SSE RESPONSE TO: THE ENERGY MARKET INVESTIGATION (ELECTRICITY TRANSMISSION LOSSES) ORDER 2016

1. Introduction

1.1.1 Over the course of the energy market investigation (***EMI***), SSE has submitted a significant body of evidence regarding the introduction of locational pricing for transmission losses in GB. This evidence questioned the rationale for this remedy and also challenged the assertion that, as designed, this remedy would necessarily be more cost reflective than the status quo.

1.1.2 However, since the remedy will be implemented ostensibly as originally proposed by the CMA, this response is focused on ensuring that the modification is delivered in a reasonable and practicable way. In particular, it is important to ensure that an appropriate and clear legal and regulatory framework is established regarding the adoption of this change and to cover any future modifications to the arrangements for the recovery of the costs of transmission losses.

1.1.3 SSE has previously commented upon the draft Order in September 2016; this response both reiterates and complements those comments.

2. Comments on detailed aspects of the Order

2.1 The Order

2.1.1 The Order remains very detailed and prescriptive, presumably to ensure that locational charging of transmission losses in GB is introduced as envisaged by the CMA. SSE highlights that a feature and a risk of such a prescriptive approach is that it requires a high degree of precision on every detail. Two approaches could be taken to help mitigate this risk:-

(a) either consideration needs to be given to a defined process that allows revision of the relevant details to correct the Order in the necessary timescales, where currently unidentified or unintended complications arise during the progression of the detailed solution;

(b) or a simpler, more principles-based, approach should be adopted which could provide equivalent clarity whilst avoiding technical minutiae.

Part 1 – General and interpretation

2.1.2 Whilst recognising the changes that have been incorporated to allow the Transmission Company to appoint an agent to fulfil duties arising from the Order, SSE note that the obligation remains on the Transmission Company (NGET plc) in the first instance to perform duties which are carried out currently by the Balancing and Settlement Code Company (Elexon). This could result in either (i) a situation where NGET fails to meet its obligations, due to the actions of an independent party (or one which can act

independently) or (ii) the discretion of the BSC Panel to recommend an alternative proposal which it deems superior to that prescribed in the Order is fettered by the obligation placed on NGET.

Part 2 – Transmission losses principle

2.1.3 Article 3 does not make any contingency for the possibility that an issue or unintended consequence of this remedy is identified or evolves over time such that it would be in customers' best interests for industry to revert to the *current* charging arrangements for the recovery of the costs of transmission losses (i.e. on a non-locational basis).

SSE has previously expressed its concern that the remedy to be implemented is actually *less* cost-reflective than the status quo (i.e. that it may prove *impossible* to devise a workable and robust charging mechanism which is sensitive to each user's contribution to transmission losses as a result of their location on the system). It is disappointing that the provisions of the Order make no allowance for this potential scenario and instead may lead to a sequence of modifications each trying to mitigate the unintended consequences of the modification before.

SSE also notes that the term "user" is an important concept within the context of Article 3 but is not defined in the Order - it is therefore unclear whether it should, in future, be considered to include embedded generation, interconnected users etc.

Part 4 – Certain amendments to licence conditions

Schedule 3: Changes to the Transmission Licence

2.1.4 SSE considers that it is unnecessary for clause (g) to be inserted into paragraph 3 of Condition C3 of the transmission licence for the following reasons:

(a) Objective (a) under paragraph 3 already requires "the efficient discharge by the licensee of obligations imposed upon it by [the Transmission Licence]"; and,

(b) The proposed paragraph 1E already requires that the settlement arrangements in the BSC will comply with the Transmission Losses Principle.

2.1.5 On this basis clause (g) adds no substance to Condition C3 and can be removed without affecting the outcome.

Schedule 4: Changes to the Generation Licence and the Supply Licence

2.1.6 The amendments proposed to Condition 11 of the Supply Licence and Condition 9 of the Generation Licence are inconsistent with the policy intention of the Order as a whole and the changes being made to Condition C3 of the Transmission Licence. The changes should be amended to reflect that in the event of a conflict between the EMI (Transmission Losses) Order 2016 and the BSC, then the imbalance charges shall be calculated in accordance

with the provisions set out in Schedule 1. This reflects the requirement of Article 4.1 of the Order but does not reflect the effect of Article 5.3 of the Order. A clause should be incorporated into any required changes to the Supply Licence and the Generation Licence which has equivalent effect to clause 1I which will be introduced to the Transmission Licence as per Schedule 3 to the Order.

