TOWARDS THE CREATION OF AN EFFICIENT EUROPEAN INTERNAL ELECTRICITY MARKET
AN OVERVIEW OF THE LAST ETSO CONTRIBUTIONS IN THE FIELD OF CROSS-BORDER CONGESTION MANAGEMENT

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Abstract – Through ETSO (the association European Electricity Transmission System Operators), one of the overall objectives of the European TSOs is to promote the development of the Internal Electricity Market while ensuring the secure operation of the interconnected power system. Cross-border electricity exchanges in large and meshed AC power systems is indeed a complex issue part of the core TSO business. Moreover, an efficient management of cross-border congestion has not yet been fully addressed in Europe despite the existing legal and regulatory framework in force since the 1st of July 2004. This paper intends to provide an overview of three of the last ETSO contributions in the field of cross-border congestion management

Keywords: congestion management, flow-based, market coupling, monitoring of market power, preventive countertrade, ETSO

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1 INTRODUCTION

This paper intends to provide an overview of three of the last ETSO contributions in the field of cross-border congestion management.

Efficient market oriented methods for the allocation of scarce capacity are already available. Accordingly, based on previous concepts, "Flow-based Market Coupling-FMC" has been developed as a joint ETSO-EuroPEX vision for cross-border congestion management and integration of electricity markets across Europe [1].

Taking into consideration the current landscape of the European electricity industry, it is likely that competition may come from abroad. Therefore, the robustness of congestion management methods against the abuse of market power from dominant players may still need further analysis. As a first step, a review of the possibilities for the monitoring of market power could be addressed [3].

Market participants have shown their interest in relation to higher values and less volatile commercial transmission capacities. Interesting conclusions can be derived from an evaluation of preventive counter-trading as a mean to guarantee firm available transmission capacity [4].

2 FLOW-BASED MARKET COUPLING

In September 2004, the concept of "Flow-based Market Coupling" was published as a joint ETSO-EuroPEX (the association of European Power Exchanges) vision for cross-border congestion management and integration of electricity markets across Europe [1].

The visions offered in the past by ETSO on Coordinated Congestion Management and EuroPEX on Decentralized Market Coupling were in fact consistent and complementary in most respects. In particular, both organizations agree that market-based congestion mechanisms should be used at all borders wherever possible, and that they should be coordinated to take into account the interdependence of physical flows.

The major innovation introduced in the present method is the combination of a system modelling based on physical flows, which provides the means to maximize the inter-regional transmission capacity that can be made available without compromising system security, and market coupling, which provides the efficiency advantages of competition across regions, subject to the availability of inter-regional transmission capacity [2].

The method, in particular, has as its priority the focus on market co-ordination at the day-ahead stage. If the day-ahead markets are sufficiently comprehensive and compatible, they should provide the minimum facilities necessary for market participants to trade their energy and access the transmission system. FMC is proposed as a means of providing such facilities for inter-regional trade. It is also intended to bring the benefits by coupling the regional day-ahead markets using flow-based modeling on the notional inter-regional circuits to represent the effects of cross-border transmission constraints. While this model is an approximation to the congestion management tool, it is, however, expected to provide significant is necessary to provide adequate market liquidity at each node.

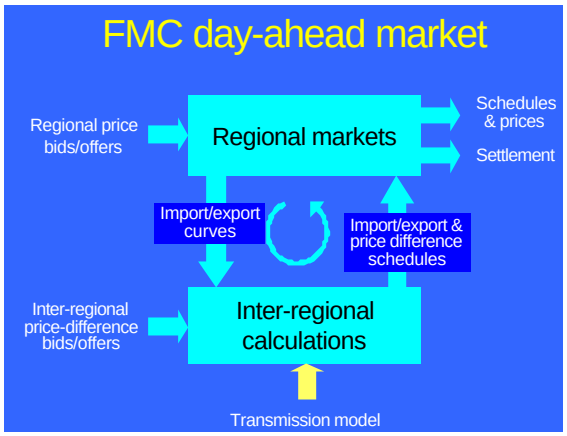

Figure 1: FMC day-ahead market.

FMC can also coexist with several forms of forward market arrangements. These provide opportunities for users to hedge cross-border price risk that they would otherwise face in the day-ahead market. Possibilities could include participation in electricity related financial markets and/or participation in explicit auctions of forward transmission rights. These arrangements would operate independently from the day-ahead FMC.

The TSO support for the markets is therefore essential as regards the transmission model, the firmness of the resulting cross-border commercial exchanges and the allocation of forward transmission rights. TSO action (e.g. re-dispatch, counter-trade) will be necessary to deal with issues such as transmission constraints and transmission model simplifications.

In ETSO and EuroPEX view, the FMC approach on cross-border congestion management meets the needs of both the market and system operation. The work as described is itself incomplete, and both ETSO and EuroPEX agree that it will need to be revised and extended.

3 MONITORING OF MARKET POWER

In December 2004, the University of Cambridge and ETSO published a Report based on a review of the monitoring of market power [3]. Its conclusions constitute a first step towards a more clear understanding of this crucial issue.

There is a growing consensus that the market monitoring process is an essential part of a well functioning electricity market. There are sound theoretical reasons (and supporting evidence) for suspecting that electricity markets may be unusually susceptible at times to the exercise of market power, compared to other markets. The peculiar features of the electricity supply industry make normal antitrust or competition law an inadequate base for addressing issues of market power and constitute the main argument for market monitoring. In some markets, the monitor can mitigate some kinds of abusive behaviour automatically, but the presence of an adequately resourced market monitor should act as a deterrent to the exercise of market power. Resources here include both information and analytic capabilities.

