

Single Electricity Market

SEM Committee decision on all-island harmonised Transmission Loss Adjustment Factors (TLAFs)

Decision Paper

24th September 2010

[SEM-10-066](#)

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1. INTRODUCTION

This paper sets out the decision of the SEM Committee (SEMC) in relation to the harmonisation of all-island Transmission Loss Adjustment Factor (TLAF) arrangements from 1st October 2010 and beyond. This decision follows a period of public consultation on the Regulatory Authorities (CER and NIAUR) proposed decision on all-island harmonised Transmission Loss Factors (SEM-10-039) and a July 2010 public workshop on this topic.

The Regulatory Authorities (RAs) are still in the process of reviewing the harmonised TUoS arrangements and a proposed decision by the SEMC on these arrangements will be published by the RAs soon.

1.1 Background to TLAF arrangements review

The development of harmonised all-island transmission charge and losses arrangements was an objective stated in the original Single Electricity Market (SEM) high level design¹. It was also stated as an objective that the harmonised transmission arrangements should provide locational signals to users that reflect the costs that they impose on the transmission system. The RAs initiated a review into all-island transmission loss adjustment factors (TLAFs) as part of a review of transmission network locational signals in January 2009 (SEM-09-001). This review of TLAFs by the RAs is now complete and this document outlines the decision of the SEMC in relation to harmonised all-island transmission loss adjustment factors (TLAFs) arrangements.

The transmission of electricity results in a proportion of energy being lost as heat. Losses are caused in part by the energisation of equipment and the volume of losses varies depending on where a party puts energy on, or takes energy off the transmission system. Putting energy onto the system further from centres of demand will therefore increase the volume of losses on the system. Harmonised transmission losses arrangements for Ireland and Northern Ireland were introduced as part of SEM implementation.

Under the current arrangements, TLAFs are determined ex-ante (at the year-ahead stage, four months before the start of the relevant year) for each Generator Unit. A TLAF value is determined for day and night periods for each month, each calculated as an average of marginal transmission losses linked to that Unit at the relevant time. These TLAF values are used by the Generator Unit when submitting bids – their offer prices (the Ps in their PQ pairs) are divided by their TLAF.

This loss-adjusted offer price is used both in setting merit order in dispatch and in the calculation of the SMP in market pricing and therefore the setting of the market schedule. The SMP is finally multiplied by the respective loss-adjusted Market Schedule Quantity (MSQ) for each Generator to ensure the correct settlement. So a good/high (e.g. >1) loss factor will in general lead to a Generator more likely being dispatched with access to the market schedule, while a poor/low loss factor (e.g. <1) will in general make it less likely that the Generator will be dispatched and get access to the market schedule.

However, there are a number of concerns relating to the current TLAF arrangements for Generator units. First, the derived TLAF values have, in some cases, been volatile with significant year-on-year variations. This creates risk and uncertainty for the affected Generators. Second, as they are calculated year-ahead, the ex-ante TLAFs do not reflect

¹ Please refer to AIP/SEM/42/05.

the prevailing conditions on the system at the time of dispatch. This creates a concern that the arrangements are not contributing to efficient dispatch.

It is also considered that increased dispatch efficiency cannot be obtained without increased TLAF volatility and this presents a significant issue for new and existing market participants alike. Expectations are that this situation will deteriorate as the generation mix changes and the penetration of intermittent generation increases. These issues have contributed to the ongoing review of the TLAF arrangements. Section 3.2 of this paper outlines in detail the RAs concerns with the existing TLAF methodology.

1.2 Objectives of the workstream

TLAFs are designed as a mechanism to allocate the costs associated with transmission losses in a fair and equitable manner to all Generators as users of the transmission system. In theory Generators who contribute more to transmission losses by virtue of a poor location (e.g. long distance from demand centres or weak network assets in that area) should have poorer loss factors than those Generators who contribute less to transmission losses. Effective loss factors should promote efficient dispatch in real-time.

However there are other competing objectives which the RAs have attempted to address in this review.

The next section of the paper outlines the Transmission System Operators (TSOs) proposed weighting for various objectives related to TLAFs and the RAs perspective on the key objectives of this review. It is important to note that the TSOs and RAs/SEMC have distinctly different statutory obligations and therefore the objectives of the TSOs may not be fully aligned with the objectives of the RAs/SEMC.

1.2.1 TSOs perspective

Based on feedback from various stakeholders which requested that the objectives for all-island TLAFS arrangements be ranked, the TSOs proposed weightings to evaluate each option, such as Compression, Uniform, Zonal etc. These, the TSOs argued, reflected the relative importance placed on each objective by a combination of industry, regulatory and TSO input. The weightings proposed by the TSOs in SEM-09-107 were as follows:

Table 1: TSO criteria weightings for TLAFs in SEM-09-107

Objectives	Weighting
Efficient Dispatch	.25
Efficiency	.20
Cost Reflectivity	.20
Volatility	.15
Predictability	.15
Transparency	.05

As evident from the above table, the TSOs placed significant importance on efficient dispatch, efficiency of location and cost reflectivity for participants. Removal of volatility and the promotion of predictability and transparency were deemed to be less important than the three other objectives.

1.2.2 RAs perspective

The RAs have outlined both in the proposed decision paper (SEM-10-039) and at the industry workshop held on 26th July 2010 the importance of finding an improved solution

for the calculation of TLAFs compared to the existing methodology which it is believed has ran its course. Overall, the key goal of the RAs throughout this process has been to try to find the correct balance between all of the objectives outlined by the TSOs above in table 1, some of which are competing against each other. For example, to ensure short term efficient dispatch and cost reflectivity, it is intuitive that the losses methodology should be responsive and sensitive to new generation developments, which may come at the expense of the promotion of predictability and non-volatility for Generators.

For these competing reasons, the RAs have decided not to apply individual numerical weightings to each objective, because it is clear from the responses to SEM-09-107 and SEM-10-039 that the application of weightings is largely subjective. It is clear that particular stakeholders value certain objectives over others. Therefore, it is not the case that the RAs believe that there is one overarching objective of the all-island TLAF arrangements workstream, but that the options chosen for implementation on 1st October 2010 and beyond strike a balance between them.

It is also clear that there is not one outstanding or simple solution which meets all of the objectives and will be favoured by all market participants, the RAs and the TSOs. The recent experience of Ofgem in Great Britain in dealing with transmission loss arrangements also indicates as such². Therefore it is incumbent upon the RAs to weigh up all of the options available and to apply regulatory judgement to find what is considered to be the fairest, most appropriate and most progressive solution.

The RA's objectives are now discussed in turn.

As stated in SEM-10-039 the RAs consider that transmission arrangements should provide in some form appropriate signals to transmission users of the costs that they impose on the transmission system. These arrangements should be:

- Predictable
- Provide an efficient dispatch signal
- Non-volatile
- Transparent

These signals should also provide for lower costs to customers than would otherwise be the case. On the basis of these signals, users can make informed decisions concerning their use of the transmission system. This should, other things being equal, lead to more efficient development and use of the transmission system and therefore lower costs for the all-island customer. The RAs are also of the view that these arrangements should be **predictable** for participants so that they have a general picture of what losses they expect to be applied to their output in the year(s) ahead.

One objective of losses is to deliver **efficient generation dispatch** in real-time. The application of appropriate TLAFs to Generator volumes allows each Generator's contribution to overall transmission losses to be reflected in dispatch decisions. Efficient dispatch includes both the efficient use of energy and the minimization of unnecessary dispatches. TLAF arrangements should also allocate losses to individual Generators on a

² Please see following link on Ofgem website:

<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=97&refer=Licensing/ElecCodes/BSCode/las>

cost-reflective basis, thereby providing signals to Generators relating to their impact on overall transmission losses.

The arrangements should be **non-volatile**, to the greatest possible extent. Stability for investors is an important aspect of any competitive market. The perceived level of risk associated with an investment is priced into that investment – markets with many volatile and unpredictable features will have higher investment costs and as a result higher costs for end users.

Regulatory consistency can be provided in two ways. Firstly, the SEMC decisions should be clear and justifiable and should indicate the RAs intentions for the future. Secondly, these decisions made by the SEMC should implement stable and non-volatile policies. While it is not possible to provide certainty to market participants against a dynamic and changing environment, the RAs and SEMC are aware of the value that market participants place on stability.

A losses methodology that is driven by a locational signal may by its very nature be volatile. It may be sensitive to the amount and type of generation in a given location, but the RAs believe that this volatility should be reduced to an acceptable level.

Finally, the methodology chosen should be **transparent** to stakeholders, in that it is beneficial to participants to be able to see that the losses are calculated accurately and are non-discriminatory.

1.3 Process to date

It should be noted that the RAs and TSOs have consulted extensively with stakeholders since this review of TLAFs was initiated in January 2009³. The RAs are aware that the structure of the TLAF arrangements on the island are of concern to all participants in the SEM and have therefore taken every available opportunity to consult with industry and listen to its view. The consultation process to date is as follows:

- in January 2009, at the request of the RAs, the TSOs initiated the review of locational signals provided by generator TUoS charges and TLAFs (SEM-09-001);
- in March 2009 the TSOs prepared a questionnaire in order to ascertain more information from participants regarding their positions with regard all-island TLAF arrangements and a workshop was held;
- in May 2009, based on responses from the questionnaire, the workshop and a number of position papers submitted by interested parties the TSOs published a consultation paper (SEM-09-049) which presented a range of potential methodology options in respect of generator TUoS and TLAFs⁴;
- based on feedback provided to the May 2009 consultation, in November 2009 the RAs published a further TSOs consultation paper (SEM-09-107) in which the TSOs set out their preferred options for both generator TUoS and TLAFs⁵;
- in December 2009 the TSOs held a workshop in Dundalk where they presented on their preferred options outlined in SEM-09-107. The RAs also presented on their

³ Please refer to [SEM-09-001](#)

⁴ Please see following link:
http://www.allislandproject.org/en/transmission_current_consultations.aspx?article=135317f0-49cd-4f7c-b0a3-fb4b75c84bc3

⁵ Please see following link:
http://www.allislandproject.org/en/transmission_current_consultations.aspx?article=c4fdb48e-4a1a-44d6-848d-af13746ddcb8

perspective at the workshop and participants were invited to comment on the TSOs preferred options⁶;

- in February 2010, having considered responses to the November 2009 consultation, the TSOs provided a formal response to the RAs in which they set out their updated position and recommendations;
- in June 2010, the RAs published a SEMC proposed decision (SEM-10-039) on all-island harmonised TLAFs arrangements;
- in July 2010, the RAs held a workshop in Dundalk where we presented on the proposed decision outlined in SEM-10-039. A number of interested parties also presented on their perspective at the workshop and participants were invited to comment on the proposed decision; and
- in August 2010 the RAs publish a Uniform TLAF study which was carried out by the TSOs. The overall average figure calculated for the all-island system is 2.14%, or a TLAF of 0.9786.

Building on the progress made by the TSOs and the input provided by industry participants, the process now moves onto the decision phase. The RAs consider that extensive consultation and analysis has been carried out on a variety of solutions and options for all-island harmonised TLAFs since this review commenced in January 2009. It is now important to move to a decision.

Since November 2009 the RAs have received advice from technical consultants working on the project – Poyry.

1.4 Purpose of paper

The purpose of this decision paper is three-fold:

- to outline and respond to the key points raised by respondents in their submissions to the proposed decision paper SEM-10-039;
- to outline the SEMC decision on all-island harmonised TLAF arrangements from the 1st October 2010; and
- to provide stakeholders with the results of analysis and modelling to support the SEMC decision.

Queries with regard to this decision paper should be submitted to jburke@cer.ie and billy.walker@uregni.gov.uk.

As outlined above the RAs are still in the process of reviewing the harmonised TUoS arrangements and a SEMC proposed decision on these arrangements will be published by the RAs in the near future.

1.5 Comments received

There were 33 responses received to the Proposed Decision paper SEM-10-039.

They were:

- ABO Wind Ireland
- AES Kilroot

⁶ Ibid

- Airstream Wind Energy
- Art Generation
- Beam Wind
- Bord Gais Energy
- Bord na Mona
- Coillte
- EirGrid and SONI
- Endesa Ireland
- ESB International
- ESB PG
- Firmus Energy
- IWEA
- Killala Community Windfarm
- Meitheal Na Gaoithe
- Mutual Energy
- NIE ES
- NIE PPB
- Northern Ireland Manufacturing
- NOW Ireland
- Premier Power
- RES Energy
- RUSAL Aughinish
- Saorgus Energy
- Seabreeze Energy
- SSE Renewables
- SWS Energy
- Synergen
- The Consumer Council of Northern Ireland
- Viridian Power and Energy
- Windsource
- Your Energy

All full responses, which were not indicated as confidential, are published with this document.

