

Treatment of Losses in the SEM

Synergen's response to SEM-11-098

1 Introduction

This paper is Synergen's response to the consultation paper "Treatment of Losses in the SEM" published by the SEMC on 18th November 2011. Synergen has no objection to this response being published.

References in this response are to SEM-11-098, unless otherwise stated.

2 Comments on background section

The paper sets out the considerations of harmonised TLAF arrangements going back to the SEM high level design in AIP-SEM-42-05). As noted, the high level design principle for TLAFs was to implement arrangements that "provide locational signals to users that reflect the costs that they impose on the transmission system". Synergen broadly supports this objective, and it is its long-standing position that this should be delivered through the application of locational TLAFs both in the market schedule and in the dispatch of plant.

Synergen notes that the RAs have been guided by the SEM Committee to apply different policy objectives to the market schedule than are applied to the dispatch. The objective is "stability (non volatility)" for the schedule phase but while an "efficient dispatch signal" is the objective for the dispatch phase. It is this selective targeting of objectives to different elements of the market arrangements that gave rise to the "splitting" option being considered by the RAs, and subject to the analysis within the consultation paper.

In previous submissions, Synergen questioned the rationale for splitting and opposed its introduction so we welcome the broad impact assessment of a range of TLAF options in both the market schedule and the dispatch. However Synergen was surprised that, While after such a long process, the RAs have not assessed the findings from the analysis presented in this paper for comment against either:

- (i) their own assessment criteria; or
- (ii) the objectives of SEM with respect to locational signals.

The remainder of this response comments on the consultation paper, and specifically addresses the questions posed by the RAs.

3 Methodology for impact assessment

Synergen notes the scope of the TLAF assessment specified by the RAs, and the four criteria against which the splitting (and indeed non-splitting options are assessed).

Stability – Synergen regards the variation in IMRs that would result from more dynamic loss factors (essentially in the case of the RAs' assessment a locational

TLAF set periodically not a true dynamic loss factor) as relatively unimportant. It is not clear that there has been a case made to demonstrate that the benefits of stability outweigh, for example, lower costs to end customers. Synergen considers that unless it could be demonstrated that there are significant costs arising from revenue uncertainty resulting from cost reflective TLAFs, and these are quantified, than this criterion should carry little weight.

Efficiency of the dispatch schedule, - how total production costs vary as loss factors move closer to real time - While a solution that reduces production costs (as part of reducing total costs) is clearly desirable, Synergen does not consider that loss factors increasing in granularity over time (i.e. some form of change in factors used over time) is a criteria in itself. For example, this criteria seems to imply a consistent approach in the schedule and the dispatch is undesirable.

Impact on the all-island customer – Synergen notes that the RAs’ consideration of the impact on customers in both jurisdictions is consistent with their regulatory duties.

Divergence between the schedule and the dispatch – The paper clearly sets out that the RAs’ starting position for this assessment was splitting – a solution that would lead to an increased divergence of the schedule and the dispatch. However, Table 8 (section 4.5) colour codes greater divergences between the schedule and dispatch in red (which we take to be negative) and smaller differences as green (which we take to be positive). It thus appears that the RAs’ assessment of options would favour smaller divergences between the schedule and dispatch. This is contrary to Synergen’s understanding of the RAs’ position that we had understood to be, at least historically, supportive of splitting. For the avoidance of doubt Synergen opposes splitting options.

Synergen is not convinced that minimising the difference between the schedule and the dispatch should be an objective. In section 4.3 the RAs assess the impact on constraint costs of different TLAF options. Synergen considers that while, all things being equal, constraint costs should be minimised, the SEM is designed to operate on an unconstrained basis. The efficiency of this approach is predicated on the benefits of energy price setting on an unconstrained basis exceeds the consequential cost of constraints. On this basis, constraint costs are not a primary consideration in assessing possible options.

The comment is made by the RAs that “constraint payments keep generators financially neutral to the difference between the market schedule and actual dispatch”. Synergen does not accept that this is always true within the operation of the SEM. Specifically regarding splitting options where dispatch is more cost reflective (i.e. more locational than the scheduling approach), a plant that has a scheduled position lower (100 MWh) than its dispatch position (120 MWh) would be constrained on for 20 MWh. In this scenario the plant would lose IMR on that 20 MWh, and it is this not neutral to the difference between its scheduled and dispatched positions.

