for competitors to secure a lower cost*". However, Ofgem also expressed concern that "*some participants consider*" that the "*allocation of fixed and variable losses in a marginal scheme … would introduce new cross-subsidies in the opposite direction*", and agreed that "*allocating fixed losses on a marginal basis may be inappropriate*". On this basis P75 was rejected, whilst a direction issued to make P82.

An Authority decision on a further Modification Proposal, P105, was also published in January 2003. This Modification had proposed monthly marginal loss factors, rather than P82's annual average loss factors. P105 was rejected on the grounds that P82, assessed concurrently, would better facilitate the achievement of the Applicable BSC Objectives to a greater extent than P105.

Ofgem decided on a further Modification Proposal, P109, in June 2003. This had proposed a 'hedging scheme' whereby BSC Parties could 'lock in' TLFs associated with BM Units. This proposal was rejected on the ground that it diluted the benefits of P82, and that the terms of the scheme were discriminatory between different types (notably CVA-registered and SVA-registered) of BM Units. Ofgem also concurred with the view of one BSC Panel Member that the arguments put forward, to the effect that the Modification would 'mitigate perceived increases in the cost of capital', were not robust.

2000 - 2003: Scotland & BETTA

Only one consultation paper, published in September 1993, associated with the Scottish transmission price controls starting in 1994 has been reviewed. From this, there does not appear to have been any discussion about locational pricing in formulating these price controls[10]. The price control proposals in March 1998, extending the price control from 1998/99 to 1999/00, referred to a consideration of the "*level and incidence of transmission losses*", but this is likely to refer to setting the ex-ante loss factors to the appropriate values, and considering the variation by voltage levels (and possibly time of day), rather than locational issues.

The August 2000 consultation paper, "Interim Proposals for reform of Scottish Trading Arrangements", advocated the interconnector being replaced by "*alternative means of introducing distance-related charges*".

However, by December 2002, "The Balancing & Settlement Code under BETTA", stated that Ofgem was "*not making any assumptions as to whether provisions will be included at some future time in the BSC to implement locationally varying loss factors*". In subsequent consultation papers, further discussion was deferred pending the outcome of the DTI's consultation, "Transmission Losses in a GB Electricity Market", published in June 2003. In it's 27th June 2003 press release, Ofgem expressed disappointment with the Secretary of State "*rejecting plans to extend cost-reflective charging arrangements for losses on the electricity transmission network in England and Wales across Great Britain*", arguing that it would be against the interests of consumers and the environment.

[10] Papers associated with the first NGC transmission price control have not been seen either, although we know from the Annual Reports that locational issues were discussed, and a structure of charges was approved on the understanding that the Pool would address locational charging of losses.

Non-Ofgem Documents

A number of documents have been reviewed[11]. Generally these have been associated with consultations on developments to the Balancing & Settlement Code, and have been produced on behalf of interested parties, including BSC Parties, the DTI and Scottish Executive.

The reports, from NERA, OXERA and ILEX, give various estimates of the NPV of benefits of locational losses charging ranging from £1m to over £14m per annum. Costs of implementation estimated at up to £40m set-up and £5m per annum for operation. In Elexon's P82 consultation, however, a number of respondents stated that implementation costs were low or zero and, on this basis, Ofgem considered "*that there are likely to be significant net benefits*".

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[11] See Appendix 1, Section N: 'Non-Ofgem Documents'.

Appendix 1 - Relevant Document Extracts

No.	Date.	Document	Document Position	Remarks
Section AR: Ofgem Annual Reports				
AR1	05/1989	Ofgem Annual Report (Year ending 31/12/89)	"[NGC's] *charges should also encompass all the costs of transmission including transmission losses so that location decisions are properly informed.*" "*So far as transmission losses are concerned, the Pooling and Settlement Agreement provides for a review of the arrangements for allocating these costs. The timetable set out in that Agreement envisages a works programme submitted by December 1993, with implementation of approved changes within two years thereafter. … On this basis I accept the initial structure of use of system charges for transmission and distribution.*"	Location decisions properly informed. Anticipated Pool implementing by December 1995.
AR2	05/1991	Ofgem Annual Report 1990 (Year ending 31/12/90)	No statement on transmission losses.	-
AR3	05/1992	Ofgem Annual Report 1991 (Year ending 31/12/91)	No direct statement on transmission losses. Reference only to locational incentives the DGES was keen to see given by NGC's transmission charges would also have the effect of reducing losses.	Keen to see reduction in losses
AR4	05/1993	Ofgem Annual Report 1992 (Year ending 31/12/92)	No statement on transmission losses.	-
AR5	05/1994	Ofgem Annual Report 1993 (Year ending 31/12/93)	"*In November 1993, OFFER issued a consultation paper on transmission services suggesting ways in which these costs might be kept to a minimum. OFFER sought views on whether the responsibility for the costs underlying the transmission elements of Uplift and transmission losses should be transferred from the Pool to NCC no later than April 1995. In general, there was wide support. NGC and the suppliers are negotiating the terms of an interim scheme to minimise the costs of Uplift from 1 April 1994.*" In respect of the Distribution Price Control, "*Another key energy efficiency issue is the appropriate treatment for energy losses.*"	Transfer responsibility for losses to NGC. Energy efficiency (Distribution losses).

No.	Date.	Document	Document Position	Remarks
AR6	05/1995	Ofgem Annual Report 1994 (Year ending 31/12/94)	In respect of the Distribution Price Control, "*The proposals also changed the form of the control to relate revenue to the forecast numbers of customers as well as to the number of units sold, and to increase the gains from reducing system energy losses. Both changes should improve incentives for the efficient use of energy.*"	Energy efficiency
AR7	05/1996	Ofgem Annual Report 1995 (Year ending 31/12/95)	"*In October 1995 the Transmission Services Scheme (TSS) came into operation.*" "*For the first time NGC was also given incentives to reduce electrical losses on the system. Negotiations to extend the arrangements to March 1997 are presently taking place.*" "*At present, transmission losses are averaged across all customers, and have increased by around £33 million over the last four years. This system gives no indication that greater losses and costs are imposed on the whole system by locating generation further away from demand, while locating nearer to demand generally reduces losses and costs. This failure to reflect costs distorts competition in generation and leads to higher transmission losses and higher costs to customers. It also disadvantages major industrial customers who are not able to take advantage of the reduction in losses that location nearer to generation would bring to the system. By changing to a more cost-reflective basis of charging, customers generally will benefit from lower costs. The Director General invited the Pool to bring forward proposals by March 1996 for modifying the present arrangements.*" "*In November, the Director General issued a consultation paper on the price control review of NGC's transmission business. The review will cover a wide range of issues, including: the treatment of transmission losses.*"	Distortion of competition. Reducing losses.
AR8	06/1997	Ofgem Annual Report 1996 (Year ending 31/12/96)	"*In December, I wrote to the Pool urging it to resolve as quickly as possible a number of long-outstanding issues, including transmission losses. In July 1996 the Director General published his decision on appeals from Energy Supply Contracts Ltd and South Western Electricity, on the treatment of transmission losses. He upheld the principle that cost-reflective charging for transmission losses should apply to both demand and generation. He said that better locational signals would be conducive to a more efficient, lower cost and environmentally friendly industry. Such signals would also be an important influence on the location of new generation sites and on the closure of existing sites.*" "*For some time the* [Yorkshire Electricity Consumers'] *Committee had lobbied hard for cost-reflective charging for transmission losses. It therefore welcomed the Director General's announcement in October 1996 of a revised transmission price control for NGC, which will mean a tighter control and fairer charging for losses.*"	Cost-reflectivity. Efficiency, costs and environment.

No.	Date.	Document	Document Position	Remarks
AR9	06/1998	Ofgem Annual Report 1997 (Year ending 31/12/97)	"*In May 1997 two generators, Teesside Power Ltd and Humber Power Ltd, appealed against a Pool resolution allowing work to continue on a particular method of zonal charging for transmission losses. At present, charging for transmission losses is uniform across England and Wales. The Director General considered that the zonal charging outlined in the Pool's resolution would be conducive to a more efficient supply of electricity, with less adverse environmental impact than the present arrangements. In May 1997 he determined that the Pool's resolution should have effect. Following the determination of the appeal, Teesside Power Ltd and Humber Power Ltd sought leave to apply for judicial review of the Director General's decision. They argued that the Pool Members' decision breached the terms of the Pooling and Settlement Agreement and that it was incumbent on the Director General to strike the decision for that reason. Leave was granted in October 1997; the date for the hearing has not yet been set.*"	Efficiency. Environmental impact.
AR10	06/1999	Ofgem Annual Report 1998 (Year ending 31/12/98)	"*In October 1997 Teesside Power Limited and Humber Power Limited were granted leave to apply for a judicial review of the Director General's decision to uphold a Pool resolution to allow work to continue on a method of zonal charging for transmission losses. At the time of the last report a date for the hearing had not been set. However, a hearing which was set for 15 and 16 March 1999 has been, by a mutual agreement, deferred until the autumn.*"	Purely factual.
AR11	06/2000	Ofgem Annual Report 1999 (Year ending 31/12/99)	No specific reference to losses.	-
AR12	07/2001	Ofgem Annual Report 2001 (Period 1 January 2000 to 31 March 2001)	No direct reference to losses. South West Electricity Consumers' Committee requests more generation in the South West, referring to the inevitable losses associated with "imports" of electricity.	-
AR13	07/2002	Ofgem Annual Report 2002 (Year ending 31 March 2002)	"*Ofgem has suggested that reform is necessary to the current transmission losses arrangements. Whatever reforms are eventually agreed, they must enable accurate signals to be given about the costs of entry to the system at different locations and bring environmental benefits through reduced transmission losses.*" "*Reforming the arrangements for access to the high voltage transmission network and charging for transmission losses was taken forward to help ensure that the full benefits of NETA are realised. The key objective of the reforms proposed during the year is to enhance long-term security of supply for all customers and reduce losses on the system.*" "*Ofgem put forward proposals during the year to reform the electricity transmission network arrangements in England and Wales. These reforms are aimed at giving generators and suppliers a right to firm, long-term access to the network to transport electricity and a fairer allocation of*	Accurate price signals re costs of entry. Environment. Realising "*full benefits of NETA*". Reducing losses. Fairer allocation.