1.6 Structure of this paper

Section 2 outlines the comments received to the SEMC proposed decision paper SEM-10-039 and the RAs response to these comments.

Section 3 discusses options reviewed during the process and the market effects of a Uniform TLAF.

Section 4 outlines the SEMC decision on all-island harmonised TLAF arrangements.

Section 5 outlines the RAs next steps with regard to the all-island harmonisation workstream (TLAFs and TUoS).

Appendix A outlines the modelling results carried out by the RAs for the TLAF workstream, which includes assumptions used and scenarios examined.

Appendix B sets out the proposed modification to the Trading and Settlement Code.

2. COMMENTS RECEIVED

2.1 Introduction

As evident from the list in section 1.5 there were a large number of responses to SEM-10-039 (33 in all). The RAs have attempted to respond to as many of the points raised by stakeholders in their submissions, including those related to the concept of 'Splitting'. With regard to those responses in favour of the proposed decision, that the treatment of losses in dispatch and the market schedule are to be treated on a uniform basis from 1st October 2010, the following is a summary of the key points raised:

- The current calculation method of TLAFs in the SEM is flawed;
- Uniform TLAF promotes stability, transparency and predictability;
- Uniform TLAF is the fairest, most equitable solution; and
- A Uniform TLAF of 1.0, as opposed to the proposed value of 0.98 should be adopted;

With regard to those responses against the proposed decision the following is a summary of the key points raised in the responses:

- The consultation process carried out by the RAs has been inadequate;
- There was no analysis carried out and provided to stakeholders by the RAs on the effects of a Uniform TLAF of 0.98 or to show flaws in the current calculation method of TLAFs;
- A Uniform TLAF of 0.98 will increase costs in SEM, i.e. SMP, Production costs, Error Supply Unit, environmental costs etc;
- A Uniform TLAF of 0.98 will increase costs for the Northern Ireland end customer, in particular those associated with the Northern Ireland PSO; and
- A Uniform TLAF of 0.98 is not in fitting with the principles set out in the 2005 SEM High Level Design paper or the stated objectives of the workstream.

2.1.1 Respondents in favour of Uniform TLAF proposal

A majority of those who responded to the paper were in favour of the proposal to introduce a Uniform TLAF in the market and dispatch from 1st October 2010. There were a number of general themes advanced by these parties.

Current calculation method of TLAFs

A number of respondents believed that the existing TLAF calculation methodology was discriminatory and that the sensitive nature of the methodology to new generation resulted, as one respondent put it, in 'excessive loss apportionment'. *"(This) arises as a result of the TLAF calculation methodology which determines a single loss factor at the margin only but then applies it across the entire output of the plant"*.

This respondent went on to note that *"(under the current methodology) excessive losses/benefits are attributed to various generators resulting in revenues to plant which bear little correlation to the value they deliver"*. Another respondent stated that *"the current methodology of calculating TLAFs is erroneous, discredited and flawed which results in less efficient plant being run more regularly or higher up the merit order than the most technically efficient plant on the system"*.

It should be noted that some respondents believed that the current methodology is not flawed and the RAs response to this is also outlined below.

RAs response

One of the reasons for undertaking this review of TLAFs was to determine and implement a solution for loss allocation which is deemed, among other things, to be non-discriminatory⁷.

It has been argued by a number of respondents that the marginal cost approach leads to overly punitive losses being attributed to particular Generators on the island. It should be made clear that the current calculation methodology does not attribute the fully efficient marginal cost of losses to Generators. This is because the allocation of losses using efficient (marginal) cost pricing principles would lead to over-recovery of losses. Hence, marginal loss adjustment factors are usually scaled down by the TSOs (by about 50%).

The marginal loss factors derived for each Generator are scaled uniformly using a shift (delta), or subtractive, approach so that the apportionment (Generator output multiplied by the loss factor) meets the base-case losses. This is performed for each applicable case (i.e. day and night for each month). The overall loss allocation for each representative case (losses multiplied by case hours) is summed to determine whether the total allocated losses meet the forecast of overall system losses for the year. These factors are then scaled again using the shift method; to ensure the final apportionment (forecast Generator output multiplied by the TLAFs) exactly recovers the annual forecast of transmission system losses.

However, even with the process of scaling, losses still cannot currently be exactly measured because of infrastructure issues associated with bulk supply metering. Furthermore, the derived marginal loss factors are only precisely 'accurate' if the assumed generation and demand patterns prevail. When alternative conditions prevail, the derived marginal loss factors will be less 'accurate', thereby compromising the efficiency of dispatch and the appropriateness of the resultant system marginal price (SMP).

The appropriateness of marginal transmission loss factors hinges on the scope for deviation between assumed generation and demand patterns within the derivation methodology and those that actually prevail. At present, deviations are observed because conditions do vary from the set of 24 modelled system conditions. For example:

- As the current TLAFs are defined at the year-ahead stage, they are unlikely to accurately reflect the prevailing system conditions when the dispatch schedule is being created, potentially compromising efficient system dispatch⁸.
- A particular Generator's contribution to system losses would be expected to be less in cases where its actual output is lower than that assumed in the modelling. Application of the derived marginal loss factor in such circumstances may, therefore, overstate the Generator's contribution to system losses. This could adversely affect its position in the merit order and distort the SMP.

⁷ Please see SEM-09-001.

⁸ This is one of the key drivers behind the potential adoption of Splitting, which would allow loss factors to be calculated closer to real time for the purposes of dispatch while an alternative, more stable, methodology (such as Uniform or long-term Zonal) is applied for purposes of the market.

The potential for deviation is expected to increase in the future as increased intermittent generation and demand side flexibility are expected to make patterns of generation and demand patterns less predictable. In this eventuality, the marginal transmission loss factors derived using the current approach would, therefore, be expected to become less accurate in comparison to real time losses on the system.

However the merits of appropriately defined marginal transmission loss factors remain; in theory, they should help to optimise dispatch and deliver efficient prices. It is possible that issues with the current approach for deriving marginal transmission loss factors could be resolved by changing the methodology (e.g. calculate closer to real-time and/or for a larger number of time periods), rather than deviating from marginal loss factors all together. Indeed, this is inherent in the potential longer-term adoption of Splitting, which is discussed below in Section 4, under which locationally varying loss factors will still be calculated for purposes of dispatch.

Uniform TLAF promotes stability, transparency and predictability

A number of respondents maintained that the current TLAFs do not provide an effective location signal for investors to make economic investment decisions - it is too volatile, unpredictable and non-transparent. They believed that a Uniform TLAF would address these concerns. One respondent stated that, *“Investors now ignore the signals given by TLAFs, instead looking towards other signals provided through constraints and connection costs. Uniforming TLAFs and stabilising the signal for investors will improve the overall investment environment and investors confidence in the market”*.

Another noted that *“the volatility of TLAFs prevents generators from entering into long-term contracts with retailers. This increases risks for market entry and expansion and also reduces the number and flexibility of products that can be offered to customers. Stability of uniform TLAFs will provide greater opportunities for generators and retailers to plan and devise long-term strategies for their businesses”*.

RAs response

Throughout the review process and in response to the various questionnaires, consultation and workshops a number of stakeholders have highlighted⁹ the highly volatile nature of the calculation methodology as problematic and considered this to be undesirable in a small market. It is acknowledged that the 2005 SEM High Level Decision paper¹⁰ states that *“transmission losses in the SEM will be accounted for by applying locational loss factors to the outputs of each generator”* and therefore that a certain level of volatility is an inherent feature of locational loss factors, i.e. changing TLAF values year-on-year. But it is worth highlighting that 82% of respondents to the March 2009 TSO questionnaire believed low volatility (i.e. stability) to be most significant objective in the setting of an all-island TLAF methodology¹¹.

It was in this context that the RAs proposed the treatment of losses in dispatch and the market schedule be done on a uniform basis from 1st October 2010, with the enduring solution, ‘Splitting’, to be the subject of an Impact Analysis¹². It was believed that these steps would address this flaw, which a majority of stakeholders believed to be a significant objective of the all-island TLAF harmonization workstream.

⁹ Please refer to SEM-09-060 and SEM-10-039.

¹⁰ Please refer to AIP/SEM/42/05

¹¹ Please refer to Figure 22 of SEM-09-046

¹² Please refer to section 4.3 of this paper.

As outlined in SEM-10-039, due to highly volatile nature of the TLAF methodology and the considerable timelines associated with generation projects it is possible for a Generator to respond to a 'good locational signal' only to find that their presence impacts the calculation of losses to such an extent that they get a very poor loss factor once operational. The signals provided are not stable and are therefore not effective in delivering the desired outcome of a locational loss signal. Hence, the RAs believed in SEM-10-039 that a stable long-term locational signal, e.g. Uniform / long-term zonal TLAFs, should be put in place.

Certain stakeholders have made the case to the RAs that generation projects incorporate a risk premium in their WACC for the potential revenue volatility attributable to TLAFs. This risk raises the cost of debt, cost of equity and the equity beta. The extent of these components will also affect what is considered an appropriate gearing level for a given project.

The RAs believed this to be a negative consequence of the current TLAF regime, which would be addressed by a stable, predictable and transparent Uniform loss factor. The reduction of the risk premium attached to generation projects was another of the factors considered by the RAs in proposing the Uniform loss factor from 1st October 2010 and Splitting from 1st October 2011 (on the basis of outcome of the Impact Analysis).

With considerable generation investment, particularly in renewable generation expected in the SEM over the next 10 years, the RAs were aware that any reductions in risk premium in project finance, as a result of improved stability in TLAFs could result in cost savings for projects which would ultimately lead to savings for customers.

Uniform loss factor of 1.0

A number of respondents argued that a Uniform loss factor of 1.0, as opposed to the RA proposed value of 0.98, would enjoy more 'acceptability' among stakeholders. One stated that the "*REFIT support is based on a TLAF of 1 - if a uniform TLAF of 0.98 was implemented, the effective support of REFIT would be reduced by 2% for the vast majority of REFIT supported projects which are settled at the Trading point*". This respondent went on to state that "*a TLAF of 0.98 introduces a North-South distortion as ROCs are counted at the gate and REFIT is counted at the trading point*".

RAs response

The RAs continue to be of the view that transmission losses should be recovered from Generators rather than Demand. As stated in the proposed decision - Generator flows contribute to losses on the transmission system. To apply a uniform loss factor of 1.0 would to completely ignore this fact and presume there are no losses on the system accountable to any Generator. It would also mean that all losses on the system would be allocated to the Error Supply Units in both jurisdictions.

The ESU is registered in each jurisdiction by ESB Customer Supply (ESB CS) and NIE Energy Supply (NIE ES) in Ireland and Northern Ireland respectively. In the absence of global aggregation, the ESU accounts for the demand of the relevant supplier as well as any unaccounted for energy consumption and losses on the system. On the all-island system a number of factors will cause differences between metered generation and metered demand plus "recovered" losses. These factors are outlined in section 4.4 below.

It is the view of the RAs that attributing total losses on the all-island system and associated costs to ESBCS in Ireland and to NIEES in Northern Ireland would be discriminatory against customers of these suppliers.

The modelled effects on the ESU within the various scenarios are discussed further in this paper and outlined in Appendix A of this paper.

Both the Terms and Conditions of the REFIT and ROC schemes and the related references prices are a matter solely for the governments of Ireland and the United Kingdom respectively. They are not a matter for the RAs or the SEMC. Therefore, the RAs are of the opinion that concerns associated with the levels of financial support within both renewable generation support schemes and the designs of these schemes should be addressed to the relevant Government departments.

2.1.2 Respondents against Uniform TLAF proposal

There were a number of responses (8 from 33) against the proposal to introduce a Uniform TLAF in the market and dispatch schedules from 1st October 2010. A number of general themes were advanced by these parties.

Consultation process carried out by the RAs

A number of them believed that the consultation process carried out by the RAs has been inadequate and against best regulatory practice. One respondent stated that *“the process does not reflect good regulatory practice – the SEM minutes (29.4.10) say the Uniform proposal was adopted by the SEMC...(this) seems to go against Proposed Decision paper”*.

Another stated that *“this poor decision has significant implications for future regulatory decisions and regulatory risk, thereby increasing the cost of capital and discouraging future investment”*. This respondent believed the consultation length of the proposed decision to be insufficient and went on to say that *“the RAs haphazard involvement in this review considerably reduces the effective duration of it such that it is inappropriate to consider this as an 18-month regulatory process”*.

