

Market Coupling: Key to EU Power Market Integration

Market coupling is a way of using existing cross capacity efficiently and of creating regional energy markets. Our Expert Panel believe that coupling is a necessary but not sufficient condition for reducing congestion. It works best where there is a day-ahead power exchange but it is no substitute for more fundamental reforms such as TSO network unbundling.

Setting the Scene

Market coupling is now a key element in the European Commission's approach to creating an integrated energy market. The current process focuses on establishing regional energy markets – 7 electricity regions and 3 gas regions – by bringing together what are essentially fragmented national markets. This is currently the focus of considerable activity at EU level, while the next challenge – creating a European market from these regional clusters – awaits.

In its 3rd energy package, the Commission has highlighted the need for greater co-ordination and co-operation amongst

transmission system operators, particularly in the areas of the development of market and technical codes, the co-ordination of grid operation and investment planning. The EC's eventual aim appears to be regional, rather than national, transmission system operators fully independent of supply or generation interests.

The proposed Agency for the Co-operation of Energy Regulators to improve energy regulation across Europe is also aimed at developing common standards and approaches that would make regional energy markets and ultimately a European energy market a reality.

Process of market coupling

Market coupling is a congestion management method where allocation of cross-border transmission capacity is determined according to demand on the respective energy markets. It is an *implicit auction* approach typically used at the day-ahead stage whereby for every hour of operation either prices across the energy markets converge or all the available transmission capacity is utilised, with power flowing towards the high price area.

In contrast, in *explicit auctions* the transmission capacity is auctioned to the market separately and independently from the trading of electricity. Explicit auctions are a relatively simple method ►



of handling cross-border capacity, and are widely used across Europe. The capacity is normally allocated in portions, through annual, monthly and daily auctions.

In implicit auctions, the capacity between bidding areas is made available to the spot price mechanism operated by the power exchanges. If there is sufficient capacity, bids in the high price market can, in effect, be matched against offers in the low price market. If there is sufficient capacity the markets become one; if not, prices converge but remain different, and the gap represents the cost of congestion.

Market coupling is only slightly different from market splitting, another form of implicit auctions pioneered by Nord Pool. Under market splitting one power exchange operates across several price zones, whereas market coupling links together separate markets in a region. The effect is, however, the same.

According to EuroPEX (the Association of European Power Exchanges), market coupling can help to remove the unnecessary risks of trading short-term capacity and energy separately, encourage liquid, robust spot markets and allow all spot market participants to benefit from cross-border access. Introducing market coupling can help to minimise price differences and achieve market convergence if there is sufficient capacity. It also means an efficient use of interconnector capacity, a key concern of the European Commission, which wants to maximise efficiency of the existing European electricity infrastructure, as well as constructing new interconnectors.

Market coupling can involve explicit capacity auctions or implicit capacity auctions. An explicit auction is when the transmission capacity on an interconnector

is auctioned to the market separately and independently from the marketplace where electricity is auctioned. An explicit auction is considered to be a simple method of handling the capacity on international interconnections in Europe. The capacity is normally auctioned in portions, through annual, monthly and daily auctions.

An implicit auction is when the flow on an interconnector is taken into account based on market data from the market-place in the connected markets. In implicit auctions, the capacity between bid areas is made available to the spot price mechanism in addition to bid/offers per area, thus the resulting prices per area reflect both the cost of energy in each internal bid area (price area) and the cost of congestion. ►



A study by Frontier Economics, Consentec and IAEW for the German Federal Network Agency, published in November 2006,¹ showed that the explicit auctions are an efficient mechanism the further away one is from real time, for example when considering transactions for several months or a year ahead. Conversely, the report concluded that implicit auctions are more efficient for short-term capacity rights, for example day-ahead.

Market coupling in practice

So far the Nordic, the TLC (France, Belgium and the Netherlands) and Iberia, have created regional implicit auctioning arrangements.

The Nordic market splitting was the first, beginning in 1996 with the start-up of the joint Norwegian-Swedish power exchange, renamed Nord Pool. In 1998, Finland joined, and trade with western Denmark began in 1999. The Nordic power market became fully integrated with the addition of eastern Denmark in October 2000. In 2005, Nord Pool Spot opened a bidding area in Germany, linked via the Kontek cable.

