Single Electricity Market

Treatment of Losses in the SEM

Proposed - Decision Paper

05 April 2012

SEM-12-024

1. EXECUTIVE SUMMARY

This paper discusses the responses to the SEM Committee's consultation paper (Treatment of Losses in the SEM, SEM-11-098[1]) and presents the SEM Committee's proposed decision on the treatment of losses in the SEM in light of these responses.

The SEM Committee proposes to continue to use compressed TLAFs and does not propose to introduce splitting between the TLAFs in the dispatch and market schedules.

Regarding splitting, while the SEM Committee had previously expressed its preference to introduce splitting this is not considered appropriate at the present time.

When the decision to adopt splitting was made (as along as consumers are not materially worse off through the implementation of splitting) the SEM Committee was aiming at an efficient dispatch signal through TLAFs and stability in the market schedule. From reviewing the impact analysis modelling carried out by both the RAs and the TSOs, the SEM Committee concluded that an improvement in dispatch efficiency through loss factors is most likely to be achieved by the adoption of close to real time TLAFs. Therefore, the SEM Committee is of the view that until such time as the determination of close to real time TLAFs is achievable by the TSOs, the current methodology should prevail.

In addition, the SEM is likely to be subject to significant changes due to regional integration and the SEM Committee does not wish to make further changes to the TLAF methodology that may have to be revisited in the medium term. The potential impact of the EU Network Codes in the future are also noted here.

Regarding the proposal to continue to use compressed TLAFs the SEM Committee has considered:

1. The inconclusive modelling results,
2. The polarised responses from industry and
3. The significant changes to the market that will take place in the coming years.

Given the factors above outlined the SEM Committee proposes to maintain the current approach, compressed TLAFs, for the medium term and will review the approach to transmission losses in the SEM in the future.

[1] http://www.allislandproject.org/en/transmission_current_consultations.aspx?article=5d9a6485-4f5d-431f-a207-2a6fc4005557

2. INTRODUCTION

In February 2011 the SEM Committee published its Terms of Reference for and impact assessment on the proposed splitting of the treatment of losses in the market schedule from that in the dispatch schedule (SEM-11-006)[2]. Following on from this, the Market Monitoring Unit (MMU) on behalf of the SEM Committee carried out the TLAF modelling analysis in line with the requirements of the Terms of Reference. This modelling was completed in May 2011 and the results of the modelling presented to the SEM Committee at its meeting on 26 July 2011. The SEM Committee requested that a full and detailed consultation on the TLAF splitting analysis and modelling results be carried out in advance of it moving to a decision on this workstream.

On 18th November 2011 the SEM Committee published a paper (Treatment of Losses in the SEM, SEM-11-098[3]) to report on the results of the TLAFs splitting impact analysis in the SEM and to carry out a full public consultation on this matter. The consultation period ended on the 27th January 2012. The SEM Committee also encouraged market participants to carry out their own TLAF modelling and to include full details of their modelling in their submissions on this consultation.

The purpose of this paper is to outline and summarise the responses to that consultation and to put forward the proposed decision of the SEM Committee on the treatment of losses in the SEM resulting from that consultation process.

Comments are requested from interested parties on the matters raised in this paper, specifically the SEM Committee proposals. Comments on this paper should be submitted by **17.00 on Friday 04 May 2012**, preferably in electronic format, to Jean Pierre Miura – details below. Please note that the Regulatory Authorities intend to publish all responses. Therefore, confidential responses should be clearly marked as such or, where possible, confidential elements placed in a separate annex to the response.

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[2] http://www.allislandproject.org/en/transmission_decision_documents.aspx?article=5d9a6485-4f5d-431f-a207-2a6fc4005557&mode=author

[3] http://www.allislandproject.org/en/transmission_current_consultations.aspx?article=5d9a6485-4f5d-431f-a207-2a6fc4005557

3. BACKGROUND

The development of harmonised all-island transmission charges and losses arrangements was an objective stated in the original Single Electricity Market (SEM) high level design (AIP/SEM/42/05)[4]. 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 and the proposed decision paper published on 18 June 2010 (SEM-10-039)[5]. Following this period of public consultation by the Regulatory Authorities a public workshop followed in July 2010.

