IWEA Response to SEM 09-060

Methodology Options for Locational Signals - Consultation paper

Introduction

The Irish Wind Energy Association (IWEA) welcomes the review of the All island Transmission Use of System Charging and Loss Factor locational signals in SEM currently underway and appreciate the opportunity to comment.

As indicated in all previous consultations on this matter, the volatility and lack of transparency of the current methodology of the All-Island Transmission Use of System Tariffs and Losses are a matter of serious concern to IWEA members.

In particular the current methodology of transmission charging contains a set of volatile and arbitrary set of tariffs that seem to unduly discriminate against wind generators. It is unclear how these signals are linked to the objective of efficient development of the energy infrastructure on the island.

With the industry on the cusp of significant investment over the next ten years there is significant benefit in having a joined up approach to network planning and generation development.

The current methodology is a large step away from this type of strategic development approach and as such imposes additional costs on consumers, by increasing risk to developers, without delivering any apparent benefit to transmission development.

Volatility

Generators have experienced unexpected changes of 10-15% in TLAFs in recent years. Changes of this magnitude have the potential to eliminate the financial viability of generation projects and may lead to bankruptcy. The risk of these swings is now being priced in to the financial assessments of all projects and this is significantly increasing the overall costs of all generation development on the island. The volatility of the mechanism acts as an uncontrollable risk rather than a locational signal in generation investment decisions. It is also worth noting that the signal is not in any way linked to transmission investment plans.

IWEA recognise the need for efficient development and utilisation of the transmission network. Consideration of long term effective and strategic development is key to delivering a 21st century energy system in an efficient manner. It is estimated that there will be over €16bn invested in

renewable generation projects and several hundred million in transmission over the next decade. A strategic approach to development has the potential to greatly increase the pace and efficiency of delivery of this infrastructure.

However, the application of highly volatile "signals" that do not properly link into more general strategic development significantly damages efficient investment signals.

The current methodology is too complex and EirGrid are the really the only party that can complete studies and projections, therefore the methodology lacks transparency and predictability.

Marginal Losses

In reviewing the current methodology it is important to note also in particular that the marginal loss signal is too volatile, and indeed should be removed. Generators that reduce losses may in fact be penalised. Currently there is a danger is that if you listen to a signal, you could be punished by causing a reverse flow which cannot be predicted, and we believe that the signal has not performed its intended function since the start of the wind industry in Ireland.

Loss of Load

TLAFs for existing generators can be significantly impacted by the appearance & disappearance of load which leads to huge lack of predictability in the system.

Losses are an inevitable consequence of running an electricity system, as for example are ancillary services, which are not attributed on the basis they are incurred. You could just as easily argue that the load is in the "wrong" place.

They can also be impacted by the actions of the TSO and other generators. It is not clear if there is any monitoring of actual transmission losses and on the "basis that they are incurred". If this were to be the case the increased losses caused by delays in network reinforcement should also be considered.

Cost/Benefit Analysis

There may be a case for retaining the TLAF signal for price making plant to gain a better dispatch, but there would need to be much more granular and uncorrected loss data available to ensure this was applied fairly. The cost of creating this level of detail should be compared with the benefit of a slightly improved dispatch. It is important to note that the current mechanism is adding significantly to the cost of generation development in Ireland. This is completely out of proportion to the potential benefit of the signal.

The IWEA continues to recommend that the current review include a cost benefit study of TLAFS and locational TUoS charging. Such a calculation would take the form of:

Benefits:

- **Dispatch Benefit:** Consider two thermal plant, with similar heat rates, but one located more remote from load. Only when these two similar plant are the marginal plant, and the losses criteria chooses one over the other, will there be a saving through having a better dispatch by considering losses. For arguments sake assume that the remote plant has 5% higher losses than the local generator. Say this marginal plant makes up around 10% of the generation in that period, then the saving, as a percentage of system load in that trading period will be 0.5%. But this race may only happen 10% of the year, for the rest of the year, the TLAF adjustment is not enough to change the marginal generator. So we are expecting to save perhaps 0.05% of the energy traded in the market annually. This is roughly **€2m** per annum.