4 Comments on Section 4 “Results of the Impact Assessment”

Synergen has some significant concerns regarding the, modelling approach and the presentation of data. This relates both to the accuracy and consistency of the data provided, and to counter intuitive outcomes that could only be understood with further data and explanation. Specific examples are included in our other comments in relation to Section 4 In the remainder of section.

It is Synergen’s position, as expanded on in Section 5 of this response, that the modelled outcomes of the system wide benefits of alternative approaches are unclear, and that there is absolutely no demonstrated benefit of moving to a splitting option instead of the existing compressed approach or the previous approach.

4.1 Section 4.1 – Stability of IMRs

As noted earlier, Synergen does not consider that the stability of IMR revenues is an important assessment criterion unless it is demonstrated that the cost of volatility offsets or significantly reduces the benefits of efficient value signals. We accept that quantification of this is problematic but, if a higher value is to be attached to stability than cost reflectivity then the case for this must be demonstrated. Any move away from efficient market outcomes, which we see as synonymous with cost reflectivity, is counter to the high level objectives of the SEM.

Data observations

Regarding the data presented in the paper, Synergen observes that:

- The IMR variances between years are far more significant than the differences between locational, compressed and uniform options – to the extent that different TLAF approaches are “noise” compared to the swings in IMRs between years; and
- An approach with more location related signals provided relatively greater IMRs to plant with “better” TLAFs. This is an intuitively correct outcome.

Synergen conclusions

Synergen concludes from this data that:

- A more locational response to TLAFs is not the main driver of any IMR variances in the BNE peaker cost / revenue calculation as other factors seem to outweigh the relative impact of differential approaches. Consequently, using more uniform TLAFs to reduce volatility appears unnecessary in the overall context of the market price dynamics; and
- Locational TLAFs allocate rewards to generators with better loss factors, and this is the correct economic outcome.

4.2 Section 4.2 – Production efficiency

Data observations

In Table 1 (the production cost figures) there are instances (2008/9, 2011/12 with EWIC) where compressed TLAFs produce lower cost outcomes than uniform or locational solutions.

It is not clear that the relatively minor differences in the modelled production costs are not within the bounds of modelling error. In response to questions from Synergen, the RAs stated that, modelled market production costs were 5.8% higher than actual outcomes for 2008/9 and results for 2010 showed similarly higher (5.5%) modelled production costs compared to actual outcomes. The RAs also observed that the intent of the modelling was to consider the differential impacts of different options, and that modelling simplifications and assumptions would account for these differences, and would not invalidate the differential impacts between TLAF options.

Synergen accepts the RAs' observations and is cognisant of the inherent difficulties in attempting to model the differential impacts of TLAFs only (excluding other factors). However, the differences between modelled production costs for each TLAF option are (in percentage terms) very low and thus it is not clear that any differences do not fall within a reasonable range of potential modelling error.

Synergen conclusions

- Even if all modelling variances between TLAF options can be excluded, the data provided in Table 1 and Graph 3 do not provide a robust case for any individual approach on the basis of differential production costs.
- It is Synergen's position that actual costs can only be most efficiently reflected, and allocated, under locational TLAF approaches. Where uniform approaches may appear to produce lower costs then this is actually a manifestation of forcing artificial costs into the market and dispatch, causing costs to arise in other areas and/or distortionary (non-economic) wealth transfers between participants.

4.3 Section 4.3 – Constraint Costs

Data observations

Synergen understands that the results set out by the RAs are modelled outcomes. Further, we accept that this is appropriate given the need for consistency between historic and future years.

In response to questions raised by Synergen, the RAs have explained the significant difference between SEMO reported constraint costs¹ and those presented in SEM-11-098. It is difficult to compare the reported and modelling figures on a like for like basis as the SEMO data is on a calendar year basis, not on a financial year basis (as

¹ http://www.sem-o.com/pages/MDB_ValueOfMarket.aspx

modelled by the RAs). However, the early years show significant variances between the SEMO Values below, and the RA modelled outcomes (Table A below).