2.2 Schedule 1 – Calculation of Transmission Loss Factors

2.2.1 The provisions of Schedule 1 are very detailed in nature, including such details as the specific assumptions to be used in relation to the voltage phase angle in the load flow model to be established and adopted by the Transmission Company. SSE considers that it should be possible (and preferable) to specify the broad principles without needlessly constraining the modelling approach in a way that does not add value. Any load flow model established with the intention of calculating zonal and seasonal average transmission loss factors will necessarily make a number of simplifying assumptions in order to make the problem tractable, and it is possible that these will broadly align with the CMA's anticipated assumptions. What is not clear is what possible benefit arises from specifying particular assumptions as actual requirements. No sensitivity testing has been conducted by or on behalf of the CMA to substantiate the need for such a prescriptive approach.

2.2.2 Notwithstanding our comment in 2.2.1 above, and given the details included in the final Order, SSE have concerns that the treatment of HVDC circuits within the load flow modelling, as set out in paragraph 17 (c) (ii) is inappropriate and inconsistent with the treatment of HVDC circuits in the TNUoS methodology.

Specifically, paragraph 17 (c) (ii) seeks to disregard any power flows on any part of the Transmission System used to transport HVDC power flows. Given that a fundamental rationale for building the HVDC Western Link transmission line between Scotland and England was to support the transport of energy from areas of high renewable energy production to centres of demand at minimum cost (including minimisation of transmission losses through the selection of an HVDC solution), the failure to model the line would tend to impose greater losses on flows of energy North to South than might otherwise be the case. This would tend to sharpen the distributional impacts of a locational losses remedy without proper justification.

The choice to use HVDC circuits for network reinforcement involves a trade-off between a relatively high capital cost (including converter stations) against lower cost of losses, increasing the economic viability for relatively long line lengths – the cost of the converter station being a sunk cost independent of HVDC line length, but the benefit of lower losses increasing in value proportionally to the length of the line. The longer the length of line, the greater the benefit realised as reduced losses exceed the high capital cost over time.

The locational TNUoS methodology takes into account the higher capital cost of HVDC circuits, therefore the corollary of this ought to be that the locational

losses methodology takes account of the lower cost of losses fully. The losses methodology as currently set out is inconsistent with the TNUoS approach established in CMP213, and does not reflect the full benefit of lower losses afforded by use of HVDC circuits to carry power North to South.

The approach taken by the TNUoS model (as established by CMP213) derives the incremental cost of investment (£/MWkm) by using an average of the £/MWkm of the existing network. This assumes that an incremental MW of generation would cause (or avoid) an incremental requirement to invest to reinforce all circuits, without knowing what the actual reinforcement cost will be and consequently what the incremental loss factor will be.

The approach to losses should therefore use the same averaging approach, where the derived incremental cost of losses is also an average of the cost of losses on the existing network, including the lower than average cost of losses incurred by transporting flows via HVDC circuits.

The approach utilised by the TNUoS model is set in CMP213 Final Modification Report http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/CUSC/Modifications/CMP213/, Volume 1, Section 5 (pages 61 to 69), extracts of which are set out below (**emphasis** added) :-

