Exploring opportunities to improve hedging

Insights from TenneT

Contents

1 Executive summary

Pursuant to ACERs decision 02-2025, TenneT is required to investigate improving hedging opportunities available to Dutch market participants who aim their risks related to uncertain future electricity prices in the Dutch bidding zone. The main instrument TenneT has at its disposal to improve such hedging opportunities are LTTRs issued on the DE-NL, BE-NL and DK1-NL bidding zone borders. This investigation focusses on these instruments.

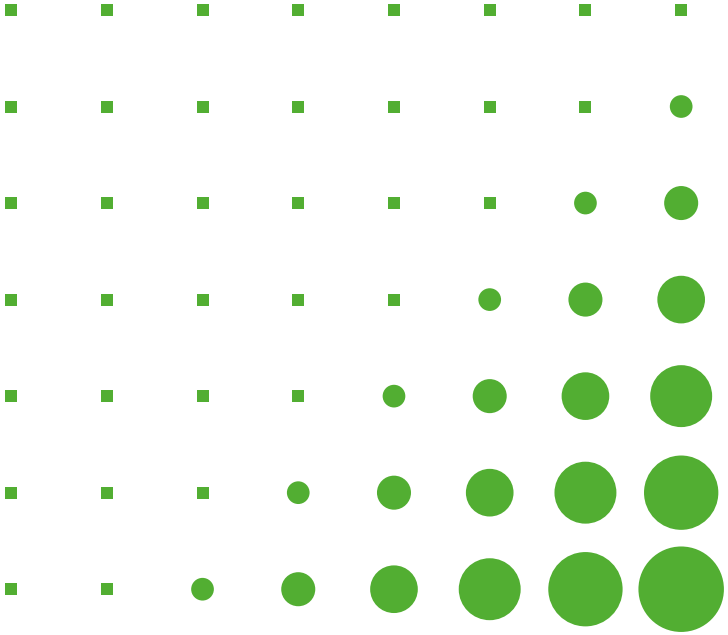
Future electricity price risks are most commonly hedged by obtaining a forward contract. A diverging price risk (or basis risk) is introduced when the forward contract obtained for the purpose of hedging is linked to a different bidding zone then the bidding zone where the hedging party is active. The role of TSOs is to issue LTTRs which aim to bridge the price difference between bidding zones, thereby addressing the diverging price risk. As such, the effectiveness of LTTRs as hedging instruments can only be assessed in relation to the effectiveness of hedging opportunities that are in a bidding zone alternative to the bidding zone where the market participants are active. Finally, LTTRs only support hedging opportunities when they are procured by market participants for the hedging purposes, and not when they are procured solely for speculative purposes.

TenneT concludes that the German forward market offers an attractive alternative to the Dutch forward market to hedge risks related to exposure to future electricity prices in the Netherlands. TenneT, in collaboration with bordering German TSOs, currently offers LTTRs on the DE-NL bidding zone border to help mitigate the diverging price risk. This improves hedging opportunities available to Dutch market participants. TenneT concludes that further improvement of LTTRs on the DE-NL bidding zone border could result in improved hedging opportunities. This could be achieved by increasing LTTR auction frequency and by increasing time-to-maturity of LTTRs on this border. Furthermore, TenneT sees that increasing volume of LTTRs on the DE-NL bidding zone border could also lead to improved hedging opportunities, though this needs further assessment.

TenneT concludes that the forward markets for the bidding zones Belgium and Denmark 1 lack hedging opportunities themselves. Therefore, the forward markets for these bidding zones do not provide an attractive alternative to the Dutch forward market. Improving LTTRs that are currently offered on the BE-NL and DK1-NL bidding zone borders is therefore unlikely to result in improved hedging opportunities for Dutch market participants.

Despite the absence of a positive impact on hedging opportunities, implementing increased auction frequency and time-to-maturity for LTTRs on DK1-NL and BE-NL bidding zone border is still recommendable, for reasons of attracting additional interest. For the bidding zone border DK1-NL, TenneT and Energinet this has been implemented as of 2024.

Regarding the identified possible improvements to LTTRs on the DE-NL and BE-NL bidding zone borders, TenneT observes that in the forward electricity market, developments in the form of Long Term Capacity Calculation (“ LTCC”) and Long Term Flow Based Allocation (“LTFBA”) are ongoing. Once live (current expectation: 2026), LTCC and LTFBA will take over the role of individual TSOs to decide on volumes of LTTRs and on auction frequency and time-to-maturity of LTTRs. This means that possible improvements to LTTRs on the DE-NL bidding zone border, as identified by TenneT in this investigation, will no longer be for the consideration of TenneT and bordering TSOs. Instead, the identified measures to improve LTTRs will be governed on a pan-European basis. Therefore, recommending to implement the identified improvements to LTTRs on the DE-NL and BE-NL bidding zone borders is blocked by the implementation of LTCC and LTFBA.