Mean of modelled constraint costs (€m)		SEMO reported constraint costs by calendar year (€m)	
2008/9	25	2008	120.8
2009/10	43	2009	96.7
2010/11	128	2010	118.5
2011/12 no EW	160	2011	159.8
2011/12 with EW	213		

Table A : Constraint Costs expressed as % difference from year average

Synergen understands that these variances are driven by utilising the 2010/11 transmission network for all the constrained runs. We accept that this provides for a common basis of comparison, and thus from a modelling perspective is a valid approach. However, it does demonstrate the dependence of results to the assumed network. Regardless of the ability of this approach to provide for some differential impact of the options within each year, the differences between known outcomes and modelled outcomes severely limits the reliance that can be placed on these figures for future years. In short, the figures for 2011/12 assume a network that existed in 2010/11, and we know that the actual state of the network will drive actual constraint costs away from those modelled. Further, it is unclear to us from the paper which TLAf values were used for each year. Our assumption is that the modelling utilised the actual (historic) TLAfs. If this is the case, then there is a mismatch between the network assumptions in the model, and the TLAfs used (as the TLAfs themselves are driven by the network, along with other factors). This could lead to modelling errors.

The data does not provide sufficient assurance that modelled constrained outcomes reflect actual dispatch outcomes (for any given network assumption). We note that the RA modelling is based on the DBC model, and that this is a Plexos based model. Our concerns regarding the modelling of constraint costs are that:

- The validation of Plexos on an unconstrained basis is more straightforward (and we would speculate) more robust than the validation of constrained outcomes using Plexos runs; and
- There will be differences between RCUC outcomes and those modelled in the DBC. It is not clear that these differences would not account for some differential outcomes.

Synergen conclusions

As noted above, Synergen is not confident that the modelled constraint costs provide a robust assessment of constraint costs. Notwithstanding this, and taking the data at face value, it also appears difficult to draw any firm conclusions on the merits of one approach compared to another if the reduction of constraints was a valid assessment criterion, as discussed in Section 3 of this response.

Table B below compares the constraint cost data presented in Table 2 of the document, expressing the costs as a percentage difference from the average value.

Market	Dispatch	2008/09	2009/10	2010/11	2011/12 w/o EW	2011/12 EW
Locational	Locational	(5.3%)	1.5%	(3.9%)	(1.3%)	(0.5%)
Locational	Compressed	(5.3%)	(0.8%)	(2.3%)	0.6%	(1.9%)
Locational	Uniform	(5.3%)	1.5%	2.3%	1.3%	(0.9%)
Compressed	Locational	6.6%	(0.8%)	(2.3%)	(0.6%)	0.0%
Compressed	Compressed	6.6%	(3.1%)	(0.8%)	1.3%	(1.4%)
Compressed	Uniform	6.6%	1.5%	3.9%	1.9%	(0.5%)
Uniform	Locational	(1.3%)	(0.8%)	(1.6%)	(2.5%)	1.9%
Uniform	Compressed	(1.3%)	(0.8%)	0.0%	(0.6%)	1.9%
Uniform	Uniform	(1.3%)	1.5%	4.7%	0.0%	1.4%

Table B : Constraint Costs expressed as % difference from year average

It is difficult to draw firm conclusions from the constraint cost data. There are significant variances between the options in 2008/9, but we are unable to draw any conclusions as to why this would be the case. 2008/09 also showed the greatest difference between modelled and actual costs, but we cannot conclude that these two observations are related. 2010/11 data also shows a significant variance (albeit with a different pattern across the options) and it is the year for which the network data in the model is closest to the actual network state. Again, it is not clear that these observations are linked.

However, there appears to be some evidence that applying locational TLAFs in the market schedule tends to reduce constraint costs. Consequently, our main conclusions are that:

- Even if all modelling variances between TLAf options can be excluded, the data provided in Tables 2, 3 and 4 does not provide a robust case for any individual approach on the basis of differential TLAf costs production costs; and
- The use of constraint costs is, of itself, of limited value in assessing the merits of the TLAf options.

4.4 Section 4.4 – Costs to the all-Island customer

Derivation of all-island customer costs

Synergen understands that the data presented in Table 5 is derived from taking modelled SMP x MSQ, and adding in the modelled constraint costs. While this approach is valid, the presentation of the data in the rest of the paper did not allow for a breakdown of this approach – notably in the absence of full IMR figures in section 4.1 of the paper.

Data observations

Synergen has recast the data presented in the paper to consider the schedule option first as per Table C below.

