

ENERGINET
Systemansvar

Energinet
Tonne Kjærvej 65
DK-7000 Fredericia

+45 70 10 22 44
info@energinet.dk
CVR-nr. 39 31 49 59

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Forfatter:
HWM/HWM

Explanatory note

IMPROVED HEDGING POSSIBILITIES IN DK1 AND DK2

1. Introduction

The aim of the Commission Regulation (EU) 2016/1719 of 26 September 2016 establishing a Guideline on Forward Capacity Allocation (hereinafter “FCA Regulation”) is to promote the development of liquid and competitive forward markets in Europe, and to provide market participants with possibilities to hedge their risk in more liquid neighboring bidding zones. To deliver these objectives, several steps are required.

One of these steps is to ensure sufficient cross-zonal risk hedging opportunities. The competent regulatory authorities (Hereinafter “NRAs”) are obligated to assess if there are sufficient hedging opportunities for market participants in the concerned bidding zones if TSO’s do not offer LTTR’s. LTTR’s are not offered between DK1-SE3 and DK2-SE4, and hence pursuant to Article 30 of the FCA Regulation the relevant NRA’s have completed an assessment of the hedging opportunities. The Danish NRA’s (Hereinafter “DUR”) conclusion was that there are insufficient hedging opportunities available for Danish market participants in DK1 and DK2.

The Arrangements for hedging opportunities shall pursuant to Article 30(6) be submitted for approval by DUR no later than six months after the request by the competent NRA to the relevant TSOs as referred to in Article 30(5)(b) of the FCA Regulation. In this case DUR and Energinet have agreed a deadline of 31. July 2023.

Transmission System Operator, Energinet has developed a proposal for Arrangements to ensure cross-zonal risk hedging opportunities (Hereinafter referred to as “Arrangements for hedging opportunities”).

2. Legal requirements and interpretation

This chapter contains references to relevant articles in the FCA Regulation and the decisions by the relevant NRAs. Furthermore, a description is given on how the articles are interpreted to set the scope for the Arrangements for hedging opportunities.

Article 30 of the FCA Regulation provides the following:

“1. TSOs on a bidding zone border shall issue long-term transmission rights unless the competent regulatory authorities of the bidding zone border have adopted coordinated decisions not to issue long term transmission rights on the bidding zone border. When adopting their decisions, the competent regulatory authorities of the bidding zone border shall consult the regulatory authorities of the relevant capacity calculation region and take due account of their opinions.

2. Where long-term transmission rights do not exist on a bidding zone border at the entry into force of this Regulation, the competent regulatory authorities of the bidding zone border shall adopt coordinated decisions on the introduction of long-term transmission rights no later than six months after the entry into force of this Regulation.

3. The decisions pursuant to paragraphs 1 and 2 shall be based on an assessment, which shall identify whether the electricity forward market provides sufficient hedging opportunities in the

concerned bidding zones. The assessment shall be carried out in a coordinated manner by the competent regulatory authorities of the bidding zone border and shall include at least:

(a) a consultation with market participants about their needs for cross-zonal risk hedging opportunities on the concerned bidding zone borders;

(b) an evaluation.

...

5. In case the assessment referred to in paragraph 3 shows that there are insufficient hedging opportunities in one or more bidding zones, the competent regulatory authorities shall request the relevant TSOs:

(a) to issue long-term transmission rights; or

(b) to make sure that other long-term cross-zonal hedging products are made available to support the functioning of wholesale electricity markets.

6. In case the competent regulatory authorities choose to issue a request as referred to in paragraph 5(b), the relevant TSOs shall develop the necessary arrangements and submit them to the competent regulatory authorities' approval no later than six months after the request by the competent regulatory authorities. Those necessary arrangements shall be implemented no later than six months after approval by the competent regulatory authorities. The competent regulatory authorities may extend the implementation time upon request from the relevant TSOs by a period of no more than 6 months. ...

8. Upon a joint request of the TSOs on a bidding zone border or at their own initiative, and at least every 4 years, the competent regulatory authorities of the bidding zone border shall perform, in cooperation with the Agency, an assessment pursuant to paragraphs 3 to 5."

The relevant NRA decisions provide the following:

"AFGØRELSE

Forsyningstilsynet træffer afgørelse om, at Energinet Systemansvar A/S (CVR nr. 28980671) skal sikre, at andre langsigtede afdækningsprodukter vedrørende overførselskapacitet stilles til rådighed for at understøtte engroselectricitetsmarkedernes funktion.