No.	Date.	Document	Document Position	Remarks
			the costs of electricity losses between customers." *"Modifications seeking to change the current losses arrangements have been made under the BSC and will be with Ofgem for consideration later in 2002."*	
AR14	07/2003	Ofgem Annual Report 2003 (Year ending 31 March 2003)	*"On average, but with considerable regional variation, about two per cent of all electricity in England and Wales is lost as heat as it is transported on the transmission system. NGC has estimated that generation situated far from demand can result in losses of up to six per cent. This is neither economic nor good for the environment."* *"In January 2003, Ofgem approved a modification to the Balancing and Settlement Code (BSC) which introduced zonal transmission losses to England and Wales."* *"During the year, work continued on developing new incentives to reduce system losses on the distribution and transmission networks. Reducing system losses should not only produce economic savings but also bring environmental benefits through reductions in carbon emissions which need to be recognized and encouraged."*	Economy and environment.
AR15	07/2004	Ofgem Annual Report 2004 (Year ending 31 March 2004)	In respect of distribution, *"The price control review is also considering incentives for companies to reduce electricity losses. Electricity is lost as heat as it travels along the wires and even a small reduction in losses can have economic benefits and reduce the amount of carbon emissions".*	Economic and environmental (in the context of distribution price controls).
AR16	07/2005	Ofgem Annual Report 2005 (Year ending 31 March 2005)	No reference to losses.	-
Section CP: Consultation Papers				
CP1	07/1992	"Future Control on National Grid Company Prices", July 1992	*"Improved locational signals, especially to the extent that they encourage generators to locate nearer to demand, could significantly reduce transmission losses and the costs of building and maintaining the system. This could increase energy efficiency."*	Energy efficiency.

No.	Date.	Document	Document Position	Remarks
CP2	11/1992	"NGC Transmission Use of System Charges"	"*Other costs of transmission, including transmission losses, are recovered through charges in the electricity Pool. … I have referred to the need to reconsider this division of responsibilities so as to strengthen the incentives to efficient construction, operation and use of the transmission system.*" "*For the most part, however, there was agreement that NGC's charges should be more cost-reflective. The Select Committee for Energy also endorsed this view when it recommended in February 1992 'that NGC's transmission charges be revised to give appropriate incentives to locate new capacity in the south of England.*"	Efficiency.
CP3	09/1993	"Scottish Transmission Price Controls: Proposals", September 1993	"*Transmission charges account for about 4 per cent of the final cost of electricity to customers, and electrical losses in the transmission system for a further 3 per cent.*" "*… my staff have satisfied themselves that both companies take adequate account of the impact which various equipment types can have in reducing losses in the transmission system, for example when evaluating new equipment such as overhead lines and transformers. The companies have assured me that energy efficiency of equipment will continue to play an important role in their selection of transmission equipment.*"	Note about costs and energy efficiency. Comment made in a section concerning energy efficiency and the environmental
CP4	11/1993	Consultation paper on transmission services November 1993.	Document not seen.	-
CP5	11/1995	"The Transmission Price Control Review of the National Grid Company", November 1995.	"*The present arrangements for the treatment of losses in the Pool provide little incentive on suppliers and customers, and none on generators, to take action to reduce losses. The Director General made clear in 1990 that he did not consider this arrangement to be satisfactory. He has subsequently reaffirmed this view on a number of occasions. The Pool has so far failed to make progress in devising cost-reflective ways of charging suppliers and generators for losses. The Director General has therefore asked the Pool to put forward proposals to deal with this issue as a matter of urgency. Any change in the present charging arrangements could have implications for NGC's capital expenditure programme and the form of the revised control.*"	Comment made in a section concerning energy efficiency and the environmental.
CP6	03/1996	"The Transmission Price Control Review Of The National Grid Company: Second Consultation", March 1996	"*A particular issue with respect to energy efficiency is electricity lost through transmission and how this might be minimised.*" "*Most respondents pointed to the need for more incentives to reduce losses, but views were mixed as to whom and how these incentives should apply. Distance-related charging received most support, although a few were not in favour of this remedy. Some respondents pointed out that incentives to reduce losses should be seen in the wider context of generation and other costs; otherwise, losses reduction could be offset by increased costs elsewhere.*	Energy efficiency. Reports on respondents' views and states that 'distance-related charging' received most support. Views divided as to who should be responsible.

No.	Date.	Document	Document Position	Remarks
			Opinion varied on the question of who should bear responsibility for losses. Respondents suggested that any one of NGC, suppliers, customers, generators, or the Pool could be responsible. A number of respondents pointed out that generators have most scope for responding to locational signals and so charges for losses should rest more heavily on them."	
CP7	05/1996	The Transmission Price Control Review Of The National Grid Company, Third Consultation May 1996	*"In my letter of 14 November 1995 to the Chairman of the Pool I pointed out that transmission losses had increased and were forecast to continue to increase. I suggested that more cost-reflective charges for losses would provide better locational signals, especially to generators, reduce the need for further transmission lines, increase energy efficiency, tend to reduce charges for customers generally and avoid the situation where customers or generators in one part of the country were having to pay for those in another part . I asked the Pool to put forward proposals for dealing with this issue as a matter of urgency.* *Views submitted in response to the first consultation paper were varied, but cost-reflective charging received most support . Two of the Electricity Consumers' Committee Chairmen have taken a particular interest in this matter, together with the corresponding regional electricity companies (RECs) . They have written to MPs and local councils, some of whom have in turn written to me . I have received letters from MPs in the south west opposing cost-reflective charging, and a similar number from MPs in the Yorkshire area supporting it.* *On 21 March 1996, the Pool Executive Committee (PEC) considered proposals to implement geographically differentiated loss factors . These proposals envisaged that marginal loss factors might be scaled to match the average cost of losses, phased in over three years, and shared between demand and generation . PEC considered and voted upon several variations to these proposals . The decisions were referred to a Pool Members' Meeting, and may be appealed to me for determination . If so, I would expect to invite the views of Pool members and other interested parties, and hold a hearing in June to achieve an early determination of this issue.* *In order that I can hear the views of all who have an interest in this matter, while maintaining a manageable process, I propose to invite Consumers' Committee Chairmen to summarise and convey to me views of and on behalf of consumers in their areas . In view of my role in the Pool appeal process, it would not be appropriate for me to comment further on transmission losses at this stage".*	Reiterates November 1995 view that cost-reflective charging for losses would • reduce need for transmission lines; • increase energy efficiency; • reduce charges to customers generally; • avoid cross-subsidy

No.	Date.	Document	Document Position	Remarks
CP8	08/1996	The Transmission Price Control Review Of The National Grid Company, Fourth Consultation, August 1996	*"I have acted to secure that charges to recover transmission losses are more cost-reflective. … these changes will tend to promote energy efficiency, reduce the need for capital expenditure on transmission lines, and protect the environment."* *"Merz and McLellan say that, if regionally distinct transmission losses were introduced, a further net reduction of up to £126 million over the period 1997/98 to 2000/01 will be possible in load-related expenditure."*	Cost-reflectivity. Energy efficiency. Reduce costs. Environment. Reduction in capital costs of £126m over 4 years.
CP9	10/1996	The Transmission Price Control Review Of The National Grid Company: Proposals, October 1996	*"In the fourth consultation paper I said that I was not satisfied that the present treatment of security-related costs is justified. I expressed my concern that, if the security charge is not properly distance-related, there is a danger that NGC's charges artificially stimulate the demand for more transmission lines. However, I said I would not press for a significant change' pending assessment of the effect of differential charges for transmission losses."* *"In* [NGC's] *view the cost-reflectivity of [differential charges for transmission losses] could not be assessed on the basis of their impact on siting decisions."* *"The Pool intends to introduce cost-reflective charges for transmission losses, and I regard it as important that it does so as soon as possible."*	Cost-reflectivity. Suggests that NGC's charges could "*artificially*" stimulate demand for transmission lines, but implies that differential charges for losses could mitigate the effect.
CP10	02/1998	RETA Background Paper 1	*"In his 1989 Annual Report, the DGES first raised concerns about locational signals and the role of losses. He reminded the Pool of his concerns in 1995 and Pool members subsequently agreed to charge both generators and suppliers on a cost reflective basis and drew up a mechanism for so doing. The DGES upheld the majority decision of Pool Members to adopt this mechanism but this decision is now the subject of a judicial review."*	Purely factual. No view expressed.
CP11	02/1998	Review Of Electricity Trading Arrangements Background Paper 2: Electricity Trading Arrangements In Other Countries, February 1998	Reviews treatment of transmission losses and constraints in a number of other countries, including: Scandinavia (Nord Pool); Australia (Victoria and NEM); New Zealand; South America (Argentina); USA (California). Observes that there is "*little consensus in the treatment of losses on the different systems*". Nevertheless, all appear to employ locational charges for losses, except the England & Wales pool. *"Since marginal losses are always higher than average losses, a surplus of revenues over costs is accumulated in systems that charge on a marginal loss basis. In all these systems, the surplus is used to reduce transmission charges."*	Purely factual. No view expressed.

No.	Date.	Document	Document Position	Remarks
CP12	02/1998	"Scottish Transmission Price Controls. Consultation Paper", February 1998.	" *… for the one year interim period, the transmission price controls be revised to allow the same level of total revenue in real terms in 1999/2000 as is presently allowed in 1998/99*". "*Transmission charges account for about 4 per cent of the total cost of electricity to customers. Electrical losses in the transmission system account for a further 3 per cent.*"	-
CP13	03/1998	"Scottish Transmission Price Controls Proposals", March 1998	Mentions that a respondent, "*noted the case for further consideration of the level and incidence of transmission losses*", and notes that, "*this work is already underway*".	Likely to be referring to the level of ex-ante loss factors and their variation by voltage levels, rather than locational variation.
CP14	03/1998	"Review Of Electricity Trading Arrangements: Working Paper On Trading Inside And Outside The Pool", March 1998	"*The value of electricity varies across the grid. The two principal components causing such variations are transmission losses – energy is consumed in transmitting power over the grid, and the greater the electrical distance transmitted the greater the transmission losses – and transmission constraints … Similarly, demand* [in most of the markets in other countries studied] *is not served at the same price across the system for the same reasons – demand in some locations, due to losses and constraints, will be more expensive to serve than demand at other locations.*"	Notes that transmission losses affect the value of electricity across the grid.
CP15	07/1999	"The New Electricity Trading Arrangements: Volume 1", July 1999.	Describes proposals for NETA covering all aspects of the trading arrangements, including transmission losses. "*To provide the greatest possible flexibility with regard to the allocation of* [transmission] *losses, the settlement systems will be designed to be capable of applying individual loss factors for every entry and exit point to the transmission system. The issue of how losses should be allocated is closely tied to the treatment of transmission access and will be reviewed in that context. In the interim, the default position is that, as now, uniform transmission loss factors will be applied to all participants on the demand side but not to generators.*" "*The procurement of such systems* [that incorporate locational scaling factors] *will allow for the implementation of a system of charging for losses that more accurately reflects the extra costs imposed by changes in generation output or demand at particular locations.*" "*If NGC were to be incentivised on the basis of its overall SO costs (approach 2 above), then there would appear to be merits in the SO purchasing losses. NGC's overall incentives would be such that it would wish for these purchases to be made efficiently and would wish to use the full portfolio of options available to it (including contracts struck ahead of time and balancing mechanism actions) to minimise costs. One possibility is that NGC could recover the costs associated with the purchase of losses via use of system charges and could charge these costs out on a locational basis if there were efficiency gains (and hence potential benefits under its incentive scheme) from so doing.*"	States that NETA settlement systems will be capable of applying locational loss factors. Proposes that losses are charged to demand only (presumably non-locationally) as an interim measure. Implies that *marginal* loss factors are the most cost-reflective. Merit in NGC purchasing losses, and then recharging through TUoS on a locational basis if there are efficiency gains for it to do so under it's incentive scheme.