A decision paper was published on 24 September 2010 by the SEM Committee on all Island transmission loss adjustment factor (TLAF) arrangements (SEM-10-066)[6] for the tariff year 2010/2011. The SEM Committee decided to implement compression of the existing TLAFs as an interim solution while an enduring solution for the treatment of losses in the SEM was developed. This paper also outlined the SEM Committee's intention to examine "splitting" as a preferred long-term solution for the treatment of TLAFs in the SEM. Splitting is the separation of TLAFs in the market schedule and the dispatch schedule. The SEM Committee indicated its preference for stability of losses in the market schedule with as close to real time losses as the Transmission System Operator could manage in dispatch.

The SEM Committee requested that the Regulatory Authorities (RAs), assisted by the Transmission System Operators (TSOs), carry out an impact analysis into splitting and report back to the SEM Committee outlining the results of the analysis. An information paper on Terms of Reference for Impact Analysis on TLAF splitting was published on the 14th February 2011 (SEM-11-006). The splitting concept involves implementing different transmission loss signals in the SEM market schedule to those in the SEM physical dispatch schedule, i.e. separating the cost recovery for transmission losses in the SEM market and their locational signal associated with TLAFs for the dispatcher in physical dispatch.

The SEM Committee provided guidance to the Regulatory Authorities with regard to splitting by stating in SEM-10-066 that, "the SEM Committee favours an efficient dispatch signal through TLAFs….[and] in the market schedule, the SEMC favours and values stability (non-volatility) e.g. Uniform TLAF or long-term zonal TLAF".

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[4] AIP/SEM/42/05

[5] SEM-10-039

[6] http://www.allislandproject.org/en/project_office_sem_publications.aspx?year=2010&section=2

The aim of the splitting analysis as outlined in SEM-11-006 was to assess if the potential benefits and advantages of implementing splitting, as the long term solution for the treatment of transmission losses in the SEM, outweigh any potential costs and disadvantages of this approach. In order to assess this the RAs with the assistance of the TSOs carried out this modelling project and assessed the results of this modelling against the proposed set of measurement criteria.

The SEM Committee decided that the impact assessment for TLAF splitting would examine the case for splitting against the following four criteria

- Stability of the market schedule – how inframarginal rents (IMR) vary with loss factors.
- Efficiency of the dispatch schedule – how total production costs vary as loss factors move closer to real time.
- Impact on the all-island customer.
- Divergence between the market schedule and dispatch schedule – Dispatch Balancing Costs.

The modelling was carried out using the RA's validated Plexos model for 2010/11 with updated demand, generation and fuel costs assumptions made for each of the relevant years to be modelled. Constrained modelling was based on the TSOs 2010/11 Dispatch Balancing Cost model, with adjustments made to ensure the models were equivalent. The TSOs provided the indicative TLAFs for these years. Having reviewed the results of the impact assessment, and mindful of the potential impact on market participants and on consumers, the SEM Committee decided that the result set should be subject to full public consultation. This paper now presents the SEM Committee's proposed decision resulting from that consultation.

4. THE RAs MODELLING EXERCISE

In February 2011 the SEM Committee published its Terms of Reference for and impact assessment on the proposed splitting of the treatment of losses in the market schedule from that in the dispatch schedule (SEM-11-006). Following on from this, the Market Monitoring Unit (MMU) on behalf of the SEM Committee carried out the TLAF modelling analysis in line with the requirements of the Terms of Reference. This modelling was completed in May 2011and the results of the modelling presented to the SEM Committee at its meeting on 26 July 2011.

The same solvers were used in the constrained and unconstrained run. Making sure the models were equivalent was an important part of the work, with generator data for both models based on that used for the DC validation. Moyle interconnector flows are the only output data taken from the unconstrained and inputted into the constrained model.