RAs response

The RAs don't believe that the proposed decision paper, SEM-10-039, goes against the minutes of SEMC 29.4.10 or that the RAs did not follow best regulatory practice. It is clearly stated in the minutes of the SEMC Meeting No. 27 (29th April 2010) that a proposed decision was outlined to the SEMC by the RAs, a lengthy debate and discussion on the proposals took place and following this, the SEMC *“approved the proposed decision for publication”*. At no point is there an indication that the SEMC had approved a final decision on TLAFs.

The RAs acknowledged that the proposal in SEM-10-039 for a Uniform TLAF in the market and dispatch from 1st October 2010 was a significant change to SEM arrangements and from what the TSOs had proposed as their preferred option. This is not to say that a Uniform TLAF had not been consulted on before¹³ and discussed with industry. The RAs made clear in SEM-09-107(a) that *“the preferred options advanced by the TSOs in (SEM-09-107) do not necessarily represent the RAs views, in particular with*

¹³ Please refer to section 5.3 of SEM-09-107.

respect to the preference for TSO purchase of losses as a long term approach to treatment of losses”.

This point was re-iterated at the November 2009 TLAF workshop by the RAs¹⁴. The RAs also outlined at the November workshop that any proposed decision would be consulted on with stakeholders before implementation¹⁵.

The RAs reject the notion that the consultation process has been inadequate and that involvement in the workstream has been ‘haphazard’. Throughout the process the RAs and their consultants have reviewed all submissions made by parties to the numerous consultations and questionnaire developed by the TSOs. This project has been lead by the RAs throughout, with the TSOs acting in an advisory capacity. The proposed decision was arrived at by the RAs after lengthy review of the various options and consideration of all views put forward to the various consultations.

There was significant input provided by the RAs and discussion between the TSOs and RAs before publication of the TSOs preferred options paper, SEM-09-107. As SEM-09-107(a) states *“there has been significant input to this paper (SEM-09-107) provided by the Regulatory Authorities”*. SEM-09-107(a) also re-iterates that although there was significant input and work carried out by the TSOs in the review, the decision with regard to all-island TLAF harmonized arrangement lies solely with the RAs and SEMC - *“these comments (responses to SEM-09-107) and TSO recommendations made to the RAs will be considered by the RAs when they formulate their final decision on all-island TUoS and TLAFs”*.

With regard to the length of the review, as indicated in section 1.3 this process was started in January 2009 with SEM-09-001 requesting the TSOs to commence a joint review of the options and methodologies for deriving harmonized all-island TLAF arrangements. The RAs believe that there has been adequate and extensive consultation within this review process, both in terms of the degree of consultation and in length of time accorded¹⁶. All parties have had multiple opportunities to put their views forward to the RAs and a wide range of possible options has been discussed in detail throughout this project since commencement in January 2009. The following is a brief description of the consultation processes undertaken throughout this project:

- in March 2009 the TSOs held a workshop in Dundalk, with the RAs present, at which customers and other industry groups had an opportunity to express their views on the all-island harmonisation project;
- in tandem with the March workshop, during February and March stakeholders were requested to respond to a TSOs prepared questionnaire¹⁷. This was in order to ascertain more information from participants regarding their positions with regard all-island TLAF arrangements;

Consultation length: 8 weeks

- in May 2009, based on responses from the questionnaire, the workshop and a number of position papers submitted by interested parties the TSOs published a

¹⁴ Please refer to slide 6 of SEM-09-107(d).

¹⁵ Please refer to slide 6 of SEM-09-107(d).

¹⁶ In fact a number of respondents have indicated that the process has been too long and that any further delay will introduce regulatory uncertainty and affect future generation project build.

¹⁷ Please refer to SEM-09-046.

consultation paper (SEM-09-049) which presented a range of potential methodology options in respect of generator TUoS and TLAFs¹⁸;

Consultation length: 7 weeks

- based on feedback provided to the May 2009 consultation, in November 2009 the TSOs published a further consultation paper (SEM-09-107) in which they set out their preferred options for both generator TUoS and TLAFs¹⁹;

Consultation length: 6.5 weeks

- in December 2009 the TSOs held a workshop in Dundalk where they presented on their preferred options outlined in SEM-09-107. The RAs also presented on their perspective at the workshop and participants were invited to comment on the TSOs preferred options²⁰;
- in February 2010, having considered responses to the November 2009 consultation, the TSOs provided a formal response to the RAs in which they set out their updated position and recommendations;
- in June 2010, the RAs published a SEMC proposed decision (SEM-10-039) on all-island harmonised TLAFs arrangements;

Consultation length: 8 weeks

- in July 2010, the RAs held a workshop in Dundalk where there was a presentation on the proposed decision outlined in SEM-10-039. A number of interested parties also presented on their perspective at the workshop and participants were invited to comment on SEM-10-039; and
- in August 2010 the RAs publish a Uniform TLAF study which was carried out by the TSOs. The overall average figure calculated for the all-island system is 2.14%, or a TLAF of 0.9786.

Apart from the 3 workshops, there has been a combined total of 29.5 weeks of consultation with industry on the various publications throughout the review process. Furthermore, as with every all-island workstream, the RAs operate an open-door policy and all stakeholders have been welcome to meet with the RAs (both CER and NIAUR jointly or separately) to express their views.

No analysis carried out by the RAs on effects of a Uniform TLAF / calculation method of TLAFs

A number of respondents queried the RAs proposed decision on such a significant SEM matter without analysis provided to stakeholders to support the case for a Uniform TLAF or indeed to show that the current calculation method of TLAFs is flawed. One respondent stated that “*detailed modelling has not been made available by the RAs into the impact of both short & medium solutions*”. Another stated that “*this premise (TLAF calculation is flawed) is ill-informed, unsupported by fact or analysis and is contrary to the opinions expressed by the RAs in previous decisions*”.

¹⁸ Please see following link:
http://www.allislandproject.org/en/transmission_current_consultations.aspx?article=135317f0-49cd-4f7c-b0a3-fb4b75c84bc3

¹⁹ Please see following link:
http://www.allislandproject.org/en/transmission_current_consultations.aspx?article=c4fdb48e-4a1a-44d6-848d-af13746ddcb8

²⁰ Ibid

This respondent went on to state that *“the current methodology is not ‘broken’ it is just not supported by the requisite facilities to allow the associated risks of volatility (correctly specified) in derived TLAFs to be managed. By claiming the current methodology is broken, misspecifies the problem and, as a result of invalid examples and flawed logic, the proposed decision is to impose an unnecessary and inefficient change to uniform TLAFs...TLAFs based on marginal loss factors are appropriate when considering losses on the system”*.

RA's response

The RAs acknowledge that modelling analysis was not made available to stakeholders as part of the proposed decision to model the effects of a Uniform TLAF of 0.98. However, the RAs wish to point out also that the modelling of such effects within a base case scenario is highly sensitive to future fuel price assumptions, which by their nature would continue to change throughout the consultation period.

The evidence of this sensitivity and the effect certain assumptions have on factors, such as SMP and Generators MSQs, can be seen in the variance across a number of submissions made to SEM-10-039. One party stated that the uniform TLAF will increase SMP in 2010/2011, by 3%, while another respondent claimed their own analysis to show the effect on SMP to be minimal, less than 1%. It should be noted that in most cases, assumptions behind these figures were not provided by respondents so it was impossible for the RAs to independently verify these results.

We have taken the time during the consultation period of SEM-10-039 to fully investigate the results of a Uniform TLAF and other options. The results of this modelling are provided in Appendix A of this paper. These results have been used to inform the final decision taken by the SEMC. It is also important to note that the RAs invited market participants to carry out their own analysis and to provide the results of this analysis along with assumptions to the RAs.

The SEMC decision has also been informed by a review of the responses received to the consultation paper and further consideration of the possible market and customer impacts of moving from the existing TLAFs to a uniform TLAF in one move.

With respect to the assertion made by some respondents that the RAs failed to show analysis indicating that the TLAF calculation method is fundamentally flawed, the point must be made again about the objective of a marginal MW locational loss signal (please refer to response above). As stated in the proposed decision the RAs are aware that the current TLAF methodology is extremely sensitive to changes in dispatch scenarios and changes in the generation mix / location. Combined with this is the TSOs belief that it is undesirable to continue with the current losses methodology. It is clear that changes are required to the TLAF methodology.

Uniform TLAF of 0.98 will increase costs in SEM

A number of respondents argued that a Uniform TLAF of 0.98 will increase costs in the SEM, i.e. SMP, Error Supply Unit costs, environmental costs etc and as a result the RAs are effectively ignoring their statutory obligations under Section 9 of the 2007 Single Electricity Market Act²¹. One respondent stated *“(their) analysis shows that the impact of*

²¹ The SEM Act of 2007 states that the SEMC must carry out its functions *“in the manner which each of them consider is best calculated to promote efficiency and economy on the part of authorised persons”*.

adopting a uniform TLAF of 0.98 is to increase SMP by up to 3%...SMPs will be higher in 2010/11 if uniform TLAFs are adopted. This will have a direct impact on customers' prices.

This respondent went on to state that “*as the decision will affect the market schedule, it is likely to increase the level (in MW) of constrained despatch and is also likely to increase the compensation amounts payable...Hence conceptually, the overall cost of imperfections is almost certain to increase which in turn will further increase costs for customers. The consequence of uniform TLAFs is that efficient despatch cannot be achieved and network losses will be higher, both of which will have a negative impact on the environment. Given the negative impact on prices, on efficiency and on the environment, we (respondent) do not see how the adoption of Uniform TLAFs could be determined by the SEMC to be in accordance with its objectives*”.

RA's response

The RAs have carried out extensive and detailed modelling to determine the likely impact of the proposed decision on market parameters such as SMP, total suppliers costs and carbon costs. Details of the RAs modelling with regard to impact of SMP, Suppliers costs etc can be found in Appendix A.

In summary, the RAs modelling indicates the following with regard to a move from the current TLAF methodology to a Uniform TLAF of 0.98 for the period 1st October 2010 to 30th September 2011:

- an increase in SMP of 0.51%;
- total supplier costs decrease by 0.1%;
- a reduction of carbon emissions by circa 150,000 tonnes (or 0.9%); and
- a 1.28% reduction in the costs to the two Public Electricity Suppliers (PES') through which volumes allocated to the ESU is recovered.

The TSO's have also carried out modelling on the impacts of a uniform TLAF of 0.98 against that of the current methodology. Based on the results of this modelling the TSOs have stated in a submission to the RAs that “*indicative results...(on) the impact of Uniform on Dispatch Balancing Costs (includes constraints) would be between 1-2% of the TLAF Base Case (current methodology)*”. There is “*no systematic reason for an increase or decrease in Dispatch Balancing Costs...any effects are circumstantial*”.

Ofgem – Zonal Losses based on geographic location

Zonal losses involve participants, within the same zone, receiving the same loss factor. Importantly this zonal loss factor is based on their geographic location and would be similar to the current nodal-specific location loss factor allocation²².

The experience and studies of Ofgem in relation to zonal loss factors must be highlighted at this point. It must be acknowledged that the GB market is different to that of the SEM and for a conclusive answer to this issue (Uniform vs. Locational) a significant amount of modelling over an extended period would be required. However, the Ofgem experience is an interesting development in the debate between the benefits of a locational loss system over a uniform loss system. Transmission losses on the GB system have been treated on the same basis since 1989 - Uniform. In mid 2007, Ofgem published a

²² Please refer to Section 6.3 of SEM-09-060 for a full description of zonal losses.

consultation paper²³ which proposed the introduction of a zonal (locational) losses charges regime, on the basis that it would “*promote efficiency by reducing losses*”.

Ofgem believed that zonal (locational) losses “*would lead to the greatest reduction in transmission losses and therefore the highest savings - both environmental and financial*” and “*that the introduction of zonal locational losses would have no material adverse impact on the development of renewable generation*”. This Ofgem proposal was largely based on the findings of two Oxera reports commissioned by the Balancing and Settlement Code Modifications Group (BSM Group) in GB²⁴.

Subsequent to the publication of the 2007 consultation paper Ofgem commissioned The Brattle Group to review these Oxera reports carried out on behalf of the BSM Group²⁵. The Brattle Group noted in its report that Oxera had separately considered the impact of zonal losses in the short and longer term. For the short term, Oxera calculated what the difference in total generation costs would be with and without zonal losses. Oxera separately investigated the potential impact on demand by considering the effect that changing prices due to zonal losses would have on the level of demand in different regions.