- **Locational Benefit:** Consider that Gate 3 has already been set, and all the existing thermal fleet have already chosen their location. In fact all of the Gate 3 thermal generation required for 2020 is already in the application queue, some (e.g. Endesa) with significant development money already committed to the locations already chosen, and it likely that most developers (as with Gate 3 wind) are well past the point they could listen to a locational signal. Suppose 500MW of thermal generation listens to a locational signal and locates in an area where it causes 5% fewer losses in the long run. Suppose this generation is flexible mid-merit, running 1000hrs a year. Then it produces 500GWh per annum, and at €50/MWh, its losses are worth around **€1.25m per annum**.

Costs:

- We don't know how many resources are employed at Eirgrid and CER, but we suspect the once you take into account the knock on effects of TLAFs on many areas within the market, planning and pricing areas, that there could be up to 5 extra people employed indirectly as a result of the pervasive complexity introduced by TLAFs. Roughly speaking this could be around **€0.5m** in annual salaries etc.

- We understand that a change to the market is going to be required to incorporate TLAF's into the startup costs of thermal plant. This is a retrospective change, requiring a modification approval, software testing, configuration control etc., all of which could run to **€5-10m** in fees and related costs at a rough guess, although this is a one-off cost.

- There are only 1-2 companies outside Eirgrid who profess to be able to calculate TLAFs, and even they admit that they can't go more than one year ahead. One of our members was quoted €50,000 to complete a TLAF study. Let us assume that under the new rules the calculation was possible for 5-15 years ahead. If each of the 200 wind farms in Gate 3 required this (and banks

will always ask for a study if it is technically possible) then the total cost to the wind industry alone would be **€10m**, again a one-off cost.

- Lastly, and this is by far the biggest concern, both debt and equity investors in generation projects require a higher return if they are exposed to risk that they cannot hedge. Short of owning all (or a share) of all the generators in Ireland, it is not possible to hedge locational signals. The capital asset pricing model should allow a full economic assessment in terms of the change in beta, but let's assume that debt providers wanted to be unaffected by a 10% swing in TLAFs. This might swing a project from 80:20 to say 70:30 debt:equity split. If debt is 6% and equity is 15% for both cases, then the WACC could be increased by 1-2%. This would increase the cost of wind generation by 5-10%. If we have 4000MW of Gate 3 wind on the system built under these conditions, then it would be producing around €500m worth of energy, and so the additional cost would be in the region **of €25-50m per annum**.

It appears that the costs are one to two orders of magnitude larger than the benefits. Of course our numbers are very rough estimates, but they are unlikely to be 10x off their actual value. Our intention was only to demonstrate to the CER and Eirgrid that it is possible to complete a cost benefit analysis, and indeed this should surely be the starting point for any fundamental review of a charging structure. The CER and Eirgrid could with relatively little effort refine the numbers above, and if, as we believe, it turns out that the costs far outweigh the benefits, this is surely a critical input to your review. In reviewing other options presented, given the current lack of detail as to their implementation, it is very difficult for IWEA to assess at this stage whether or not we agree with the SO's assessment of the options presented for Loss Adjustment Factors and Purchase of Losses.

However with respect to Zonal Loss Adjustment factors presented it is noted in the consultation paper that *"…the intention of zonal transmission losses is to attempt to send long-term transmission locational signals regarding losses. It has the potential to send significant information to users regarding the implications associated with locating in a certain area and support a reduction in the total amount of electricity transmitted and therefore increase the efficient use of energy."*

Again we would re-iterate the points raised in all previous submissions that due to the current gate processing system, locational investment signals are now essentially irrelevant. For Gate 3, the system operator has essentially selected projects to offer connections to based on date order. It seems perverse having decided the locations where wind should be developed through a central planning process to then expose the constructed projects to highly volatile "signals" that have no effect other than increasing the cost of development on the island. Participants are not reasonably in a position to respond to these signals, having already committed resources to their current projects.