Overview of assessed LTTR improvements

TenneTs view on whether improvements to LTTRs lead to improved hedging opportunities for Dutch market participants:

Improvement Border	Increase auction frequency	Increase time between auctions and maturity	Increase LTTR volume
DE-NL • Highly liquid • High correlation (0.934 in 2023)	Hedging opportunities will improve. (!) + More auctions equals more opportunities to assess and mitigate price risks + Likely to improve auction results ! *Conflicts with LTFBA*	Hedging opportunities will improve, but implement with caution. (!) + Longer time to maturity gives MP to hedge their risks with more time in advance - A too long lead time will decrease interest from MP ! *Conflicts with LTFBA*	Inconclusive if hedging opportunities will improve. (?) • If demand for DE-NL LTTRs is saturated with current volume of LTTRs, then adding LTTRs does not achieve improving hedging opportunities • Data on demand for DE-NL LTTRs and on amount of proxy-hedging is not available ! *Conflicts with LTCC*
BE-NL • Not liquid • High correlation (0.930 in 2023)	Hedging opportunities will not improve, although worthwhile to implement. (!) + More auctions equals more opportunities to assess and mitigate price risks + Likely to improve auction results ! *Conflicts with LTFBA*	Hedging opportunities will not improve, although worthwhile to implement in tandem with increased auction frequency. (!) - A too long lead time will decrease interest from MP ! *Conflicts with LTFBA*	Hedging opportunities will not improve. (x) - Higher volume of LTTRs results in lower auction prices & results ! *Conflicts with LTCC*
DK1-NL • Not liquid • Moderate correlation (0.855 in 2023)	Hedging opportunities will not improve. (√) + More auctions equals more opportunities to assess and mitigate price risks + Likely to improve auction results This has already been implemented by TenneT and Energinet in 2024.	Hedging opportunities will not improve, although worthwhile to implement in tandem with increased auction frequency. (√) + Longer time to maturity gives MP to hedge their risks with more time in advance - A too long lead time will decrease interest from MP This has already been implemented by TenneT and Energinet in 2024.	Hedging opportunities will not improve. (x) - Higher volume of LTTRs results in lower auction strike price

(√) This improvement should be implemented, and can be implemented
(!) This improvement should be implemented, but cannot be implemented (due to LTCC/LTFBA)
(?) Its inconclusive whether this improvement should be implemented, and cannot be implemented (due to LTCC/LTFBA)
(x) This improvement should not be implemented.

2 Regulatory background & legal process

2.1 Procedure before the ACM

On the 16th of August 2024, the Dutch National Regulatory Authority ("ACM") and the Norwegian Energy Regulatory Authority ("NVE-RME") issued a request to the Agency for the Cooperation of Energy Regulators ("ACER") to adopt a decision regarding possible measures either under article 30(5)(a) or under article 30(5)(b) COMMISSION REGULATION (EU) 2016/1719 of 26 September 2016 establishing a guideline on forward capacity allocation ("FCA Regulation"), specifically for the bidding zone border NL-NO2 ("ACM decision").[1]

The ACM decision consists of two parts: an assessment for liquidity in the Dutch electricity forward market,[2] pursuant to article 30(3) FCA Regulation ("ACM liquidity assessment") and the conclusion that ACM and NVE-RME couldn't agree on the type of cross-zonal support measures as specified in article 30(5) FCA Regulation. This second part of the ACM decision was subsequently forwarded to ACER.

2.2 Procedure before ACER

Following the ACM decision, ACER issued decision 02-2025 on the 12th of February 2025 concerning risk hedging opportunities for the NL and NO2 bidding zones ("ACER decision"). ACER decided, pursuant to article 30(5)(a) FCA Regulation that on the border between bidding zones NL and NO2 the respective TSOs TenneT TSO B.V. ("TenneT") and Stattnet SF ("Stattnet") will not issue Long Term Transmission Rights ("LTTRs"). Instead, ACER decided that TenneT shall make sure that other long-term cross-zonal hedging products are made available to support the functioning of wholesale forward electricity markets, pursuant to article 30(5)(b) FCA Regulation.

Following article 30(6) FCA Regulation, TenneT shall develop the necessary arrangements and submit them to the competent regulatory authority, ACM, for approval. This document describes the investigation of possible development of such arrangements.

[1] *ACM Decision to ACER: ACM-site.*
[2] *ACM's liquidity assessment: ACM-site.*

3 Market needs & context

To understand what possible arrangements need to be developed, the ACM liquidity assessment must be observed. In this report, ACM investigated the need for hedging instruments in the Dutch forward electricity market (chapter 2.1), assessed whether the available hedging opportunities are adequate and efficient to cover the risks of volatile electricity prices within the Dutch bidding zone (chapter 2.2) and draw conclusions on the results (chapter 2.3). The subsequent decision was referred to ACER (chapter 2.4).

3.1 Assessing the need for hedging opportunities

The first element of the ACM decision is a consultation among market participants about their needs for cross-zonal risk hedging opportunities on the concerned bidding zone borders (article 30(3)(a) FCA Regulation). Market participants indicated that:

- Hedging instruments (electricity contracts for forward delivery, such as yearly, quarterly, monthly products) are used to manage trading positions and/or risks in the portfolios;
- There is a need for additional hedging instruments;
- Most respondents indicate that the Dutch bidding zone experiences liquidity problems; one response indicates that the long-term market offers adequate hedging opportunities for the Dutch bidding zone;
- All responding market participants indicate that transmission rights are used for hedging and are an important tool to improve hedging opportunities;

Based on the above mentioned consultation responses, ACM comes to the conclusion there is a need for cross-zonal risk hedging opportunities for the bidding zone border NO2-NL.

