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EFET recommendations for objective quantification and allocation of continental European cross border power transmission capacity

1. Background

One strand of the Florence process has since 1998 dealt with the management of congestion affecting, or potentially affecting, cross border trade in power in the EU, particularly across the UCTE member grids of Continental Western Europe. Progress towards commonly accepted principles for allocating constrained cross border transmission capacity was encouragingly rapid in the years 1999 and 2000. These years also marked the initiation of explicit auctions of cross border transmission capacity on the continent, with the Germany-Jutland interconnection followed by interconnection points between the Netherlands, Germany and Belgium. System users were promised the publication by TSOs of indicative, but objectively justifiable, NTC and ATC figures for all borders where there exist high voltage level interconnections.

A number of anti-trust and regulatory decisions, some involving intervention by DG COMP or DG TREN of the European Commission, helped pave the way for agreement by Florence Forum participants at their 6th meeting in November 2000 of quite detailed guidelines on cross border congestion management. Since then, however, progress in implementing these guidelines in relation to further borders, where market based methods had not by that time been adopted, has been very limited.

2. Optimising the availability of cross border capacity to market participants

In the absence of a nodal or zonal organization of allocation of transmission capacity in the European internal electricity market, irrespective of national borders, transmission system users need from TSOs reliable and consistent indications of NTC and ATC. (NTC stands for net transfer capacity, taken normally as physical load capability of an interconnection point under foreseen simultaneous flow conditions, at the $n-1$ security level, subject to deductions for TSO system balancing purposes and to adjustments for abnormal national network conditions. ATC stands for available transfer capacity, taken normally as NTC less reservations for legacy import/ export contracts or for other preferred users/ purposes.) The

objective quantification and prompt publication of NTC and ATC per border or per interconnection point over appropriate time intervals is of the utmost importance to wholesale market parties, for the purposes of nominations and scheduling. On the other hand mere data is insufficient, in the absence of objective verification by TSOs, *working in consultation with each other for the benefit of the overall market*, of the accuracy of their estimates. A misrepresentation as to truly available physical capacity, especially on the negative side, may cause serious wholesale market distortions and yield windfall income for the TSO or its affiliates.

EFET believes that at nearly all regularly congested borders in the UCTE area potential NTC, and therefore actual ATC, are systematically underestimated. Moreover, deductions from NTC for contractual reservations can be too generous over a given time interval, leading to exacerbated underestimation. Among the reasons TSOs may do this are:

- Inaccessibility of accurate information about expected flows in other countries
- Failure to net off predictable counter flows to a dominant flow
- Inaccurate or unduly conservative calculation of expected counter and loop flows
- Lack of co-ordination of nomination and scheduling periods and procedures
- Insufficiently rigorous application to capacity reservations of the use-it-or-lose-it principle
- Non-objective approach to capacity reservations claimed by suppliers for legacy import/ export contracts
- Non-provision of appropriate economic incentives (including through regulatory regime) to avoid declaring congestion at borders
- Over-cautious withholding of capacity within a control area on one side of an interconnection, on the pretext of system security or balancing eventualities
- Unwillingness to co-operate for the purpose of coordinating redispatch of generation plant, even where this might contribute to a cost efficient elimination or reduction of congestion across a border between their control areas

We note that the resulting underestimation of available capacity tends to be least, and to be most easily addressed, when there is both a fully unbundled TSO and a pro-active, independent regulatory authority on each side of the relevant interconnection.

3. Objective and efficient allocation of ATC: Market based methods are essential

In those countries in Europe, between which power is already traded on a competitive basis, wholesale prices may immediately react to encountered or perceived congestion attributed to their common border. In fact, wholesale prices would be the same throughout Europe, if there were no artificial barriers to market entry, nor any limitations on transportation infrastructure. The spread between wholesale prices of neighbouring countries with fully open markets can therefore be viewed as the best indication for the value of transmission rights between them.

Country specific industry circumstances (e.g. availability of primary fuels, presence of hydro resources and degree of physical interconnection), combined with energy policy regimes (e.g. attitude to nuclear production, encouragement of renewables, approach to security of supply) have largely determined the development of varying types of power plant in use throughout Europe. These factors in turn lead to significant differences in the marginal cost curves of generation. In a competitive single European market those differences, or spreads in prices across time reflecting them, would be the only reason to transport power from one country (or region or node) to another.

In addition, differences in achievable price levels on the wholesale market provide a powerful mean for determining the location of new generation. Vibrant wholesale markets and accordingly robust price forward curves are the best way to provide siting signals. Adding realistic and market based pricing of congestion would help to make those signals more visible and would ensure that proper price signals are sent to the market to encourage either the construction of new generation or transmission infrastructure or the shedding of load, depending on the relevant economics.