TLAFs Purpose

Historically the TLAF system has been so broken that developers have ignored it, and even if the locational signal aspect was fixed now (by making it less volatile and more predictable), all the wind farms that are going to be developed for the next 10-15 years have already chosen a location, and been assigned a grid queue position, either in Gate 3 or post Gate 3. From our discussions with developers, none of the developers took TLAF into account when selecting particular sites over others.

It is also noted that *"In terms of efficient dispatch and other considerations (see objectives), there is a trade-off to be made between the costs and benefits of nodal loss factors and uniform losses which needs to be managed."* Again we would respectfully request that this detailed cost benefit analysis is carried out for the options presented. Without this information the SO's are not in a position to manage the trade-off of costs and benefits of uniform and zonal options referred to.

We note at the Consultation workshop in Dundalk on 16th June 2009 that the SO's admitted criteria for selecting zonal areas will be "subjective" and will require "extensive/comprehensive analysis". It is even more so important in this context that a fully comprehensive and detailed cost benefit analysis is carried out before any decision on what is considered a "preferred option" to develop further. To proceed with a zonal approach will again increase uncertainty in the market with no idea of the method to be adopted. Even if this detail was available, there is nothing to suggest that substantial annual changes in TLAF's will discontinue.

Accepting that there is an absence of detail and methodology from the SO's on how exactly the Zonal method will be calculated, IWEA strongly believe that to select this method would retain uncertainty in the market and further delay the industry on the road to delivering targets; notwithstanding the current bottleneck. The adoption of a uniform method would deliver surety to those considering accepting offers over the next three years and ease the cost burden for system operators.

It is noted that in considering the Uniform TLAF factor that in considering dispatch, the use of one TLAF for every participant perhaps may not lead to an efficient dispatch in terms of losses. This may be correct, however, this assertion has no basis in fact without a full cost benefit analysis to indicate if it is correct.

We have argued that the cost of losses should be socialised as the TLAF does not achieve its purpose as a locational signal and generator sites have already been decided through the Gate process. As such the relevance of cost reflectiveness as a primary objective is diminished and should not be a deciding factor in terms of methodology selection as it would be unfair to discriminate between adjustment factors for generator losses, when developers were unable to take this consideration into their investment decision due to wildly unpredictable volatility.

SEM High Level Design

It is also noted that the consultation paper indicates that a uniform loss adjustment approach would not be compatible with the June 2005 SEM High-Level Design however it is also understood that the SEM will require a modification to deal with the TLAF's going forward and so in adopting the uniform TLAF approach, changes required to the SEM will be less complex and so contribute to possible savings.

Market Model Research

Again we would re-iterate that this study does need to deliver a framework that promotes the efficient development of generation and transmission on the island. There is an excellent window of opportunity ahead of the forthcoming flood of investment to deliver significant benefits for all users and consumers of the energy system on the island through such a review.

We would request that the SO's carry out a study in a market the size of Ireland's where the SO's have chosen the uniform approach. It would merit as much attention as the other larger markets studied and presented.

IWEA are mindful of the fact that when researching other market options, proposed modifications pending under review Ref: section 10 are presented. The presentation of information in relation to this modification is shared in relation to those in support of applying zonal locational transmission loss factors and there is no information shared in relation to those opposed to this change. There is also no mention of the fact that that previous modifications to move from uniform to zonal were unsuccessful nor any information presented on the impact and costs[1] this change will deliver (both initial and ongoing).

Conclusion

In conclusion, we would like to strongly re-iterate that the locationality of TLAF and TUoS is our concern, and having both uniform TLAFs and postalised TUoS will remove both the locationality and hence the volatility. As indicated in all previous responses, it no longer makes sense to incentivise development of renewable generation in windless population centres instead of in locations with rich wind resources. IWEA call for the removal of these non-value added location transmission connection incentives in context of strategic grid development.

[1] Potential Impacts and costs of certain parties involved are outlined in http://www.elexon.com/documents/Change_and_Implementation/modifications/229/Collated_P229_Assessment_Phase_IA_Responses.pdf