Oxera also considered the extent to which zonal (locational) losses might affect where new plants are built, in particular that of renewable generation²⁶. Generally, Oxera found that the implementation of a zonal losses system would result “*in a number of benefits being realised by the system overall*”²⁷. However in its March 2008 findings, the Brattle Group noted the following of the 2007 Oxera reports:

*“We (the Brattle Group) believe that Oxera’s general conclusions on the benefits of (locational) zonal losses are robust. **However, we have concluded that there are more reasons why Oxera may have over-estimated the likely net benefits than there are reasons why it may have under-estimated them.** Our concerns regarding potential over-estimation relate primarily to Oxera’s methodology and whether it has appropriately assessed the risks inherent in all the modifications. By contrast, the potential for Oxera to have under-estimated the effect of zonal losses relates largely to its input assumptions, where actual future outcomes are inevitably uncertain. **Overall, therefore, we consider it more likely than not that Oxera may have over estimated the net benefits to some extent**”.*

Uniform TLAF will increase costs for the Northern Ireland end customer

Certain respondents argued that the Uniform TLAF of 0.98 will increase costs for the Northern Ireland end customer, in particular those associated with the Northern Ireland PSO. One noted that the adoption of Uniform TLAFs will reduce their revenues “*by c£6m in 2010/11 which will be recovered through an equivalent increase to PSO charges for NI customers*”.

²³ *Zonal transmission losses - the Authority's 'minded-to' Decisions* - 26 June 2007

²⁴ Oxera reports: ‘What are the costs and benefits of zonal loss charging?’ July 2006 & ‘What are the costs and benefits of annual and seasonal scaled zonal loss charging?’ September 2006.

²⁵ Please refer to “*A review of Oxera’s cost-benefit analysis of the introduction of Zonal Losses*” – March 2008, The Brattle Group.

²⁶ *ibid*

²⁷ *ibid*

Another questioned the effects of a Uniform TLAF on the Moyle interconnector. *“Moyle users who have purchased capacity 2-3 years in advance will find their capacity devalued and may factor this decision into their bids in future capacity auctions. This could reduce Moyle’s revenue stream, which would eventually impact NI customer since the investment in Moyle is underwritten by them”.*

RA’s response

With respect to the effect on NI customers, it should be stated that the SEMC does not make its decisions based on jurisdictional issues, in favour of particular customers, Generators or Interconnectors. Indeed the SEMC has no decision making powers over PSO issues, which are external out of market supports. Decisions are made for the good of the SEM market and electricity customers across the island.

The SEMC has a duty not to discriminate between customers across the island, and to the extent that there is potentially any discrimination, jurisdictionally or otherwise, the SEMC will seek to correct this.

Principles of SEM High Level Design / objectives of the workstream

A number of respondents maintained that a Uniform TLAF of 0.98 is not in keeping with the principles set out in the SEM High Level Design or the stated objectives of the workstream. One respondent stated that *“the decision is completely at odds with the SEM High Level Design, the stability of which is critical to building confidence in the market....the adoption of uniform TLAFs unfairly discriminates in favour of certain generators in poor locations to the detriment of other generators in good locations and in our assessment, this clearly represents unfair discrimination”.*

Another stated that *“the appropriateness of locational marginal loss factors are included in the HLD decision paper and in subsequent decision papers”.* A number of responses imply that undue emphasis has been placed by the RAs on non-volatility, predictability and transparency, while ignoring other objectives of the workstream. One respondent went on to state that *“the RAs decision process fails to consistently consider the objective criteria in evaluation of each option”.*

RA’s response

The arguments in favour of the appropriateness of a Uniform TLAF as a locational signal were outlined in the RAs proposed decision. Furthermore and as already stated, the RAs believe that while the existing system did provide a loss factor individual to each Generator’s location, this signal was both too volatile, lacking in predictability and caused uncertainty for investors.

It must also be noted that 74% of respondents to the March 2009 TSO questionnaire believed that locational signals was not an important element of TLAFs²⁸. This indicates that the ‘locational’ loss factor was not performing as intended and over the course of the review there has been no evidence provided to the RAs that the current approach to TLAFs incentivises locational decisions.

The RAs are fully aware of what AIP-SEM-042-05 states in relation to loss factors. The RAs also believe that it would be remiss of them to adhere to the principles of AIP-SEM-042-05, without taking into account the views of stakeholders (SEM-09-046) and ignoring

²⁸ Please refer to figure 19 of SEM-09-046.

the significant level of response to SEM-09-060, SEM-09-107 and SEM-10-039 stating that the 'locational' loss factor is not working. It is appropriate that the SEMC can change aspects of the SEM market as it evolves and on the basis of market experience. This is carried out in the interests of the whole SEM market and the all-island customer.

In addition to this, the RAs have continually outlined the need for stability in the market for investors. As consistently stated by a large number of stakeholders, the current TLAF methodology is extremely volatile, with significant swings in TLAF values year to year. This does not support this objective of stability, whereas a Uniform TLAF by its nature is stable and certain. For these reasons it was clear that changes to the existing methodology for calculating TLAFs was needed, hence the proposal in SEM-10-039.

The RAs don't believe that the decision process failed to consistently consider the objective criteria in evaluation of each option. As outlined above and as stated previously by the RAs²⁹ there is no perfect solution to this process. There has not been one key goal of this process – in fact the main aim of the RAs for this review has been to try to find the correct balance between all of the objectives. The majority of respondents agree with the RAs that the existing methodology has shortfalls, is over sensitive and that it is important that a fairer solution is found. The RAs also acknowledge that, in light of the responses to SEM-10-039, the proposed for a uniform TLAF met many of the objectives of this workstream but was relatively weak in terms of meeting the objective for efficiency in dispatch. This is one of the reasons for the SEMC decision of the modified form of Compression, outlined in section 4.1 below.

The RAs would like to address the arguments that (i) 'new' objectives have been introduced by the RAs during the review process and (ii) that undue weighting has been applied to particular objectives, e.g. reducing volatility.

In response to (i) section 2.1 of SEM-09-001 stated that the review needs to take into account seven principles, non-discriminatory, transparency, cost-reflectivity etc. Section 2.2 of SEM-09-001 also states that "*the methodology needs to allow for greater medium to long term predictability of generator charges and to limit year-on-year tariff volatility*". Section 2.4 states that "*this review will also...take into account the objectives and issues discussed above including, amongst other things...the mitigation of year-on-year tariff volatility and/or unpredictability*". It is clear that the RAs did not introduce 'new' objectives during the course of the review or indeed for the purposes of SEM-10-039.

In response to (ii)- it should be noted that 82% of respondents to the March 2009 TSO questionnaire believed low volatility (i.e. stability) to be most significant objective in the setting of all-island TLAFs. There were 15 responses to the SEM-09-060, which was published in May 2009, and as outlined in SEM-09-107 there were a number of common themes that were expressed in the feedback. One of these themes was the reduction of volatility, which was ranked as an important objective of the proposed new approach for the treatment of losses. This response from industry re-affirms the picture set by the response to the March 2009 questionnaire.

Furthermore, the majority of the respondents to SEM-09-107 highlighted the year-on-year volatility issues associated with the current methodology and the difficulty associated with predicting future year TLAFs as the biggest weakness of the current TLAF methodology. It is clear that it would have been negligent of the RAs to ignore this constant theme coming through from stakeholders: that volatility is an important, if not the most important issue, with regard to the TLAF review. It was in this context that the

²⁹ Please refer to slide 4 of SEM-09-107(d)

RAs proposed a Uniform TLAF, which it was believed would address the most important criterion of 82% of respondents to SEM-09-046, that of volatility.

2.1.3 Further comments

Purchase of Losses

A number of parties requested the RAs to review the Purchase of Losses (POL) option advanced by the TSOs as Step 3 in SEM-09-107. Some respondents believed that we should avoid all other steps and focus solely on POL. One stated that “POL was dismissed too easily in the proposed decision”.

RA's response

In SEM-09-107 the TSOs proposed a ‘purchase of losses’ mechanism to overcome the misalignment in the market between what has been produced by generators and what is being consumed by demand. This mechanism would involve the TSO buying, at the system marginal price, the unit (MW) gap between what has been produced and consumed. As stated in the SEM-09-107 “*this is a long term option and due to the infrastructural changes required cannot be implemented in the short term*”. As indicated by the TSOs in their presentation to the November 2009 workshop there are a number of serious issues³⁰ with this option, e.g. the physical roll-out of accurate metering tools/infrastructure - which will take time. The RAs believe that the issues with the current TLAF methodology still need to be addressed and cannot wait for the full roll-out of metering infrastructure, hence the focus in SEM-10-039 on a Uniform TLAF and the proposal for ‘Splitting’.

The RAs are still of the opinion that any POL scheme would need to be carefully designed and that the lead-time (5 years +) for implementation of this approach proposed by the TSOs is significant. For these reasons, the RAs do not propose to proceed with Option 7 at this point in time. This is not to say that the RAs will not review this option in the future.

Demand TLAFs

One respondent requested that the scope of the review “*is widened to include consideration to apply losses directly onto demand customers*”.

RA's response

Moving all losses directly onto the Demand customer essentially means a TLAF of 1.0 applied to all Generators and that transmission losses are not a cost to generators. As stated in SEM-10-039 generator flows contribute to losses on the transmission system. To apply a uniform loss factor of 1.0 would to completely ignore this fact and presume there are no losses on the system accountable to any Generator. Therefore, the RAs are still of the view that in the case of a Uniform TLAF it would be more equitable to attribute losses to all Generators as opposed to Demand.

³⁰ Please see slide 17 of SEM-09-107(e)

Treatment of Interconnectors

One respondent requested that the treatment of losses on Interconnectors in the SEM should be addressed in the decision paper.

RA's response

The enduring treatment of losses on Interconnectors in the SEM is a complex matter and affects workstreams outside of the all-island locational signals one. Therefore this matter will be addressed at a future stage by the RAs both through the enduring solution for TLAFs and as part of various workstreams dealing with the incorporation of the East-West Interconnector into the SEM rules.

Timing of the Proposed Decision

A number of respondents believed the timing of the publication was detrimental to the CfD market. One stated that the *"lateness of decision results in significant commercial impact on the CfD market and increases the regulatory risk"*.

RA's response

The RAs don't believe that the timing of the proposed decision either increased regulatory risk or resulted in significant commercial impact on the CfD market. All parties were aware that a review of TLAFs was ongoing, with a proposed decision imminent. Indeed parties were aware of the suite of options open to the RAs and so should have been aware of the possibility of a change to the TLAF methodology to be implemented in October 2010.

The RAs acknowledge that it was intended to publish a proposed decision in March, as opposed June. This delay indicates the level of internal consideration given to the various options which was conducted by the RAs. Also, stakeholders were made fully aware in SEM-09-107 (a) that the preferred options advanced by the TSOs in SEM-09-107 might not turn out to be the options proposed by the RAs. Therefore, the possibility of a Uniform TLAF being implemented from 1st October 2010 should not have been ruled out by parties engaged in NDC auctions, nor should the effects such a measure would have on CfD sales.

Alternative 'Splitting'

One respondent believed that the RAs *"should look into having separate TLAFs for Capacity and Energy, i.e. a 'capacity' TLAF applicable at the time of connection to the Grid should be used as the minimum figure applied to the Capacity element combined with a 'energy' TLAF which will allow for efficient dispatch"*.

RA's response

The RAs believe that this proposal is not far from that of 'Splitting', as outlined in SEM-10-039. Both forms of 'Splitting' look to allocate a TLAF to Generators which allows for efficient dispatch. As outlined in section 4.3 of this paper the RAs will be carrying out an Impact Analysis on the form of 'Splitting' advanced by the TSOs.

However the RAs will also examine and discuss with the TSOs the form of 'Splitting' advanced by the respondent to SEM-10-039 during this process.

Impact Analysis of ‘Splitting’

One respondent stated that within the envisaged Impact Analysis of Splitting “*consideration should be given to the consequences on carbon emissions of an ineffective dispatch process, balanced against the benefits of achieving an ‘optimisation’ of network losses*”.

RAs response

As outlined in SEM-10-039 and in section 4.3 below the impact analysis on Splitting will address a number of issues, including, impact on SMP, changes in the marginal plant, changes to in-merit plant in the market schedule etc. The list of issues provided in SEM-10-039 was non exhaustive and the impact of carbon emissions, within a Splitting methodology, will be examined in the Impact Analysis.

