Follow-up to the joint association workshop: Assessing the impacts of regional virtual trading hubs on forward markets

Executive summary

Brussels, 20 February 2025 – Following the recent review of the EU Electricity Market Design, the European Commission has been entrusted with an impact assessment by 17 January 2026 to identify measures that can improve the functioning of electricity forward markets. Among the proposals under review, the European Commission is considering the introduction of regional virtual trading hubs as the basis for proxy hedging in continental Europe. Theoretically, such hubs could provide interested market participants in a certain bidding zone with a synthetic price based on the aggregation of their different zonal prices.

On 26 November 2024, Eurelectric, Energy Traders Europe and Europex hosted a workshop to present a quantitative assessment on the potential impacts that virtual trading hubs (VTHs) may have on the functioning of forward markets in continental Europe, with main focus on the CORE region, and in particular on the hedging opportunities available to market participants.[1] The study, conducted by Compass Lexecon, simulates VTH prices in continental Europe based on electricity forward market prices and compares how regional trading hubs would perform for proxy hedging compared to existing proxy hedging markets, such as the German forward market. Based on an analysis of price correlation, volatility and price spread distribution, the study finds that, in continental Europe, proxy hedging on existing physical hubs generally bears lower risks than on virtual trading hubs. In addition, the analysis highlights the risk of a liquidity split between physical hubs and the virtual hub in case traders hedge on both markets, which could have negative effects on transaction costs, thereby increasing electricity prices for consumers.

The recent publication by ACER of a virtual hub simulator based on day-ahead prices[2] has revived the public debate, since it showcases very different correlation trends compared to Compass Lexecon simulations based on forward market prices. Questioning how such diverging input will be looked at in the upcoming impact assessment, electricity market participants and operators jointly call on the European Commission to hold a public consultation to gather stakeholder feedback before it makes proposals to revise the Forward Capacity Allocation Guideline. Indeed, we believe that the possible design of virtual trading hubs in continental Europe requires further discussion between policymakers

[1] Compass Lexecon: Assessment of potential impacts of regional virtual hubs on the forward markets, 07 November 2024, Link.
[2] ACER launches a virtual hub price correlation simulator for electricity forward trading, 10 January 2025, Link.

and stakeholders. In the meantime, we outline below the key points discussed during our workshop and provide additional considerations for the ongoing impact assessment.

1. Proxy hedging offers efficient alternatives to trading on illiquid forward markets

Forward markets are fundamental for market participants to manage risks by providing price signals from a few days to several years ahead of delivery. They allow market participants from both the buy- and sell-side to secure a price for future delivery, thereby hedging them against volatile short-term prices.

Today, market participants in Europe can hedge market risks either in their own bidding zone, on more liquid neighbouring bidding zones through proxy hedging, or on a virtual trading hub in the Nordic case through the Nordic System Price. When relying on proxy hedging, market participants can complement their hedge with an additional product covering the remaining locational risk that derives from the price difference between the two concerned bidding zones. These products include Long-Term Transmission Rights (LTTRs) issued by Transmission System Operators (TSOs) and market-based instruments such as zonal futures, spread products or Electricity Price Area Differentials (EPADs) as used in the Nordic region.

The lack of liquid forward markets in smaller bidding zones across continental Europe, a fact also touched upon in the European Commission's public consultation last summer, was highlighted as a factor negatively affecting hedging opportunities during the workshop. While we would always welcome more liquidity in the different markets, proxy hedging provides an effective remedy against low liquidity in certain bidding zones. Market participants anywhere in Europe can and do proxy hedge on the market of their choice. Across continental Europe, market participants hedge their future price exposure primarily on the German bidding zone, which constitutes the most liquid physical hub in Europe. Besides, the Italian, French, Spanish and Hungarian forward markets are also used for proxy hedging to different degrees.

The Compass Lexecon analysis shows that, in continental Europe, German forward prices are better correlated with other EU forward market prices for most countries compared to the investigated virtual trading hubs, thereby translating into lower basis risk to transfer a given position back to a local zone. The study indicates that this observation also stands for smaller bidding zones in continental Europe, where market participants would be better off proxy-hedging on the German hub than on a virtual trading hub.

2. Why do we rely on forward market prices to construct virtual hub prices?

The reliance on forward market prices to hedge forward on virtual hubs is a methodological aspect that caused a lively debate during the workshop and was identified as the primary objection to the study conducted by Compass Lexecon. It will likely constitute a central point of focus in the ongoing impact assessment by the European Commission.

