

European Federation of Energy Traders

Towards a permanent European tariff model for cross border power transmission: EFET suggestions for next steps

A paper for the 9th Florence Regulatory Forum meeting, 17-18 October 2002

A. Background

The Conclusions of the 8th Florence meeting recognize the establishment of a preliminary inter TSO compensation scheme to cover disproportionate national costs of transit, export and import flows. The Conclusions also call for implementation by 1 January 2003 of a tariffication mechanism reflecting the resulting compensation, which will dispense with all transaction related tariffs and rely instead entirely on charges/credits to system users at points of generation (G) and consumption (L). “Adequate locational signals” are intended to be in place as part of a new arrangement, and the desirability of harmonization of the level of G charges is recognized. However, in some countries there is as yet no G element in national arrangements for system access charging. Wholesale market parties continue during 2002 to experience impediments to trade, as a result of the levying of export and import related transmission tariffs in certain EU countries.

ETSO and CEER have continued work since February to fine-tune the inter-TSO compensation mechanism, but this fine-tuning brings no tangible benefits to the internal market. EFET is most disappointed at the lack of attention paid to the necessary components of a permanent transmission tariffication system. We conclude that it will be appropriate in future to relegate the discussion of inter-TSO compensation to a committee of regulators and TSOs, with the Commission in attendance if it wishes. The resulting debits or credits to categories of system user, *assuming they are not transaction based*, need not concern those stakeholders in the wider Florence Forum, who are truly interested in building the future foundations of a single market in electricity.

B. Charges/ credits to system users to reflect an inter-TSO compensation scheme

(i) Achieving a permanent tariffication mechanism difficult by January 2003?

The main challenges in progressing from the interim 2002 mechanism, which still has not eliminated all transaction related tariffs and which is poorly harmonized, to an absolutely permanent mechanism appear to be:

- The absence of any national basis for the calculation and imposition of G transmission tariffs in some countries which still permit export or import related tariffs. (Of greatest concern in terms of volume of cross border trade and remoteness of consensus on a way forward are Germany and Switzerland.)
- Disagreement about how and when to harmonise the level of G transmission tariffs, so as to minimize distortions of competition between EU Member States which export or import a significant net percentage of their power output/ demand.
- Debate about the nature of longer term locational signals for power generation investment, appropriate as an intrinsic part of system use charging. (In particular there are varying views as to whether it is feasible or desirable to establish such signals not just within national systems, but across borders.)

(ii) Mild cross border locational signals for 2003?

EFET appreciates the complexity of achieving consensus as to these three challenges in the near future. Agreement on exactly how to incorporate regionally differentiated and truly cost reflective long term locational signals (if any) in tariff increments/ decrements, which in turn reflect the incidence of inter TSO compensation, seems impossible by the end of this year. We have considered the suggestion of the CEER, that weak cross border signals be achieved for an intervening period, from January 2003 for one calendar year, by the expedient of attributing any particular country's net contribution to the inter TSO fund to an increment to G tariffs (as soon as they may be established as part of a national charging scheme) in net exporting countries, and to an increment to L tariffs in net importing countries. Decrements to tariffs would apply inversely in those countries, which are net recipients from the fund. The suggestion is worthy of further discussion at the Rome meeting, but the methodology could be considered essentially arbitrary, pending both differentiation of G charges within countries and harmonization of average levels of G between countries. Whether it is adopted or not, *system users require certainty by the end of October this year at the latest, as to what the CBT regime in each country will be for the whole of the calendar year 2003.*

(iii) Absence of G tariffication in Germany no bar to a way forward from 2002 to 2003

The ETSO internal compensation scheme (inter TSO fund) operates since March 2002. In most countries only the net surplus/ deficit accruing to TSO[s] is

attributed to current tariffication for system users, in the form of credits or charges respectively. In Germany, Switzerland and Belgium TSOs are expected to be net beneficiaries of the scheme. Nonetheless they are levying charges of 1 Euro per MWh on certain exporters and/or importers. (At the borders of Switzerland and Belgium these charges have negligible impact so far on non-incumbent wholesale market parties, because of trading patterns, combined with first come, first served reservation of whatever transmission capacity which has been declared available. They nonetheless will tend to hinder trade and discriminate against new entrants, if allowed to persist once capacity availability and allocation barriers to new entrants are overcome.)

If TSOs in these three UCTE countries conform in 2003 to the predominant practice of only taking account of their net [surplus] position in ETSO's inter-TSO compensation scheme, they will be in a position to cease demanding transaction related tariffs, without any detriment to their overall revenue. In addition, it should be noted that at those German borders where the 1 Euro per MWh is charged in practice *and* which are regularly congested, explicit transmission capacity auction mechanisms are in place. The auctions serve the dual purpose of providing short/ medium term market locational signals and giving the relevant TSOs a related income stream. (This last point is also of relevance to the 1 Euro per MWh transaction related tariffs introduced as of March 2002 in one direction on the Danish/ German border and on the France/ England interconnector.) At several other borders where market based capacity allocation methods have yet to be adopted, nonetheless similar short term market locational signals are given by differential power commodity spot prices either side of the border.

C. Harmonising long run locational signal elements in national G and L based tariffs beyond 2003 (independently of inter-TSO compensation)

(i) Transmission charges nationally, cost of transmission, and harmonization

The harmonisation of transmission charges is an essential ingredient to liberalising the European electricity market. National arrangements for transmission charges should normally have two objectives. Firstly they recover the revenue required by the network owners to cover their costs, as determined by the responsible supervisory or regulatory authority. Secondly, in order to encourage economic efficiency in the siting of system users' plant and in its operation (whether the plant is associate with generation or customer load), they should give locational signals, reflecting the marginal costs which such users place on the transmission system.