Transmission operators are well-placed to provide the main data required for market monitoring, given their access to much of the data required. They also have the expertise to analyse that data and support it from their understanding of the behaviour of generating companies. That suggests that where they are truly independent of other market participants, they may provide a home for a market monitoring unit. This approach has worked with reasonable success so far in the United States and other non-European electricity markets. In Europe, the cooperation between Eltra and the Nordic Competition Authorities in the development of the MARS model of the Nord Pool area, which has been applied to analysing the market power of dominant generators, provides a good example of the potentially beneficial involvement of a TSO in the market monitoring process. Where unbundling between TSOs and generation is not sufficient, it is clearly more difficult to assure complete impartiality, and any market monitoring unit that depends on information and analysis from the TSO will need a carefully designed oversight and governance structure if it is to maintain a reputation for effective and impartial market surveillance.

Network congestion potentially provides a number of opportunities for the exercise of market power. It is therefore important that congestion is monitored and taken into account in market power monitoring in practice. TSOs clearly have a central role to play in this regard. However, little empirical work published relating directly to transmission-related means of exercising market power. In Europe, transmission constraints are responsible for creating market power by effectively fragmenting markets. It will be particularly important to consider the market power implications of new proposals for cross-border access and congestion management in the European market. The TSOs have to allocate transmission capacity for commercial national and international transactions and for system security purposes. Given the large implications of small changes of available transmission capacity on local prices and the exercise of market power, a credible and transparent process has to be developed to guide these decisions. To assist in this process, system and flow patterns need to be stored for verification.

Cambridge's investigation suggests three key lessons. First, it is desirable to employ a range of techniques, and market monitors should be open to new evidence of their success and weaknesses. Second, there should be a presumption in favour of retaining data, so that it is available for any tests that may be developed or adopted in future. Third, as much data as possible should be published, to allow independent analysts to refine techniques for the detection, and hence the deterrence, of market power. Politically sustainable electricity markets require market participants, consumers and politicians to have confidence that market abuse will be detected and deterred, and ensuring

market sustainability is therefore in the interest of all participants.

4 EVALUATION OF PREVENTIVE COUNTERTRADE

It is the current understanding of ETSO that only explicit and implicit auctions possibly combined with countertrade and re-dispatch are considered to fulfil the requirements for market based congestion management mechanisms set up by EC Regulation 1228/2003.

While evaluating these mechanisms with respect to functioning of the electricity market and economic efficiency, special attention could be given to preventive countertrade as a mean to increase and/or guarantee firm trading capacity [4].

A weighty criterion for the evaluation of congestion management methods is economic efficiency implying that the method of choice should give appropriate incentives to minimize overall cost. Proper economic signals should provide efficient decentralized decisions of demand, generation and transmission in both short and long run.

The designations "countertrade" and "re-dispatch" are often perceived as synonyms, but in this context a distinction is appropriate. Countertrade means TSO-initiated trade between two adjacent price areas relieving the congestion caused by trade between these two areas with an amount equal to the countertraded quantity. Re-dispatch is a counter-measure where the TSOs change the generation and/or load pattern to redistribute the flows in the grid. The TSOs choose the participants on the basis of their physical location in the grid to achieve the maximal relieve of the actual congestion. The relief in congestion can exceed the re-dispatched amount. Countertrade is primarily regarded as a preventive measure that normally takes place day-ahead. Re-dispatch is primarily regarded as a curative measure employed during day of operation.

The objective of preventive countertrade is to increase and/or guarantee a firm trading capacity to the market players. The objective of guaranteeing firm and relatively constant trading capacity is to reduce uncertainty with respect to availability of interconnector capacity for the market players. The objective of increased virtual trading capacity is to re-duce or eliminate the price difference between market areas.

An economic analysis demonstrates that preventive countertrade causes considerable distributional consequences for the involved parties. Some market players gain and some lose, and the TSOs lose with respect to both reduced congestion rents and extra costs for countertrade. The sum of the economic consequences for all market players and the involved TSOs will at best - in competitive markets, where the merit orders for generators and consumers are not altered - equal zero. But preventive countertrade will reduce both the short and the long term economic efficiency in non-perfect electricity markets as they exist today. Extensive countertrade will inevitable lead to a poorer socio-economic utilisation of the present system and distorted incentives for new investments in generation and load.

Increase of virtual trading capacity obtained by preventive countertrade is comparable to a financial price hedging product as for instance CfD's (Contract for Difference) as offered in the Nordic electricity market. A major difference between the commercially offered financial price hedging products and the guaranteed virtual trading capacity offered by TSOs is, that the guaranteed capacity product will be a standardized and compulsory product not differentiated according to market players' individual risk profiles. All market players will be forced to pay for the same product in a socialized way. It is questionable whether such a product is compatible with the independent TSO-role.

The socio-economic optimum for interconnector capacity is obtained when congestion rents from market based congestion management mechanisms (explicit or implicit auc-tions) equal the overall costs for the interconnector. With extensive countertrade another source for financing the appropriate interconnector capacity would be needed. The most efficient locational signals are obtained when the market players' willingness to pay for capacity balances the costs for building and maintaining the capacity.

Countertrade may reduce the possibility for exercise of market power in the day-ahead market, but will inevitably increase the possibilities in the "re-dispatch market". However, this may not considered as a forward-looking way to solve the problems related to market power.

Overall conclusion is that preventive countertrade may be beneficial for the well-functioning of the market when employed in limited extent to guarantee a relatively constant interconnector capacity to the market. In this way TSOs take over a part of the financial risk in connection with reduced interconnector capacity under planned and unplanned outages in the transmission system. However, extensive preventive countertrade to create increased virtual capacity is likely to set up new challenges for the function of the market or the socio-economic efficiency.

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