3. TRANSMISSION LOSS ADJUSTMENT FACTORS

3.1 Proposed Decision SEM-10-039

In June 2010 the RAs published a SEMC proposed decision (SEM-10-039) on all-island harmonised TLAF arrangements for comment by stakeholders. This proposed decision was reached after considerable consultation with industry by both the RAs and TSOs.

SEM-10-039 proposed that from 1st October 2010 the treatment of losses in dispatch and the market schedule were to be treated on a uniform basis. The paper also proposed, in principle, of adopting in the long-term the concept of 'Splitting', to be implemented from 1st October 2011, based on the results of an Impact Analysis.

With regard to the proposed decision to implement a uniform TLAF from 1st October 2010, the RAs had proposed a uniform TLAF should be equivalent to the sum of the average losses on the SEM transmission system (subsequently calculated by the TSOs to be 0.9786).

3.2 Concerns with current TLAF methodology

The RAs review of harmonised transmission losses arrangements was initiated in January 2009 because the RAs had a number of concerns with the existing TLAFs methodology. Harmonised transmission losses arrangements were introduced as part of SEM implementation in 2007 and there have been annual consultations on the TLAF figures derived by the TSOs for the year ahead. As outlined in SEM-10-039 there are a number of concerns relating to the current TLAF arrangements. They include the following:

- Existing volatility: The derived TLAF values have, in some cases, been volatile with significant year-on-year variations. This creates risk and uncertainty for the affected generators.
- Relevance for dispatch: As TLAFs are calculated year-ahead, the ex-ante TLAFs do not reflect the prevailing conditions on the system at the time of dispatch. This creates a concern that the arrangements are not contributing to efficient dispatch. There has been no evidence made available to the RAs that these ex-ante derived TLAFs reflect real time losses on the transmission system.
- Increasing volatility: It is likely that increased dispatch efficiency cannot be obtained without increased TLAF volatility and non-predictability for Generators. This presents a significant issue for both new and existing market participants alike. It is believed that this situation will deteriorate as the generation mix changes and the penetration of intermittent generation increases.
- Complexity and lack of transparency: The methodology for calculating the TLAFs is deemed to be too complex and lacking in an appropriate degree of transparency. It is difficult for participants to work out the impact that these TLAFs have on their plant in advance or indeed to forecast their TLAFs.
- Appropriateness as a locational signal: One of the original objectives of the methodology was for TLAFs to incentivise the locational decisions of Generators. While the existing TLAFs do provide a definite locational signal, other locational signals such as existing brown field site, proximity to gas pipeline, quality of site for wind generation are arguably stronger.
- Sensitivity: As outlined above the methodology is extremely sensitive to changes in dispatch scenarios and changes in the generation mix and location. As a result of

this, TLAFs have been perceived to be 'perverse signals'. Using the existing methodology, it is possible for a Generator to respond to a 'good locational signal' only to find that their presence impacts the calculation of losses to such an extent that they get a very poor loss factor. It therefore follows that the signals provided are not stable and are not effective in delivering the desired outcome.

3.2.1 Options considered by RAs over TLAF review

As outlined in SEM-10-039 during the course of the locational signals review process there were a number of options considered for implementation on 1st October 2010, which are discussed in turn below. The reasons advanced by the RAs in SEM-10-039 for not pursuing the following options are also discussed.

- **Maintaining the current TLAF methodology:**

Employing the current methodology, that has been in place since the introduction of the SEM, to calculate the TLAFs for market participants for 1st October 2010.

Original RA reason for not pursuing option

The current TLAF methodology is extremely sensitive to changes in dispatch scenarios and changes in the generation mix / location. In the interests of promoting fairness, stability and predictability³¹ and finding a 'better solution', the RAs were focused on addressing the sensitivity issues of the current methodology during the review process. Therefore, the RAs felt that the option of maintaining the current approach would not be in keeping with a number of the RAs objectives outlined in SEM-09-001.

Analysis against TLAF Objectives

A discussion on the current marginal loss factor methodology is contained in Section 2 above. The RAs consider the current methodology to be non-predictable, volatile (lack of stability), non transparent and possibly discriminatory. As the current TLAFs are defined at the year-ahead stage, they are unlikely to accurately reflect the prevailing system conditions when the dispatch schedule is being created, potentially compromising efficient system dispatch. It is not possible to assess this option against impact on all island customer and all island market as this is the baseline TLAF position.

- **Differentiating between fixed and variable losses:**

Individual loss factors should only seek to reflect variable losses. This is on the basis that fixed losses are not location specific and so cannot be influenced by a Generator's location.

Original RA reason for not pursuing option

A number of respondents to SEM-09-107 maintained that losses on the system can be split into both fixed and variable and that fixed losses should be charged on a uniform basis. One respondent suggested that fixed losses accounted for 30% to 50% of overall losses, while another maintained that fixed losses can be 20% to 35%. As stated in the proposed decision it is clear that the ranges of the breakdown between variable and fixed losses, as proposed by respondents vary considerably (between the lowest and highest point).

The TSOs have not been able to provide the RAs with an exact breakdown of losses between fixed and variable on the all-island system. Therefore, the RAs are still of the view that differentiating between fixed and variable losses is not appropriate as a short-term option for implementation on 1st October 2010.

³¹ Please see sections 2.1 and 2.2 of SEM-09-001.

Analysis against TLAF Objectives

The RAs consider that enough information is not available at this time to fully analyse the detail or the impact of this option. Given an exact breakdown of losses between fixed and variable is not available, it is considered that this option is not predictable or transparent at this point, while it is difficult to assess against the other criteria.

▪ **Iteration:**

Currently, the generation dispatch modelling used to determine TLAFs does not reflect loss factors. It was argued by some respondents to SEM-09-107 that this does not provide a realistic view of actual dispatch patterns in practice and consequently, provides an inappropriate basis for TLAF determination. Iterative dispatch modelling, incorporating the derived loss factors from each model run into the next iteration, is a possible option for overcoming this perceived shortcoming.

Original RA reason for not pursuing option

The RAs, in conjunction with the TSOs, also examined applying an iterative approach to the current methodology. Initial modelling runs using Plexos indicated that this would not deliver a significant change in the final TLAFs and therefore suggested that the lack of iterations was not the source of the problem, i.e. a large range of TLAFs.

Furthermore, a full iterative approach (feeding the results of the PSSE study back into Plexos to alter a dispatch which was then fed back into PSSE) was considered by the TSOs to be impractical as it would double or triple the amount of time taken to calculate TLAFs. The TSOs stated that this would add a number of months per iteration.

Therefore, the proposal made by a number of respondents that the lack of iteration was the cause of the problem with the current methodology is not a well-founded argument. Finally, many of the fundamental issues associated with the once yearly ex-ante TLAF approach apply regardless of whether an iterative approach is used or not. For these reasons, the RAs have decided not to adopt this option.

Analysis against TLAF Objectives

On the basis of the above discussion, the RAs consider this option to be non predictable and non transparent. Volatility is still likely to be a feature particularly as new generation enters the market while the level of resource involved makes this option non-cost reflective. The option would provide a locational signal, however its effectiveness as a dispatch signal is unknown given that TLAFs would still be set on an ex-ante basis. The impact on the all-island customer and the market has not been examined as the RAs have ruled out this option on the basis of its other disadvantages.

▪ **Multiplicative scaling:**

Marginal loss factors derived from the dispatch modelling process are scaled such that the sum of all nodal losses equals system-wide losses. At present an additive scaling factor is used. It was argued by some respondents to SEM-09-107 that this process distorts the locational relationship between different nodes. A multiplicative scaler was suggested as an alternative method that maintains the percentage contribution of each generator to system losses.

Original RA reason for not pursuing option

The proposed 'multiplicative' approach to TLAFs would be derived under the current TLAF methodology. The TSOs state that in itself the approach is legitimate as is the alternative (additive), but the additive approach maintains a uniform differential in the data maintaining the locational relationship between TLAF data. However, the RAs are of

the view that the adoption of the multiplicative approach would not significantly address the shortcomings of the current methodology and have decided not to adopt this option.

Analysis against TLAF Objectives

The RAs consider this approach to be non-predictable, non transparent and likely to be volatile as it is based on the current approach. It would likely be more resource intensive than the existing approach but would continue to provide a locational signal. It should provide a more efficient dispatch signal than at present. However the RAs did not decide to pursue this option as the fact that it was building upon the existing methodology means that it was not seen to address the shortcomings of the existing methodology.

▪ **Crude form of Splitting**

The use of different loss factors in the market schedule from that of the dispatch schedule.

Original RA reason for not pursuing option

The RAs explored the possibility of implementing a splitting based methodology for 1st October 2010. While this may be desirable, the TSOs confirmed in April 2010 that it is not possible to use different loss factors in dispatch and in the market schedule as at present. These both feed in to RCUC and to the market pricing engine through the Generator bids. If different factors were to be used this would involve a number of changes to the central market systems, which could not be implemented by 1st October 2010. In addition the RAs full Impact assessment will take some time as outlined below.

Analysis against TLAF Objectives

The RAs considered this to be one of the preferable options for October 2010 as it would be an appropriate stepping stone to the enduring solution of Splitting. However, on the basis that the impacts of this option have not been calculated yet and the advice from the TSOs that it could not be developed and effectively implemented (as noted above) for 1st October 2010, this option will not be pursued.

▪ **Three year rolling average of TLAFs**

This option would give each Generator a simple average of their TLAFs for the past three years for each of the 24 TLAF periods.

Original RA reason for not pursuing option

It would not be possible calculate an average historical 3 year TLAF new Generators connecting to the system this year. Applying a uniform TLAF of 0.98 to Generators connecting in 2010 could be seen as discriminatory against Generators who have had consistently low TLAFs, especially those with TLAFs below the system average of 0.98.

Analysis against TLAF Objectives

The RAs considered this option to be more predictable (although a solution for new Generators would need to be found), less volatile and more transparent compared to the current methodology. It would be cost effective to implement and would maintain a locational signal. The efficiency of the signal provided by this option was deemed to be poor. This option was viewed as being more arbitrary than Compression but could be viewed as discriminatory depending on the TLAFs chosen for new Generators. While it would be feasible to implement for October 2010, the RAs did not believe that this option warranted consideration ahead of compression or uniform as alternatives to the existing methodology due to its arbitrary nature.

- **Possible changes to bidding code of practice**

This option would allow Generators to negate the impact of a poor TLAF, through their competitive advantages.

Original RA reason for not pursuing option

It would be very difficult to implement this option by 1st October 2010 and it would involve wider market power issues, not just those affecting TLAFs. It would also involve significant change to SEM bidding practices and therefore require further consultation with industry.

Analysis against TLAF Objectives

The RAs considered that this option would not address the fundamental question about the methodology to calculate or attribute losses but rather would be a workaround solution. The predictability of TLAFs for Generators would not be improved, nor would the volatility, while transparency would still be a problem. A locational signal would remain but the signal in dispatch would not be improved. Primarily this option was not considered as feasible as it would be a major change to the bidding code of practice, which was not the intention of the TLAFs review.

- **Compression:**

This involved the compression or 'squeezing' of TLAFs within a particular range. TLAFs still vary locationally. The same TLAF value is used in the market schedule and in dispatch. Generators would still be ranked appropriately in the merit order.

Original RA reason for not pursuing option

SEM-10-039 stated that reform will only be progressed if it offers progress towards a preferred long-term solution or is an improvement on the existing TLAFs, from the point of view of the objectives set at the start of this workstream, such as predictability, efficient dispatch etc. Under the Compression Factor option, floor and ceiling limits are applied to TLAFs. It involves the use of an algorithm to compress the TLAF order, while ensuring that limits are applied to minimum and maximum factors allocated. Assuming that the initial TLAF falls within the range of 0.90 and 1.10, then the compression factor works to retain the relative. Generators TLAF would not go above or below these limits.

It was argued by the TSOs in SEM-09-107 that this algorithm would reduce volatility but that in certain cases the short term efficient dispatch may be reduced. Cost reflectivity would also be diluted as Generators are not being paid or benefiting for the full extent of their effects on the system.

SEM-10-039 stated that the RAs, while accepting that Compression would reduce the range in TLAF values, were of the view that Compression would be arbitrary and would not address the underlying sources of sensitivity within the methodology.

Analysis against TLAF Objectives

Compression is discussed further in the next section. The RAs view is that predictability, stability and transparency would be improved through a modified form of Compression compared to the existing methodology. The RAs believe that the modified form of Compression which is described in Section 4.1 is an improvement on that consulted on in SEM-09-107 in that it squeezes the range of TLAFs further to between 0.94 and 1.04. Also, in light of the responses received to SEM-10-039 and until the Impact Analysis on Splitting is complete, the RAs believe that a modified form of Compression is a reasonable compromise between criterion. Compression is still cost effective and continues to provide a locational signal.