3.2 Assessment of current hedging opportunities

ACM assessed whether the currently available hedging opportunities are sufficient and efficient. The purpose of the assessment is to determine whether the products that are offered for the Dutch bidding zone can be considered an appropriate hedge against the risk of change of the day-ahead price of the Dutch bidding zone. The assessment considers forward products for the Dutch bidding zone, and excluded proxy hedges (via neighboring bidding zones and/or via natural gas forward contracts) and cross-border support measures by TSOs. For the assessed products, ACM concludes that they form an appropriate hedge against the risk of change in the Dutch day ahead price.

ACM also assessed the efficiency of hedging opportunities, by assessing various liquidity indicators, listed in article 30(4) FCA Regulation, such as trading horizon, bid-ask spread, churn rates, open interest in relation to physical consumption. Based on the assessment of the various indicators, ACM concludes that there is insufficient basis to be able to conclude that there is a sufficient degree of liquidity. Taking this into consideration, ACM cannot conclude that the hedging instruments (mentioned in paragraph 3.1) are efficient.

3.3 Conclusion of the ACM liquidity assessment

The ACM concluded:

- There is a need for cross-zonal risk hedging opportunities for the bidding zone border NO2-NL;
- The products that are offered for the Dutch bidding zone represent appropriate hedges against the risk of change in the Dutch day-ahead price;
- ACM cannot conclude that these products are efficient.[3]

Based on the these findings ACM concludes that there is insufficient basis to be able to conclude that the electricity forward market provides sufficient hedging opportunities for the Dutch bidding zone.

Next, ACM was to request TenneT, based on article 30(5) FCA Regulation, (i) to issue transmission rights on bidding zone border NL-NO2, or (ii) to make sure that other long-term cross-zonal hedging products are made available to support the functioning of wholesale electricity markets. This decision needs to be coordinated amongst ACM and NVE-RME (the Norwegian regulator). Nevertheless, ACM and NVE-RME couldn't come to a coordinated decision and the request was forwarded to ACER. This resulted in the ACER decision.

3.4 ACER decision

ACER decided that TenneT shall not issue LTTRs on bidding zone border NL-NO2 (article 30(5)(a) FCA Regulation). Instead, ACER decided that TenneT shall make sure that other long-term cross-zonal hedging products are made available to support the functioning of the wholesale electricity market (article 30(5)(b) FCA Regulation), and requested TenneT to do so, following article 30(6) FCA Regulation.

[3] *ACM Decision to ACER, recital 66: ACM-site.*

4 Improving cross-border hedging tools

Pursuant to article 30(6) FCA Regulation, TenneT shall develop the necessary arrangements and submit them to the competent regulatory authorities' approval no later than six months after the request. This chapter describes TenneTs investigation to develop the necessary arrangements.

Measures that will be investigated for improvement are the LTTRs that are currently issued by TenneT. First, it will be explained how LTTRs can contribute to hedge future price risk, which is the aim of the FCA Regulation (chapter 4.1).[4] Secondly, improvements of LTTRs will be investigated for the bidding zone borders on which TenneT issues LTTRs, which are DE-NL (chapter 4.2), BE-NL (chapter 4.3) and DK1-NL (chapter 4.4). LTTRs on the bidding zone border NL-NO2 will not be considered, since these have been rejected in the procedures preceding this investigation, specifically in the ACER decision (see paragraph 3.4 above).

In its decision, ACER also mentions market making as an alternative to support the forward market. To this, ACM replied that market making is not a cross-border measure and, as such, falls outside of the scope of article 30(5) FCA Regulation. This interpretation was confirmed in a bilateral meeting between TenneT and ACM. Therefore, market making will not be further considered in this investigation.

4.1 How can LTTRs contribute to hedging opportunities?

The aim of the FCA Regulation is to develop efficient hedging opportunities to mitigate future price risk in the bidding zone where the market participants operate.[5] These future price risks are mitigated/hedged through forward contracts, which are traded by market participants in the organized markets and on bilateral basis. The uncertain future prices and forward contracts, the forward contracts are both linked to a specific bidding zone.

In this respect, it must be noted that forward markets related to different bidding zones can have various degrees of market liquidity, therefore can offer various degrees of hedging opportunities. As per ACM conclusion, the Dutch market is not sufficiently liquid and offers only few hedging opportunities, whilst other forward market offer more hedging opportunities.

It is easier, thus less costly, to obtain a forward contract in a liquid market. Therefore, it can be attractive to obtain a forward contract in a forward market that is linked to a bidding zone in which a market participant is not active.

Obtaining a forward contract in a bidding zone in which a market party doesn't operate results in an imperfect hedge (a practice known as proxy-hedging). The market participant is exposed to electricity prices in the bidding zone it is located in, while the proxy-hedge offers risk mitigation based on the electricity price in the bidding zone of the forward contract.

[4] *Whereas, section 3, FCA Regulation.*
[5] *Whereas, section 3, FCA Regulation.*

The remaining risk consists of diverging electricity prices between the bidding zones and is referred to as a diverging price risk (or simply "basis risk"). The magnitude of the diverging price risk can be analyzed by assessing the correlation between electricity prices in the respective bidding zones.

FCA Regulation addresses the diverging price risk by having TSOs develop instruments that help market participants mitigate this risk, such as LTTRs. These LTTRs function as instruments that effectively hedge the price difference between bidding zones.