Forsyningstilsynets afgørelse er truffet i henhold til Artikel 30, stk. 5, litra b, og artikel 30, stk. 8 i Kommissionens forordning (EU) 2016/1719 af 26. september 2016 om fastsættelse af retningslinjer for langsigtet kapacitetstildeling (FCA GL)."

2.1 Interpretation and scope of the Arrangements for hedging opportunities

Firstly, it should be noted that the assessment conducted by DUR concluded that there are insufficient hedging opportunities in the two Danish bidding zones DK1 and DK2.

Secondly it should be noted that DUR's decision is not to issue long-term transmission rights on the bidding-zone borders DK1-SE3 and DK2-SE4. The TSO's should instead focus on ensuring that other long-term cross-zonal hedging products are made available to support the functioning of the wholesale electricity markets.

Based on the above Energinet have the responsibility to support the financial markets and increase hedging opportunities in DK1 and DK2. The increased hedging opportunities should in theory lower the risk premiums paid by the end-consumers and generators when hedging their price risk in the energy market.

However, it is important to emphasize that the arrangements should be put in place to enhance power generators and consumers hedging opportunities against price risk and that TSO's cost associated with supporting financial markets will ultimately be covered through transmission network tariffs. Therefore, the arrangements that mainly contribute to speculative market participants profit, are not well suited to solve this task.

If this support doesn't benefit tariff customers sufficiently, in terms of improved hedging opportunities, then the TSO will have created unintended redistribution between end-customers and speculative agents, and this is not the TSOs responsibility or goal – nor is it the goal of the FCA regulation.

Lastly but of particular importance, the TSOs must not undermine the market's ability to solve issues by itself. Only when the market cannot solve issues and it has a negative impact on end-customers it would be justified for the TSOs to intervene if decided by the concerned NRAs. This implies that TSO's would also have to take future expected market adjustments, like new products, new market participants, new financial exchanges into consideration before new hedging arrangements shall be introduced.

In short, the purpose of the TSOs intervention in the financial markets is to ensure socio-economic efficient hedging opportunities for producers and consumers.

3. Current long term market setup

In the Nordic region the current financial markets are structured around a common Nordic financial System price contract and Electricity Price Area Differentials (hereinafter "EPADs" contracts). In combination these contracts are used as a perfect baseload hedge for the day-ahead price risk in the different bidding zones within the Nordics. There are however some issues within the EPAD system and Vattenfall left the role as a market maker for the Swedish bidding zones in 2021.

The day-ahead System price is a virtual price and can be interpreted as the common Nordic price if there were no limitations on physical flows between the Nordic bidding zones. This virtual System price for the Nordic region is calculated every day for each hour by the day-ahead market algorithm alongside the individual hourly area-prices for the different bidding zones. Previously the system price could be used quite effectively by market participants to proxy hedging due to high correlations between Nordic bidding zones and the System price. According to market participants it is no longer the case as a result of the correlations are not at a sufficiently high level anymore.

An EPAD is defined as the average price differential between the area-price of the EPAD bidding zone and the day-ahead system price. These financial contracts give consumers and producers the possibility to hedge the volatility of the day-ahead market and thereby achieve a fixed baseload price.

Financial contracts in the form of Nordic EPAD-futures are typically traded on Nasdaq OMX Commodities (hereinafter "Nasdaq"). It is also possible to trade Nordic futures on the exchange European Energy Exchange (hereinafter "EEX"). However, on EEX the contracts listed are limited to financial system price contracts while Nasdaq also offers EPAD contracts.

This implies no price spread product between DK1/DK2 and Germany, DK1-Holland and between DK1-DK2 are currently listed on the power exchanges. But it is possible to combine EPADs between Nordic bidding zones or EPADs (+System price) and forwards in Germany/Netherlands to

effectively buy a price spread between the concerned bidding zones. For this hedge to work properly the forward market needs to be liquid in the concerned zones.

Long term transmission rights

Energinet offer Long Term Transmission rights (hereinafter “LTTRs”) on the following borders: DK1-NL, DK1-DE/LU, DK1-DK2 and DK2-DE/LU. Currently Energinet offer a monthly and a 1 year ahead product. LTTRs are offered as an option which gives the owner the option to receive the market spread in one direction between two neighboring bidding zones.

Market participants can use LTTRs to get access to a neighboring bidding zone forward market (there might be more liquid) or simply to speculate in future day ahead market spreads.