Under all scenarios of the modelling, the East West Interconnector (EWIC) increases constraint costs. For the constrained modelling the interconnector flows are fixed based on those produced in the unconstrained run (similar to the existing process where I/C flows are based on the Ex Ante market run). However the interconnector flows produced in the unconstrained run are quite variable and this may have been a factor in raising production costs when the EWIC was added. As it can be seen from the remainder of the modelling, results change (sometimes complete reversal) from year to year; therefore any results from the EWIC need to be viewed in the context horizon that forecast modelling was carried out, in this case only one year.

There are also differences in the constraint costs set out in the paper and the data on constraint costs published by the SEMO. One reason driving this differential is that the constraint modelling is based on the 2010/11 DBC model which includes transmission network as for 2010/11. To make the modelling exercise manageable the same network is used throughout the modelling exercise. This may explain why the differential is larger in earlier years and why the 2010/11 numbers are more similar. It should also be noted that the actual constraint costs include several items that are very difficult to model in Plexos, for example the cost of SO-SO trades is not included in the modelling results. Only Plexos modelled results are included.

With regard to the results (published in the SEM Consultation Paper Treatment of Losses in the SEM (SEM-11-098)), the impact analysis of the implementation of splitting did not provide evidence that any combination of the TLAF methodologies have a material positive or negative impact on customers. While the results were to a large extent inconclusive, the RAs have confidence in the employed methodology and the model has been comprehensively verified.

5. RESPONSES TO THE CONSULTATION

There were 12 responses received to the Proposed Decision paper SEM-11-098. They were:

- NI Consumer Council
- RES
- AES
- Energia
- PPB
- Synergen
- Power NI
- Bord Gais
- Endesa
- ESB PG
- ESB Wind Development
- IWEA

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

The responses were generally high level and noticeably polarised in their conclusions. There was almost no support for splitting as a favoured option and a majority of respondents opposed it. There was a general consensus from industry that the results were inconclusive. However, respondents drew different conclusions from this view.

One respondent conducted their own analysis and also found the results to be inconclusive. Another referred to previous analysis commissioned in response to SEM-10-039 which argued against uniform TLAFs. Several respondents stated they did not have enough information to conduct their own analysis.

Reoccurring issues in the responses to the consultation paper (SEM-11-098) were:

- issues with the analysis in the paper;
- the results of the analysis are too ambiguous to draw conclusions;
- the current methodology does not provide good locational signals; and
- the current methodology provides good locational signals.

The majority of the respondents raised issues with the reliability of the analysis. However, one respondent was somewhat selective in which parts of the analysis were reliable and which were not, the analyses they considered reliable supported locational TLAFs while the analysis that they did not consider reliable

indicated less favourable results for the locational TLAF option. In particular the results relating to EWIC were queried by several respondents. There was a general consensus that the results were ambiguous and that there was no evidence provided by the modelling to support the implementation of splitting. Only one respondent was in favour of splitting as the favoured option.

There was less consensus amongst respondents with regard to conclusions to draw from this ambiguity (i.e. either uniform or locational as a favoured option).

The respondents in favour of a locational TLAF as the enduring solution generally did not consider the TLAF methodology itself to be a problem and either explicitly or implicitly stated that it provided a good locational signal. Therefore they saw no reason (i.e. in the absence of conclusive results from the RA analysis) to move away from locational TLAFs as it would result in generators in good locations subsidising generators in bad locations. Furthermore these generators argue that moving away from locational TLAFs would remove the incentive to locate in 'good' parts of the network close to demand centres.

The respondents in favour of uniform were more likely to consider the TLAF methodology itself flawed. Given the ambiguous results they concluded that there was no argument in favour of locational TLAFs especially as they are ex-ante estimates which can be volatile from year to year. One respondent also noted that once an investment decision has been made there is very little a generator can do about its location and that therefore the TLAF did not reward investment in a good location.