The conclusion is that LTTRs do not provide a hedge against uncertain future prices. Instead, LTTRs provide a hedge against diverging future electricity prices between bidding zones. This means that the effectiveness of LTTRs on a given bidding zone border, must be assessed in relation to the availability and effectiveness of hedging opportunities (forward contracts) that are offered on the other side the bidding zone border.

Lastly, it must be kept in mind that the LTTRs issued by TenneT and the respective bordering TSOs are financial instruments (as opposed to physical instruments). The holder of the LTTR receives a certain amount of money, equal to the (positive) difference in electricity prices. While LTTRs can be obtained for the purpose of risk-hedging as described above (fundamental purpose), LTTRs can also be obtained for the purpose of speculation. In this case, the procurer of the right speculates that the price it pays will be lower than the pay-out it receives. If LTTRs are procured for a speculative purpose instead of a fundamental purpose, then the LTTR will not effectively contribute to improved hedging opportunities.

4.2 Improvements to existing LTTRs on the DE-NL bidding zone border

In its decision, ACER invites TenneT to investigate LTTRs on the German bidding zone border. First, it needs to be assessed if the German forward market is relevant for proxy-hedging for Dutch market participants.

As stated by ACER, the German forward market shows the highest liquidity in the EU forward electricity market.[6] In addition, price correlation between NL and DE is high, at 0.943/0.955 in 2023/2024.[7] This combination makes proxy hedging in the German forward market an attractive alternative for obtaining a forward contract in the Dutch forward market. This was also highlighted by ACER in its decision. As such, improving LTTRs issued on the DE-NL bidding zone border is likely to result in improve hedging opportunities for Dutch market participants.

There are several ways to improve LTTRs on the DE-NL bidding zone border. Most notably:

- Increase auction frequency (4.2.1);
- Increase time-to-maturity (4.2.2);
- Increase volumes of LTTRs (4.2.3);

For all possible improvements above it must be noted that TenneT cannot implement these on its own, as LTTRs on this bidding zone border are issued in collaboration with the German TSOs Amprion GmbH and TenneT TSO GmbH who are responsible for the German grid connected to the Netherlands ("bordering German TSOs").

4.2.1 Increase LTTR auction frequency

The current LTTRs on the DE-NL bidding zone border are structured as yearly products and monthly products, which are linked to all hours within a year or month, respectively. These yearly and monthly LTTRs are sold in one yearly product auction and twelve monthly product auctions.

[6] *See ACER Market Monitoring 2023 Progress of EU electricity wholesale market integration, page 13.*

[7] *Annex 1: Price correlations.*

Increasing auction frequency provides market participants more opportunities to obtain LTTRs.[8] This provides market participants more opportunities to assess the diverging price risks in their portfolio and to use LTTRs to mitigate those risks.

In case of a higher auction frequency, the resulting LTTR volume per auction should be considered and participation should be carefully monitored. With sufficient LTTR volume per auction, an increased auction frequency could result in increased interest from market participants, expressed by the bid volume in all auctions combined, and positively impacting auction results. However, auctions with a LTTR volume considered too low to be worthwhile could also result in reduced interest from market participants, expressed by lower number of participants, ultimately negatively impact auction results.

Given the current low frequency of auctions, TenneT sees increasing auction frequency of LTTRs on the DE-NL bidding zone border as a promising way to improve hedging opportunities for Dutch market participants.

4.2.2 Increase LTTR time-to-maturity

Currently, LTTRs on the DE-NL bidding zone border are sold in November preceding the year of maturity for the yearly product and roughly two weeks before the month of maturity of the monthly product. The time between auctioning and maturity could be extended, for example to auction the LTTRs half a year, a year, or multiple years in advance. This has also been asked for by market participants in the consultation by ACM.[9] This allows market participants to have an earlier opportunity to identify and match the risks in their portfolios with the LTTRs, resulting in improved hedging opportunities.

Organizing LTTR auctions with longer time-to-maturity will only be successful if this matches with the market participants interest. Uncertainty regarding future market developments (specifically: electricity prices) might lead to more cautious bidding strategies by market participants, resulting in decreased interest. Without sufficient interest from market participants, there will be fewer bids in the auction. This might lead to worse auction results. The longer the time-to-maturity, the higher the risk of decreasing interest. When implementing increased longer time-to-maturity, the interest of market participants must be accounted for.

There is a connection between increasing auction frequency and increasing time-to-maturity. The aim of increasing auction frequency is to give market participants additional opportunities to assess their risks and need to hedge those risks. Increasing auction frequency works best when there is sufficient time between each auction. In practice, this will result in longer time-to-maturity of the first auction. For reference, see the example given in paragraph 4.2.1.

TenneT sees increasing time-to-maturity of LTTRs on the DE-NL bidding zone border as promising way to improve hedging opportunities for Dutch market participants, although must be aligned with market participants interest.

4.2.3 Increase volumes of LTTRs

Until the ongoing developments, as described in paragraph 4.2.4, are finalized, the volume of LTTRs is determined in a multilateral process between TenneT and the bordering German TSOs. Furthermore, the Netcode Elektriciteit (article 12.4 (2) (a) and (b)) applies to TenneT, which sets the volume LTTRs for the combination of bidding zone borders DE-NL and BE-NL to 1300MW for yearly LTTRs and to a value between 400MW and 850 MW for monthly LTTRs.