EFET has consistently since its foundation in 1998 advocated the use of market based methods of allocating truly constrained transmission capacity. The desirability of using market-based methods also on a cross border basis has been clearly recognized by participants in the Florence Forum since March 2000. The two main options are explicit auctions, where transmission capacity utilization rights are themselves the subject of bidding, or market splitting/ implicit auctioning, where allocation of capacity out of a lower priced commodity market area occurs according to the lowest electricity prices offered to a neighbouring higher priced market area. Explicitly auctioned capacity can be made available over varying time periods and subject to varying degrees of firmness. As long as the terms of the capacity product are clear and the processes of nomination by market participants and any necessary curtailment by TSOs are objective, transparent and non-discriminatory, there is no reason why more capacity than may be expected to be actually available on a day should not be auctioned. Allocations by implicit auction, on the other hand, will naturally only take place a day ahead or intra-day, and should in normal circumstances be firm once final nominations are received.

Over the past two and a half years there have nonetheless been notable failures to progress explicit (or implicit) auctions of transmission capacity at certain borders, where traders had been led to believe that market based mechanisms could soon be agreed and implemented:

- Spain – France
- Italy – Switzerland – France
- France – Belgium

More recently, difficulties with objective and transparent allocation have been observed, in relation to increasingly frequent declared congestion at the France – Germany border.

Furthermore, several other borders with interconnection points or cables are still not subject to market based capacity allocation procedures:

- Italy – Austria
- Italy – Slovenia

- France – Switzerland
- Sweden – Denmark - Germany
- Switzerland – Austria
- Switzerland – Germany
- Austria – Germany

At present the last three of these are not under normal network conditions subject to declarations of bottlenecks. We do not advocate the organization of capacity auctions in such circumstances, although it would be desirable for the TSOs either side of each border to agree standby market mechanisms, in case circumstances change. Agreement of this nature might have the further benefit of facilitating their mutual understanding of capacity reservations and sources of loop flows. (Loop flows affecting these uncongested borders can emanate from neighbouring regions, where congestion management is not yet market based.)

The failures to progress market based mechanisms seem to be attributable to a mixture of well defended vested interests with differences of view about the likely fairness and efficiency of allocation resulting from any auction. What remains clear to EFET, however, is the unfairness and inefficiency of the substituted first-come, first-served or pro-rata reduction methodologies.

We believe the challenge is now for independent TSOs and progressive regulatory authorities, in consultation with system users including traders and power exchanges, to move rapidly beyond the existing patchwork of capacity allocation methods in the UCTE area. Non-market based methods must be replaced. While some doubts remain as to the strict economic efficiency of the outcome of all explicit capacity auctions implemented so far, these auctions have at least represented a move away from arbitrary allocation.

4. Setting the framework for new or revised explicit capacity auctions

The introduction of further, or newly organized/ coordinated explicit auctions for cross border transmission capacity seems an essential next step. They can be set up relatively quickly, even prior to improvements in other aspects of inter-TSO co-operation. (It should be noted however that the expansion and harmonisation of TSO data exchanges and load flow modeling foreseen at the 9th meeting of the Florence Forum in October 2002 should permit many upward revisions of declared NTC and ATC. These in turn will impact on the design and pricing of any related explicit capacity auctions.)

EFET supports the extension of explicit auctioning of capacity at borders as a step towards the completion of the internal market in electricity, provided some key issues as to design and pricing are addressed. A company enjoying a monopoly over transmission assets and operation in a given territory does not always desire the same outcomes from an auction model as may system users and regulators active in that territory. Wherever possible, any monopolist is likely to seek to maximise revenue. The most obvious means to achieve that is by restricting supply, but even if supply is expanded, there are other possibilities for abuse.

On the other hand, properly monitored economic incentives for a TSO, in respect of certain elements of the allocation and revenue collection processes, will help to make the auction efficient, while contributing to system security and development.

Auction design and pricing issues will include:

- Identification of available capacity (see discussion on NTC and ATC above);
- Tools to manage capacity positions;
- Investment incentives; and
- Default provisions to handle system safety and security.

A TSO (as a monopolist) will need some encouragement to offer all of the available capacity and to invest further if there is sufficient demand. This can be achieved by a supervisory authority rewarding efficient implementation of oversold capacity buyback procedures and efficient investment (i.e. where there is a demonstrated demand). On the preventive side, normally the TSO should not be allowed to keep monopoly profits raised through sales of constrained capacity.