These respondents favoured uniform TLAFs on the basis that analysis showed no benefit to locational and that uniform would provide investor certainty and thereby reduce capital costs in the SEM. Many considered this particularly important given the current level of uncertainty in the market (regional integration, EU target model, the large integration of renewables, etc). One respondent argued that locational TLAFs constitute a barrier to trade, and placed SEM generators at a disadvantage relative to GB generators and are contrary to EU law.

They further argued that regional integration and the adoption of EU network codes will require TLAFs to be replaced and losses recovered through TUoS; this they contend favours using uniform as an interim measure. Another respondent argued that as losses are not currently accurately measured the RAs should wait until the roll-out of smart grids (and accurate measurement of losses) to try to allocate losses accurately amongst generators.

One respondent also noted that the Error Supply Unit was not considered in the consultation and requested that any decision on TLAFs be postponed should the decision on Global Aggregation be delayed.

5.1. LIST OF RESPONDENTS AND THEIR RECOMMENDATIONS

Market Participant	Market	Dispatch
NI Consumer Council	-	-
RES	Compressed	Compressed
AES	Locational	Locational
Energia	Locational	Locational
PPB	Locational	Locational
Synergen	Locational	Locational
Power NI	Uniform	Locational
Bord Gais	Uniform	Uniform
Endesa	Uniform	Uniform
ESB PG	Uniform	Uniform
ESB Wind Development	Uniform	Uniform
IWEA	Uniform	Uniform

5.2. THE SEM COMMITTEE VIEW ON SPECIFIC ISSUES RAISED BY RESPONDENTS

5.2.1. RAs Analysis

The majority of the respondents raised issues with the confidence level of the analysis. In particular the results relating to EWIC were queried by several respondents.

5.2.2. SEM Committee Response

In terms of confidence level associated with the modelling (quantitatively), while it was considered important to ensure the absolute results of the models were reasonable, the main focus of the modelling was to ensure the constrained model/ unconstrained model were equivalent so that differentials and trends could be identified and analysed. Notwithstanding the caveat above enunciated, the results were largely inconclusive, often with variations from year to year as a result of different TLAF methodologies being difficult to definitively identify. Therefore while the modelling was accurate and different loss factors may have significant impacts on individual plant in the SEM, the "global" results (e.g. on impact on consumer) were difficult to conclusively link to TLAFs. The SEM Committee is of the view that the part of the inconclusiveness of the results is also related to the fact that the "quasi real time" TLAFs were not employed in the analysis.

With regard to the results related to the EWIC, the interconnector flows produced in the unconstrained run are quite variable and this may have been

a factor in raising production costs when the EWIC was added. However any results from the EWIC need to be viewed in the context that forecast modelling for only one year was carried out, in this case (estimates for 2012/2013 TLAFs were not available by the time that the modelling exercise was undertaken).

5.2.3. Splitting

One respondent was in favour of splitting, based on the RA analysis they favoured locational in dispatch and uniform in the market schedule.

Several respondents made the case that without the ability to determine close to real-time loss factors it was not possible to justify the introduction of splitting. Several respondents also noted that the RA analysis did not provide any conclusive evidence that splitting was an optimal approach.

5.2.4. SEM Committee Response

The SEM Committee notes that several of the respondents expressed that they were strongly opposed to splitting. The SEM Committee concurs with the view that the analysis is inconclusive. The SEM Committee agree that the inability to determine close to real-time loss factors is a major obstacle for the implementation of splitting.

5.2.5. Locational v. Uniform

Several of the respondents expressed a strong preference for locational. This argument was supported by some respondents by reference to the results of the RA analysis but also by reference to the objectives of the SEM. Respondents in support of locational tended to consider the TLAF methodology to be a good locational signal and therefore argue that a locational TLAF will reward those generators who chose to locate in good parts of the network and avoids subsidising generators in bad parts of the network. One respondent also made the case that a stable investing environment requires predictability not necessarily stability of TLAFs between years; arguing that the ex-ante methodology is a predicable process.