[8] *To give a concrete example of how to increase auction frequency. Currently, yearly auctions are organized in Q4 of the year before delivery and monthly auctions are organized 2 weeks in advance for monthly auctions. Yearly auctions could be organized in threefold: in Q2, Q3 and Q4 of the year before delivery and monthly auctions could be organized 6 and 2 weeks in in advance of monthly auctions.*

[9] *ACM's liquidity assessment, recital 32: ACM-site.*

In previous years, the volume of LTTRs on the DE-NL bidding zone border was 827MW for the yearly product auction and 254MW for each of the monthly product auctions. Increasing the volume of LTTRs means market participants have more opportunities to obtain the LTTRs, which allows them to better hedge diverging price risks. However, this will only contribute to improving hedging opportunities, if the market participants are not able to hedge this risk with the current volume of LTTRs. If the demand to hedge diverging price risk is already saturated, then increasing LTTR volume will not contribute towards the goal of improving hedging opportunities.

The assessment whether the demand to hedge diverging price risk on the DE-NL bidding zone border is already saturated is outside of the scope of this investigation. What this means is that it cannot, without further investigation, be concluded that increasing LTTRs on the DE-NL bidding zone border will necessarily lead to improved hedging opportunities.

Higher volume of LTTRs will influence auction results, although this effect depends on the reaction of market participants. A downward effect on auction results could be mitigated (to some extend) if higher the LTTR volumes results in higher interest from market participants.

TenneT sees increasing the volumes of LTTRs on the DE-NL bidding zone border as a possible way to improve hedging opportunities, though this depends on who procures the LTTRs and why (speculative or fundamental purpose).

4.2.4 Ongoing developments for DE-NL LTTRs: Long Term Capacity Calculation and Long Term Flow Based Allocation

It must be noted that TenneT (in collaboration with other TSOs) is working on significant developments that have an impact on the DE-NL bidding zone border LTTRs. Most importantly are the development of Long Term Capacity Calculation (“LTCC”) in CCR Core and Long Term Flow Based Allocation (“LTFBA”), both which are a regulatory requirement to be developed. The current best expectation is that the processes will be live in 2026, calculation and allocating LTTR volumes for delivery-year 2027.

LTCC ensures that LTTR volume is determined through a calculation based on the physical network, following standardized and transparent processes and flow-based principles. This means determination of LTTR volume on the DE-NL bidding zone border will no longer be possible by TenneT and the bordering German TSOs.

LTFBA organizes the auctioning of LTTRs in such as a way that auctions for the whole respective capacity calculation region (for DE-NL bidding zone border, that is CCR Core) are organized centrally for both frequency of the auctions and the time-to-maturity of the LTTR auctions. This means that TenneT and the bordering German TSOs will no longer be able to determine the frequency of LTTR auctions and the time-to-maturity of LTTR auctions.

4.2.5 Conclusion for the DE-NL bidding zone border

TenneT sees possibilities to improve hedging opportunities for Dutch market participants, by improving auctions set-up and LTTRs issued on the bidding zone border DE-NL. Increasing auction frequency is seen as promising way to improve hedging opportunities. Increasing time-to-maturity is also likely to have a positive effect on hedging opportunities, though should be aligned with market participants interest. Increasing volumes of LTTRs has potential to improve hedging opportunities, though this needs further assessment.

However, there are limitations that obstruct the implementation of these options. First, TenneT is currently co-developing the LTCC and LTFBA processes, which, once active, will determine the volume of LTTRs (LTCC) and determine how often and when auctions will take place (LTFBA). This eliminates TenneTs flexibility to implement the improvements. Second, TenneT cannot implement improvements to LTTRs unilaterally, but needs to do so in collaboration with the bordering German TSOs.

4.3 Improvements to existing LTTRs on BE-NL bidding zone borders

TenneT also issues LTTRs on the bidding zone border to Belgium (BE-NL). Before assessing the LTTRs issued on this bidding zone border, its needs to be assessed whether the Belgium forward market is relevant for proxy-hedging for Dutch market participants.

Price correlation between NL and BE is high, at 0.920/0.957 in 2023/2024.[10] Nevertheless, the Belgium bidding zone lacks hedging opportunities, even fewer than the Dutch bidding zone, as shown in the ACER Market monitoring 2023.[11] Given this lack of hedging opportunities, proxy-hedging via the Belgium forward market is, for Dutch market participants, inferior to proxy hedging via the German forward market and unlikely to happen.

The reverse could also be possible. Since price correlation is strong and the Dutch forward market offers better hedging opportunities then the Belgium forward market, Belgium market participants might opt to hedge their position in the Dutch forward market. LTTRs would then – indirectly – increase liquidity in the Dutch forward market, thereby improving hedging opportunities for Dutch market participants. Nevertheless, it is questionable whether this happens in practice. Price correlation between Germany and Belgium is also strong (0.920/0.957 in 2023/2024) and the German forward market offers sufficient hedging opportunities whilst the Dutch forward market does not. Therefore, from the perspective of Belgium market participants, the German forward market is more attractive for obtaining a proxy hedge than the Dutch forward market.
As such, TenneT finds it unlikely that improving LTTRs on the BE-NL bidding zone border will be effective at improving hedging opportunities for Dutch market participants. Nevertheless, improvements to LTTRs will be assessed.