No.	Date.	Document	Document Position	Remarks
			"At present, consideration of the most appropriate way to allocate the costs of losses under the new arrangements will be taken forward in the context of a separate consultation on the SO incentives schemes."	
CP16	10/1999	"The New Electricity Trading Arrangements: Ofgem/DTI Conclusions Document", October 1999.	*"The treatment of losses will be considered in further detail in Ofgem's forthcoming November paper on SO incentives and transmission issues. However, we agree with respondents that locational loss charging on both sides of the market should be considered and introduced as quickly as possible. Depending on the detailed incentive arrangements proposed for NGC, there would appear to be merit in the SO purchasing losses, with the costs being recovered via charges to system users. With NGC properly incentivised to minimise the costs of purchasing losses, it is anticipated that it would obtain benefits from charging out the costs on a locational basis."*	Defers to November paper (actually published December), but reiterates that: • locational loss factors should be introduced as soon as possible; • there is merit in NGC purchasing losses and that it would then benefit by recovering on a locational basis.
CP17	12/1999	"NGC System Operator Incentives, Transmission Access and Losses Under NETA: A Consultation Document", December 1999	*"If participants are not exposed to locational signals,* [the] *difference in value cannot be reflected in their short-term decisions with regard to levels of generation and demand. Moreover, the value that the SO places on generation and demand at different locations when considering balancing options may not reflect participants' preferences but this can not be revealed since the value judgements are implicit. For these reasons, it is important that participants are exposed to signals that appropriately reflect the value of energy at different locations through differences in the costs of transportation."* The paper also discusses aspects of a losses scheme involving locational loss factors, specifically: (i) nodal vs zonal (ii) ex-ante vs ex-post (iii) marginal vs average (iv) losses purchased by SO or participants Comments relevant to each of these aspects are 1. "*Nodal* [c.f. zonal] *pricing can reduce liquidity*." 2. "*In theory, to give an accurate signal to the market for the efficient day to day running of the system, transmission loss charges should reflect the state of the system on an instantaneous basis. However, such an approach can increase the risks to which market participants are exposed as the changes in losses and thus loss charges may be difficult to predict*" and "*… actual loss factors will be influenced in part by the decisions taken by the SO with regard to the maintenance and configuration of the network since this effects the pattern of flows across the network. Thus, it can be argued that it is inappropriate that the prices for losses to*	Restates that locational signals are necessary for differences in locational value to be reflected in short-run generation and consumption decisions. Proposes: 1. zonal over nodal TLFs on grounds of improved liquidity of the energy market. 2. ex-ante over ex-post TLFs as reducing risk to participants albeit at the (theoretical) cost of reduced efficiency 3. marginal over average TLFs as giving more efficient economic signals/ 4. abolishing "balancing factors" (which are equivalent to $TLM0^+$ and $TLMO^-$ in the Balancing & Settlement Code) as the retention of excess revenues (from marginal loss factors) reduces the distortionary effect of the charging of other fixed transmission costs.

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			which market participants are exposed should depend on these decisions taken by the SO." 3. *"Prices reflecting marginal losses better capture the costs that participants impose on the system and thus give more efficient economic signals than average pricing. … However … marginal pricing results in an over-recovery of costs. … There are two main advantages of the SO retaining this surplus revenue. First, it avoids the need to scale down charges or redistribute the additional revenues, both of which blunt the signals faced by participants. Second, it reduces other transmission charges payable by participants. These other charges have to cover all the capital and operating costs of the transmission network and are consequently not marginal costs for the SO (in essence they are fixed costs) although they appear as marginal costs to participants. … Thus, reducing the impact of these charges through using over-recovered revenues from the losses regime to offset them would mitigate any distortionary effects."* 4. *"Ofgem proposes that whilst the attenuation and sharing factors should be included in the NETA losses scheme, balance factors should not be retained. As discussed earlier, there can be benefits in allowing the SO to retain the excess revenues arising form the use of marginal losses and such excess revenues would be one component of the balance factors."*	
CP18	12/1999	"The New Electricity Trading Arrangements And Related Transmission Issues Proposals on Licence Changes: A Consultation Document", December 1999	Oblique reference to imbalances including, "*energy imbalances, information imbalances and losses*".	Implies (but doesn't define) the concept of "losses imbalance". This may refer to a financial surplus generated by the application of marginal loss factors, which is retained by the SO.
CP19	04/2000	"NGC systems operations under NETA: transitional arrangements - A consultation document", April 2000	*"Ofgem recognises the concerns … with regard to attempting to implement a full zonal marginal loss factor scheme in time for the start of NETA. For example, the calculation of ex-ante loss factors to be used in a losses scheme for the introduction of NETA would have had to be based on data for electricity flows prior to the introduction of NETA. It is uncertain at this stage the degree to which pre-NETA patterns of generation and demand will be a fair indication of energy flows, and hence transmission losses under the new arrangements."* *"Ofgem proposes that for the introduction of the new trading arrangements, the treatment of transmission losses should be as follows.* • *… participants' metered volumes should be adjusted in each settlement period to reflect the actual losses incurred in each settlement period. Ofgem believes that the use of actual losses rather than an ex-ante forecast of marginal loss factors will help, in the absence of information on the pattern of flows under NETA, to avoid the uncertainties and risks involved in using pre-NETA data to determine loss factors to be applied to generation and demand under NETA."*	Proposes to continue with uniform losses for the introduction of NETA, on the grounds that no information available regarding network flows which could be different under NETA A 40%:60% split is proposed between generation and supply.

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			• *… both generation and demand should be exposed to the costs and benefits of transmission losses. Hence, transmission loss volumes (adjustments to metered volumes) determined for each settlement period should be allocated across all BSC parties. Ofgem proposes that for the start of NETA, 40% of the total volume of losses should be allocated to generators while 60% should be allocated to the demand side. The rationale for this 40:60 split (as opposed to say a 50:50 split), is that broadly speaking, the Defined Meter Point for generation (under the Metering Codes of Practice) is the high voltage side of the generator transformer, whereas that for demand is the low voltage side of the supergrid transformer.* • *… participants should be responsible for purchasing losses. … Some uncertainty will be faced by participants through the adjustment of metered volumes in the settlement process on the basis of actual ex-post losses, as it may be difficult to accurately predict, and thereby contract for, the level of losses that will actually be applied, but this uncertainty is less than that faced by demand side participants under the current treatment of losses (due to the wider charging base over which losses will be spread)."* Also, "*This will incentivise participants to adapt their contractual positions to reflect their expectation of actual transmission losses. "*	
CP20	08/2000	August 2000 Initial Proposals for NGC's System Operator Incentive Scheme under NETA A Consultation Document and Proposed Licence Modifications	"*Under the transitional regime, actual losses will be used to adjust the metered volumes of production and consumption on a 45:55 basis before energy imbalances are calculated. This will incentivise participants to adapt their contractual positions to reflect their expected allocation of losses.*" NB Section entitled, "Transmission Access and Pricing and the Long Term Treatment of Losses" doesn't mention losses. Footnote to section on CUSC states that the design of the CUSC, "*might also potentially cover Transmission losses*". In respect of responses to the December consultation paper, "*the majority supported the need for reform to the treatment of transmission losses, though reservations were expressed concerning the introduction of marginal losses at the same time as NETA*". Reiterates that, "*It is uncertain at this stage whether pre-NETA patterns of generation and demand will be a good indication of energy flows, and hence of transmission losses under NETA. Given these uncertainties, Ofgem agreed that it would not be appropriate, at the outset of NETA, to expose participants to the sharper signals provided by locational and marginal loss factors.*" "*ex-post transmission loss factors in making loss adjustments may not be an appropriate long term solution*" "*… following the consultation on the BSC, Ofgem has accepted that the split of transmission losses between generators and suppliers should be in the ratio 45:55 rather than 40:60. This 45:55 ratio, which is included in the draft BSC, will better reflect the impact of the different ways in which transformer losses are treated for generation and demand.*"	Not appropriate to use marginal locational loss factors from NETA Go-Live because pre-NETA power flows may not be a reliable indicator of post-NETA flows and hence post-NETA loss factors. 45%:55% split proposed.

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			"In terms of the enduring treatment of transmission losses, Ofgem, in the December Consultation, presented some potential options and is in the process of considering a number of alternative approaches that would be consistent with new transmission access and pricing arrangements."	
CP21	08/2000	"Interim Proposals for the reform of Scottish Trading Arrangements: British Electricity Trading and Transmission Arrangements (BETTA)" August 2000.	*"Ofgem would expect the removal of the interconnector charges to be replaced by alternative means of introducing distance-related charging. Examples of this would be through transmission losses and auction payments for use of transmission capacity between nodes"*	Distance-related charging for losses mooted for BETTA.
CP22	12/2000	"NGC system operator price control and incentive schemes under NETA Final proposals", December 2000	Identically to August document, section entitled, "Transmission Access and Pricing and the Long Term Treatment of Losses" doesn't mention losses. Footnote to section on CUSC states that the design of the CUSC, "*might also potentially cover Transmission losses*".	Mentions Jan 2001 CP on longer-term access and losses - this is likely to be the May 2001 paper.
CP23	05/2001	"Transmission Access and Losses under NETA. A Consultation Document", May 2001	Objectives of reform include establishing "*a framework that more accurately targets the short and long term costs imposed on the transmission system by the locational patterns of generation and demand*". Weaknesses of the initial NETA arrangements include: • that they do not take into account the fact that, "*Locational signals reflecting the costs of transmission losses can significantly increase short run economic efficiency*"; • that, "*Independent academic research has indicated that the economic cost of using a system of uniform (national) pricing versus a more locational pricing regime in England and Wales is approximately 0.6% of the cost of generation. This is equivalent to nearly £40m per annum*"; and • "*The costs of inefficient location decisions are very significant, and they are influenced by how the other issues (losses and constraints) are addressed. For example, incorrect location decisions by generating plant can raise generation costs by 12%, and such effects can persist for periods of approximately 20 years*" "*Exposing participants more fully to the economic costs of their own actions will encourage ex ante trading in NETA markets that reflects, more accurately, the configuration of the transmission network. In turn, this will facilitate competition in generation and supply.*" "*Ofgem believes that enduring arrangements for transmission losses should be designed to expose participants to the costs of locational marginal losses.*"	Short-run efficiency. Benefit of £40m pa. Options for losses treatment described, with a preference for marginal loss factors. Discussion as to whether loss factors should be constrained or unconstrained. Arguments for mitigation measures dismissed.