Conversely several of the respondents expressed a strong preference for uniform. One of these respondents had carried out their own analysis with results consistent with the RA's inconclusive results. Respondents argued that given the lack of any demonstrable benefit from any of the options considered the best approach was one that removed the volatility and uncertainty from the industry. Accordingly they support a uniform TLAF.

One respondent proposed a TLAF of 1.0 because REFIT support payments are made on the basis of a TLAF of 1.0.

In relation to compressed TLAFs, the approach proposed in this paper, several of the respondents expressed their opposition to it. The arguments tended to rest on similar grounds to their respective opposition to uniform or locational. A compressed TLAF is based on the same methodology as the locational TLAF and so respondents opposed to locational consider that compressed is still based on a flawed methodology fundamentally exhibiting the same problems. Those respondents who favoured locational tended to consider the fact that the locational signal will be reduced to be a concern. Some respondents did express support for compression as a compromise solution.

One respondent noted that the implementation of smart grids will allow for an accurate measurement of losses on the network.

5.2.6. SEM Committee Response

The SEM Committee notes the arguments presented to it. The difficulty in finding a balance between competing objectives is reflected in the highly polarised nature of the responses. The SEM Committee has previously stated that there is no ideal solution available at present and that each option has advantages and disadvantages. However bearing in mind the SEM Committee's stated objective for stability in the MS and efficiency in the DS, the Committee is of the view that the compromise solution offered by compression most closely meets these objectives at this time.

Regarding REFIT payments, the structure of support schemes is a matter for the national governments and is outside the SEM Committee's remit. However, it is noted that the SEM Committee does not consider it appropriate to change the structure of the SEM so as to optimise the payments received from a given national support scheme.

5.2.7. The Ex-Ante TLAF Methodology

Several of the respondents raised concerns with the TLAF methodology itself. These respondents tended to be those in favour of a uniform TLAF. Respondents argued that the current methodology creates several winners and losers in the market and is highly volatile between years and between generators, is arbitrary and is a flawed approximation of system losses. This volatility and uncertainty creates difficulty making investment decisions and securing financing, it is argued. One respondent stated that the methodology is discriminatory against windfarms.

Respondents also argued that the methodology is a poor locational signal as once the investment decision is made changes to the TLAF faced by a generator will not result in its relocation.

It should be noted that other respondents did not raise any concerns with the TLAF methodology and several indicated their view that it was a good locational signal.

5.2.8. SEM Committee's Response

The SEM Committee is also aware of the limitations of the current ex-ante mechanism whereby TLAFs are calculated. As TLAFs are calculated year-ahead, the ex-ante TLAFs may not reflect the prevailing conditions on the system at the time of dispatch. This creates a concern that the arrangements may not be contributing optimally to efficient dispatch. While the ex-ante methodology gives some certainty to generators, an ex-post calculation would provide for more accuracy. The SEM high level design favoured the predictability offered by the ex-ante approach. However, in the future, the SEM Committee may revisit this approach.

5.2.9. Impact on Regional Integration

One respondent argued that the current TLAF methodology created a barrier to trade noting Regulation 714/2009 and the anticipated Network Codes. The respondent also noted the uncertainty surrounding the market structure that will be in place following regional integration.

5.2.10. SEM Committee Response

The SEM Committee does not consider that the treatment of losses in the SEM constitutes a barrier to trade, as noted by the respondent there is not a consistent approach to this issue currently across Europe. As regional integration progresses barriers to trade between the relevant markets will be examined. In relation to the Network Codes it is noted that the consultation process is still on-going and the SEM Committee considers that it would be premature to decide policy on the basis of Network Codes which have not yet been finalised. The SEM Committee does however acknowledge that there are considerable developments arising from developments towards a more integrated and harmonised European electricity systemand has taken this into consideration in developing the proposal outlined in this paper.

5.2.11. Error Supply Unit

One respondent requested that the decision on TLAFs not be made until global aggregation comes into effect.