Capacity products should bear certain characteristics:

- Mostly firm financial rights
- Tradability
- Anti-hoarding protection

Firm financial rights (that are relatively long term) are the best basis for the development of secondary markets, investor certainty and risk management tools. While a TSO may wish to offer different levels of firmness in its products, a firm product would form the backbone for further market development.

Tradability of capacity rights is essential for two key reasons. Firstly, it is not reasonable to assume that any primary allocation mechanism will produce the most efficient market outcome, particularly when auctions take place well ahead of capacity utilisation. Secondly, markets are best placed to re-shape primary products into more useful structures. (For example, monthly capacity rights may be broken into daily products, weekly strips or used as a basis for offering derivative products).

Anti-hoarding measures are essential to ensure that all of the available capacity is available to the market (and it may discourage over-booking of capacity). This is particularly important for smaller players that may face financial or information availability limitations in participating in the primary allocations. For example, if capacity is sold in seasonal strips, some participants may not wish to have the risk of holding a large amount of capacity when they only expect to use it for a few months in the year. Credit worries may also deter some users from participating in primary auctions. In such cases, a user may wish to purchase capacity in the secondary market or shorter-term auctions. The development of the secondary market would be encouraged by anti-hoarding measures such as use it or lose it and allocation caps.

TSOs' use of income from explicit auctions

Although the income from an auction might be insufficient to construct new interconnection capacity, the income raised from each one should still be used to reduce congestion in the most efficient way that is practicable.

Part of the income might be used to compensate owners of capacity, who voluntarily give up their capacity reservations linked to legacy contracts. Another significant portion will most likely be needed to assure that the quality of interconnection services sold is assured. As the TSO carries the risk of unplanned outages of transmission lines, to the extent it has sold firm transmission capacity, it has to ensure that in case of an unplanned outage the owner of the transmission right can close his position, as if physical transmission would occur. The TSO might also assure NTC availability by power plant redispatching or by counter-trading, and then pay costs incurred out of the income from auctions.

To assure that auction revenues are used beneficially for the further development of a single European market, income and related expenditure could be ring fenced in a harmonised manner (to be agreed by the CEER and the Commission) and made subject to regulatory oversight (to be co-ordinated by the CEER.)

ATC for an explicit auction: Determining the fate of long-term physical contracts

There has been discussion in EU policy and regulatory circles, as to whether legacy physical export or import contracts, and existing capacity reservations linked with them, should continue to reduce the total amount of capacity to be auctioned. The discussion would be relevant when considering an implicit auction method too.

The economic argument against continuing to recognise such reservations is as follows: If a reservation of this type is accepted as permanent and uninterruptible by the export side TSO, the benefiting party does not have to take the risk of bidding more than fair value for his transmission rights, in contrast to other system users. Nor, in the absence of a consistent application of the use it or lose it principle over all relevant time intervals, does he have to worry about another party coming into his territory to compete for the sale to the importing supplier or consumer. In the absence of legacy contracts and long term capacity reservations, explicit capacity auctions will tend to reveal the fair and true value of transmission. Where forward curves exist in both exporting and importing areas, all market participants would then have access to reliable, undistorted information about the future development of the spread, thus also ensuring that longer term siting signals could be more clearly created.

But what of the practical approach to long-term contracts which should be adopted by TSOs and regulatory authorities? Each case will turn on its own facts and legal interpretation.

Certainly TSOs cannot be expected to turn down a claimed capacity reservation, where in doing so they risk interfering with established, legitimate contractual rights. On the other hand, they should not just accept the claimed reservation to its full extent without due enquiry. Given the history of most of the long-standing export or import contracts, it is unlikely that they contain clauses specifically dealing with entitlement to transmission capacity, as opposed to the commodity take-or-pay conditions. It is thus incumbent upon

properly unbundled TSOs each side of a relevant border, acting in the new environment of third party access rights, to make their own *objective* evaluation of the extent of the necessary corresponding capacity reservation. Beyond proper protection of the rights of the contracting parties, the TSOs will then want to consider how they can best optimise the availability of remaining capacity to other market participants. In this process the watchwords must be *non-discrimination and transparency*, so that over different time periods capacity is not illegitimately withheld from the market.

5. Beyond purely explicit auctioning of capacity rights

As we indicate above, the extension of the explicit auctioning method to borders, where arbitrary allocation of capacity so far continues, will probably yield the most rapid progress possible in the immediate future. However, good work has been done by DG TREN, CEER and ETSO on the concept of “coordinated congestion management”. As long as this is not a pretext for minimization, rather than optimization, of ATC, and as long as it includes a positive approach to the possibilities of market splitting within the UCTE area, EFET supports the concept. Explicit auctions alone are subject to abuse as noted in section 4 above, and may give rise to inefficient pancaking of congestion fees in cases of transit, barriers to entry for new or smaller market participants and excessive costs for TSOs.