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			Appendix 8 describes proposed options, being: • Option 1, Approach 1: *"participants' metered volumes would be adjusted using ex-ante estimates of unconstrained marginal loss factors which have been scaled down to equal expected average losses (and possibly adjusted for expected transmission constraints)"* resulting in "*there* [being] *no systematic need for NGC to accept bids in the BM.* • Option 1, Approach 2:: " *…loss factors … would be calculated at Gate Closure on the basis of physical notifications made to the SO*". Unconstrained marginal loss factors would be published ex-ante and participants provided with the means of calculating constrained marginal loss factors given their expectations of constraints. • Option 2, Approach 1 (proposed by NGC): "*estimate of unconstrained marginal loss factors, along with a reference electricity price to set relative reserve prices for any primary access right auction*" and "*funds raised by the auction reserve prices (i.e. those specifically related to losses)*" retained by NGC. However, Ofgem considered that, "*it does not on its own result in energy being contracted to cover actual system losses.*" • Option 2, Approach 2:: as Approach 1 except that the funds are returned to participants and "[non-locational] *adjustments … made to participants' metered volumes to incentivise them to purchase average losses*". Ofgem prefers Option 1 to Option 2, and "*considers that determining loss factors ex ante has advantages in terms of encouraging liquid trading … accept*[ing] *that this can distort the interaction between constraints and losses but believ*[ing] *that this distortion may not be significant unless the volume of constraints increases substantially from its current level*". Ofgem not persuaded by the arguments made by some generators with regard to the need for long-term mitigating arrangements for existing participants because: (i) does not accept that "*the introduction of a marginal loss system will increase regulatory risk*" … "*nor that it is a new initiative whose consequences were not understood at the time when investment decisions were being made*" … "*The introduction of such as regime is not a wilful or unjustified act, it is one it is one designed to increase the overall efficiency of the system and thus to facilitate the fulfilment of Ofgem's statutory obligations*" … "*The possibility of introducing a more cost-reflective arrangement for losses has been signalled since 1990*"; (ii) *"… the suggested mitigating arrangements to a marginal losses scheme proposed by some generators appear discriminatory* [against new entrants] *and to some extent arbitrary*"; (iii) "*a producer who is at the margin of a merit order that ignores losses may not be a marginal producer if loss factors are taken into account. Thus, to charge marginal losses only on the current marginal producers would arbitrarily discriminate against some participants and ignore the dynamic effects of marginal losses across the merit order*".	

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CP24	02/2002	"Transmission access and losses under NETA: Revised proposals", Ofgem, February 2002	*"… current arrangements for charging transmission losses do not encourage efficient use of the transmission system as the costs are averaged nationally across all users. This leads to cross-subsidies between generators, and between customers, that harm competition and distort wholesale electricity trading."* *"At the start of the RETA many companies and customer representatives highlighted the importance of reform of the transmission access and losses arrangements. However, Ofgem decided at the time, given the scale of the changes to the energy trading arrangements being undertaken, to address these issues separately and to a slower timetable. This decision was widely welcomed."* ***"**Ofgem has also reconsidered its views on transmission losses as a result of concerns raised during the consultation. A number of respondents argued that charging for losses on the basis of locational marginal losses would provide unduly strong and potentially unstable price signals to participants and would overstate the actual costs of transmission losses. In light of these concerns, Ofgem have examined whether the scaled marginal loss approach proposed by the Pool might be more appropriate than the full marginal loss treatment proposed in the May document. The Pool spent a considerable amount of time developing this scheme and the proposals were subsequently approved by OFFER.**"* *"The Pool's scheme, which can be thought of as an average zonal losses approach, overcomes the issues associated with how to deal with revenue over-recovery under a full marginal losses approach (marginal losses are approximately twice actual losses) whilst retaining most of the cost signalling benefits. Ofgem now believes that the Pool proposals should form the starting point for discussions on reform of losses charging".* *"Ofgem's proposed transmission access and losses reforms offer a number of potential environmental benefits. These benefits have always been recognised by Ofgem and, in light of our environmental obligations under the Utilities Act 2000, we believe it is important to highlight this aspect of the transmission access and losses reforms. Our proposals should reduce the level of transmission losses both in the short-term (through more efficient use of existing generation) and in the longer-term (by influencing the location of new generation). Reductions in the level of losses will see less electricity generated to meet demand, thereby reducing emissions. Ofgem's proposals to use better cost targeting to influence the location of new generation should also encourage more local, embedded and on-site generation (such as CHP) as they will face relatively lower transmission costs. Finally, Ofgem's proposals should, over time, lead to a more efficient level of transmission investment by encouraging efficient locational decisions and better use of existing assets. This will reduce the resources consumed in electricity transmission and the visual intrusion caused by new overhead transmission."* *"Ofgem's initial view on the treatment of transmission losses was that marginal losses should be charged to all participants on an ex ante zonal basis. The metered volumes of both generators and suppliers would be adjusted using marginal locational loss factors, prior to the calculation of electricity imbalances. Ofgem considered that this approach would provide the most appropriate*	Distortion of competition. Environment, including obligations under the Utilities Act 2000. Reduce level of losses. Reduced emissions. Encourage embedded and on-site generation (not specific as to whether this is due to losses as well as access proposals). Efficient level of transmission investment. Reconsiders views as a result of concerns raised during consultation. Notes concerns expressed by participants that marginal locational loss factors would be "*unduly strong*" and "*potentially unstable*". 'Scaled marginal loss factors' (i.e. average) may be more appropriate. Also argues for avoiding the over-recovery of revenues as refunding surpluses is inevitably discriminatory.

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			signals to market participants of the costs of losses associated with generation and production in different locations. Any surplus revenues generated by such a scheme would be offset against other transmission costs." *"Given the locational signals emerging from the proposed transmission access and losses regimes, Ofgem suggested that it might be necessary for NGC to consider reviewing the structure of its TNUoS charges."* *"The present arrangements also involve significant cross-subsidies. Relative to the actual costs they impose on the system, 'Northern' generators pay too little and 'Southern' generators pay too much. We estimate that compared with the actual costs imposed, Northern generators pay £23m too little and generators in and around Greater London pay £11m too much. Conversely, 'Northern' customers pay too much relative to 'Southern' customers. Our estimates suggest that 'Northern' customers pay £19m more than the actual cost of losses they impose on the system whilst consumers in and around Greater London pay £7m too little."* *"Under the Utilities Act 2000, Ofgem has certain obligations, as set out in the Environmental Action Plan, with regard to the environmental effects of our work and the industries we regulate. We believe that the proposed reforms to transmission access and losses arrangements offer a number of potential environmental benefits."* *"One of the key aims of the reforms to transmission losses arrangements is to reduce the overall level of losses. We believe that, by better reflecting the costs of transmission losses on participants, existing generation will be used more efficiently in the short-term and participants will face long-term incentives to take transmission losses into account when making investment decisions. Any reduction in overall transmission losses will mean less energy is required to meet electricity demand and hence would mean an overall reduction in emissions."* *"However, the use of marginal loss factors would result in an over-recovery of the cost of transmission losses (since marginal losses are approximately double average losses). These over-recovered revenues would have to be returned to participants via some route. Where possible, Ofgem would like to avoid situations of cost over-recovery as in some cases, such as the auctions for gas entry capacity, refunding these revenues cannot be achieved without producing discriminatory outcomes. In addition, several respondents to the May consultation expressed the view that a process using marginal loss factors would be overly complex and increase the risks on participants by providing unstable price signals. Because of these reasons, we now believe that it might be more appropriate to use a mechanism that does not recover more than the cost of average losses."* *"Ofgem does not accept that there will be windfall losses and gains resulting from the implementation of Option 1. As set out in Chapter 2, OFFER has consistently indicated since before the Pool was introduced that it would like to see locational pricing introduced for losses. Reference was made to this objective as long ago as OFFER's 1989 Annual Report and it was mentioned in the prospectus for the privatisation of the Regional Electricity Companies in 1990 and British Energy in 1996. A chronology of public information relating to the introduction of*	

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			locational pricing for losses is included as Appendix 5."	
CP25	12/2002	"The Balancing and Settlement Code under BETTA. Ofgem/DTI Consultation on a BSC to apply throughout GB", Ofgem 80/02, December 2002.	Consultation on applying (non-locational) BSC losses treatment across GB, stating, "*At this juncture, Ofgem is not making any assumptions as to whether provisions will be included at some future time in the BSC to implement locationally varying loss factors.*"	Proposes to average higher Scottish losses with England & Wales losses to give a GB average, although pending future implementation of locationally varying loss factors.
CP26	06/2003	"The Balancing and Settlement Code under BETTA Ofgem/DTI. Conclusions and Consultation on the legal text of a GB BSC, Volume 1", June 2003	"*Thirteen respondents replied in this respect* [of applying the current England and Wales treatment of transmission losses on a GB basis via a GB BSC.]. *All but one, expressed their opposition to the inclusion of P82 in the GB BSC. Given that the DTI is conducting a separate consultation on the application across GB of this modification, it is not intended to consider this matter further in this consultation paper*". "*Ofgem/DTI note that the current treatment of losses in the BSC does not in general approach the allocation of losses on the transmission system on the basis of voltage and consider that the application of the BSC to include Scotland does not in and of itself require such a change.*"	Consultation on locationally varying loss factors deferred in view of DTI consultation.
CP27	11/2003	"The Balancing and Settlement Code under BETTA Ofgem/DTI Conclusions and second consultation on the legal text of a GB BSC. Volume 1", November 2003.	"*Given that the question of the applicability of zonal transmission losses on an average basis* [i.e. P82] *throughout GB has been consulted upon by the DTI, Ofgem/DTI do not intend to address the topic again here*".	Consultation on locationally varying loss factors deferred in view of DTI consultation.
Section DA: Decisions and Appeals				
DA1	11/07/1996	"Decisions on the Appeals Regarding Implementation of Differential Transmission Loss Factors", PSA/R/010	"*… arguments in favour of cost-reflective charges have been expressed by, for example, House of Commons Energy Committee, Government's Energy Advisory Panel, and Energy Efficiency Policy Division of Department of the Environment*". "*Arguments in favour of cost-reflective charging are strong ones.*" "*… not convinced that differential loss factors need reduce liquidity of* [the contracts] *market*". "*It was argued that differential TLFs would discourage competition in generation by increasing the uncertainty of future payments … However, it would be open to generators to enter into hedging contracts to stabilise any potential volatility.*" "*The package recommended by the* [Pool's Transmission'] *Steering Group has substantial merits.*	Cost-reflectivity. Efficiency. Costs. Environment. Number of objections dismissed. Argued that volatility can be hedged.