Market	Dispatch	2008/09	2009/10	2010/11	2011/12 w/o EW	2011/12 EW
Locational	Locational	2114	2085	2757	2978	3050
Locational	Compressed	2114	2084	2759	2981	3047
Locational	Uniform	2114	2085	2765	2982	3049
Compressed	Locational	2128	2101	2764	2958	3031
Compressed	Compressed	2128	2100	2766	2961	3028
Compressed	Uniform	2128	2102	2772	2962	3030
Uniform	Locational	2148	2113	2785	2990	3026
Uniform	Compressed	2148	2113	2787	2993	3023
Uniform	Uniform	2148	2114	2793	2994	3025

Table C – Data from Table 5 of SEM-11-098 showing “market data” as the first variant.

This data can be seen as percentage variances from the average TLAF value for each year in Table D.

Market	Dispatch	2008/09	2009/10	2010/11	2011/12 w/o EW	2011/12 EW
Locational	Locational	(0.8%)	(0.7%)	(0.5%)	0.0%	0.5%
Locational	Compressed	(0.8%)	(0.7%)	(0.5%)	0.1%	0.4%
Locational	Uniform	(0.8%)	(0.7%)	(0.3%)	0.1%	0.5%
Compressed	Locational	(0.1%)	0.1%	(0.3%)	(0.7%)	(0.1%)
Compressed	Compressed	(0.1%)	0.0%	(0.2%)	(0.6%)	(0.2%)
Compressed	Uniform	(0.1%)	0.1%	0.0%	(0.5%)	(0.1%)
Uniform	Locational	0.8%	0.6%	0.5%	0.4%	(0.3%)
Uniform	Compressed	0.8%	0.6%	0.5%	0.5%	(0.4%)
Uniform	Uniform	0.8%	0.7%	0.8%	0.5%	(0.3%)

Table D – RA data from Table 5 of SEM-11-098 expressed as variances from the average TLAF for each year

These results in Table D may show a broad (but weak) trend of the early study years showing lower costs under locational scenarios, with a shift towards uniform approaches producing lower cost outcomes. However Synergen is cautious in attempting to identify trends in these data as we have queried the modelling of the EW interconnector, given that the results indicate that it increases both constraint costs and other costs. The RAs have told Synergen that the introduction of the EW interconnector appears to reduce production costs in the unconstrained schedule, but there are slight increases in SMP as a result of uplift costs.

Synergen regards these results are counter-intuitive and counter to Eirgrid’s analysis of the impact of the EW interconnector “By connecting to the UK grid Ireland has access to power from right across Europe. This will create a more competitive market

and help reduce the price of electricity for consumers.² It would be appropriate for the RAs to undertake further investigation of its results for 2011/12 with EW included, in order to ensure that the outcomes are correct. At this stage, it is Synergen's view that the "2011/12 with EW" included cannot be relied upon at this stage.

Synergen conclusions

The RA's "valid" choices are highlighted in green in Table D. This indicates that under most scenarios a locational – locational option would provide the lowest overall cost. It is also noted that the lower costs are generally associated with the application of a locational or compressed approach within the schedule. This appears to drive costs to a greater extent than does dispatch efficiency. This outcome appears to be intuitively correct.

Further, options that the RAs deem are inappropriate as they are counter-intuitive also perform well – notably the options where the market is locational but dispatch is compressed or uniform.

Synergen concludes that:

- Any case for a uniform approach is not borne out by the data. The only area where a uniform approach appears to lower costs is the 2011/12 EW modelling run, and as noted earlier this run in particular should be treated with caution; and
- Synergen believes that, on balance, the RA analysis makes more of a case for a "locational-locational" approach than for any alternative approach. There is a notable trend of locational market signals producing lower costs, and on the basis of a rational design outcome, this would also dictate that dispatch was treated locationally.

5 RA consultation questions

5.1 "What is the respondent's own interpretation of the results of the impact assessment?"

The comments regarding the data set out in this section should be taken as Synergen's response to the RA's question 1 in section 5 of SEM-11-098.

While Synergen notes the statement on page 7/8 that backcasting was undertaken there is no evidence presented that the backcasting exercise validated the dispatch figures. It is our understanding that "backcasting" means running historic data through Plexos – it does not validate the presented outcomes against actual SEM outcomes – indeed there are significant variations between modelled, and actual market, outcomes.