Four categories of transmission costs can be identified, namely:

1. The incremental costs of investment that result from the siting of a generator or load;
2. The costs of electrical losses on the transmission system;

3. Costs of congestion, which will often manifest themselves as costs of re-dispatching generation; and
4. A balance of revenue needed to meet the primary objective of earning the transmission owner a reasonable rate of return on its regulated asset base.

(ii) Locational signals for siting generation or load: Allocating costs

This section of this EFET paper primarily addresses the locational signals that may be associated with the first of the above cost categories. The treatment of electrical losses is not considered at this stage.

Economic theory dictates that any balance of revenues that may be required to meet a regulated target should be levied on the least price elastic user groups (Ramsey pricing), which will generally be loads that are not energy intensive. Locational signals in transmission charges that reflect future investment costs can be derived from the use of a model of the transmission system, which incorporates the disposition of load and generation, and the topography of the physical network. Generally these models will be represented by a collection of nodes connected by lines and cables. A locational signal for the siting of generation is created by assessing the impact on the overall cost to the system of an increment of demand at a reference node being met by an increment of generation at each of the system nodes. A locational signal for the siting of load can be created by examining the marginal cost of meeting an increment of load at each of the system nodes from an increment of generation at the reference node.

Locational signals derived in this fashion implicitly assume that the increment of load that has been added will give rise to either additional transmission investment, or a saving in transmission investment. Thus they give “long run” signals, whereas locational signals in respect of congestion and losses will generally reflect costs in operational time-scales, and will therefore be “short run” signals.

Various mathematical techniques are possible in simulating the functioning of the system. A relatively simple approach is to configure the model as a transport model where the cost minimising algorithm assumes that additional transmission capacity is provided over the shortest route available. More sophisticated approaches would be to configure the model to represent actual power flows (DC power flow model), or perhaps make the model more sophisticated through the recognition of system security requirements. At its most complex an AC power flow model (of the type generally used by TSOs in the planning of their systems) that recognises both current and voltage constraints might be employed.

The output from all these models will be a series of nodal shadow costs that indicate the marginal cost of adding generation or load at each node on the system. These may be averaged into zonal costs for administrative ease and to

remove the effect of volatility attributable to short term repositioning of generation and load. The costs can be biased to create an overall revenue recovery for G or L by the addition of a constant amount.

(iii) Variation of G and L transmission tariffs on a locational basis

Generally charges derived in this fashion will show positive charges to generation in areas where there is a surplus of generation over demand and credits for generation in areas where there is a preponderance of load. Conversely charges to load will be high in areas where there is an inflow of generation, but relatively low in areas where there is a generation surplus, and from which there is an export of power.

Such charges should be applied at times of relatively high demand since it will be peak demands on the system that drive prospective new investment. This implies that they will either be formulated as kW (i.e. capacity) related charges, or charges linked to kWh consumed (or produced) at time of system stress. Such charges (or credits) should fall on generators or end customers (in the case of the latter possibly by reference to an aggregated charge, attributed to a point linking the high voltage network to a lower voltage distribution network).

(iv) Applying locational charging across the European Union

For the purposes of cross border trade in the EU, locational signals are derived in relation to the physical arrangement of the transmission system and are calculated on a basis that does not recognise TSO or Member State boundaries. As a result the approach applies a consistent methodology that automatically creates the basis for a harmonised approach. The approach can be divorced from any arrangement between TSOs to provide compensation by some TSOs in one region for the use of adjacent systems for transit or export/ import. Indeed any compensation of this type should not be allowed to pervert the economic basis for the locational signal, but instead adjust the regulatory asset base and overall revenue recovery permitted on a national basis for the TSO. Maps, derived from a model using imputed costs and based on this methodology, which give some indication of appropriate locational variations in pricing of G and/ or L across most of western Europe, have already been produced by an EFET member.

D. Conclusion

EFET concludes that:

1. ETSO, CEER and Eurelectric should redouble their effort to achieve consensus about:

- (a) an appropriate methodology for calculating G transmission charges (recognizing that at some individual locations a charge may equal zero or constitute a credit) in all UCTE countries,
- (b) harmonization of the average national level of G charges across that area, and
- (c) a sound basis for any long term investment locational signals operating across national borders, probably independent of any inter-TSO compensation mechanism relating to the cost of hosting transits and/or exports and imports.

EFET has engaged in these three debates and is available for further consultation.

Section C. of this paper offers a suggested methodology for item c) above

2. In the meantime, there is no excuse for delaying the abolition of transaction related transmission tariffs throughout the UCTE area, since the proviso of the 8th Florence Forum that “adequate locational signals be in place” is satisfied.
3. *All export and import related transmission tariffs currently levied in UCTE countries can be abolished in practice from January 2003, whether or not a locational mechanism of the type favoured by CEER is introduced, without any detriment to the visibility of short term (congestion related) cross border market signals, nor to relevant TSO income streams.*
4. *Market parties need to be notified by the end of October this year at the latest of the CBT mechanism agreed for each country in respect of the calendar year 2003.*
5. In future meetings of the Florence Forum, discussion of the mechanics and costs behind the inter-TSO compensation mechanism should be excluded. It has proved to be a diversion from the real business of breaking down the barriers to transparent, non-discriminatory transmission access across borders and hence to intra-Community trade in electricity.

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