The study conducted by Compass Lexecon considers that, if implemented, a virtual hub price would be calculated in day-ahead as a weighted average of day-ahead market prices, and market participants would trade on the forward virtual hub against that basis. However, both the zonal day-ahead prices and the day-ahead virtual hub price derived from them will not be available to market participants when they perform their hedging activities – days, months, or years beforehand. To assess forward

market prices on the virtual hub, the study assumes that the best price anticipation of market participants in the different zones is reflected by forward market prices, and therefore uses the weighted average of forward market prices in the CORE region (and in a CORE + South configuration including Italy, Spain and Portugal to test sensitivity) to determine its virtual hub price.

In contrast, the simulator recently published by ACER determines ex-post the *day-ahead* virtual hub price based on the yearly consumption-weighted average of day-ahead prices in the bidding zones included in the VTH but does not provide any estimation or assessment of the *forward* virtual hub price. This calls for further clarification:

- A real-life analysis of the basis risk faced by market participants trading on forward markets is not feasible, since the data needed to achieve such analysis does not exist. Any simulation of virtual hub prices therefore relies on an assumption about the way traders consider risks in the forward timeframe.
- By relying on forward market prices, the Compass Lexecon study aligns with existing practices of traders, who do not merely rely on historic variations of spot prices but also consider forward market prices to evaluate future spot price developments and decide on their hedging strategy.
- While an ex-post analysis of virtual trading hub prices based on day-ahead prices may show better price correlation between CORE bidding zones and a CORE virtual hub, it provides limited indications on how to trade in the forward timeframe based on this short-term price or on the actual price correlation in the forward timeframe.

Forward market prices reflect information that goes beyond the pure expectation of what the day-ahead price will be down the line. In particular, they include elements such as risk premia, reasonable price expectations and uncertainty. Hence, the importance of assessing whether market participants would be better off trading on a VTH or rather on existing physical hubs from a forward market perspective, as presented by Compass Lexecon, rather than a sole day-ahead perspective, as presented in the ACER simulator.

3. How does low liquidity translate into price correlations between bidding zones?

It is accurate that low liquidity in the forward timeframe of certain bidding zones across Eastern Europe translates in correlations in the upper 90% range between the German hub and those zones.

This stems from the fact that within those bidding zones, market participants typically use proxy hedging with the German hub and/or spread trading between the local bidding zone and the German hub as their foremost hedging strategy, for several reasons. On days without any orders or trades in a certain bidding zone, the settlement procedure and input provided by the market within these procedures follows the exact same rationale.

This is equally the case further out on the curve (i.e. multiple years ahead), where prices reflect a lower amount of information than prices close to real time. A forward-looking price relies on macro-economic information and is less subject to variation than prices closer to delivery, when granular information about weather or available assets in different bidding zones is available.

4. Why does the Compass Lexecon study express correlations in log-differences?

The correlation between electricity prices on a given hub (being Germany or a continental virtual trading hub) and other countries is a key indicator to analyse the ability of either hub to provide a hedge for price risks faced by market participants in different bidding zones. The study conducted by Compass Lexecon calculates static correlation by observing the average relationship between the prices of a hub (Germany or VTH) and other countries. Correlation is here calculated as the difference in logarithmic returns of relevant prices (log-differences). In addition, the study observes rolling correlation between pairs of power prices in log differences, based on data for 20 trading days, to capture changes between prices over time that may result from supply shocks or changes in demand, among others.

The use of log-differences is a common practice derived from financial market analysis. It addresses the non-stationarity of variables in such markets, meaning that values and the relationship between these variables change over time. Forward market prices typically exhibit time-varying mean and variance, as well as strong autocorrelation. Such dynamics are evened out by log-differences, which brings the series closer to stationary behaviour. Log-differences also help address heteroscedasticity issues when variance increases with price levels. By log-differencing, the study focuses on short-term price dynamics, which is particularly relevant for traders and risk managers.

We acknowledge that an approach based on log-differences does not integrate long-run relationships between series and cointegrating relationships. This can be taken up in a future, formal assessment on virtual trading hubs to formally test stationarity and cointegrations, and apply alternative models, such as error correction models that capture both short- and long-term relationships.

5. Different virtual trading hub configurations lead to exclusionary dynamics

The study conducted by Compass Lexecon tests two different hub configurations, relying on either the CORE region or additionally integrating Italy, Spain and Portugal into a CORE + South configuration. By doing so, the study tests the sensitivity of results to a change in configuration. The results of the different configurations provide insights into the dynamics between correlation and geographic coverage, with the hub price being more strongly correlated to certain countries than others.

A virtual hub price based on the CORE + South configuration would reduce the correlation between the hub price and some CORE countries. Conversely, a hub configuration based on CORE countries only, or a set of hubs with different geographical scopes, would likely result in a further fragmentation of forward markets.