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			It embodies locational signals with respect to transmission loss factors. It would be conducive to the more efficient, lower cost and environmentally friendly operation of the electricity industry."	
DA2	27/05/1997	"Decision on the Appeal Regarding the Works Programme for the Zonal Allocation of the Cost of Transmission Losses", PSA/R/014	"*… the characteristics and consequences of* [the resolution to implement scaled marginal loss factors] *characterise a competitive or efficient market in the presence of transport or transmission costs."* "*I also note that seven years from 1990 will have elapsed before New Principle 11(B) is implemented, and that a further transitional period of five years is proposed. These periods provide considerable financial mitigation to Pool Members who would be adversely affected. In any case, I do not consider that my statutory duties necessarily require me to protect every licensed generator from the consequences of decisions it has made and contracts it has entered into."* "*It would also be open to generators to enter into hedging or other contracts to stabilise any potential volatility."*	Efficiency. Apparently arguing "*in any case*" that the announcement at Vesting of locational charging would not have been essential. Volatility can be hedged.
DA3	17/01/2003	'Modification to the Balancing and Settlement Code ("BSC") - Decision and Notice in relation to Modification Proposal P75: "Introduction of zonal transmission losses"'. MP No. P75	The Proposed Modification is described as proposing the application of ex-post zonal TLFs, varying by Settlement Period and calculated on a marginal basis. The Alternative Modification proposed ex-ante TLFs, still zonal and marginal, but varying monthly and phased-in over a four year period. On efficiency, "*The introduction of zonal transmission losses would enhance efficiency through more cost reflective charging which could be expected to influence both short and long term business decisions. This enhanced efficiency is of particular importance over the next 20 years given the potential major changes in the type and distribution of plant, especially as a result of the government's climate change commitments" and "These inefficiencies have economic and environmental costs, the size of which will depend upon system conditions*". On promoting effective competition, "*In general, uniform pricing presents a barrier to competition as it offers less scope for competitors to secure a lower cost. The present uniform pricing arrangements artificially impose higher costs on generators in the south and suppliers in the north. This restricts the market for generation alternatives in the south (whether this be Combined Heat and Power ("CHP") or other forms of new generation) and supply in the north. Consequently, introducing differential charges would have a positive effect on competition. However, Ofgem was concerned that some participants consider that the allocation of fixed and variable losses in a marginal scheme (such as the original Modification Proposal and the Alternative Modification Proposal) would introduce new cross subsidies in the opposite direction to those presently existing. Ofgem agrees that allocating fixed losses on a marginal basis may be inappropriate."* On efficient discharge of NGC's obligations, "Ofgem *considers that the original Modification*	Efficiency. Promotion of competition. Concern that "*some participants consider*" that P75 allocates more than the cost of variable losses, thereby introducing cross-subsidy in the opposite direction to uniform charging.

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			Proposal and the Alternative Modification Proposal could enhance NGC's discharge of [the obligation to ensure efficient, economic and co-ordinated operation of the system]*, but that it is unclear whether it will enhance its discharge of* [the facilitation of competition]". "*However, Ofgem was concerned that some participants consider that the allocation of fixed and variable losses in a marginal scheme (such as the original Modification Proposal and the Alternative Modification Proposal) would introduce new cross subsidies in the opposite direction to those presently existing. Ofgem agrees that allocating fixed losses on a marginal basis may be inappropriate.*" Ofgem rejects the Proposed Modification and Alternative Modification on the basis: that the Proposed Modification does not promote efficiency in the administration of the BSC and that it is unclear whether it better facilitates efficient, economic and co-ordinated operation of the system; and that it is not persuaded of the case for phasing in of TLFs (and hence the benefits) in the Alternative Modification.	
DA4	17/01/2003	'Modification to the Balancing and Settlement Code ("BSC") - Decision and Direction in relation to Modification Proposal P82: "Introduction of zonal transmission losses on an average basis"', MP No. P82	The Proposed Modification is described as proposing the application of ex-ante annual TLFs, calculated on an average basis. An Alternative Modification proposes phasing in over four years. On efficiency, "*The introduction of zonal transmission losses will therefore enhance efficiency through more cost reflective charging which could be expected to influence both short and long term business decisions. This enhanced efficiency is of particular importance over the next 20 years given the potential major changes in the type and distribution of plant, especially as a result of the government's climate change commitments*" and "*These inefficiencies have economic and environmental costs, the size of which will depend upon system conditions*". On promoting effective competition, "*In general, uniform pricing presents a barrier to competition as it offers less scope for competitors to secure a lower cost. The present uniform pricing arrangements artificially impose higher costs on generators in the south and suppliers in the north. This restricts the market for generation alternatives in the south (whether this be Combined Heat and Power ("CHP") or other forms of new generation) and supply in the north. Consequentially, introducing differential charges could have a positive effect on competition*". On efficient discharge of NGC's obligations, *"Ofgem considers that the original Modification Proposal will enhance NGC's discharge of* [the obligation to ensure efficient, economic and co-ordinated operation of the system]. *Addressing the cross subsidy in the present transmission losses charging arrangements through more cost reflective charging will also help to remove the discrimination that exists in the present arrangements.*" "*This argument* [that phasing-in would give participants time to adjust] *has to be set against the opposing arguments that delay would reduce the net benefits of the change and that the change has already been long awaited.*" "*A variety of commentators have looked at quantifying the benefits of more locational charging*	As for P75, without the concern about allocation of fixed costs. No case for phasing-in. Short-run benefits £0.2m to £1.5m per annum; long-run benefits upwards of £5.3m.

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			for transmission losses. For a scheme of this nature commentators estimated short run benefits in the range of £0.2m p/a to more than £1.5m p/a. Estimates of long run benefits range from £5.3m p/a upwards to very substantially higher figures." Ofgem directs the Proposed Modification on the basis that it facilitates: the efficient discharge of the Transmission Licensee's objectives; the efficient, economic and co-ordinated operation of the system; and promoting effective competition in generation and supply. The Alternative Proposal is rejected on the basis that the case for phasing in is unpersuasive and that there is a strong efficiency case for earlier implementation of the improved price signals.	
DA5	17/01/2003	'Modification to the Balancing and Settlement Code ("BSC") - Decision and Notice in relation to Modification Proposal P105: "Introduction of zonal transmission losses on a marginal basis without phased implementation"', MP No. P105	The Proposed Modification is described as proposing the application of ex-ante monthly TLFs, calculated on a marginal basis without phased implementation[12]. As for P75, with the addition of, "*The benefits of removing market distortions, such as uniform losses, are generally difficult to quantify, since they depend upon the uncertain and unknowable evolution of the relevant market including, in this case, transmission system conditions. … Although a marginal scheme (such as this Modification Proposal) would have higher benefits than an average zonal losses scheme (such as Modification Proposal P82) the costs will also be higher since the loss factors would be calculated on a monthly rather than an annual basis. Although as this Modification Proposal was submitted directly to report phase*". Ofgem rejects apparently on the basis that costs will be higher than P82[13,14].	Implies that marginal loss factor scheme has higher benefits than average loss factor scheme, but rejects on the grounds that calculating factors monthly (rather than annually) leads to higher costs.)
DA6	03/06/2003	'Modification to the Balancing and Settlement Code ("BSC") - Decision and Notice in relation to Modification Proposal P109: "A hedging scheme for changes to TLFs in Section T of the Code"', MP No. P109	The Proposed Modification is described as proposing a 'hedging scheme' against future changes in TLFs. BSC Parties would be exposed to TLFs only on the difference between metered volumes and an assigned fixed volume, referred to as the 'F-factor'. For incumbent and new entrant CVA-registered BM Units, the F-factor would be fixed until the expiry of the scheme, 15 years after an initial 'trigger' date; for SVA-registered BM Units, an F-factor for the entire GSP Group would pro-rated over the BM Units in that GSP Group, and phased out over the period of the scheme; for interconnectors, an F-factor for the interconnector, which would be fixed over the period of the scheme, would be pro-rated over the Interconnector BM Units. CVA-registered BM Units could	Cross-subsidy. Efficiency.

[12] P82 proposed only marginal TLFs. P75 had marginal TLFs, calculated ex-post by Settlement Period, or ex-ante monthly but combined with phasing in. Thus P105 proposed the ex-ante monthly marginal TLFs of the P75 Alternative Modification but without phasing in.

[13] The P105 decision letter actually says that P82 is preferred to P105 for the reasons set out in the P82 decision letter. However, the P82 letter explains why the Authority believes P82 better facilitates achievement of the Applicable BSC Objectives, not specifically why it does this in a manner that is superior to P105. Furthermore the statement, regarding the benefits of a marginal scheme being higher but the costs of monthly scheme also being higher, is in the P105 decision letter. Nevertheless, the reference to the reasons in the P82 decision letter could be a reference to the concern that marginal loss factors introduce cross-subsidies in the opposite direction to uniform charging.

[14] The last sentence of the first paragraph on page 7 reads, "Although as this Modification Proposal was submitted directly to the report phase.". It would appear that there is some text missing.

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			elect not to have an F-factor, and be exposed fully to 'live' TLFs; the same choice would be exercised by the Interconnector Administrator on behalf of all relevant Interconnector BM Units; whilst no choice would be available to SVA-registered BM Units. On efficiency, "*Ofgem considers that Modification Proposal P109 would effectively lead to the current cross-subsidies flowing from northern customers and southern generators to southern customers and northern generators being retained*", and, "*Ofgem considers that Modification Proposal P109 would be detrimental to achieving efficiency as it would lead to less cost reflective charging of transmission losses*." On promoting competition, "*Ofgem considers that the implementation of Modification Proposal P82 will allow for differential charges for transmission losses, which could have a positive effect on competition. Ofgem considers that Modification Proposal P109 will significantly reduce the effect of the introduction of differential charges for transmission losses*." On efficient discharge of NGC's obligations, "*Ofgem considers it discriminatory that Suppliers do not have the option to opt in or out of the F-factor phasing scheme, as CVA registered generators do*", and, "*Ofgem also considers that the Modification Proposal would lead to discrimination between incumbent a new entrant generators. Incumbents will have the opportunity to lock in only the present methodology … new entrants will have the opportunity to lock in only the loss factors prevailing at the time … Ofgem considers that this would lead to significantly different treatment of incumbents and new entrants*." Ofgem rejects on the basis that it is detrimental to efficiency, competition, efficient discharge of NGC's obligations and also to the efficient implementation and administration of the balancing and settlement arrangements.	
DA7	30/01/2004	'Modification to the Balancing and Settlement Code ("BSC") – notice in relation to Modification Proposal P82: Introduction of Zonal Transmission Losses on an Average Basis"', MP No P82	"*In terms of its overall regulatory approach, the Authority continues to regard the adoption of cost-reflective charging as economically and environmentally beneficial in protecting the interests of consumers*".	P82 rejected on grounds that, following the judicial review, the Implementation Date has been superseded.

