Response to

Draft 2010 Transmission Loss Adjustment Factors

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Scottish and Southern Energy

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Introduction

Airtricity has been consistent in objecting to the methodology approved by the RAs for determining transmission losses in SEM. Our objections have variously pointed out the asymmetric treatment of generation and demand, the inaccuracy of scaling Marginal Loss Factors uniformly to match target (unmeasured) average losses and the lack of ex-post reconciliation of the calculations.

Our objections also extend to the dispatch scenarios devised for use within the methodology and by association the TLAF values produced at the end of each annual exercise. The simplifying assumptions made for the dispatch scenarios significantly alter the essential character of the problem under study because stochastic conditions are shoehorned into a deterministic model. Regarding the results, the recently published draft 2010 TLAF values have failed to address any of the identified shortcomings and contain within them the same flaws that we have outlined over the years; particularly the year-on-year swings and the disconnect from the underlying objective of signalling efficient location of generating plant. These deficiencies pose significant financial risk to generating plant connected (and connecting) to the system; risks not arising from economic fundamentals or geopolitical considerations in international energy markets, but created within a modelling exercise. Risks stemming from the dynamics of international energy markets can be managed by responsible participants using the many trading instruments that exist in these markets. Those arising from the TLAF methodology are unmanageable and arise from conditions outside the control of any generating plant.

In our response to an earlier consultation arising from the 'Locational Signals Project' review of TLAFs and GTUoS methodologies, we recommended uniform transmission loss adjustment factors (uTLAFs) as "the fairest approach to charging for losses"[1], involving no subjectivity in allocating ownership of losses. Attribution of ownership goes to the core of the principle underpinning the treatment of transmission losses. "In a meshed system, all [participants] (including demand) are jointly responsible for losses"[2] and any methodology that seeks to resolve this joint-cost allocation problem in favour of some participants against others within the same class is inherently subjective and therefore open to dispute.

[1] Airtricity (July 2009) *Response to Consultation on Methodology Options for the Implementation of Location Signals on the Island of Ireland (SEM-09-060)* p.3
[2] Ibid

Moving from Cost-Based to Value-Based Philosophy

The fundamental principle that has underlain the treatment of losses in the SEM is that "the costs of transmission and distribution losses are borne by the individual market participants who cause them"[3]. Hence generators' transmission losses have depended "on their point of connection to the grid"[4]. On this basis TLAFs are envisioned to "promote the efficient location of generating plant"[5]. However the reality has differed significantly from the aspiration.

1. Experience shows that generating plant that has responded to TLAF 'efficient location signals' has subsequently been penalised as a result of changes in other parts of the network. For example the proposed TLAF changes in Donegal are driven largely by new generation connecting in Cork. What rationale then is there for attributing Cork-driven losses to generating plants in Donegal?

2. Government energy policy requires the connection of remaining Gate 2 and Gate 3 capacity, but transmission charging policy acts to create investment risks, increase financing costs, redistributes value between generating plants and therefore acts in opposition to policy.

3. Importantly, 'efficient location' of generating plant can no longer be justified as responding to availability of network capacity. The Grid25 strategy being progressed by EirGrid essentially reverses that logic to represent the state whereby the network will be responding to the location of indigenous resources suitable for siting electricity generation.

4. As demand is not measured in the SEM, any increase in losses allocated to zero marginal cost generation, compared with conventional generation, will change Scheduled Demand and will therefore affect SMP.

5. No justification has ever been provided for the TLAF calculation process scheduling priority dispatch plant against a background dispatch of conventional generation. Compliance with priority dispatch requirements means that renewable plant should be scheduled onto a system with zero conventional plant operating.

We have consistently argued that management of locational access should move away from use of transmission losses to a charging regime that broadly recognises the value of the network as facilitating the transmission of electricity produced from resources, both indigenous and imported, distributed across the island. We reiterate that call here.

[3] ESB National Grid (2003) *Review of Derivation of Transmission Loss Adjustment Factors* p.4
[4] Ibid
[5] Ibid

In developing methods for managing the various complex aspects of the electricity system such as evaluating and allocating transmission losses, there are cost-benefit trade-offs ("materiality function") that need to be considered alongside the mathematical rigour required to deliver stated objectives ("principle function"). Adopting a system of postalised (uniform) transmission losses provides significantly greater benefit (predictability, stability, ease of administration) than any perceived costs (incremental losses arising from locating a generating plant at a remote point on the network). This is certainly the case when the network is being developed to accommodate generation in remote areas. In addition it aligns with EU legislation which makes provisions against discrimination of electricity from renewable energy sources, "including in particular electricity from renewable energy sources produced in peripheral regions, such as island regions and regions of low population density"[6].

Materiality v. Principle

To validate the necessity of adopting overly rigorous efforts to solve a problem in conformity to a stated principle, it is also necessary to ensure that the benefits anticipated at the very least equal the expended efforts and costs. In relation to the TLAF methodology, the rigour in the modelling and costs associated with the subjective redistribution of wealth between generating plants should at least equal some concomitant benefit to consumers. A proxy for this benefit would obviously be lower SEM prices. A quick analysis will suggest that such a benefit would be illusory under the current TLAF methodology.

Since the current TLAF methodology does not account for the dependence of conventional generation on imported fossil fuels, which have in the past risen to astronomic levels and subsequently fed into electricity prices, 'efficiently located' plants may actually lead to higher consumer costs. This beggars the rationale for the continued use of the methodology.