Monthly LTTR products are auctioned once a month and yearly products are auctioned once or twice a year depending on the border. The auctions take place at Joint Allocation Office (hereinafter “JAO”) and Energinet is offering a fixed amount of MW for each product and are price takers. It is possible for market participant to return part of previously bought yearly LTTRs at the auctions (next month price spreads). Market participants do not have access to a secondary market, where they can sell LTTRs continuously.

ACER’s policy paper from February 2023¹ and the European Commission article 9 Electricity market design reform² includes proposed adjustments to the LTTR product to better fit the financial markets need. It is recommended to have more frequent LTTR auctions, more LTTR maturities (longer maturities or other times frames), full financial firmness and LTTRs should be offered as obligations instead of options.

Lastly it is as part of the marked design reform proposed by the European Commission to create regional Virtual hubs. Currently it is uncertain if this proposal will be adopted and therefore it is not considered further in this report.

There are in general support from the market participant to the proposed adjustments, apart from the obligation measure and the regional virtual hub.

4. Expected changes to the current Nordic forward market

The current forward setup in the Nordic region is going to change substantially from Q4 2023 and onwards in terms of forward products available for market participants in the Nordic bidding zones and which Power Exchange Nordic forward products are listed at. As mentioned previously currently EPADs and the System price are the forward products in the Nordic area, and they are listed at Nasdaq.

EEX and Nasdaq announced on the 20 June 2023 that EEX intends to take over Nasdaq’s European power and environmental trading and clearing business. Subject to receipt of customary regulatory approvals, the transaction will involve the transfer of existing open positions in Nasdaq’s Nordic, French, and German power futures as well as European carbon emission allowance futures (EUAs) to EEX’s clearing house ECC. EEX will update the current Nordic power market structure, replacing Electricity Price Area Differential (EPAD) contracts with zonal futures contracts.

EEX will list future price spreads products between bidding zones, also to Germany, which by far is the most liquid forward market in Europe.

¹ [Electricity Forward Market PolicyPaper.pdf \(europa.eu\)](#)

² [eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52023PC0148](#)

The forward price spread product will give market participants the opportunity to hedge between bidding zones by buying a single purely financial product. It will basically be a LTTR with full financial firmness and as an obligation. The EEX product will to a large extent be in line with ACER's policy paper and EU-Commission Electricity market design proposal on the forward market.

Energinet note, that EEX hasn't requested support from any of the Nordic TSOs to foster liquidity in the Nordic forward market. Energinet interpret it as EEX expects to be able to create liquidity in the Nordic forward market on their own.

Market participants have indicated strong support for EEX new outright future products in the Nordic area in bilateral meetings with Energinet.

This expected change to the forward market in the Nordics can contribute to improve hedging opportunities for market participants in DK1 and DK2 without TSO involvement.

In addition to a new power exchange entering the Nordic forward market, there will be substantial changes to the physical grid connection to a neighboring country in course of the next year.

A new 1,4 GW interconnector between DK1 and UK, Viking Link, is expected to go online January 2024. Currently Energinet doesn't offer LTTR on that particular border since there're no interconnector. LTTR's on that border could increase UK market participants hedging possibilities in DK1 and Danish market participants hedging opportunities in UK.

5. Analysis done by Energinet

Since there is no description or definition of "other long-term cross-zonal hedging products" as given in Article 30(5)(b) of the FCA Regulation, the range of possible products can be considered wide. The objective of the FCA Regulation is to ensure efficient hedging opportunities for producers and consumers to hedge their future price risk.

There are potentially several different products that may be implemented to meet the NRAs request. When deciding which way to go ahead it is important to stress that the main aim is to increase hedging opportunities in the Danish bidding zones where there are insufficient hedging opportunities. Overall, there are four different ways to improve liquidity:

- 1) Improve connection to a bidding zone with the most liquid forward market.
- 2) Offer LTTR on new physical connections.
- 3) Improve connection between DK1 and DK2 so the Danish forward market is stronger connected.
- 4) Improve liquidity within DK1 and DK2 by market making.

In the next sections we will cover each possibility more in detail.

5.1 Improve connection to a bidding zone with a liquid forward market

The idea here is to connect the Danish bidding zones closer to more liquid forward markets adjacent to the concerned Danish bidding zones. This will give the market participants in DK1 and DK2 the opportunity to use the neighboring forward market in combination with LTTR's to do a full baseload price hedge.

Firstly, it is important to connect stronger to a liquid bidding zone. In this case it is natural to look to the Germany forward market since both DK1 and DK2 are connected to Germany which is by distance the largest and most liquid forward market in Europe.