No.	Date.	Document	Document Position	Remarks
Section O: Ofgem Other				
O1	10/1990	'Statement by the Director General of Electricity Supply: The regulatory system and duties of the DGES', October 1990.	*Document not seen.* [Reference in "Transmission Access and Losses under NETA. A Consultation Document", May 2001, Appendix 8.41, Footnote 93.]	
O2	14/11/1995	Letter to Pool Chairman, 14th November 1995 from Director of Regulation and Business Affairs)	*"On numerous occasions since 1990, I have had to repeat my view that charges for transmission losses need to be made cost reflective.* *It is important that decisions on the despatch of existing generation, the location of new generation, and on capital expenditure on the transmission system are properly informed. If they are not, costs and losses will be unnecessarily high, energy efficiency will be reduced, prices to customers will be increased and additional transmission lines will need to be built, with adverse environmental impacts."* *"The limitations of the present charging arrangements include the following.* *i) At present, none of the transmission losses are charged directly to generators - they are all charged to customers. This means there are no pricing signals indicating to generators that location further away from demand imposes greater losses and costs on the whole system, While location near to centres of demand, or where there is a shortage of generation in relation to demand, will generally reduce losses and costs on the whole system.* *ii) This failure to reflect costs tends to bias decisions on the location of new power stations, on the closure of older ones and on development of own generation, including combined heat and power schemes. It will therefore distort competition in generation, and will lead to higher transmission losses and higher costs to customers.* *iii) …* *iv) A transmission system which leads to unnecessarily high transmission losses is not consistent with energy efficiency. It requires more generation to meet den: and, and perhaps the construction of more new generating stations, than would otherwise be the case.* *v) A distorted locational pattern of generation and demand, and the associated increased transmission losses, would mean that transmission constraint costs would be higher and/or more new transmission lines would need to be constructed than would otherwise be the case. Either of these consequences would be costly to customers. Either could be alleviated by even a modest shift in the location of new generation stations towards the South rather*	Costs. Energy efficiency. Prices to customers. Environmental impact (through additional transmission lines and generating stations) Location of new entry and closures. Distortion of competition. Modest shift in location of generation stations sufficient. Adequate to reflect average rather than marginal losses. Generators should pay half of losses. Important to tackle when other elements of electricity prices are reducing.

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			than the North. *vi) The construction of more transmission lines than would otherwise be necessary would have adverse environmental effects, particularly on many of those living in or visiting the areas concerned.* *vii) There are also limitations in present arrangements quite apart from the impact on future location and investment decisions. The present system which schedules and despatches operational generating plant takes no account of the differential impact of the selected plant on transmission losses. This results in a merit order which does not properly reflect, and therefore fails effectively to minimise, the operational costs of generation."* *"… taken in conjunction with increasing zonal differentials in NGC use of system charges, it should be adequate for transmission loss charges to reflect average rather than marginal losses."* *"… there seems no adequate justification for charging transmission losses to customers alone, since the most important single need is properly to inform decisions about the location of new generation. Transmission losses should therefore be charged to generators also. There seems no uniquely correct way of determining the proportions as between generators and customers, but it might be reasonable for each to bear half the losses. This would have the added advantage of reducing the impact on customers of the differentiation of charges."* *"…it is important to tackle this issue at a time when other components of electricity prices are reducing."*	
O3	12/1996	Letter to Pool Chairman. (Annual Report for 1996 refers)	Document not seen. Referred in Annual Report for 1996, *"In December, I wrote to the Pool urging it to resolve as quickly as possible a number of long-outstanding issues, including transmission losses, rules for trading across interconnectors, reactive power, demand side bidding, security of supply, and constraint and capacity payments."*	-
O4	22/05/2001	R/48,Tuesday 22 May 2001, "Proposed Reforms in Transmission Access Announced".	*"The four main objectives that have been put forward by Ofgem for consultation are to:* • *ensure that traded electricity markets are not unduly distorted by transmission-related actions and effects and exercise of locational market power, by separating pricing of electricity from the pricing of transmission capacity* • *establish a framework that more accurately targets the short and long term costs imposed on the transmission system by the location patterns in generation and demand* • *provide effective signals to, and unified incentives on, NGC to make transmission capacity*	Targeting short-term costs. Efficiency.

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			available in the short term and invest appropriately in transmission capacity in the long term • *provide a framework for efficient and effective interaction between the gas and electricity markets in the short and long term.* *Ofgem considers that the best means of achieving these objectives is the establishment of firm tradable access rights and appropriate charging for transmission losses. Such an approach will address all of the weaknesses in the initial NETA arrangements with regard to transmission issues."*	
O5	26/02/2002	R/19, Tuesday 26 February 2002, "Reform Proposals for Transmission Access and Losses Arrangements".	*"The cost of electricity lost as heat as it travels along the wires, currently spread across all generators and suppliers, will be targeted to those whose locations and grid usage cause the losses.* *This will encourage the development of smaller distributed generation - 'off-Grid' generation such as Combined Heat and Power (CHP) plants, solar energy and small wind farms – because it reduces the amount of losses as it is not connected to NGC's transmission system."*	Cost-reflectivity. Encourage smaller, distributed generation.
O6	25/02/2002	"Transmission Access and Losses", Factsheet, February 2002	Factsheet published to accompany the February 2002 consultation paper, "Transmission access and losses under NETA: Revised proposals". *"Losing electricity as it is transported along the National Grid Company's high voltage transmission system is neither economic nor good for the environment"* *"Ofgem's transmission access and losses proposals will mean:* • *for customers – improved security of supply, lower costs overall as a result of less network congestion and a fairer allocation of the costs of electricity losses between customers in the North and South of England* • *for NGC – better signals on which to base future investment decisions and improved financial incentives to respond well and efficiently to these signals* • *for generators and suppliers – for the first time, a right to firm, long-term access to the transmission grid as well as better information on which to base decisions about where to build new generating plant* – *for smaller generators, such as small wind farms, CHP and solar – who connect to the distribution system rather than the Grid, the proposals give new incentives for the development of these alternative forms of generation where it is economic to do so."*	Fairer allocation. Economy and environment. Lower costs for customers.

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O7	17/04/2003	R/38, Thursday 17 April, "Statement: Ofgem to Defend Judicial Review Proceedings".	*"We strongly believe that the right decision on zonal transmission losses was made on economic and environmental grounds and all due process was followed."*	Economy and environment.
O8	27/06/2003	R/58, Friday 27 June, "Disappointment over Secretary of State Statement on Electricity Losses".	*"The decision on the intention not to implement cost reflective charging for losses across Great Britain is one for the Secretary of State, not Ofgem. We regret this announcement as we believe it is against the interests of consumers, the environment and the development of the electricity market generally."* *"In making its decision in January 2003 to approve industry proposals, Ofgem was aware that cost reflective charging for transmission losses would :* • *be consistent with the Secretary of State's Social and Environmental Guidance to the Authority (November 2002)* • *benefit consumers – Scottish consumers would benefit by around £7 a year* • *make an important contribution to meeting Britain's CO2 emissions targets and achieving a low carbon economy – objectives which lie at the heart of the energy White Paper, and* • *be consistent with proposals which have long had wide support within Government and industry"*	Interests of consumers, environment, electricity market development. P82 consistent with environmental guidance, benefits consumers and lower CO_2 emissions.
O9	08/07/2003	R/63 Tuesday 8 July, "High Court Rejects Judicial Review Of Ofgem's Decision to Introduce Cost-Reflective Charging Arrangements for Transmission Losses".	*"The High Court found that our decision to reform transmission losses was reasonable and took into account the costs and benefits of the proposal. We believe that apportioning costs to those most responsible for losses is in the interests of consumers, the environment and the future development of the electricity market."*	Interests of consumers, environment, electricity market development.
O10	21/01/2004	R/04 Wednesday 21 January, "Ofgem to Reconsider Losses Proposal".	*"The Gas and Electricity Markets Authority today (Wednesday) said that it has submitted to the judgement of the court on the Judicial Review proceedings in respect of its decision in January 2003 to approve BSC Modification P82."*	-

No.	Date.	Document	Document Position	Remarks
O11	30/1/2004	R/07 Friday 30 January, "Statement on Transmission Losses Decision".	*"On 21 January 2004 the Gas and Electricity Markets Authority (which governs Ofgem) submitted to a judgement on judicial review that the Authority's original decision to introduce cost-reflective charging for transmission losses ("P82") be quashed because of a procedural error, dating from January 2003. The effect of this ruling was that the Court sent the decision back to the Authority.* *After careful consideration of the legal constraints, the Gas and Electricity Markets Authority is of the opinion that it is not legally possible for it to approve this Modification Proposal. This is because the relevant timetable set down in the Final Modification Report made its implementation conditional on a decision being reached by 31 March 2003. No further Authority decision is therefore possible in relation to P82, and the proposal can not and will not be implemented."*	P82 not to be implemented.
Section E: Evidence & Responses				
E1	30/04/2002	Environmental Audit Committee – Sustainable Energy Tuesday 30 April 2002.	*"Nevertheless, it seems to me your argument about this two per cent loss is important but you are putting too much emphasis on it and that is going to override some important renewable developments."* (Mr McCarthy) *"I do not think it is going to override important renewable developments. If there are significant advantages in a wind farm in Cardigan Bay or anywhere else in the country over the ones in the Thames Estuary I expect those to prevail. There is absolutely no difficulty in that whatsoever. It does seem that one of the good things to do is to give the relatively small economic signals that when there is a choice between two things which are equal, one of which will result in less waste which is involved in transporting electrons a long distance, there is some incentive to actually use the generating choice which involves less waste. That seems environmentally good as well as economically good."* *"For clarification, it is two per cent on average so if you shift to a system where there is a lot of wind generation from places like Scotland and West Wales, it will not be two per cent any longer, it will go up."* (Mr Neilson) *"It is about reflecting the costs also of building that extra transmission capability to move the electricity long distances. In calculating whether the development proceeds in Cardigan Bay or the Thames Estuary, what the transmission losses proposal involves is taking account of the extra costs that are incurred in having a greater degree of long distance transmission. That seems a reasonable thing to do in terms of deciding whether there is a commercial advantage in building one way or the other which will be counteracted by the stronger winds or whatever in Cardigan Bay."*	Economy and environment. Cost-reflectivity.
E2	25/02/2003	"BETTA Minutes of Evidence	*"Moving on to the point at which a GB basis does seem to be feasible; there are some who would*	Expectation that P82 applied to GB