For all possible improvements it must be noted that TenneT cannot implement improvements on its own, as the LTTRs on this bidding zone border are issued in collaboration with the Belgium TSO Elia (“Elia”).

4.3.1 Increase LTTR auction frequency

Currently, LTTRs on BE-NL bidding zone border are sold as yearly products in one yearly product auction and as monthly products in twelve monthly product auctions. Increasing auction frequency leads to more opportunities to address risks and obtain hedging instruments, as described in paragraph 4.2.1. However, it does not seem to be the limiting factor determining the attractiveness to proxy-hedge via Belgium for Dutch market participants. Therefore, higher auction frequency is unlikely to improve hedging opportunities for Dutch market participants.

As described in paragraph 4.2.1, increasing auction frequency could have a positive effect on the auction results, unless the reduced volume in LTTRs per auction leads to unattractive auctions. When increasing auction frequency, there must be sufficient time between auctions, as explained in paragraph 4.2.2.

TenneT sees increasing auction frequency of LTTRs on the BE-NL bidding zone border not as an effective way to improve hedging opportunities for Dutch market participants. Nevertheless, it is worthwhile to consider implementing this change, because auction results could be improved. Auction results do need to be closely monitored.

4.3.2 Increase LTTR time-to-maturity

LTTRs on the BE-NL bidding zone border are sold in November preceding the year of maturity for the yearly product and roughly two weeks before the month of maturity for the monthly product. The time between auctioning and maturity could be extended, for example to auction the LTTRs half a year, a year, or multiple years in advance. However, this will not change the attractiveness to proxy-hedge via Belgium and, therefore, is not considered effective at improving hedging opportunities for Dutch market participants.

[10] *Annex 1: Price correlations.*

[11] *See ACER Market Monitoring 2023 Progress of EU electricity wholesale market integration, page 13.*

As described in paragraph 4.2.2, increasing time-to-maturity comes with a risk of lower interest from market participants, which could lead to worse auction results.

TenneT sees increasing time-to-maturity of LTTRs on the BE-NL bidding zone border as ineffective way to improve hedging opportunities for Dutch market participants, with an additional risk for auction results in case of reduced interest.

4.3.3 Increase volumes of LTTRs

The volume of LTTRs on the BE-NL bidding zone border is set according to the same procedure as LTTRs on the DE-NL bidding zone border, reference is made to paragraph 4.2.3.

Volume of LTTRs on the bidding zone border BE-NL was 473MW for the yearly product auction and 146MW for each monthly product auction. Increasing this volume of LTTRs will results in more opportunities for market participants to obtain the LTTRs. Nevertheless, this will not change the attractiveness to proxy-hedge via Belgium and will, therefore, not be effective at improving hedging opportunities for Dutch market participants.

Higher volume of LTTRs will influence auction results, in a similar manner as explained in paragraph 4.3.2.
TenneT sees increasing volumes of LTTRs on the BE-NL bidding zone border as ineffective way to improve hedging opportunities for Dutch market participants, with an increased risk of negative auction results.

4.3.4 Ongoing developments for BE-NL LTTRs: Long Term Capacity Calculation and Long Term Flow Based Allocation

The ongoing developments with regard to LTCC and LTFBA, as described in paragraph 4.2.4, also apply to LTTRs on the bidding zone border BE-NL.

4.3.5 Conclusion

The Belgium forward market does not offer an attractive alternative to the Dutch forward market to market participant aiming to hedge their risk exposure to uncertain Dutch DA prices. This because the Belgium forward market offers even less hedging opportunities than the Dutch forward market, in combination with an additional risk related to diverging prices. In addition, hedging opportunities offered by the German forward market are superior to hedging opportunities offered by the Belgium forward market. Therefore, TenneT concludes that improving LTTRs on the BE-NL bidding zone border will not result in improved hedging opportunities for Dutch market participants.

TenneT does, however, see benefits in increasing auction frequency for LTTRs on BE-NL, for the reason of attracting additional interest from market parties. Nevertheless, the ongoing developments regarding LTCC and LTFBA limit TenneT and Elias flexibility to implement this change.

4.4 Improving existing LTTRs on DK1-NL bidding zone borders

TenneT also issues LTTRs on the bidding zone border to Denmark (DK1-NL). Before assessing the LTTRs issued on this bidding zone border, its needs to be assessed whether the DK1 bidding zone is relevant for proxy-hedging for Dutch market participants.

Price correlation between NL and DK1 was 0.855/0.885 in 2023/2024,[12] which is lower than the price correlation between NL and DE (0.934/0.955 in 2023/2024) and between NL and BE (0.920/0.957 in 2023/2024). In addition, hedging opportunities in the bidding zone DK1 are known to be lacking.[13] Given reduced price correlation and hedging opportunities, proxy-hedging via the DK1 forward market is considered inferior to proxy hedging via the German forward market and is, therefore, unlikely to happen.