The inception of partial implicit auctioning of capacity, alongside explicit auctioning, seems feasible in the medium term around the not permanently congested borders of northwestern continental Europe. EFET will welcome early consultation on plans by TSOs and power exchanges in the relevant countries, particularly about how any scheme involving partial implicit auctioning could be implemented in relation to the OTC physical spot market.

As to the design of any implicit auctions, it is more realistic to envisage also these being organized in the UCTE territory initially as between control areas coinciding with national borders. (Their introduction in this manner could ideally, however, act as a prelude to a potential permanent market splitting scheme, based on commodity pricing zones whose boundaries would not necessarily coincide with those of nations, nor even of control areas.) Any such new implicit auctions must:

- Be based on an expansive estimation of NTC at the relevant borders
- Command the maximum possible portion of NTC at such borders (preferably the majority, especially if legacy reservations or any non-market based allocations remain)
- Enjoy at least equal priority with any other allocations remaining at a given border (including explicitly auctioned capacity rights, which can more rationally be offered as firm or non-firm), with respect to firmness and availability of ancillary services

6. Conclusions

- a. *Improvements in the provision of information by TSOs about NTC and ATC are still awaited in relation to some borders. In addition, a thoroughgoing review is needed of the basis for declared NTC and ATC figures at several borders. New (“soft”) operational measures and procedures on the grids either side of those borders, before additional investment in infrastructure is undertaken, could often optimise capacity availability to wholesale market parties. Better co-ordination of forecasting and flow monitoring between TSOs, and a willingness on their part to net off predictable counter or loop flows, for example, would in many cases make a dramatic difference. Timeline: Before, or immediately after the next Florence Regulatory Forum meeting.*
- b. *The guidelines for congestion management and capacity allocation set out in the Conclusions of the 6th meeting of the Florence Regulatory Forum in November 2000 must be applied without delay, wherever they have not already been. . Wherever they have not been applied, regulatory authorities and TSOs will need to find creative new means to ensure transmission capacity is quickly re-allocated, in accordance with those guidelines, in an objective and non-discriminatory manner. This must entail the consistent enforcement of the “use it or lose it” principle (UIOLI), the introduction as soon as practicable of market based methods and the removal of more arbitrary mechanisms Timeline: Without delay for objective re-allocation; by the end of 2003 for introduction of market based methods, with a fallback deadline based on new guidelines to be adopted under the comitology of the new cross border power trade regulation.*
- c. *The introduction of market-based methods will in practice necessitate the organization of auctions at all actually, even some apparently, congested borders. In most cases we expect these should initially be explicit auctions. They may at some borders be coordinated with day-ahead (or other short term) allocations to market participants, who bid the lowest electricity prices into a net importing territory. That would entail decisions about what proportion of ATC could be reserved for the explicit process, how much for the implicit process, nomination periods and degrees of firmness for each category. Such coordinated congestion management by definition would require a high degree of co-operation and full information exchange between TSOs either side of relevant borders.*
- d. *Explicit auctions need to be carefully designed and supervised, to ensure that new entrants could participate successfully, to achieve fairness of outcome and to result in non-discriminatory pricing of capacity rights. Marginal bid, rather than pay-as-bid, pricing may be appropriate, as may the imposition of allocation caps. Another aim should be the creation of reliable siting signals, according to the indicated wholesale commodity price spread. It is desirable that the capacity rights auctioned should be*

capable of being traded in a secondary market, subject to due notification to TSOs which schedule power inputs. Supervising authorities will need to determine legitimate uses of auction income by TSOs. We expect that wherever feasible such revenue should be devoted primarily to helping resolve congestion. In determining how much capacity may be auctioned, TSOs must make an objective evaluation of the extent of prior reservations necessary to protect the rights of exporters and importers under legacy long term physical supply contracts. Without interfering with legitimate contractual rights, the UIOLI principle must in any event be applied to such reservations.

- e. Coordinated explicit/ implicit methodologies may form an appropriate prelude to a more comprehensive market splitting scheme for transmission capacity allocation across western continental Europe. EFET would support the early introduction of an experimental coordinated congestion management scheme around the borders of the Benelux with France and Germany. This scheme could be based on regional nodes, the boundaries of the regions not necessarily coinciding with national borders, nor even with TSO control areas.*

Timeline: For an experimental scheme mid-2004 might be a realistic target.

- f. Permanent congestion, at those borders where it will not be resolved by a combination of the mechanisms discussed at 1. to 5., requires hard measures investment in infrastructure. EFET's recommendations concerning investment in energy infrastructure are set out in a separate paper, published in June 2002.*