5.2.12. SEM Committee's Response

While the SEM Committee notes the concerns of the respondent the SEM Committee does not consider it necessary to ensure a specific sequence to the respective decisions. In any the implementation of the Global Aggregation should mitigate this problem.

6. SEM COMMITTEE PROPOSED DECISION.

The SEM Committee has now prepared two proposed decisions in relation to the treatment of losses in the SEM, following this review of the responses to SEM-11-098 and consideration of the options available at this time. These two proposed decisions are as follows:

1. Splitting: The SEMC is proposing not to implement splitting;
2. The SEMC is proposing to maintain compression to the treatment of losses in both the market and distribution schedules.

The SEMC's terms of reference (SEM-11-006 - Section 5) for the impact analysis of splitting stated the following:

"Where there is deemed to be a net benefit or advantage to the all-island customer or customers are not materially worse off through the implementation of Splitting, the SEM Committee will decide to implement Splitting. Where there is deemed to be a net cost or material disadvantage to the all-island customer of pursuing Splitting, then the SEM Committee will not implement Splitting."

With regard to the impact analysis of the implementation of splitting, there was no clear evidence that any combination of the TLAF methodologies have a material positive or negative impact on customers. The inconclusiveness of the impact analysis is likely to be derived from the fact that given limitations on the modelling tools currently available to the TSOs, near real time TLAFs were not available to be used in the analysis.

When the decision to adopt splitting was made (as along as consumers are not materially worse off through the implementation of splitting) the SEM Committee was aiming at an efficient dispatch signal through TLAFs and stability in the market schedule. From reviewing the impact analysis modelling carried out by both the RAs and the TSOs, the SEM Committee concluded that an improvement in dispatch efficiency through loss factors is most likely to be achieved by the adoption of close to real time TLAFs. Therefore, the SEM Committee is of the view that until such time as the determination of close to real time TLAFs is achievable by the TSOs, the current methodology should prevail.

In addition, the recent developments on the European Internal Market create additional risks for the implementation of amendments to the current TLAFs methodology. For these reasons the SEM Committee decided not to implement Splitting on this occasion.

In proposing not to proceed with the implementation of splitting, the SEMC is therefore proposing that losses will be treated under the same methodology in

both the market schedule in SEM and in the physical dispatch schedule. The SEMC's proposed decision in this regard is to implement compression for the treatment of losses.

In relation to the decision on Locational/Compressed/Uniform TLAFs, the SEM Committee has considered the following points:

- The inconclusive modelling results;
- The polarised responses from industry;
- The current developments with respect to the future structure of the SEM in a regionally integrated market (SEM-12-004);
- The development of European Network Codes (under the provisions of Regulation EC 714/2009) which will cover rules regarding harmonised transmission tariff structures including locational signals and inter-transmission system operator compensation rules.

Given the decision to not implement splitting, the SEM Committee proposes to maintain the current approach, compressed TLAFs, for the medium term. The methodology for compression is stated on the Publication of Loss Factors paper (SEM-11-081).

In taking a decision to implement compression as a medium-term approach, the SEM Committee recognises both the competing nature of certain objectives and the ability for these important objectives to be reflected in what amounts to a compromise position. Compression, as implemented, importantly preserves a locational TLAF approach while amending it predictably to provide for greater stability around the outturned TLAF.

The SEM Committee is aware that compression is not a perfect solution for the treatment of losses; however none of the available solutions are perfect and all have significant limitations. The SEM Committee is also aware that the views of market participants with regard to compression or indeed the other alternative solutions is heavily dependent upon their existing TLAF value and whether this value would be "better or worse" under the alternative options.

7. NEXT STEPS

- This consultation concludes on 17.00 on Friday 04 May 2012
- SEM Committee Decision June 2012.
- TSO consultation on 2012-13 TLAFs – 1 to 31 of July 2012
- Publication by TSOs of TLAFs for 2012 – 2013 - 1 September 2012
- Application of enduring solution to TLAFs 1 October 2012