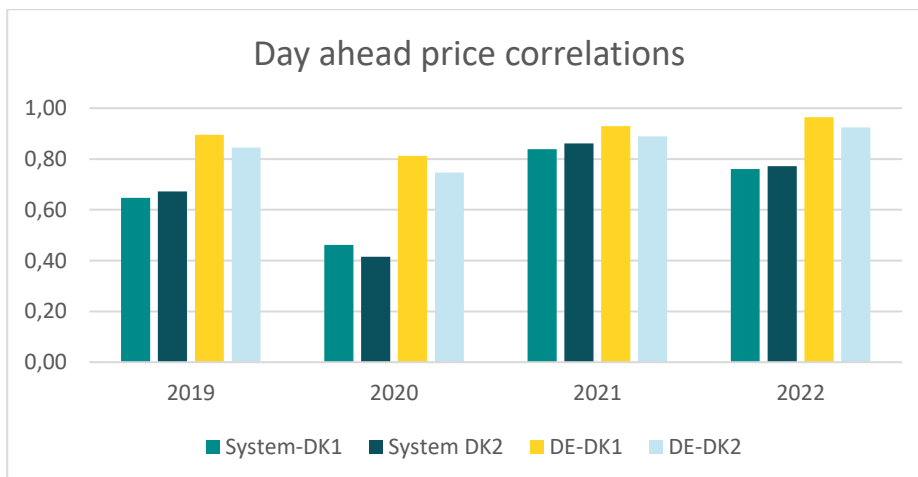
The Churn factor (total traded forward volumes divided by power consumption in the concerned bidding zones) in Germany is around 8 and in the Nordic area, all Nordic bidding zones combined, is a bit over 2.

Churn factors in major European forward markets – 2017-2021



Source: Market Monitoring report 2020 (europa.eu)

Lastly ACER and EU commission point at correlations to the connected bidding zone (or hub) be important for the success of a long term market framework. The Danish bidding zones are more correlated to the German bidding zone than to the System Price.



Source: Own calculations. Data from ENTSO-E transparency platform.

There are multiple ways the stronger connection can be done all of them are in line with ACER's and the European Commission's proposal:

- 1) Offering larger amounts of LTTR's.
- 2) More frequent auctions and hence more dates where hedging can take place for market participants. Can work as a proxy for a secondary market.
- 3) Other maturities. Currently Energinet offer monthly and yearly LTTR. It could be extended in several ways like to quarterly and/or Y+2.

5.2 Offer LTTR on new connections

Energinet expect the commissioning of DK1-UK interconnector, Viking Link, will take place around January 2024. It gives Energinet the opportunity to introduce LTTR between DK1 and UK, and hence provide new hedging opportunities for market participants in DK1 and UK and it would link DK1 to a large bidding zone with a relatively well functioning forward market.

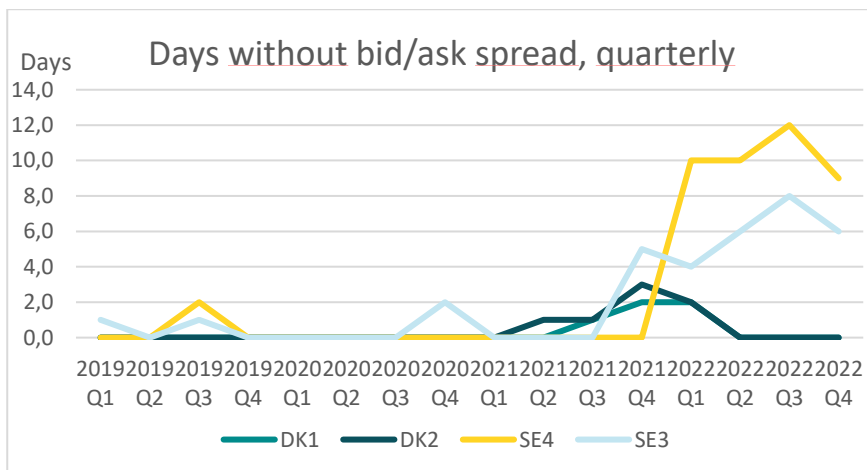
It is not possible to measure the relevant day-ahead correlation between DK1 and UK, since it would change quite a lot (and increase) after the commissioning of 1,4 GW Viking Link, connecting the two bidding zones much stronger than today.