Our view is that the current methodology is inaccurate, unfair, ineffective and irrelevant in an electricity system that is no longer based on large, individual thermal generating plants, but rather targeted at delivery of Ireland's share of European renewable obligations, a requirement that means development of a considerable quantity of distributed renewable generation in areas where the existing network is absent or weak.

[6] Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC

2010 Application of TLAFs

It is clear that proposed TLAF values for 2010 would result in material economic transfers between generating plants, on the basis of the opaque assumptions underpinning implementation of the current methodology.

To avoid such further wealth transfers (building on those that have already taken place in previous years) Airtricity strongly believes that uniform transmission loss adjustment factors (uTLAFs) should be applied across all generator units in the SEM. However given the short lead time left till the start of the new year and the potential to frustrate the expectations of those participants who perceive advantageous treatment in this current round of the TLAF raffle, it would be acceptable to retain current 2009 TLAF values for 2010. As transmission losses are not measured, there is no reason why this would be less accurate overall than the current methodology based on simplifying assumptions.

Response to Consultation Questions

Dispatch Scenarios

The methodology used to determine TLAFs in SEM makes a number of assumptions that are never tested and adopts scenarios with dubious validity, such as the statement that losses are derived from varying each generator's output in turn against a "background of generation and demand that is *representative*[7] of the month and day/night condition to which TLAFs are to be applied". Issues with the dispatch scenarios range from the approach adopted to solving the problem, through to concerns about the treatment of losses across the entire output of generating plants. These issues are detailed below.

Adopting a deterministic approach to solve a stochastic problem

While models often have to make simplifying assumptions about the reality they intend to represent as means of dealing with complexity, those simplifications should not significantly alter the essential character of the problem being solved. The dispatch scenarios employ a deterministic approach in addressing an inherently stochastic problem, but there is no reason why the calculation could not be based on stochastically-relevant simulation.

By providing that "the maximum possible output of each generator in each scenario is determined by the Maximum Export Capacity scaled to reflect average availability" and hence assuming a flat profile for wind of essentially the average of capacity factors (31% - ROI; 33% - NI), the System Operators have essentially modelled variable generation as if it were conventional capacity, a very unreasonable simplifying assumption. Were wind generation merely a relatively inconsequential component of the system this simplification would not matter greatly, but on a system that has seen wind exceed 40% of demand, and with installed capacity set to increase even further, this treatment strips out the essential variable nature of wind. This transgresses the basic rule of modelling; ensuring that simplifying assumptions do not significantly modify the essential character of the problem under study.

Background Conditions

Background conditions against which a plant is dispatched are assumed to be representative of the month and day/night conditions operative. As a result of the faulty simplifying assumption identified above, there are no 'representatives' of high-wind/low-demand conditions (or vice versa) because wind has been averaged out to reflect average capacity

[7] Italics intended

factors and not 'stochastic' availability. Given that deterministic approaches are highly sensitive to initial conditions, this averaging ensures that there are no scenarios under which high-wind means that very little or no conventional generation is dispatched in the background. The absence of such representation of the 'stochastic' availability of wind does not align with European policy on promotion of renewable generation which mandates the priority dispatch of generating installation using renewable energy sources. Thus the dispatch scenarios are fundamentally flawed, failing to deliver on the basic claim that they are representative of network conditions.

Losses vs. Output

The averaging effect continues with the application of derived losses across the entire maximum possible output determined for each generator. The relationship between generator output and losses is non-linear; the ratio of losses to output increases as output increases. We believe this relationship to be fundamental but yet it is 'smoothed' out of existence by the simplifying assumptions made in the modelling.

Draft Values

The draft values arrived at through the TLAF process are more that just modelling artefacts; they represent significant financial redistributions between generators connecting to the network. This is a perverse conclusion to a philosophy aiming for efficient location of generating plant. As we argued above, these redistributions are based on very subjective foundations and patently unfair, with the values arrived at through a methodology we argue does not sufficiently account for the complexities being modelled. Given the range of issues we have with the underlying philosophy, the implemented methodology, the adopted dispatch scenarios, we can only discount the draft TLAF values published for consultation.

Early Introduction of New Methodology

We welcome the possibility, subject to policy considerations, of introducing a new TLAF methodology earlier than October 2010. As we have noted above our preference would be for the application of uniform transmission loss adjustment factors (uTLAFs) across all generator units in the SEM from the start of year 2010. However given the short lead time left till the start of the new year and the potential to frustrate the expectations of certain participants, we would recommend that for 2010 the current 2009 TLAF values should be carried forward instead. For avoidance of doubt this 'carry-forward' of 2009 values would subsist till the TLAF review was completed and a new, enduring methodology decided on.

Summary

Losses occur as inherent by-products of transmitting electricity from locations of production to locations of consumption. These losses have being attributed to generating plants under the principle of *polluter pays*. On face value this logic appears faultless and gives the impression of precisely allocating electricity losses to the principal causative agents. But that does not reveal the whole picture. The losses attributed to any generating plant are the residual effects of very many other causes. However as the most directly observed causative agent the generating plant, located at a specific and fixed site, is attributed as the cause of the losses.

But given the evolving realities of electricity systems the network should not be the determinant for locating energy production, but rather the facilitator for transporting energy produced wherever good and available resources, particularly renewable indigenous resources, dictate. Hence network charging should represent the value for providing such service and not arbiter between historic decisions made about siting generating plant.

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