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		Taken Before The Trade and Industry Committee", Tuesday 25 February 2003.	*suggest reliance on location and market signals within the GB system would have an exaggerated effect in Scotland, partly because of its small size relative to England and Wales. Recognising that the question is coming from an English MP, how would you respond?"* (Mr McCarthy) "*Firstly, we have only looked at it from England and Wales. We were clear that in relation to England and Wales it brought considerable benefits and would bring further benefits in the future. I would expect that the same argument would apply on a GB basis, although I would make it clear that I have not done the analysis."*	would bring "considerable" benefits.
E3	03/2003	"Transmission Losses in A Great Britain Market: Ofgem's Response to the DTI", March 2003.	On the P82 decision: "*In accepting P82, Ofgem concluded that the proposal would better facilitate the achievement of the Applicable BSC Objectives (a), (b) and (c), with the most significant benefit arising in relation to BSC Objective (b)* [efficient, economic and co-ordinated operation ... of the licensee's transmission system]. *Ofgem considered that the adoption of zonal transmission losses will remove cross subsidies that the uniform charging for losses create. The cross subsidies give rise to higher short run costs than would otherwise be the case since they lead to some plant generating when it would be less costly for it not to generate and allow other plant, which it would be more efficient to operate, to generate. In the long run, there will be a tendency towards inefficient locational siting decisions, with their consequential adverse impacts on transmission and the environment. …* "*In relation to its wider statutory duties, Ofgem was of the view that the present set of uniform charges embodies a cross subsidy which zonal losses will help to remedy. Such a cross subsidy is not consistent with Ofgem's principal objective of protecting the interests of consumers. Additionally, zonal charges can be expected to reduce the total costs of generating and transmitting electricity (together with providing concomitant environmental advantages), to the overall benefit of present and future consumers."* On GB zonal losses: "*In the short term the benefits are primarily in terms of more efficient operation of plant. In the longer term the benefits mainly derive from more efficient investment decisions, more effective competition from generators near to centres of demand, and reductions in the monetary and environmental costs of transmission systems*." "*As well as having beneficial effects on consumers of electricity, which are the effects of primary concern to Ofgem, cost-reflective zonal charges for losses will have positive implications for other strands of government policy. For example, compared with the cross-subsidies inherent in a uniform loss approach, they will enable either environmental objectives to be achieved at lower cost or more stringent environmental targets to be achieved for any given cost to consumers."* "*Failing to confirm Ofgem's decision on modification P82 and implementing uniform losses throughout GB, would introduce unnecessary doubts about the consistency of regulatory and*	Reiterating that P82 would better facilitate the Applicable BSC Objectives, in particular, efficient, economic and co-ordinated operation of the system. Efficiency of operation and in investment decisions. Reducing cross-subsidy, and thereby protecting interests of customers Environmental. Regulatory certainty, through consistency with previous Ofgem policy and also international policy. Cost benefit in the order £86m. Carbon saving of the order of 0.33m tonne p.a. Noting that DTI's BETTA Impact Assessment states that charging for losses is a matter for Ofgem.

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			government policy. It would also be inconsistent with the direction of policy internationally." On estimating the benefits: *"Ofgem has previously noted that the long-run benefits of zonal charges for losses in England and Wales might well be substantially higher than £5.3m per annum. This minimum figure is consistent with a calculation by n/e/r/a in a memo it submitted last November to ELEXON12 that suggested that the present value of long term benefits associated with relocation of plant closures and the opening of new plant in England and Wales could be of the order of £39m over 20 years."* *"If the n/e/r/a calculations are taken as a base, one might, for example, double them to reflect more realistic assumptions about the potential influence of zonal pricing of losses. For England and Wales, therefore, the present value of long term benefits over 20 years could be of the order of £78m rather than £39m. The same considerations apply to Scotland, but the system is of the order of one tenth the size of England and Wales. Without further modification, this calculation suggests that zonal losses might yield additional long term benefits of the order of £8m if extended to Scotland."* On implementation costs: *"… not clear that any significant further costs will be imposed by an extension of zonal losses from England and Wales to GB."* On environmental considerations: "[Zonal charging of losses] *may have a beneficial effect on any health related effects of transmission, on the environmental appearance of the system and, perhaps most significantly, on environmental pollution in the form of carbon dioxide and other emissions which would otherwise result from the less efficient development and operation of the transmission system."* *"… carbon saving associated with GB zonal transmission losses could be of the order of 0.33 million tonnes of carbon (MtC) per year in the longer term."* *"Ofgem has considered the impact of zonal losses on government climate change initiatives. … The adoption of more cost reflective charging for losses will encourage the more effective location of such plants. This would include encouraging the development of economic plant located in more southern regions, which might have been rendered uneconomic and therefore not have been developed, in the absence of cost-reflective charging. In this respect, it is important to note that some of the zones in England and Wales that have favourable loss factors e.g. South Western and SWALEC, also have high average wind levels."* *"Ofgem notes that the DTI addressed the concerns expressed about the possible adverse effects of locational price signals on renewables development in its RIA for BETTA: … BETTA does not require any particular set of locational price signals and it will be a matter for Ofgem, in consultation with the industry, to devise a fair and transparent system for transmission access and*	

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			pricing and for the charging of transmission system losses. In devising such a system, Ofgem will need to take account of the need to avoid discrimination against any particular source of generation and the need to comply with its environmental duties … as well as seeking an efficient pricing system which protects the interests of customers."	
E4	05/06/2003	"Transmission Losses across Great Britain", letter from Callum McCarthy to Patricia Hewitt, 5 June 2003	*"We think reasonable conclusions from the Oxera analysis are that:* • *the implementation costs of extending zonal transmission loss charging from England and Wales to a GB basis are essentially zero;* • *the benefits of improved locational signals for zonal transmission loss charging on a GB basis are significant, ranging up to £74m;* • *the impact on emissions is small and uncertain, particularly as the results do not suggest a systematic shift away from any form of generation;* • *the impact on wholesale prices is likely to be small and uncertain;* • *there will be no new barriers to entry; and* • *there is no material impact on the probability of achieving the 10% renewables target by 2010".*	Cost benefit of up to £74m Impact on emissions is small and uncertain. Impact on wholesale prices is small and uncertain.
E5	28/01/2004	"House Of Lords Science and Technology Committee Inquiry Into The Practicalities of Renewable Energy", Oral Evidence, Wednesday 28 January 2004. Mr John Neilson, Dr Boaz Moselle, Mr John Scott and Ms Amanda McIntyre.	Lord Wade of Chorlton: *How have recent changes to NETA affected the generation of renewable electricity and what do you predict the effects of BETTA will be? We have had evidence that criticised the zonal transmission charges and zonal transmission losses described in BETTA. Can you explain these to us and in particular how they might affect the development of renewable energy in Scotland and the north of England where the potential for renewables is the greatest?* Mr Neilson: *The underlying principle that we have adopted in these charges is that they should reflect costs. That is why generators in the south, closest to the places of greatest demand, will use the transmission networks the least and therefore that will give rise to fewer costs. Under our charging methodology and the one that NGC implements, they should pay a lower cost.*	Cost reflectivity. (Refers to transmission charging generally rather than losses specifically.)
E6	07/2004	"House of Lords Science and Technology Committee Inquiry into Energy Efficiency", July 2004 Memorandum by Ofgem	*"In other areas of Ofgem's work we are mindful of the benefits reduced distribution losses on the networks can bring."*	Mention of distribution losses (although not transmission losses) in connection with energy efficiency.

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Section N: Non Ofgem Documents				
N1	30/03/1990	Pooling & Settlement Agreement, Schedule 12, March 1990.	*"Review and, if agreed, implement changes in the arrangements for allocating the costs of transmission losses on the supergrid, e.g. to reflect:* *(i) electrical location of generation and demand; and/or* *(ii) contractual arrangements between Generators, Suppliers and NGC; and/or* *(iii) incentives for investment in supergrid facilities"* *for implementation by July 1996."*	-
N2	04/1998	"Electricity Transmission Pricing: How much does it cost to get it wrong?", Richard Green, April 1998	*"Looking at operating costs alone, moving from a system of uniform pricing for demand and for generation (except to take account of constraints) to optimal nodal prices could increase welfare by approximately 0.6% of the cost of generation."*	This paper is cited in "Transmission Access and Losses under NETA", May 2001, where the benefit is valued at "nearly £40m per annum". This benefit includes constraints as well as losses.
N3	04/2000	"Privatisation, Restructuring and Regulation of Network Utilities", The Walras-Pareto Lectures, David Newbery, 1995, MIT Press, 2000. (Page 269)	Document not seen.	(Referenced in "Transmission Access and Losses under NETA. A Consultation Document", May 2001.)
N4	10/2002	"Cost Benefit of Transmission Losses Proposal P75. A Report for the P75/P85 TLFMG", NERA, October 2002	Report to Transmission Loss Factor Modification Group by NERA (acting on behalf of some BSC Parties). NERA calculates annual savings for P75, as follows: • dispatch savings of £0.9m, rising to £1.4m after 10 years; • a loss of welfare of due to a shift in demand from South to North combined with a reduction in demand overall of £0.1m rising to £0.5m after 5 years, but becoming a benefit of £0.1m at 10 years; • a saving from the relocation of 1000 MW generation of between £4.3m and £12.8m (depending on whether the relocation is associated with just closures of plant, or whether there is the further relocation of 1000MW associated with new entry). Costs are assumed to be £1.0m for BSC Agents and £4.0m for participants. Using a discount rate	Negative NPV.

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			of 6% over 10 or 20 years gives NPVs of the benefits in the range £13.9m to £56.3m, and NPVs of the costs in the range £77.5m to £98.1m.	
N5	03/2003	"Assessing the Introduction of Zonal Charging for Transmission Losses in Great Britain: A Report for the Scottish Executive", ILEX/Strbac, March 2003	Prepared for the Scottish Executive to assist the Executive and market participants in responding to the DTI consultation, 'Transmission Losses in a GB Electricity Market'. The reports find that the introduction of zonal charging reduces losses by 8%, reducing generation in Scotland by 4%. In the longer term, there will be a more significant reduction in Scottish generation of 10-13%.	8% reduction in losses is equivalent to 0.12% of GB generation; assuming GB generation of 350TWh and an energy price of £30/MWh, this is equivalent to £12.6m/yr.
N6	06/2003	"The Impact of Average Zonal Transmission Losses Applied Throughout Great Britain", OXERA/DTI, June 2003	For the DTI, OXERA found NPV of future benefits to be in the range £6.67m to £55.50m. NPV of the costs however, range from £27.9m to £34.6m, "*with the key driver of these results being the assumption made regarding long-run benefits*".	Net benefit ambiguous.
N7	27/06/2003	"Transmission Losses in A GB Electricity Market: A DTI Consultation Paper. Government Response", 27 JUNE 2003	"*It is the Government's view that any positive net benefit that might flow from the introduction of Average Zonal Transmission Losses is ambiguous, especially in light of the wide margins of the upper and lower limits of the costs and benefits. The Government does not believe that Average Zonal Transmission Losses, in the form set out in P82, has been proven as producing a definite beneficial effect in a GB market or that the benefits will definitely outweigh the costs.* *As is mentioned earlier, there are uncertainties in an exercise of this nature, prior to the GB market becoming operational. We expect that the practical operation of the GB market may, over time, clarify some of these uncertainties. This decision does not preclude proposals for changes to the charging for Transmission Losses to be put forward in the future by the Industry. It is obviously possible, through the modifications process, for the industry to reconsider this issue in the context of a GB market and in light of experience, if appropriate.*"	Net benefit is ambiguous. Uncertainties may be clarified over time.
N8	26/07/2004	"Review of GB-Wide Transmission Pricing. A Report for ScottishPower UK Division", NERA, 26 July 2004	"*Our survey reveals that most markets with bilateral energy trading systems like NETA, or with uniform price pools like the old Electricity Pool of England and Wales, have uniform (i.e., non-locational) transmission charges. The only exceptions are Greece, Ireland and Italy. The transmission charging systems in Greece and Ireland appear to resemble that used by NGC, in that charges vary partly to reflect differences in the cost of expanding the transmission system at different connection points. The locational component of the transmission tariff in Italy reflects the cost of congestion between different zones in the network.* *Most of the other markets we have surveyed operate some sort of zonal or nodal spot market for electricity. In all of these markets, the cost of losses and congestion are charged through locational transmission charges for generation and sometimes demand (implicit in nodal or zonal energy price differentials). But most of these markets have uniform capacity or infrastructure*	Most non-bilateral markets have locational transmission charges, which include locational charging for losses.