Therefore, the risk of exclusionary dynamics resulting from the introduction of virtual trading hubs and the quest for ‘optimal’ correlations in the delineation of a VTH need to be analysed in detail to ensure that they do not outweigh the expected benefits.

6. Zone-to hub transmission rights entail increased financial risks

The role of zone-to-hub Long-Term Transmission Rights in a forward market design based on virtual trading hubs was a subject of debate during the workshop on 26 November. A lot is expected from

these hedging instruments to cover the basis risk that market participants would face when hedging on a virtual trading hub. However, it would strongly rely on the willingness and/or ability of TSOs to issue increased volumes of zone-to-hub LTTRs, especially if the VTH model relies on LTTRs to bring liquidity to the VTH.

Given the weakened link between physical cross-zonal capacity and zone-to-hub LTTRs compared to the current zone-to-zone LTTR design across continental Europe, TSOs could be taking a pure financial commitment when issuing zone-to-hub LTTRs, which would not be backed by an ability to cover LTTR remuneration with day-ahead congestion rent – as is the case today. In these conditions, such an increase of LTTR allocation volumes seems doubtful.

Moreover, in the current market design, TSOs are not subject to collateral posting when issuing zone-to-zone LTTRs; this would, however, change in a set-up involving virtual trading hubs. Financial exposure to zone-to-hub LTTRs would therefore oblige TSOs to negotiate credit lines to meet heightened liquidity needs.

In addition, the introduction of zone-to-hub LTTRs would likely require moving from FTR options to FTR obligations, as proposed by ACER. Yet, there is little appetite from market participants in continental Europe for Financial Transmission Right (FTR) obligations. According to Eurelectric and Energy Traders Europe, FTR options offer a better hedge, resilient to market developments, whereas obligations lead to a 'lock-in' of positions, unless they are traded away. Furthermore, FTR obligations might push TSOs to engage in trading activities either on the LTTR market or on the spread markets to manage their position and secure their revenue.

7. Consolidate the building blocks of forward markets as a key priority

The need for well-functioning forward markets is becoming ever more relevant with increasing volatility in short-term electricity markets and major investments into generation capacities. A balance must be found here between consolidating the different components of forward market functioning while ensuring regulatory stability.

Existing products for forward market trading, such as futures, forwards, and options traded on exchanges or bilaterally, are simple and connected to physical fundamentals. Their further development also requires a stable regulatory framework. The workshop organised by electricity market stakeholders highlighted the costs and complexity of setting up a VTH in continental Europe. Indeed, such a change in forward markets involves uncertainties for traders, with a real possibility of liquidity splits, and an increase in transaction costs as well as eventually in electricity bills.

It is also worth noting that power exchanges could already calculate hub prices for multiple bidding zones and that market participants could already use complex formulas in OTC deals and PPAs using prices from multiple zones to calculate an alternative reference price – along the lines of the VTH concept. This possibility is however not used, since it currently remains more cost-efficient to transact on existing physical hubs. Should a need for forward/future contracts based on synthetic forward prices emerge in continental Europe, we trust that the market will develop products to match these needs, as we have seen in the three decades since the start of electricity market liberalisation.

Furthermore, different options can be considered to improve cross-zonal capacity allocation and forward markets liquidity in continental Europe, as also reflected in past Eurelectric and Energy

Traders Europe positions. Measures discussed during the workshop include increasing the auction frequency of zone-to-zone LTTRs, having longer contract maturities to align LTTRs with the hedging needs of market participants and creating secondary markets for LTTR trading to reallocate capacity rights in accordance with market needs. In addition, the introduction of voluntary market making should be considered to allow market makers to actively drive liquidity on forward markets.

Finally, high collateral requirements and unpredictable margin calls during crisis situations disincentivise forward market transactions. In line with recent changes to the European Market Infrastructure Regulation (EMIR 3.0), future implementing rules should improve collateral regimes and support market participants in these situations.

Considering the limited benefits identified through quantitative analysis in the Compass Lexecon study, we call on the European Commission to focus their impact assessment on solutions tailored to the actual challenges encountered and avoid introducing any unnecessary complexity. We also invite the European Commission to run a formal public consultation towards the end of their impact assessment to test their analysis and conclusions with stakeholders before considering a revision of the Forward Capacity Allocation Guideline.

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Energy Traders Europe is the voice of Europe's energy traders. We promote competition, transparency and open access in the European energy sector. We build trust in power and gas markets across Europe, so that they may underpin a sustainable and secure energy supply and enable the transition to a carbon neutral economy.

For more information: www.energytraderseurope.org

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Eurelectric is the federation of the European electricity industry. We represent more than 3,500 European utilities active in electricity generation, distribution and supply.

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