

The cost of uncoupling GB interconnectors

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On 1st January 2021 the UK ended the transition period of exiting the European Union and started trading under the new Free Trade Agreement (FTA, the *Trade and Cooperation Agreement*). Until that date, Great Britain traded electricity under the EU Integrated Electricity Market (IEM) arrangements designed to facilitate electricity trade over interconnectors joining different countries.

This paper estimates quantitatively the impact of the change in trading arrangements over interconnectors to the Continent on the efficiency of trading, the revenues of their owners and of traders, and specifically, the social cost of uncoupling. There is a deadline of March 2022 to implement new “volume loose coupling” trading arrangements, and this paper argues for additional changes to improve their efficiency.

While GB remained in the IEM the interconnectors were subject to the Single Day Ahead Coupling (SDAC) arrangements. At the day-ahead stage all coupled members of the IEM submit bids and offers to the EUPHEMIA EU-wide Day Ahead Market (DAM) auction platform. The EUPHEMIA algorithm finds the consumer and producer surplus maximising solution for generation and demand offered into the auction, subject to meeting transmission constraints, including the capacity of interconnectors. If the interconnector capacity constraint binds, prices will diverge, and the price difference times the volume flowed will be the congestion revenue received by the interconnector owners.

Under the FTA, GB runs an explicit auction for interconnector capacity and the resulting direction of trade is supplied to the EU DAM algorithm. After this auction the GB DAM clears, and after that traders can submit bids to the EU DAM. Traders buy the option to nominate trades on the interconnector, which in this paper we assume is always exercised, partly as any trades in the DAMs would otherwise have to be unwound at some cost. This over-estimates the cost of uncoupling as there are opportunities to unwind positions by not nominating and trading in intra-day markets. Provided all externalities are internalised through charges and subsidies and if electricity wholesale markets are workably competitive, market prices correctly measure the social cost of generation. Uncoupling reduces the willingness of traders to pay for interconnector capacity as they are uncertain of future DAM prices. As a result, they bid lower prices for the interconnector, and sometimes buy capacity in

the wrong direction. Lower prices for capacity and incorrect volumes reduce interconnector congestion revenue. The *commercial cost of uncoupling* is the reduction in interconnector revenue. The *social cost of uncoupling*, on the other hand, is the increase in generation cost caused by reducing the extent to which imports from the lower cost country are replaced by costlier domestic generation.

The actual DAM price differences are likely to differ from forecasts, and may be of the opposite sign. The resulting Flow Against Price Difference (FAPD) will cause losses that need to be addressed by more cautious bidding. The paper considers three different scenarios: in the first two (the current arrangement), neither GB's nor the Continental DA hourly prices are known when bids are made to the explicit interconnector auction. In Scenario 2, a relatively simple reform, the GB DA hourly market clears before the interconnector auction.

We find that the autoregressive model with exogenous variables substantially outperforms econometric methods, and that in Scenario 2, traders make better forecasts of relative values, while in Scenario 1, they make better forecasts of the sign of the price difference. This implies that there is no unambiguously preferred ordering of market timings, which should be determined by the timing that minimizes social loss. That loss will depend on the relative importance of the loss of FAPD against improved willingness to trade from improved price forecasts.

The total commercial cost of uncoupling is about €31 m./yr. under the current trading rule, while if the GB DAM price is revealed before the explicit auction (Scenario 2), the commercial cost raises to €40 m./yr. The estimated social cost of uncoupling is about €28 m./yr. under the current trading rule, but can be as high as €36 m./yr. if the GD DAM prices were revealed before the explicit auction. The higher commercial and social costs of uncoupling in Scenario 2 are due to the high FAPD. These findings are reassuring as there is no conflict between commercial and social objectives and that the current trading rule does not need to be changed. In both scenarios, our (over-) estimated cost of uncoupling is lower than that estimated by other recent estimates of the cost of "Elecxit".

The UK has agreed to replace the current trading arrangements by "loose volume market coupling" by April 2022, which combines the explicit auction with the GB DAM into which buyers and sellers trading within GB can also offer, as well as those wishing to trade across borders. This mimics some of the advantages of the SDAC coupling by coupling the GB DAM with one side of interconnector trade. In addition, and as part of the market redesign, creating a new auction market in forward Financial Transmission Rights that are obligations, not options, would seem desirable. That is not required by the FTA but nor is it prevented.

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