Synergen accepts that the RAs have adopted a modelling approach that seeks to consider the differential impact of different TLAF on schedule and dispatch outcome, and that this is reasonable. Thus, for example by utilising 2010/11 transmission

² <http://www.eirgridprojects.com/projects/east-westinterconnector/benefits>

network data for all years, it is not unexpected that “backcasting” in a conventional modelling sense would show significant variances between modelled and actual data. This does not invalidate the RAs approach. However, valid questions remain:

- Do unconstrained Plexos runs replicate the market engine sufficiently closely to mean that the small variances in costs between options would still occur in the actual market?
- Do constrained Plexos runs replicate RCUC sufficiently closely to mean that the small variances in costs between options would still occur in actual dispatch?
- Consequently, are modelled schedule-dispatch variances equal to market-RCUC variances (in percentage terms)?

In Synergen’s view, it is very plausible that the answer to each of these questions is “no”. Consequently, there is no demonstrated basis that, given the relatively small variances between options, robust policy decisions can be based on the analysis within the paper.

Further, Synergen considers that the results from the modelling show some outcomes that are counter-intuitive. The example we referred to earlier (the 2011/12 EW run) is one example of this – and indeed this particular scenario may require re-examination by the RAs. However, there are other examples where we would expect to see a trend in modelled outcomes. To take production costs as an example, we would expect to see costs increasing or decreasing in a sequence of locational-compressed-uniform. However, in some years compressed produces the lowest cost outcome. There may well be specific explanations for this if the modelling data were to be examined in detail – but it is not available to respondents to this consultation, nor are these outcomes commented on in the text of the paper.

The lack of clear trends, in results, and the relatively small variances between outcomes in many of the cases considers, is a further reason why considerations other than the actual modelled outcomes need to play a significant part in determining the nature of the future TLAF arrangements.

Finally, it is disappointing that quasi-real time option could not be modelled as this approach had theoretical merit in the schedule and dispatch phases.

5.2 Synergen conclusions – modelling

Synergen does not have the analytical tools or necessary data in-house to carry out the assessment of the impact of alternative TLAF arrangements on elements of market costs. Thus, it does not have any information other than that set out in the consultation paper, the supporting paper from the TSOs and information previously published by the RAs and the TSOs.

Synergen’s conclusions from the analysis presented by the RAs are:

- There is no evidence to support moving to splitting and this should be discounted. Synergen (a) opposes splitting, and (b) agrees that any dispatch should be at least as cost reflective as the market schedule;

- To the extent that any reliance could be placed on the results, there is a case for utilising locational prices within the schedule. The “2011/12 with EW” analysis should be discounted at this stage as there appears to be significant doubt that the results for that option are robust; If that element of the analysis is not robust, it raises the question of how much confidence the RAs and market participants can have in the robustness of the rest of the analysis;
- Given the observation about how close modelled scheduled and dispatch runs are to the market engine and RCUC, and the relatively close outcomes under different scenarios, the analysis itself does not by itself, provide a stand alone case for any option – be that for the proponents of locational, compressed or uniform approaches;
- However, there is some evidence that a locational approach would under most circumstances be superior to a uniform approach. The modelling somewhat supports an intuitively correct theoretical approach; and
- The modelling can thus only provide supporting evidence for any option.

5.3 Preferred option

Synergen considers that, given the modelled outcomes, the RAs need to go back to principles of cost reflectivity and economic efficiency to inform the decision on future TLAF arrangements. Synergen’s conclusion is that TLAFs should have a strong locational signal.

The impacts between generators under alternative approaches also need to be considered, even if it is close to a zero sum game in terms of total costs under the metrics looked at by the RAs. These distributional impacts are important, as they do send locational signals to new generation (notably larger thermal plant) and reward plant that has actual lower costs of meeting demand. In terms of the existing plant, locational pricing TLAF principles were known when investment decisions were made by plant with “poor” TLAFs. If plant is required in certain locations for system security reasons, and it would have TLAFs that made the investment uneconomic, then consideration should be given to it being supported through AS payments by the TSOs – subject to a demonstrated business case. Supporting such plant by wealth transfers within the TLAF mechanism is a distortionary approach and there is no case for such an approach.

In summary:

- **Synergen’s preference is for locational approach in both the schedule and dispatch.**
- **Any cost of volatility is not demonstrated. Further, it is not clear that any such cost, if it exists, exceeds the benefits of a locational signal.**
- **Synergen can see no case for splitting, and believes that this should be discounted.**

- Synergen can see no case for a Uniform TLA approach. This has already been rejected by RAs and should continue to be off the table. There is absolutely no evidence to support a change in this direction, and Synergen considers that any move to uniform TLAs would be unduly discriminatory.