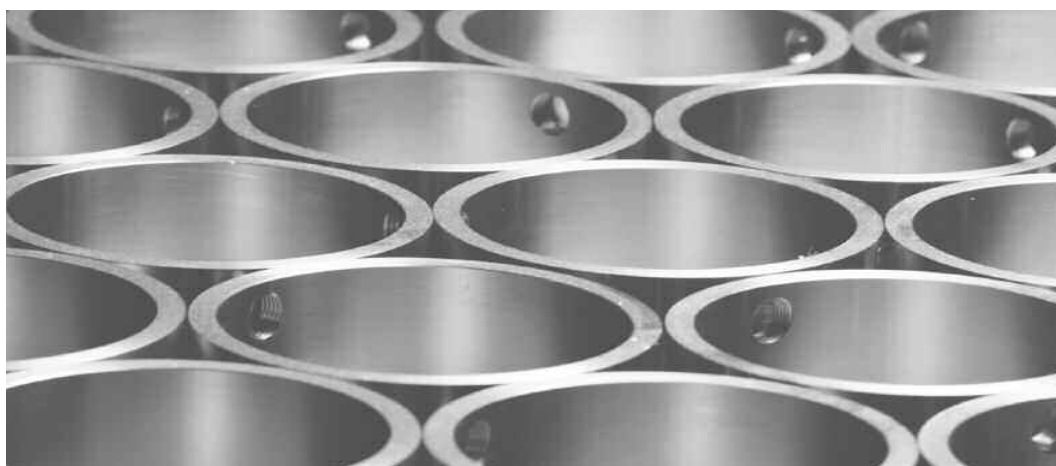
More recently, the trilateral market coupling was launched in November 2006. This links France's Powernext, APX of the

Netherlands and the newly created Belgian spot market, Belpex, in a day-ahead market coupling mechanism. This brings together three major electricity markets that account for 25% of the EU's electricity production. Other parties are the TSOs TenneT, Elia and RTE. The aim is to maximise electricity trade and drive up the cross-border capacity utilization, and many observers believe that there has been substantial success in achieving both these objectives.

The trilateral coupling establishes a single price for power across the region, which only differs if there is insufficient capacity available on the Belgian-French or the Belgian-Dutch borders. Since the start of market coupling operations last November there has been a single market price across the region 61% of the time, and the incidence of large price differences as reduced considerably. In addition, the use of interconnectors has become very much more efficient.

The new joint market also enabled the creation of a power exchange in Belgium, Belpex, which from its start has had good liquidity and prices close to those of

(1) Economic Assessment of Different Congestion Management Methods (translated from the German). Report for the Federal Network Agency. November 2006.



France and the Netherlands. Members of our expert panel believed that on the whole the project has been a success. It has helped to boost liquidity on the exchanges and to increase market convergence.

A plan to extend market coupling to Denmark and Germany by using implicit auctions for the daily cross-border capacity allocation for both interconnectors between the two countries was agreed in 2006. This intention is to connect the Nord Pool market, where implicit auctions are already implemented, and the German market. Originally, it was planned that the link should be operative by the 4th quarter of 2007, but now the project is planned for launch on 3 June. Participants in the project are Nord Pool Spot, EEX, E.ON Netz and Vattenfall Europe Transmission.

Another market coupling project concerns the NorNed cable, a 700MW link between Norway and Netherlands. The licence for this project was given on condition that the capacity be allocated by market coupling

between Norway and Netherlands. In the short term, however, the cable will be operated through explicit auctions, while it is planned to introduce implicit auctions as soon as possible.

There are also plans for the British and Dutch markets to be coupled by 2010, when the BritNed cable linking the two countries should be completed. Access to the capacity will be through daily implicit auctions facilitated by APX, together with the option of explicit auctions

In a further development, a Memorandum of Understanding on market integration and security in the Central West European region was signed in June this year by France, Germany, Belgium, the Netherlands and Luxembourg – the widest agreement on co-operation in electricity markets so far in Europe. The coupling of these different markets is targeted for January 2009 according to the MoU. The European Commission has hailed the agreement as “the foundation stone for the EU’s largest integrated regional energy market to date.” ▶



The power sector is also calling for market coupling to be extended to the Iberian market, and also to Eastern Europe. The Balkan states are in the early stages of planning a regional power network, and the Italian energy regulator is chairing a south European initiative to integrate the region up to the Black Sea. Physical links in the area are also improving, with Greece hoping to be connected to Turkey's power market through a new transmission line by the end of this year.

Next steps

The members of our expert panel were in broad agreement on the subject of market coupling. Contributors generally agreed that market coupling was one way, if not always necessarily the best way, to solve congestion management, although they also believed that some markets, for example the UK and France, are not currently amenable to coupling. There was also a consensus that market coupling works best when there is a day-ahead power exchange, while market coupling is not a substitute for more fundamental reforms, for example ownership unbundling of TSOs and cooperation between regulators.

However, there was more disagreement about whether market coupling could create capacity that is not there, and whether spot market coupling does or does not allow market participants to hedge transmission price cost.

Most members of our panel agreed that there would be more market coupling in the future, although this could take some time to achieve. Markets that are likely to be coupled in the next few years include France and Germany, France and Spain, as well as the linking of west European markets with central European markets, for example Germany with Poland. However, the time-scale for these initiatives is difficult to predict and depends partly on the success of the current initiatives. Clearly, however, the momentum is currently working in favour of greater market integration, and market coupling is seen as an efficient way to achieve this objective. ■

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