The key difference between the original form of Compression and the 'modified' form is the application of the normalisation number (NN) in the Compression algorithm. This is outlined further in section 3.2.5 below. The RAs consider this modified form of Compression to be an effective stepping stone to a more enduring long term solution (e.g. Splitting). The impacts of this modified form of Compression on SEM parameters are also discussed in the next section.

▪ **Uniform TLAF:**

A uniform TLAF approach, whereby the treatment of losses in dispatch and the market schedule, are treated on a uniform basis (i.e. applying a TLAF of 0.98 to all Generators).

Original RA reasons for pursuing option

There were a numbers of reasons advanced, however the main ones were the following. It is not apparent that losses allocated to Generators under the current methodology are anymore accurate or reflective of the losses actually on the system in real-time. The current methodology for calculating losses is extremely sensitive, with TLAFs being vulnerable to significant swings from 'good' to 'bad' location, which in turn affects the cost of capital for generation projects.

A uniform TLAF would provide a stable and predictable long-term locational signal to future projects. It was also argued that a Uniform TLAF would be transparent to Generators.

Analysis against TLAF Objectives

The proposed decision paper outlined the view that a uniform TLAF would be a predictable, non-volatile and transparent approach. While not providing a dispatch signal or a locational signal, the RAs argued that these deficiencies would be compensated for by the advantages of uniform TLAFs. It was feasible to implement in October 2010. The impact on the SEM parameters has been modelled by the RAs and is discussed below.

3.2.2 Discussion on Uniform TLAF option

The RAs still believe that, with regard to the current TLAF methodology, remedial action needs to be taken for the 1st October 2010. The RAs objective is to implement 'a better solution' in both the short term and the long term, from what is currently in place and which addresses, to the greatest possible extent, the objectives and concerns outlined throughout this review process.

The RAs accept that Generators, both renewable and conventional, with TLAFs presently greater than 0.98 would be disadvantaged relative to their present position as a result of a move to a uniform TLAF. However, one of the key criticisms of the existing TLAF methodology was that there was significant volatility in the TLAF numbers from year to year and this created great uncertainty. In particular, as new Generators came on to the system, this could radically impact on the TLAFs of existing ones. In areas where the network is weaker, this impact is often more pronounced.

Secondly, it must be acknowledged that the TSOs had proposed the implementation of a Compression factor instead³². In arriving at the proposed decision, the RAs did not ignore the position taken by the TSOs. The RAs considered all of the options outlined above and which could have been feasibly implemented from 1st October 2010. These considerations were taken into account whilst working against the background that the existing TLAF methodology was widely accepted to be overly sensitive to new Generators connections and overly punitive on particular Generators. However, following a review of the responses received to the consultation (refer to section 2) and further

³² Please refer to SEM-09-107.

consideration of the possible market and customer impacts of moving from the existing TLAFs to a uniform TLAF in one move, the RAs have now decided to implement a modified form of Compression for 1st October 2010. The application of the 'Compression' factor to TLAFs and the RAs studies behind this application are outlined in detail in the next section.

The RAs have carried out modelling, using the RA's validated Plexos model, on the broader market impact by comparing the existing TLAF methodology (A) with that of a Uniform TLAF (B) for the upcoming TLAF period.

3.2.3 RAs modelling on impact of uniform TLAF

- (A) The current locational TLAF regime, assuming that TLAFs in 2011 are similar to those in the 2nd half of 2010. The TSOs have provided draft TLAFs for 2010/2011 based on this assumption and adjusted for 2% losses. The TLAF values range from 0.919 to 1.048.
- (B) A universal TLAF of 0.98 for all Generators.

The model used by the RA's Market Modelling Group (MMG) was Redpoint's Validated Plexos model for 2010/11 with:

- updated scheduled outages;
- updated TLAFs as per the policy options listed above; and
- forward fuel and carbon prices and exchange rates from early August 2010.

The results shown are based on a snapshot of forward fuel prices as above and are sensitive to fuel price changes (especially the relative movement of coal and gas). The model was run for ten different forced outage patterns for each scenario and the results shown are the mean of these ten runs.

The same load file (load at the Station Gate) is used for all scenarios. Any potential increase or decrease in the efficiency of dispatch, i.e. increase or decrease in actual transmission losses, and thus increase or decrease in required generation at the Station Gate in the market is beyond the scope of the MMG modelling.

The indicative results are presented below. It should be made clear that the RAs have focused on the effects on the all-island system as a whole. The RA's full modelling report is available in Appendix A.

System Marginal Price (SMP):

There is an increase in Time-Weighted average SMP of €0.30 S/MWh, or 0.51%, under a Uniform TLAF of 0.98 compared with the current methodology for 2010/2011. The effect on Shadow Price is dependent on the TLAF of the marginal plant in every half hour, while the effect on uplift is dependent on plant starts, start cost assumptions and number of plants committed.

	Current methodology	Uniform TLAF
SMP €/MWh	57.79	58.09
Change €/MWh		0.3
% SMP Change		0.51%
Shadow price €/MWh	47.97	48.24
Change €/MWh		0.27
% SMP Change		0.57%
Uplift €/MWh	9.82	9.85
Change €/MWh		0.03
% SMP Change		0.26%

Suppliers Costs:

This is the total cost to all Suppliers of purchasing energy at the Trading Point. Suppliers' Costs decrease by 0.1% under a Uniform TLAF of 0.98 compared with the current methodology. It should be noted that in terms of Supplier costs, Price x Quantity, the RAs have modelled the P impacts, not the Q (which the RAs have assumed is constant).

The RAs modelling does not take into account the effects on generation quantity as a result of different TLAF scenarios. The TSOs have not been able to provide the RAs with estimates on quantity impact.

€ millions	Current methodology	Uniform TLAF
Suppliers Costs	2,162.1	2,160.2
Change		-1.9
% Change		-0.1%

Carbon Emissions:

It must be acknowledged that the effect on Carbon Emissions (environmental impact) was not a stated objective of the review. However, a number of responses to SEM-10-039 requested the RAs to carry out such analysis. Carbon Emissions are lower under a Uniform TLAF of 0.98 when compared against TLAF derived under the current methodology. This intuitively makes sense as the newest, most technically efficient plants are running more in these scenarios. However generation volumes may increase with a move away from a locational TLAF in dispatch, thereby increasing emissions

Million tonnes	Current methodology	Uniform TLAF
Carbon Emissions	15	14.86
Change		0.14
% Change		-0.9%

Error Supply Unit:

The Error Supply Unit (ESU) is jurisdictional based (currently PES in both ROI and NI). The ESU recovers the cost of energy unallocated to losses or independent supplier demand. There is a net SEM PES decrease of €7.6 million by moving to a Uniform TLAF. This jurisdictional allocation of ESU costs and a proposed modification to the Trading and Settlement Code to allow fairer allocation is discussed further in section 4.4 below.

€ millions	Current Methodology	Uniform TLAF
Net SEM PES	593.8	586.3
Change (+/- €m)		-7.6
Change %		-1.3%

Capacity Payments

The RAs are satisfied that the capacity pot is immune to changes in TLAF methodology if the total volume of losses remains the same. The TSOs have been unable to indicate to the RAs whether the total volume of losses would increase, decrease or remain the same by moving from the existing methodology to a uniform TLAF.

Dispatch Balancing Costs:

The TSO's have also carried out modelling on the impacts of a uniform TLAF of 0.98 against that of the current methodology. Based on the initial results of this modelling the TSOs have stated in a submission to the RAs that *"results...(on) the impact of Uniform on Dispatch Balancing Costs (includes constraints) would be between 1-2% of the TLAF Base Case (current methodology)"*. There is *"no systematic reason for an increase or decrease in Dispatch Balancing Costs...any effects are circumstantial"*.

3.2.4 Decision with regard to implementation of uniform TLAF for October 2010

Having considered the submissions received through the public consultation process and the modelled impact of a uniform TLAF on the various parameters examined, the SEMC has decided not to implement a uniform TLAF for all Generators for 1st October 2010. This decision has been made for the following reasons:

- *Step nature of change:* The SEMC have decided that a small steps approach should be implemented with regard to TLAFs. Step one will involve the introduction of a compressed TLAF (see section 3.2.5) for one year with step two being a move to Splitting (subject to the outcome of an Impact Analysis). There will be a stable signal in the market schedule of Splitting, with efficiency being the key focus on losses in dispatch. If the Impact Analysis is negative in the assessment of Splitting the RAs

will look to ensure that the SEMC decision (i.e. stable signal in the market schedule and efficiency in losses) will apply in TLAF arrangements from 1st October 2011.

- *Efficiency in dispatch:* The RAs proposed decision paper pointed out that a uniform TLAF was as likely to be as close to the actual real-time losses in dispatch, as the present ex-ante TLAF methodology. However there is no indication that a Uniform TLAF would improve the efficiency of dispatch, while there is a risk that the impact on dispatch could be negative. This is one of the key disadvantages with a Uniform TLAF in the absence of Splitting. The SEMC have decided that a stable signal (for example, uniform, long-term zonal TLAF or another form of stable TLAF signal) is best implemented in conjunction with an appropriate model of Splitting (on the basis of an Impact Analysis).

3.2.5 Modified form of Compression

As outlined in SEM-09-107 Compression involves the use of an algorithm to compress the TLAF. Assuming that the initial TLAF falls within the range of 0.90 and 1.10, then the Compression factor works to retain the relative order, while ensuring that limits are applied to minimum and maximum factors allocated.

The key difference between the original form of Compression and the 'modified' form is the application of the normalisation number (NN). In SEM-09-107 the Compression algorithm was normalised around an NN of 1.0. Further to studies carried out by the TSO on average system losses (SEM-10-054), which calculated the overall average figure for the all-island system to be 2.14% or a loss factor of circa 0.98.

There are two key differences between the form of the Compression consulted on in SEM-09-107 and the modified form.

- 1) Instead of using 1 as the Normalisation Number, the algorithm is now normalised around a monthly calculated value which ensures that approx 2% losses are recovered for each month. This value is calculated as approx 0.98 every month. This difference is required in order to ensure the correct recovery of losses as stated in the Transmission Locational Signals Preferred Options Paper, Nov 26th 2009.
- 2) The Divisor is multiplied by the Normalisation Number – this is in an effort to add stability to the algorithm by adjusting above and below the line by the Normalisation Number.

Original Compression algorithm in SEM-09-107:

$$\text{If } X \leq 1, \frac{1-X}{2} + X$$

$$\text{If } X \geq 1, X - \frac{X-1}{2}$$

Modified Compression algorithm to be adopted for 1st October 2010:

$$\text{If } X \leq NN, \frac{NN-X}{2 \cdot NN} + X$$

$$\text{If } X \geq NN, X - \frac{X-NN}{2 \cdot NN}$$

Where $X = \text{TLAF}$

Where NN = Normalisation Number of 0.98

4. SEM COMMITTEE (SEMC) DECISION

4.1 Modified form of 'Compression'

Although the SEMC has decided to move away from the proposal for a Uniform TLAF for October 2010 the RAs continue to believe that the existing methodology, as a result of its sensitiveness to new generation, would bestow unfair advantage on particular Generators. Therefore, the SEMC have sought an alternative solution for October 2010.

The SEMC has decided to adopt a modified form of the Compression factor for TLAFs for implementation on 1st October 2010. In light of the responses received to SEM-10-039 and until the Impact Analysis on Splitting is complete, the RAs believe that a modified form of Compression is a reasonable compromise between criterion. This will be a one year compression of the existing TLAF methodology and differs in effect to that consulted in SEM-09-107.

As with the Uniform TLAF proposal, the RAs accept that the modified form of Compression is not a perfect solution. In fact considering all of the points highlighted in section 3.2.1 we are of the opinion that there is no perfect solution in the short term.

4.1.1 Characteristics of modified form

The SEM Committee has decided to adopt the modified form of Compression outlined above in Section 3.2.5 and apply a 50% compression factor- that is a divisor of 2.

Therefore the Compression algorithm to be applied is as follows:

$$\text{If } X \leq NN, \frac{NN - X}{2 * NN} + X$$

$$\text{If } X > NN, X - \frac{X - NN}{2 * NN}$$

Where X = TLAF for 2010/2011 derived using existing methodology. The 2010/2011 Forecast Compression TLAF is based on 2010 TLAFs from July to December.