[12] *Annex 1: Price correlations.*
[13] *Danish NRA, Improved hedging possibilities in DK1 and DK2: Danish NRA-site.*

The reverse, market participants from DK1 hedging in the Dutch forward market, is also considered unlikely to happen. The price correlation between the bidding zones DK1 and DE is better than price correlation between the bidding zones DK1 and NL (0.855/0.885 in 2023/2024). In addition, the German forward market offers better hedging opportunities than the Dutch forward market. Therefore, from the perspective of market participants in DK1, the German forward market is more attractive for proxy-hedging and is considered the superior alternative.[14]

As such, TenneT finds it highly unlikely that improving LTTRs on the bidding zone border DK1-NL will be effective at improving hedging opportunities for Dutch market participants. Nevertheless, the following ways to improve LTTRs will be assessed:

- Increase auction frequency;
- Increase time-to-maturity;
- Increase volumes of LTTRs;

For all possible improvements it must be noted that TenneT cannot implement improvements on its own, as the LTTRs on this bidding zone border are issued in collaboration with the Danish TSO (“Energinet”).

4.4.1 Increase LTTR auction frequency

At the time when ACM concluded its assessment on liquidity (16th of August 2024), LTTRs on DK1-NL were sold in one yearly product auction and twelve monthly product auctions. Increasing auction frequency leads to more opportunities to assess risks and obtain the instruments, as described in paragraph 4.2.1 Nevertheless, this will not change the attractiveness to proxy-hedge via DK1 and will, therefore, not be effective at improving hedging opportunities for Dutch market participants.

In 2024, TenneT and Energinet have increased the auction frequency of the yearly product auctions, with the aim to attract more interest in LTTRs on DK1-NL bidding zone border. Currently, discussions with Energinet are ongoing on how to best organize the auctions for LTTRs for the following years.

TenneT sees further increasing auction frequency of LTTRs on the DK1-NL bidding zone border as ineffective way to further improve hedging opportunities for Dutch market participants.

4.4.2 Increase LTTR time-to-maturity

In 2024, LTTRs on the DK1-NL bidding zone border were sold in September and November preceding the year of maturity for the yearly product and roughly two weeks before the month of maturity for the monthly product. The time between auctioning and maturity could be extended, for example to auction the LTTRs half a year, a year, or multiple years in advance. Nevertheless, this will not change the attractiveness to proxy-hedge via DK1 and, therefore, is not considered effective at improving hedging opportunities for Dutch market participants.

As described in paragraph 4.2.2, increasing time-to-maturity comes with a risk of lower interest from market participants, which could lead to worse auction results.

When in 2024 TenneT and Energinet have implemented multiple yearly auctions (as described in paragraph 4.4.1.), the time-to-maturity for the first yearly auction was also increased. Instead of the regular auction moment of November in the year before delivery, the first yearly auction is organized in September in the year before delivery.

TenneT sees further increasing time-to-maturity of LTTRs on the DK1-NL bidding zone border as ineffective way to improve hedging opportunities for Dutch market participants, with an additional risk for auction results in case of reduced interest.

[14] *Danish NRA, Improved hedging possibilities in DK1 and DK2, page 7.*

4.4.3 Increase of LTTR volume

The volume of LTTRs on the DK1-NL bidding zone border is determined in a bilateral process between Energinet and TenneT. Furthermore, the Netcode Elektriciteit (article 12.4(4)(d)) specifies that TenneT must obtain approval from the ACM for the volume of LTTRs to be issued.

In previous years, the volume of LTTRs on the DK1-NL bidding zone border was 180MW on yearly product auctions and 120MW for monthly product auctions. Increasing the volume of LTTRs will results in more opportunities for market participants to obtain the LTTRs. Nevertheless, this will not change the attractiveness to proxy-hedge via DK1 and will, therefore, not be effective at improving hedging opportunities for Dutch market participants.

Higher volume of LTTRs will influence auction results, in a similar manner as explained in 4.3.2.

TenneT sees increasing volumes of LTTRs on the DK1-NL bidding zone border as ineffective way to improve hedging opportunities for Dutch market participants, with an increased risk of negative auction results.

4.4.4 Ongoing discussions with Energinet

LTTRs on the DK1-NL bidding zone border are issued in collaboration with Energinet. As explained above, LTTRs on this bidding zone border are unlikely to contribute to additional hedging opportunities in neither the Dutch nor in the DK1 bidding zone. As such, a probable reason why these LTTRs are procured is for speculative reasons, rather than fundamental (hedging) reasons.

This is supported by the fact that TenneT and Energinet together, have paid out a significant amount of money to the holders of LTTRs in surplus of the income from auction results, about EUR 32mio over the past 5 years (for both directions, DK1 -> NL and NL -> DK1, combined).[15]

Energinet has signaled a desire to limit issuance of LTTRs on the bidding zone border DK1-NL, stating these LTTRs do not contribute to hedging opportunities and have larger payouts then auction income.

4.4.5 Conclusion for the DK1-NL bidding zone border

TenneT does not see possibilities to improve hedging opportunities for Dutch market participants by improving LTTRs issued on the bidding zone border DK1-NL. This, because the German forward market is superior alternative to the DK1 forward market to obtain a proxy hedge, for Dutch market participants.

TenneT sees benefits in increasing auction frequency for LTTRs on DK1-NL, in tandem with implementing longer time-to-maturity, for the reason of attracting additional interest from market parties. This improvement has been implemented by TenneT and Energinet in 2024.