5.3 Stronger connection between DK1 and DK2

Small bidding zone can face issues related to liquidity in the forward market since there typically are fewer market participants in smaller zones compared to larger zones. Therefore, it can make sense to connect internal bidding zones more in terms of the three measures presented above, larger LTTR quantities, more auctions, and more maturities on DK1-DK2 border.

5.4 Improve liquidity within DK1 and DK2 by market making

The concept behind this market making measure is to ensure there are forward prices in DK1 and DK2 at sufficiently narrow bid-ask spread. As it is shown in the graph below there are bid ask spreads in DK1 and DK2 for EPADs at Nasdaq (here front quarter epad is shown), so the aim here would be to narrow the spread.



Source: Own calculations. Data from Nasdaq.

Energinet note Power exchanges can decide to hire market makers who are obligated to deliver a narrower bid-ask spread to increase liquidity and hence the Power Exchanges revenue. From an economic perspective it seems logical that the reason it hasn't happened for the EPADs in DK1 and DK2 could be due to low expected extra liquidity compared to the extra market maker cost for the power exchanges.

There is currently a commercial market maker operating in the forward market at Nasdaq in DK1 and DK2.

Furthermore, it is important to highlight that a commercial power exchange is entering the Nordic market later in 2023 without asking for TSO involvement. From an Economic perspective it would only make sense if EEX expects to be able to foster liquidity in the Nordic forward market.

6. Interaction with market participants

There has been interaction with market participants on at three different occasions.

First Energinet presented the task and possible solutions at Elaktørforum on the 30 March 2023.

Here the main outcome from the interaction was that EEX mentioned they internally were in a process considering entering the Nordic forward market. But no decision had been made.

Second interaction with market participant was through a survey where market participants could share their view on how to create more liquidity in Danish forward markets or better hedging opportunities through closer connection to adjacent bidding zones.

Here the main outcome of the survey was that larger amounts of LTTR offered by Energinet would have the largest impact on hedging opportunities. Around 60 pct. of the market participants answered it would at least have a moderately impact on hedging opportunities. Market participants valued other measures such as Full financial firmness, opportunity to resell LTTR and other maturities less effective. They all got between 40-50 % answering at least a moderate impact on hedging opportunities, while more auctions and offering LTTR as an obligation got the lowest support at around 20-25%.

Almost 60% of the market participant answered that the market could solve the liquidity challenge itself.

In addition, market participants emphasized that:

- LTTR to UK or Norway could be an efficient way to improve the liquidity. This would enable market participants to more effectively hedge their positions given that LTTR are not available on SE-DE cables.
- The System price and EPADs are outdated and created double transaction fees and there's a need for one forward product in each zone.
- Financial spread products traded at power exchanges and bidding zone futures have significant benefits in comparison to LTTRs: Not limited in quantity, financially firm secondary market exist, additional and longer maturities exist, no financial risk for the TSO.
- Energinet should try to minimize collateral calls at Nasdaq, give more money to market makers and participate in EPAD-auctions.

Third interaction was bilateral meetings. Market participant was invited to bilateral meetings with Energinet. The idea behind bilateral meetings was to gather few people in the room to have a more open discussion about the forward market.

The outcomes of the meetings were, in line with the survey. Most emphasis was on expected changes to the current forward market in terms of outright futures for DK1 and DK2 listed at a power exchange could improve liquidity in the Nordics because market participants find it easier to hedge if fewer trades are needed (don't need also to buy the System price) and as a result the liquidity in fewer products are required.

Market participants also argued that the System price unfortunately is outdated for proxy hedging purposes due low correlations to the Nordic bidding zones. It is a result of large price

discrepancies across the Nordic region and the low correlations are expected to continue looking ahead.

Some market participants in the bilateral meetings expressed a view for a way forward should be not to engage in market making activities before it is clear if EEX or Nasdaq are able to change the liquidity situation on their own.

Lastly market participants pointed at LTTR at DK1-UK and/or at DK1-Norway could foster the liquidity in the Danish bidding zones along with larger LTTR quantities and other maturities.

7. Proposal

After a profound assessment Energinet proposed to offer LTTR on the DK1-UK border. Energinet propose to offer monthly, yearly, and at least one additional maturity, quarterly, and approximately 1,2 GW LTTR (0,6 GW in both directions) on the DK1-UK border.

It is in line with request from market participants who stressed it is a very promising opportunity to connect the Danish and UK forward markets much more closely together than today.

This proposal will increase the total LTTR volumes offered by Energinet by approximately 40% from 3,1 GW to 4,3 GW. Larger amount of LTTR offered by Energinet was deemed the most important improvement by the market participants.