Normalisation Number (NN) = 0.98.

Divisor = 2 (50%).

The compressed all-island TLAFs from 1st October 2010 to 30th September 2011 applicable to Generators and transmission nodes are published in tandem with this decision paper on the AIP website [please see SEM-10-066(a) to (d)]. These TLAF values are published in PDF and spreadsheet format.

4.1.2 Analysis of 50% Compression Factor

The RAs have carried out modelling, using the RA's validated Plexos model, on the broader market impact by comparing the existing TLAF methodology with that of a Compression factor of 50% applied to TLAFs for the upcoming period. The same assumptions used in the analysis of the Uniform study in section 3.2.3 apply to the Compression Factor study.

System Marginal Price (SMP):

There is a decrease in Time-Weighted average SMP of €0.14/MWh, or 0.25%, under a Compression factor of 50% compared with the current methodology for 2010/2011.

	Current methodology	Compression 50%
SMP €/MWh	57.79	57.65
Change €/MWh		-0.14
% SMP Change		-0.25%
Shadow price €/MWh	47.97	47.95
Change €/MWh		-0.02
% SMP Change		-0.04%
Uplift €/MWh	9.82	9.7
Change €/MWh		-0.12
% SMP Change		-1.26%

Suppliers Costs:

Suppliers' Costs decrease by €16.4 million (0.76%) under a Compression factor of 50% compared with the current methodology. It should be noted again that in terms of Supplier costs, Price x Quantity, the RAs have modelled the P impacts, not the Q (which the RAs have assumed is constant). The RAs modelling does not take into account the effects on generation quantity as a result of different TLAF scenarios. The TSOs have not been able to provide the RAs with estimates on quantity impact.

€ millions	Current methodology	Compression 50%
Suppliers Costs	2,162.1	2,145.7
Change		-16.4
% Change		-0.76%

Carbon Emissions:

Again it must be acknowledged that the effect on Carbon Emissions (environmental impact) was not a stated objective of the review. However, a number of responses to SEM-10-039 requested the RAs to carry out such analysis. Carbon Emissions are lower under a Compression Factor of 50% when compared against TLAF derived under the current methodology. As with a Uniform TLAF this intuitively makes sense as the newest, most technically efficient plants are running more in squeezed TLAF scenario. However,

keeping a locational element in dispatch means that generation volumes (and therefore emissions) will not increase as much as they would with a move to a Uniform TLAF.

Million tonnes	Current methodology	Compression 50%
Carbon Emissions	15	14.9
Change		0.1
% Change		-0.67%

Error Supply Unit:

Overall there is net reduction in the SEM PES of €10.2 million (1.7%) under a 50% Compression factor when compared against the Current methodology. This reduction is not split evenly between the ESB CS and NIE ES; there is a distributional effect taking place between the two. This distributional effect and the allocation of ESU costs to the respective PES bodies is discussed further in section 4.4 below.

€ millions	Current Methodology	Compression 50%
Net SEM PES	593.8	583.6
Change (+/- €m)		-10.2
Change %		-1.7%

Capacity Payments

As with a change to a Uniform TLAF the RAs are satisfied that the capacity pot is immune to changes in TLAF methodology if the total volume of losses remains the same. The TSOs have not been unable to indicate to the RAs whether the total volume of losses would increase, decrease or remain the same by moving from the existing methodology to a Compression factor of 50%.

Dispatch Balancing Costs:

The TSOs have stated in a submission to the RAs that there is “no systematic reason for an increase or decrease in Dispatch Balancing Costs...any effects are circumstantial”. Based on this the RAs are of the opinion that there little to no effect on Dispatch Balancing Costs with a move to a 50% Compression Factor.

4.1.3 Reasons for Implementation

Therefore based on the above analysis the SEM Committee has decided to implement a compressed TLAF for one year (50% Compression factor) from 1st October 2010 for the following reasons:

- Progressive step towards an enduring solution: Compression by its nature is a short term solution based on removing the extremities of the existing TLAFs. The RAs view it as a “step in the right direction”. Also, in light of the responses received to SEM-10-039 and until the Impact Analysis on Splitting is complete, the RAs believe that a modified form of Compression is a reasonable compromise between criterion.
- Range of TLAFs: The range of TLAFs is narrowed meaning that the impact of a negative TLAF which previously had been overly harsh is now reduced. The range is

now between 0.94 and 1.01, as opposed to 0.95 and 1.05, outlined in SEM-09-107. This should encourage enhanced generation competition on the basis of efficiency and cost reduction.

- Impact on SMP: The RAs modelling analysis shows that moving from the existing TLAF methodology to a compressed TLAF will result in a decrease in SMP of 0.25%. Further details on the RAs modelling analysis can be found in Appendix A.
- Impact on total supplier costs: The RAs modelling shows a €16.4 million decrease (0.76%) under a Compression factor of 50% compared with the current methodology.
- Impact on dispatch balancing costs: The TSO's modelling report indicates that there is no systematic reason for a decrease or an increase in dispatch balancing costs associated with a move to a compressed TLAF and any effects are circumstantial.
- Predictability and transparency: Given that compressed TLAFs are based upon narrowing the range of existing TLAFs, they are predictable, while the methodology used is transparent (see methodology in Section 4.1.1).
- Efficiency in dispatch: A TLAF signal will remain in dispatch through implementation of compression.

4.2 Decision to implement Splitting

The SEM Committee has decided to favour the implementation of 'Splitting' from 1st October 2011, subject to the outcome of an Impact Analysis. This analysis into Splitting will be commenced by the RAs following publication of this decision.

The RAs had proposed Splitting in their proposed decision paper (SEM-10-039) and outlined the high level detail of this Impact Analysis. Splitting is favoured as the enduring solution for TLAFs in the SEM, subject to the outcome of this Impact Analysis, in the absence of a cost effective method of metering losses and charging metered losses to each Generator.

Splitting involves treating TLAFs differently in the market schedule to their treatment in the dispatch schedule. The Impact Analysis, which will be led by the RAs with the assistance of the TSOs, will develop the exact model of Splitting. It will be up to the TSOs to develop the methodology for deriving TLAFs for use in the dispatch schedule. The SEMC favours an efficient dispatch signal through TLAFs and the TSOs should develop their proposal for TLAFs in the dispatch schedule accordingly. In the market schedule, the SEMC favours and values stability (non-volatility), e.g. Uniform TLAF or long-term zonal TLAF. It will be the decision of the SEMC as to what form of methodology is adopted in both the dispatch and market schedule within Splitting.

The model of Splitting must be possible to implement in the SEM on 1st October 2011 and must be a long term solution for the treatment of losses in the SEM.

If the Impact Analysis is negative in the assessment of Splitting the RAs will look to ensure that the SEMC decision (i.e. stable signal in the market schedule and efficiency in losses) will apply in TLAF arrangements from 1st October 2011.

4.2.1 Decision on TLAFs in the Dispatch Schedule in "Splitting"

Variable TLAFs are an appropriate mechanism which is used to promote increased efficiency in dispatch of generation plant. Correct TLAF signals will allow the TSOs to dispatch plant on the basis of their contribution to transmission losses (all other things being equal), thereby leading to the most efficient plant dispatch possible. This efficiency in dispatch is an objective which the RAs remain focused on. Therefore the RAs have decided to task the TSOs to develop a mechanism to calculate TLAFs for dispatch which

will be as close to the real time losses on the system and will promote efficient dispatch. This dispatch TLAF will be applied to the dispatch schedule as part of the enduring Splitting solution (subject to Impact Assessment discussed below).

4.2.2 Decision on TLAFs in the Market schedule in Splitting

It is the position of the SEMC that a stable signal should be derived for the market schedule as part of Splitting in October 2011, subject to the satisfactory outcome from the RAs Impact Analysis into Splitting. This stable signal could take the form of a Uniform TLAF or a long-term (5 years+) Zonal TLAF, a locational 'signal' in the connection offer of a Generator or an alternative form of stable, non-volatile TLAF. The RAs value stability in the market schedule as it encourages investors to invest in the SEM against a solid and stable background. This should lead to a reduction in the cost of capital employed in the SEM, with a resultant reduction in generation costs to customers.

4.3 Impact Analysis of Splitting

As outlined in the proposed decision the RAs detailed Impact Analysis will be carried out over the coming months on the separation of the market schedule from dispatch, with input provided by the TSOs and SEMO (with regard to impact on market systems). It has been decided that the implementation of any 'Splitting' proposal is to be contingent on a satisfactory outcome from this Impact analysis.

With regard to the Impact Analysis it has been decided that the first section of the analysis will consider the impact of divorcing the treatment of losses in the market from that in dispatch, i.e. Splitting. This analysis will examine the effects on the SEM/transmission system with dispatch being run in an optimal (close to real-time losses used). The study will address the following non-exhaustive list of issues for this scenario:

- Impact on SMP
- Changes in the marginal plant
- Change in supplier costs and total pool revenues
- Changes to in-merit plant in market schedule
- Changes in volume of losses incurred
- Changes in constraint payments
- Changes in the Imperfections charge faced by Suppliers

Secondly, the RA-led Impact Analysis will examine the costs/investments associated with the necessary installation of IT/metering systems to enable dispatch to be run in an optimal (close to real-time). The Impact Analysis will also examine the costs and benefits associated with the necessary installation of IT/metering systems to enable dispatch to be run in a real-time fashion (exact losses in dispatch).

It has also been decided that the RAs will task the TSOs, as metering systems develop, to conduct regular monitoring of and to provide reporting on actual losses volumes on the system in order to increase transparency. This monitoring will indicate improvements or gains in the efficiency of dispatch associated with the implementation of Splitting.

As noted above if the Impact Analysis is negative in the assessment of Splitting the RAs will look to ensure that the SEMC decision (i.e. stable signal in the market schedule and efficiency in losses) will apply in TLAF arrangements from 1st October 2011.

Finally, the enduring treatment of losses on Interconnectors in the SEM is a complex matter and affects workstreams outside of the all-island locational signals one. Therefore

this matter will be addressed at a future stage by the RAs both through the enduring solution for TLAFs and as part of various workstreams dealing with the incorporation of the East-West Interconnector into the SEM rules.

Any Splitting options decided upon by the RAs will be subject to review and comment by stakeholders. The RAs intend that the findings of the Impact Analysis will be published for consultation with stakeholders in early Q2 2011.

4.4 Error Supply Unit

The ESU is registered in each jurisdiction by ESB Customer Supply (ESB CS) and NIE Energy in Ireland and Northern Ireland respectively. In the absence of global aggregation, the ESU accounts for the demand of the relevant supplier as well as any unaccounted for energy consumption and losses on the system. On the all-island system a number of factors will cause differences between metered generation and metered demand plus “recovered” losses. These include a number of factors that can broadly be described as “metering errors”, including:

- (i) profiling errors for non half-hourly metered customers;
- (ii) the failure to account correctly for distribution losses in scaling customer demands at the point of metering to the Trading Boundary;
- (iii) unmetered supplies;
- (iv) TLAFs allocated to Generators will be different from actual losses;
- (v) metering inaccuracy or missing data for half-hourly metered customers; and
- (vi) theft.

Under the Trading and Settlement Code (TSC), these differences will accrue to the Error Supplier Unit for the jurisdiction in which the difference arises. In the absence of ‘global aggregation’ ESB CS and NIE Energy Supply demand is not metered and so this amount accrues to the Error Supplier Unit in the relevant jurisdiction.

There is currently a shortfall related to the algebra for the calculation of the ESUs in the TSC. The net result of this shortfall is that the ESU in one jurisdiction is potentially cross-subsidising the ESU in the other jurisdiction. The formula in paragraph 7.12 of the TSC determines the value assigned to each ESU³³.

However the algebra in paragraph 7.12 is an ‘interim arrangement’ which was to be superseded by the algebra in paragraph 4.91 of the TSC one year after SEM “go-live”³⁴.

Essentially, the algebra in 4.91 takes the entire net error for the whole island and then allocates this between the PES’ on the basis of relative total demand in each jurisdiction. On the other hand, the algebra in 7.12 works out separate errors in each jurisdiction and allocates these to the respective PES’. Paragraph 4.91 provides for a more equitable allocation of the error between the PES’ in the two jurisdictions. However, global aggregation will take equitable allocation one step further by allocating the error across all Suppliers on the basis of their relative demand. The RAs and SEMO are currently working towards implementation of global aggregation in Ireland for April 2011 and Northern Ireland for April 2012³⁵.

³³ Please refer to section 7.12 of the TSC for the formula.

³⁴ Please refer to section 4.91 of the TSC for the formula.