[15] *ACER has investigated this phenomenon and titles it "undervaluation" of LTTRs, ACER LTTR valuation dashboard. See for example: ACER Market Monitoring 2023, Progress of EU electricity wholesale market integration.*

5 Final conclusions & recommendations

Pursuant to ACERs decision 02-2025, TenneT is required to investigate improving hedging opportunities available to Dutch market participants who aim their risks related to uncertain future electricity prices in the Dutch bidding zone. The main instrument TenneT has at its disposal to improve such hedging opportunities are LTTRs issued on the DE-NL, BE-NL and DK1-NL bidding zone borders. This investigation focusses on these instruments.

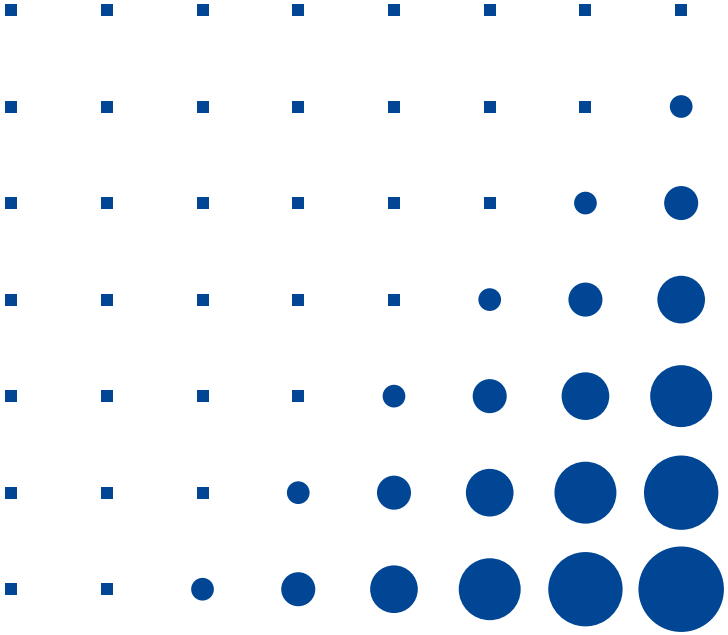
Future electricity price risks are most commonly hedged by obtaining a forward contract. A diverging price risk (or basis risk) is introduced when the forward contract obtained for the purpose of hedging is linked to a different bidding zone then the bidding zone where the hedging party is active. The role of TSOs is to issue LTTRs which aim to bridge the price difference between bidding zones, thereby addressing the diverging price risk. As such, the effectiveness of LTTRs as hedging instruments can only be assessed in relation to the effectiveness of hedging opportunities that are in a bidding zone alternative to the bidding zone where the market participants are active. Finally, LTTRs only support hedging opportunities when they are procured by market participants for the hedging purposes, and not when they are procured solely for speculative purposes.

TenneT concludes that the German forward market offers an attractive alternative to the Dutch forward market to hedge risks related to exposure to future electricity prices in the Netherlands. TenneT, in collaboration with bordering German TSOs, currently offers LTTRs on the DE-NL bidding zone border to help mitigate the diverging price risk. This improves hedging opportunities available to Dutch market participants.
TenneT concludes that further improvement of LTTRs on the DE-NL bidding zone border could result in improved hedging opportunities. This could be achieved by increasing LTTR auction frequency and by increasing time-to-maturity of LTTRs on this border. Furthermore, TenneT sees that increasing volume of LTTRs on the DE-NL bidding zone border could also lead to improved hedging opportunities, though this needs further assessment.

TenneT concludes that the forward markets for the bidding zones Belgium and Denmark 1 lack hedging opportunities themselves. Therefore, the forward markets for these bidding zones do not provide an attractive alternative to the Dutch forward market. Improving LTTRs that are currently offered on the BE-NL and DK1-NL bidding zone borders is therefore unlikely to result in improved hedging opportunities for Dutch market participants.

Despite the absence of a positive impact on hedging opportunities, implementing increased auction frequency and time-to-maturity for LTTRs on DK1-NL and BE-NL bidding zone border is still recommendable, for reasons of attracting additional interest. For the bidding zone border DK1-NL, TenneT and Energinet this has been implemented as of 2024.

Regarding the identified possible improvements to LTTRs on the DE-NL and BE-NL bidding zone borders, TenneT observes that in the forward electricity market, developments in the form of Long Term Capacity Calculation (“ LTCC”) and Long Term Flow Based Allocation (“LTFBA”) are ongoing. Once live (current expectation: 2026), LTCC and LTFBA will take over the role of individual TSOs to decide on volumes of LTTRs and on auction frequency and time-to-maturity of LTTRs. This means that possible improvements to LTTRs on the DE-NL bidding zone border, as identified by TenneT in this investigation, will no longer be for the consideration of TenneT and bordering TSOs. Instead, the identified measures to improve LTTRs will be governed on a pan-European basis. Therefore, recommending to implement the identified improvements to LTTRs on the DE-NL and BE-NL bidding zone borders is blocked by the implementation of LTCC and LTFBA.



Annex 1: Price correlations

2023	BE	DE	DK1	NL
BE	x	0,920	0,836	0,920
DE	0,920	x	0,906	0,934
DK1	0,836	0,906	x	0,855
NL	0,920	0,934	0,855	x

2024	BE	DE	DK1	NL
BE	x	0,907	0,836	0,947
DE	0,907	x	0,924	0,955
DK1	0,836	0,924	x	0,885
NL	0,947	0,955	0,885	x

Price correlations were calculated using day ahead prices for each respective bidding zone on hourly granularity. Data is available at: ENTSO-E Transparency Platform