Give fully market-based electricity markets a second chance

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Germany is about to abandon the idea of a fully market-based electricity market, due to the potential problem of large arbitrage volumes. This is a valid concern, but there might be a solution to this problem. I would like to encourage the EU and Germany to conduct further studies before abandoning the idea of a EU-wide, fully market-based electricity market.

The EU has, for several years, been working on the integration of European wholesale electricity markets. The first step was to integrate European day-ahead markets. It takes place the day before delivery, when most of the electricity is traded. Now, it is time to integrate European balancing markets. This is the market where last-minute adjustments are made before delivery.

A problem with European electricity markets is that constraints in the network are managed differently in the day-ahead and balancing markets. This can lead to predictable price differences, which give rise to arbitrage opportunities.

In financial markets, arbitrage is often beneficial. It could, for example, improve liquidity, stabilize prices, and make prices more informative. But arbitrage that is driven by differences in regulations is seldom beneficial. In electricity markets, arbitrage that is driven by differences in the rules of the day-ahead and balancing market can significantly increase the turnover in the balancing market. This is a major problem, as there is a limited number of production plants that can change output on short notice. This means that unwanted arbitrage can significantly decrease market efficiency and may even lead to a higher risk of lost load.

Unwanted arbitrage trade, and particularly the infamous inc-dec game, has been a significant problem in US electricity markets, for example, during the electricity crisis in California. Unwanted arbitrage trade is one of the reasons to why all markets in the US have changed their day-ahead market designs. Differences to the balancing market have been minimized.

Unwanted arbitrage trade has also been a problem in Europe, for example, in the UK. Some countries, e.g., Italy and the Scandinavian countries, have reduced the potential problem with unwanted arbitrage by dividing the states into several zones, which are allowed to have different day-ahead prices. But for many countries this is a politically challenging, almost impossible step. In such countries, the difference between day-ahead and balancing markets is particularly vast, and potentially they can get a significant volume of unwanted arbitrage trade.

To mitigate unwanted arbitrage trade, UK has instead introduced a stricter regulation of bids in the electricity market. Germany has an even more stringent control of prices in the balancing market. For some balancing services, it is the system operator that decides how much German producers should be paid. The payment is based on an estimate of the production cost.

Initially, the European Commission advocated that all EU members should introduce fully-market based balancing markets. But Germany is reluctant. A recent report has found that if Germany would launch a fully market-based balancing market, unwanted arbitrage trade could increase the turnover on the German balancing market by several hundred percent. This is not acceptable, and Germany has therefore argued against an EU-wide requirement to adopt fully market-based balancing markets.

There might be another solution. In the recent scientific publication ”Production efficiency of nodal and zonal pricing in imperfectly competitive electricity markets”, I and co-authors (Mahir Sarfati and Mohammad Reza marketsHesamzadeh) have investigated an alternative way to deal with unwanted arbitrage trade. We use flow-based zonal pricing in the day-ahead market. Our simulations of such markets are promising. Our examples indicate that this approach can be used to reduce unwanted arbitrage trade, even if each country would have one day-ahead price. As far as I know, no one has estimated unwanted arbitrage in Germany for the flow-based zonal design. I, therefore, encourage the EU and Germany to conduct such a detailed study before giving up the idea of having an EU-wide, fully market-based balancing market.

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