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			transmission charges. The only exceptions appear to be Australia, California and PJM. Australia uses a fully-allocated-cost method, which allocates the costs of transmission assets to users according to the use they make of them. Capacity charges in California and PJM vary by zone, although only for demand, and only because the transmission company for each zone sets a different uniform charge."	
N9	09/2004	"Electricity Transmission Pricing: How much does it cost to get it wrong?", Richard Green, September 2004	*"Looking at operating costs alone, and taking nodal spot pricing as the optimum, welfare would fall by 0.8% of wholesale revenues if a uniform demand price were applied, and by 1.5% if uniform prices for both demand and generation were adopted. In the presence of market power, the cost of sub-optimal pricing rises to 1.2% and 1.8% of revenues, respectively."*	Estimates up to three times 1998 figure.

Appendix 2 - Document Chronology

No.	Date.	Document
AR1	May-89	Ofgem Annual Report
N1	Mar-90	Pooling & Settlement Agreement, Schedule 12, March 1990.
O1	Oct-90	'Statement by the Director General of Electricity Supply: The regulatory system and duties of the DGES', October 1990.
AR2	May-91	Ofgem Annual Report 1990
AR3	May-92	Ofgem Annual Report 1991
CP1	Jul-92	"Future Control on National Grid Company Prices", July 1992
CP2	Nov-92	"NGC Transmission Use of System Charges"
AR4	May-93	Ofgem Annual Report 1992
CP3	Sep-93	"Scottish Transmission Price Controls: Proposals", September 1993
CP4	Nov-93	Consultation paper on transmission services November 1993.
AR5	May-94	Ofgem Annual Report 1993
AR6	May-95	Ofgem Annual Report 1994
CP5	Nov-95	"The Transmission Price Control Review of the National Grid Company", November 1995.
O2	Nov-95	Letter to Pool Chairman, 14th November 1995 from Director of Regulation and Business Affairs)
CP6	Mar-96	"The Transmission Price Control Review Of The National Grid Company: Second Consultation",
AR7	May-96	Ofgem Annual Report 1995
CP7	May-96	The Transmission Price Control Review Of The National Grid Company, Third Consultation May 1996
DA1	Jul-96	"Decisions on the Appeals Regarding Implementation of Differential Transmission Loss Factors", PSA/R/010
CP8	Aug-96	The Transmission Price Control Review Of The National Grid Company, Fourth Consultation, August 1996
CP9	Oct-96	The Transmission Price Control Review Of The National Grid Company: Proposals, October 1996
O3	Dec-96	Letter to Pool Chairman. (Annual Report for 1996 refers)
DA2	May-97	"Decision on the Appeal Regarding the Works Programme for the Zonal Allocation of the Cost of Transmission Losses", PSA/R/014
AR8	Jun-97	Ofgem Annual Report 1996
CP10	Feb-98	RETA Background Paper 1
CP11	Feb-98	Review Of Electricity Trading Arrangements Background Paper 2: Electricity Trading Arrangements In Other Countries, February 1998
CP12	Feb-98	"Scottish Transmission Price Controls. Consultation Paper", February 1998.
CP13	Mar-98	"Scottish Transmission Price Controls Proposals", March 1998
CP14	Mar-98	"Review Of Electricity Trading Arrangements: Working Paper On Trading Inside And Outside The Pool", March 1998
N2	Apr-98	"Electricity Transmission Pricing: How much does it cost to get it wrong?", Richard Green, April 1998

AR9	Jun-98	Ofgem Annual Report 1997
AR10	Jun-99	Ofgem Annual Report 1998
CP15	Jul-99	"The New Electricity Trading Arrangements: Volume 1", July 1999.
CP16	Oct-99	"The New Electricity Trading Arrangements: Ofgem/DTI Conclusions Document", October 1999.
CP17	Dec-99	"NGC System Operator Incentives, Transmission Access and Losses Under NETA: A Consultation Document", December 1999
CP18	Dec-99	"The New Electricity Trading Arrangements And Related Transmission Issues Proposals on Licence Changes: A Consultation Document", December 1999
CP19	Apr-00	"NGC systems operations under NETA: transitional arrangements - A consultation document", April 2000
N3	Apr-00	"Privatisation, Restructuring and Regulation of Network Utilities", The Walras-Pareto Lectures, David Newbery, 1995, MIT Press, 2000. (Page 269)
AR11	Jun-00	Ofgem Annual Report 1999
CP20	Aug-00	August 2000 Initial Proposals for NGC's System Operator Incentive Scheme under NETA A Consultation Document and Proposed Licence Modifications
CP21	Aug-00	"Interim Proposals for the reform of Scottish Trading Arrangements: British Electricity Trading and Transmission Arrangements (BETTA)" August 2000.
CP22	Dec-00	"NGC system operator price control and incentive schemes under NETA Final proposals", December 2000
CP23	May-01	"Transmission Access and Losses under NETA. A Consultation Document", May 2001
O4	May-01	R/48,Tuesday 22 May 2001, "Proposed Reforms in Transmission Access Announced".
AR12	Jul-01	Ofgem Annual Report 2001
CP24	Feb-02	"Transmission access and losses under NETA: Revised proposals", Ofgem, February 2002
O6	Feb-02	"Transmission Access and Losses", Factsheet, February 2002
O5	Feb-02	R/19, Tuesday 26 February 2002, "Reform Proposals for Transmission Access and Losses Arrangements".
E1	Apr-02	Environmental Audit Committee – Sustainable Energy Tuesday 30 April 2002.
AR13	Jul-02	Ofgem Annual Report 2002
N4	Oct-02	"Cost Benefit of Transmission Losses Proposal P75. A Report for the P75/P85 TLFMG", NERA, October 2002
CP25	Dec-02	"The Balancing and Settlement Code under BETTA. Ofgem/DTI Consultation on a BSC to apply throughout GB", Ofgem 80/02, December 2002.
DA3	Jan-03	'Modification to the Balancing and Settlement Code ("BSC") - Decision and Notice in relation to Modification Proposal P75: "Introduction of zonal transmission losses"'. MP No. P75
DA4	Jan-03	'Modification to the Balancing and Settlement Code ("BSC") - Decision and Direction in relation to Modification Proposal P82: "Introduction of zonal transmission losses on an average basis"', MP No. P82
DA5	Jan-03	'Modification to the Balancing and Settlement Code ("BSC") - Decision and Notice in relation to Modification Proposal P105: "Introduction of zonal transmission losses on a marginal basis without phased implementation"', MP No. P105
E2	Feb-03	"BETTA Minutes of Evidence Taken Before The Trade and Industry Committee", Tuesday 25 February 2003.
E3	Mar-03	"Transmission Losses in A Great Britain Market: Ofgem's Response to the DTI", March 2003.

N5	Mar-03	"Assessing the Introduction of Zonal Charging for Transmission Losses in Great Britain: A Report for the Scottish Executive", ILEX/Strbac, March 2003
O7	Apr-03	R/38, Thursday 17 April, "Statement: Ofgem to Defend Judicial Review Proceedings".
CP26	Jun-03	"The Balancing and Settlement Code under BETTA Ofgem/DTI. Conclusions and Consultation on the legal text of a GB BSC, Volume 1", June 2003
N6	Jun-03	"The Impact of Average Zonal Transmission Losses Applied Throughout Great Britain", OXERA/DTI, June 2003
DA6	Jun-03	'Modification to the Balancing and Settlement Code ("BSC") - Decision and Notice in relation to Modification Proposal P109: "A hedging scheme for changes to TLFs in Section T of the Code"', MP No. P109
E4	Jun-03	"Transmission Losses across Great Britain", letter from Callum McCarthy to Patricia Hewitt, 5 June 2003
O8	Jun-03	R/58, Friday 27 June, "Disappointment over Secretary of State Statement on Electricity Losses".
N7	Jun-03	"Transmission Losses in A GB Electricity Market: A DTI Consultation Paper. Government Response", 27 JUNE 2003
AR14	Jul-03	Ofgem Annual Report 2003
O9	Jul-03	R/63 Tuesday 8 July, "High Court Rejects Judicial Review Of Ofgem's Decision to Introduce Cost-Reflective Charging Arrangements for Transmission Losses".
CP27	Nov-03	"The Balancing and Settlement Code under BETTA Ofgem/DTI Conclusions and second consultation on the legal text of a GB BSC. Volume 1", November 2003.
O10	Jan-04	R/04 Wednesday 21 January, "Ofgem to Reconsider Losses Proposal".
E5	Jan-04	"House Of Lords Science and Technology Committee Inquiry Into The Practicalities of Renewable Energy", Oral Evidence, Wednesday 28 January 2004. Mr John Neilson, Dr Boaz Moselle, Mr John Scott and Ms Amanda McIntyre.
DA7	Jan-04	'Modification to the Balancing and Settlement Code ("BSC") – notice in relation to Modification Proposal P82: Introduction of Zonal Transmission Losses on an Average Basis"', MP No P82
O11	Jan-04	R/07 Friday 30 January, "Statement on Transmission Losses Decision".
AR15	Jul-04	Ofgem Annual Report 2004
E6	Jul-04	"House of Lords Science and Technology Committee Inquiry into Energy Efficiency", July 2004 Memorandum by Ofgem
N8	Jul-04	"Review of GB-Wide Transmission Pricing. A Report for ScottishPower UK Division", NERA, 26 July 2004
N9	Sep-04	"Electricity Transmission Pricing: How much does it cost to get it wrong?", Richard Green, September 2004
AR16	Jul-05	Ofgem Annual Report 2005

Appendix 3 - Zonal Losses Documents Timeline