³⁵ Please refer to Mod_34_09 Global Settlement on the SEMO website.

The RAs have proposed a modification³⁶ to the Modifications Committee to allow for the implementation of paragraph 4.91 of the TSC from 1st October 2010. The RAs have also requested that implementation of this proposal cannot interfere with or delay the implementation of the global aggregation modification. This latter recommended modification was recently approved by the Modifications Committee.

³⁶ Please see Appendix B in this paper.

5. CONCLUSION

5.1 Decision

The RAs have decided the following with regard to harmonised all-island transmission loss adjustment factors:

- A compressed TLAF will be implemented for all Generators for 1st October 2010. This compressed TLAF is based on a methodology developed by the TSOs and amended by the RAs. Full details of the methodology and of the actual compressed TLAFs can be found in on the AIP website [please see SEM-10-066(a) to (d)].
- This compressed TLAF will apply to both the SEM market schedule and the SEM dispatch schedule between 1st October 2010 and 30th September 2011;
- Splitting which is the separation of TLAFs in the market schedule and the dispatch schedule will be implemented from 1st October 2011 as the enduring solution for all island TLAFs. The adoption of Splitting will be subject to final approval by the SEM Committee based on the output and results of a RA led Impact Analysis. Details of the Impact Analysis have been discussed in section 4.2 above.
- This Impact Analysis will examine a Splitting proposal from the TSOs which is developed to enhance efficiency in the dispatch schedule and favour stability in the market schedule. If the Impact Analysis is negative in the assessment of Splitting the RAs will look to ensure that the SEMC decision (i.e. stable signal in the market schedule and efficiency in losses) will apply in TLAF arrangements from 1st October 2011.
- The RAs have proposed a modification to the Modifications Committee to allow for the implementation of section 4.91 of the TSC from 1st October 2010.

5.2 Next steps

The RAs propose that the findings of this Impact Analysis will be published for comment by stakeholders in early Q2 2011. Proposed timelines associated with the impact Analysis are as follows:

Date	Step
Early October 2010	Publication of draft Terms of Reference for Splitting Impact Analysis report by RAs.
End October 2010	RAs finalise Terms of Reference, with input provided by TSOs.
End Q1 2011	RAs complete Impact Analysis report.
Early Q2 2011	RAs publish findings of Impact Analysis for comment by stakeholders.
Q2 2011	RAs issue decision on treatment of losses in market schedule and dispatch schedule.

The TSOs are assisting the RAs in this process and the RAs acknowledge the significant volume of work carried out by the TSOs project team up to this point.

5.3 Queries

Queries with regard to this decision paper should be submitted to jburke@cer.ie and billy.walker@uregni.gov.uk.

APPENDIX A – RA MODELLING

Introduction

This appendix outlines the effects for the 2010/2011 tariff year of applying different TLAF policies to generators' bids in the SEM, focusing on SMP, Supplier the impact on the Error Supply Unit. Carbon emissions are also considered.

Background

This memo summarises the impact on both Generator load factors/revenues and the System Marginal Price (SMP) of applying the following different TLAF policy options for the forthcoming tariff year:

- A. The current locational TLAF regime, assuming that TLAFs in 2011 are similar to those in the 2nd half of 2010. The TSOs have provided draft TLAFs for 2010/2011 based on this assumption and adjusted for 2% losses. The TLAF values range from 0.919 to 1.048.
- B. A universal TLAF of 0.98 for all Generators.
- C. Compressed TLAFs, which is a policy between option (A) and (B) in which locational TLAFs are applied but they are normalised around 0.98 and compressed by 50%:

Model and Assumptions

The model used is Redpoint's Validated Plexos model for 2010/2011 with:

- updated scheduled outages;
- updated TLAFs as per the policy options listed above;
- forward fuel and carbon prices and exchange rates from early August.

The results shown are based on a snapshot of forward fuel prices as above and may be sensitive to fuel price changes (especially the relative movement of coal and gas).

The model was run for ten different forced outage patterns for each scenario and the results shown are the mean of these ten runs.

The same load file (load at the Station Gate) is used for all scenarios. Any potential increase or decrease in the efficiency of dispatch, i.e. increase or decrease in actual transmission losses, and thus increase or decrease in required generation at the Station Gate in the market is beyond the scope of this memo.

Note that TLAFs are not applied to wind Generators in the RAs' Validated model and the effect on individual wind Generators is beyond the scope of this memo. When determining total supplier costs an "average" TLAF of 0.98 was applied to wind revenues.

SMP, Shadow Price and Uplift

There is an increase in Time-Weighted average SMP of €0.30 /MWh, or 0.51%, under a Uniform TLAF of 0.98 compared with the current draft TLAFs for 2010/2011. However, in

all the compression scenarios the SMP decreases compared with the current draft TLAFs.

The results for each scenario can be seen in the table below. **Shadow Prices and Uplift are also included to illustrate that while Shadow Price increases in some scenarios Uplift actually decreases by a larger amount, giving a decrease in SMP overall.**

The effect on Shadow Price is dependent on the TLAF of the marginal plant in every half hour, while the effect on uplift is dependent on plant starts, start cost assumptions and number of plants committed.

	TLAFs 201011	Universal 098	Comp 50%
SMP	57.79	58.09	57.65
Change		0.30	-0.14
% Change		0.51%	-0.25%
Shadow Price	47.97	48.24	47.95
Change		0.27	-0.02
% Change		0.57%	-0.04%
Uplift	9.82	9.85	9.70
Change		0.03	-0.12
% Change		0.26%	-1.26%

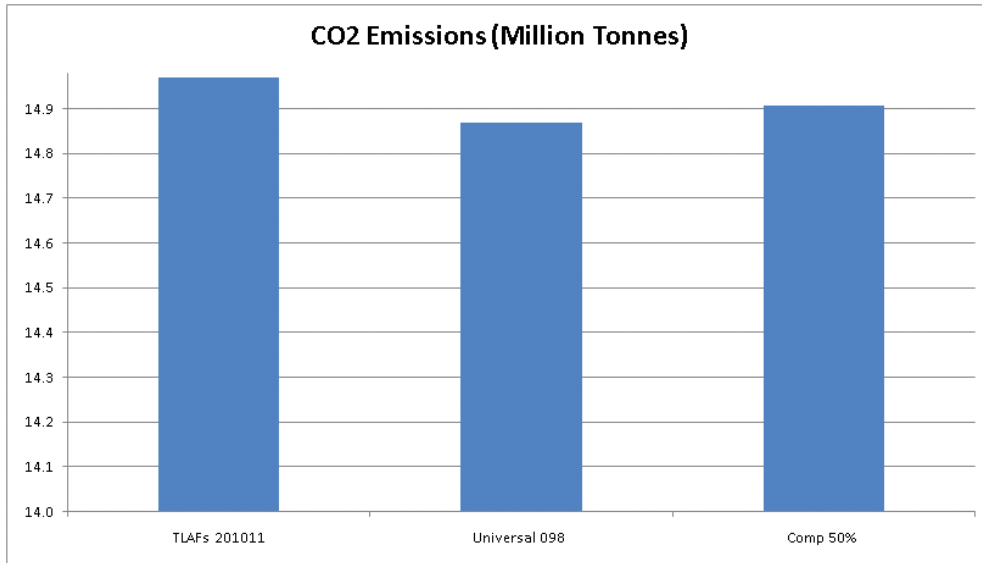
Suppliers' Costs

The Supplier's Costs (i.e. the total cost to Suppliers of buying energy at the Trading Point) for each scenario are shown in the table below.

	TLAFs 2010/11	Uniform 0.98	Comp 50%
	€m	€m	€m
SEM Total Supplier Costs	2,162.1	2,160.2	2,145.7
SEM Independent Suppliers' Costs	1,568.3	1,574.0	1,562.1
SEM PES' Costs	593.8	586.3	583.6
Change in SEM PES' Costs		(7.6)	(10.2)

Carbon Emissions

The total Carbon Emissions over the 2010/2011 Tariff Year for each scenario is shown in the chart below. Carbon Emissions are lowest under a Uniform TLAF of 0.98. This makes intuitive sense as the newest, most technically efficient plants are running more in the Uniform scenario.



Generation by Plant

The total Generation over the 2010/2011 Tariff Year of various Gas and Coal plants in the SEM for each scenario was examined by the RAs. This analysis is not published due to the confidential nature of the results to each individual generator.

Inframarginal Rent

The total Inframarginal Rent (Generator Pool Revenue minus Production Costs) over the 2010/11 Tariff Year of various Gas and Coal plants in the SEM for each scenario was examined by the RAs. This analysis is not published due to the confidential nature of the results to each individual Generator.

Impact on PSO Plant

The RAs have examined the impact on PSO supported plant. The results of this analysis cannot be published due to the confidential nature of the results to the relevant Generators.

Impact on Error Supply Unit

The Error Supply Unit (ESU) is jurisdictional based (currently PES in both ROI and NI). The ESU recovers the cost of energy unallocated to losses or independent supplier demand. The RAs have examined the impact of various Compression scenarios on the ESU in both ROI and NI.

	Current Methodology	Uniform TLAF	Compression 50%
Net SEM PES	593.8	586.3	583.6
Change (+/- €m)		-7.5	-10.2
Change %		-1.3%	-1.7%

APPENDIX B – PROPOSED MODIFICATION TO TSC

MODIFICATION PROPOSAL FORM			
Proposal Submitted by:	Date Proposal received by Secretariat: <i>(to be assigned by Secretariat)</i>	Type of Proposal <i>(please delete as appropriate)</i>	Number: <i>(to be assigned by Secretariat)</i>
RAs	16 Sep 2010	Standard	Mod_39_10
Contact Details for Modification Proposal Originator			
Name: Juliet Corbett, NIAUR	Telephone number: 0044 28 9031 1575	e-mail address: Juliet.Corbett@uregni.gov.uk	
Modification Proposal Title: Change of Error Supply Unit algebra from Section 7 to Section 4			
Trading and Settlement Code and/or Agreed Procedure change?			Code
Section(s) affected by Modification Proposal:			Section 7 7.12
Version Number of the Code/Agreed Procedure used in Modification drafting:			7.0
Modification Proposal Description <i>(Clearly show proposed code change using tracked changes & include any necessary explanatory information)</i>			
<p>7.12 Until 1 October 2010 , paragraph 4.91 shall be replaced with:</p> <p>"4.91 For each Error Supplier Unit v', each of which is associated with a Jurisdiction e, the Loss-Adjusted Net Demand ($NDLFv'h$) shall be calculated as follows:</p> $NDLFv'h = \sum_{u \text{ in } e} MGLFuh - \sum_{v \text{ in } e} MDLFvh + NIJleh$ <p>Where</p> <ol style="list-style-type: none"> 1. $\sum_{u \text{ in } e} MGLFuh$ is the total Metered Generation, Loss-Adjusted, of all Generator Units u within Jurisdiction e excluding Netting Generator Units and Demand Side Units; 2. $\sum_{v \text{ in } e} MDLFvh$ is the total Metered Demand, Loss-Adjusted, of all Supplier Units v within Jurisdiction e excluding the Error Supplier Unit; 3. $NIJleh$ is the Net Inter-Jurisdictional Import to Jurisdiction e in Trading Period h, expressed in MWh, without adjustment for Transmission Losses and Distribution Losses." 			
Modification Proposal Justification <i>(Clearly state the reason for the Modification & how it furthers the Code Objectives)</i>			
<p>To calculate the Error Supply Unit, there are two sets of algebra – the algebra set out in paragraph 7.12 has been in use since go-live. Currently Section 7.12 is in use, however it was intended that this interim measure would switch to the enduring algebra in Section 4.91 as this is the more efficient way of allocating losses on a jurisdictional basis. The Regulatory Authorities made a decision to exclude it from the scope of Day1+. The market systems currently implement the algebra in paragraph 7.12.</p> <p>Given the likely implementation of Global Settlement in ROI in the 9th scheduled release (due in April 2011) and the recent Regulatory decision on the treatment of losses in the</p>			

SEM, it is now considered timely to bring the adoption of section 4 algebra forward. This furthers the Code objective to “to facilitate the efficient, economic and coordinated operation, administration and development of the Single Electricity Market in a financially secure manner”.

Implication of not implementing the Modification

(Clearly state the possible outcomes should the Modification not be made , or how the Code Objectives would not be met)

If this Modification is not implemented, the “interim” section 7 algebra would continue to be used in the Code and the “enduring” section 4 algebra would not be effective.

Please return this form to Secretariat by e-mail to modifications@sem-o.com