> *"5.1 The HVDC aspect of the CMP213 Modification proposal seeks to keep TNUoS tariffs up to date with transmission business developments through incorporating parallel HVDC transmission circuits into the TNUoS charging methodology. It does this by addressing two issues:*
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> *(i)* ***treatment of flows in the DC load flow element of the charging model, in light of the inherent controllability of power flows through an HVDC transmission circuit****; and*
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> *(ii) calculation of an appropriate expansion factor (i.e. relative unit cost) for these HVDC transmission circuits.*
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> *5.2* ***The CMP213 Original proposal would treat power flows on HVDC transmission circuits as if they were AC circuits (i.e. as pseudo AC circuits).***
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> ***5.3 This would be done by first calculating a base case flow down the HVDC circuit, which would subsequently be used to calculate the notional impedance for it in the Transport Model. The base case flow down the HVDC transmission circuit would be calculated from a ratio of power flows to circuit ratings across a transmission network boundary 'crossed' by the HVDC circuit. This approach would calculate a desired power flow for the HVDC circuit on each transmission boundary that the link 'crosses' and then average this flow across those multiple transmission boundaries."***
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> *5.8 Prior to the Workgroup consultation, the Workgroup also discussed further areas where the CMP213 Original could be developed (that were not highlighted by the Authority's SCR Direction), and discussed each of these in turn.*
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> *i. Review the overhead factor (i.e. 1.8%) used when annuitising the capital cost in the calculation of the HVDC expansion constant*
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> *ii. Calculate the 'desired flow', and hence notional impedance, by balancing flows across the single most constrained transmission*

boundary rather than all the transmission boundaries the HVDC link 'crosses'

iii. Review security factor calculation in light of long (MWkm) HVDC links comprised of single transmission circuits that parallel the AC transmission network

Table 18 – Discussion on the Original and potential alternatives

5.9 ***A majority of the Workgroup agreed that these areas should not be developed further as potential alternatives,*** *based on both evidence provided to the Workgroup and responses to the Workgroup consultation."*

2.2.3 Additionally, SSE do not believe that it is appropriate to disregard any power flows to or from interconnectors when calculating Zonal TLF values, as set out in paragraph 17 (c) (ii). The correct economic signal would be to include the cost of the losses associated with interconnector flows within the zonal factor, and apply those costs to all contributing users. We recognise that current rules will ensure that zonal losses are not applied to interconnector users (by virtue of changes introduced as a result of European Legislation), but this should not be used as a reason to dampen the locational signal determined by the load flow model.

Given that the purported intent of zonal transmission losses is to send a cost reflective price signal for the variable cost of losses, it is arguable that interconnector users ought to be exposed to at least the variable element of the losses costs in the future, to provide the most efficient signal.

2.2.4 The algebraic drafting of Paragraph 17 (e), $ATLF_{zs} = (TLF_{zs}*0.5) + TLFA_s$, and additional definition of $TLFA_s$, is inconsistent with the legal drafting published by the P350 Assessment Consultation document https://www.elexon.co.uk/mod-proposal/p350/, which currently states that:-

"8.5 For each BSC Year:

(a) the TLFA shall, not later than 30th November in the preceding BSC Year:

(i) *determine the Adjusted Seasonal Zonal TLF ($ATLF_{ZS}$) for each Zone and each BSC Season according to the following formula:*

$ATLF_{ZS} = TLF_{ZS} * 0.5$

(ii) *send the Adjusted Seasonal Zonal TLFs to BSCCo; and*

(b) *BSCCo shall, not later than 31st December in the preceding BSC Year, publish the Adjusted Seasonal Zonal TLF ($ATLF_{ZS}$) for each Zone and each BSC Season on the BSC Website."*

It is also inconsistent with the initial text of the Order, published by the CMA on 11th October, having been introduced at a late stage by the amended text published on 4th November.

It is not clear why the CMA has chosen to adopt a different approach to that set out in the BSC drafting, particularly at such a late stage. The newly defined term $TLFA_s$, on the face of it, appears to introduce an additional "residual" mechanism on generation without neither explanation nor justification.

2.2.5 Paragraph 10(a)(i) of Schedule 1 states that "*for each Volume Allocation Unit (other than a GSP Group, or BM Unit embedded in a Distribution System)*" – SSE notes that GSP Groups are not Volume Allocation Units under the BSC, whereas some embedded BMUs are deemed to be transmission users and are licensable (where installed capacity exceeds 100MW).

2.2.6 The comments highlighted above demonstrate the inherent risks of drafting the order in an overly prescriptive and detailed manner.