



Enclosure 1: ACM's Assessment

Article 30, paragraph 3, of the FCA Regulation

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Assessment of the Netherlands Authority for Consumers and Markets under Article 30, paragraph 3, of Regulation (EU) 2016/1719 of the Commission of 26 September 2016 establishing a guideline on forward capacity allocation (hereafter: FCA Regulation)

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1. Summary

The FCA Regulation is aimed at moving towards a genuinely integrated electricity market. In order to move towards a genuinely integrated electricity market, efficient hedging opportunities should be developed for generators, consumers, and retailers to mitigate future price risk in the area where they operate.

Given the fact that the FCA Regulation has become applicable in Norway, that the bidding zone border NO2-NL has been added to a capacity calculation region, and that, at the moment, no transmission rights are offered for the bidding zone border NO2-NL, the Netherlands Authority for Consumers and Markets (ACM), and the Norwegian Energy Regulatory Authority (NVE-RME) are required, under Article 30 of the FCA Regulation, to adopt coordinated decisions for the bidding zone border NO2-NL on the introduction of long-term transmission rights or other long-term cross-zonal hedging products.

For the Dutch bidding zone, ACM carries out the assessment whether the electricity forward market provides sufficient hedging opportunities in the bidding zones involved. NVE-RME carries out this assessment for the Norwegian bidding zone(s).

The assessment consists of at least two elements. The first element is a consultation among market participants about their need for cross-zonal risk hedging opportunities on the concerned bidding zone borders. The second element is an evaluation in which the functioning of wholesale electricity markets is investigated in the bidding zones in question. The evaluation also consists of at least two elements: an analysis of whether the products or combination of products offered (i) represent a hedge against the volatility of the day-ahead price of the concerned bidding zone, and (ii) are efficient.

In this assessment, ACM comes to the following conclusions:

- a. there is a need for cross-zonal risk hedging opportunities for the bidding zone border NO2-NL;
- b. the products that are offered for the Dutch bidding zone are an appropriate hedge against the risk of change of the Dutch day-ahead-price; but
- c. ACM is unable to conclude that these products are efficient.

Taking the above into account, ACM comes to the conclusion in this assessment that there are insufficient grounds in order to be able to conclude that the electricity forward market offers sufficient hedging opportunities for the Dutch bidding zone.

ACM and NVE-RME have updated their original technical assessments, based on data until 31 December 2023, updated with data through 30 June 2024 as was agreed on in the request for extension of the deadline. ACM and NVE-RME concluded that there is still insufficient basis to be able to conclude that there is a sufficient degree of liquidity. ACM and NVE-RME were unable to adopt coordinated decisions for the bidding-zone border NO2-NL on the introduction of long-term transmission rights or other long-term cross-zonal hedging products. ACM referred this case to ACER on 16 August 2024. NVE-RME referred this case on 16 August 2024 to the EFTA Surveillance Authority.

ACM describes in this assessment the legal framework for performing this assessment, the assessment on the need for hedging opportunities, the evaluation on the products that are offered for the Dutch bidding zone, the evaluation of the efficiency of these products, and the final conclusion.

2. Introduction

1. In 2021, the FCA Regulation became applicable in Norway after the adoption thereof in the Agreement on the European Economic Area (EEA Agreement). In March 2023, ACER adopted a decision on the inclusion of the bidding zone border between the Netherlands and Norway (hereafter: NO2-NL) to the Hansa capacity calculation region.¹ On 18 August 2023, the Norwegian energy regulator, NVE-RME, adopted a decision on the basis of which the inclusion of the bidding zone border NO2-NL to the Hansa capacity calculation region also came into force for the Norwegian transmission system operator Statnett.
2. Article 30, paragraph 2, of the FCA Regulation stipulates that, if long-term transmission rights do not exist on a bidding zone border at the entry into force of the FCA 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 the Regulation. Since the FCA Regulation is now also applicable in Norway, and the bidding zone border NO2-NL has been included in a capacity calculation region, and no transmission rights are currently offered for the bidding zone border NO2-NL, this Article also applies to the bidding zone border NO2-NL.
3. As a result thereof, ACM and NVE-RME must, under Article 30 of the FCA Regulation, adopt coordinated decisions for the bidding zone border NO2-NL on whether or not to introduce long-term transmission rights or other long-term cross-zonal hedging products.
4. The period of six months mentioned in Article 30, paragraph 2, of the FCA Regulation commenced after the above-mentioned decision of NVE-RME of 18 August 2023. The period has been extended by six months. The final day of this period is thus 19 August 2024. ACM and NVE-RME have updated their technical assessments with data until and including 30 June 2024, and concluded that there is still insufficient basis to be able to conclude that there is a sufficient degree of liquidity. ACM and NVE-RME were subsequently unable to adopt coordinated decisions for the bidding-zone border NO2-NL on the introduction of long-term transmission rights or other long-term cross-zonal hedging products. Therefore, ACM referred this case to ACER on 16 August 2024. NVE-RME referred this case on 19 August 2024 to the EFTA Surveillance Authority.
5. This assessment is structured as follows. Chapter 3 contains the legal framework. Chapter 4 contains the evaluation on hedging opportunities and evaluation of the efficiency of products and chapter 5 contains the final conclusion.
6. This assessment contains one annex. This annex, called “Technical description of ACM’s assessment prescribed by Article 30(4)(b) FCA Regulation”, is part of the assessment, and contains an English-language technical description of the analysis as prescribed by Article 30, paragraph 4, under b, of the FCA Regulation.

3. Legal framework

¹ See ACER’s decision of 31 March 2023 with number 08/2023.

7. In this chapter, ACM describes the provisions that together constitute the legal framework for this assessment.

8. Article 9, paragraph 1 of Regulation 2019/943 stipulates the following:

“In accordance with Regulation (EU) 2016/1719, transmission system operators shall issue long-term transmission rights or have equivalent measures in place to allow for market participants, including owners of power-generating facilities using renewable energy sources, to hedge price risks across bidding zone borders, unless an assessment of the forward market on the bidding zone borders performed by the competent regulatory authorities shows that there are sufficient hedging opportunities in the concerned bidding zones.”

9. The assessment as referred to in Article 9, paragraph 1 of Regulation 2019/943 has been fleshed out in Article 30 of the FCA Regulation. Below are the relevant paragraphs of Article 30 of the FCA Regulation:

“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.

4. The evaluation referred to in paragraph 3(b) shall investigate the functioning of wholesale electricity markets and shall be based on transparent criteria which include at least:

a) an analysis of whether the products or combination of products offered on forward markets represent a hedge against the volatility of the day-ahead price of the concerned bidding zone. Such product or combination of products shall be considered as an appropriate hedge against the risk of change of the day-ahead price of the concerned bidding zone where there is a sufficient correlation between the day-ahead price of the concerned bidding zone and the underlying price against which the product or combination of products are settled;

b) an analysis of whether the products or combination of products offered on forward markets are efficient. For this purpose, at least the following indicators shall be assessed:

i) trading horizon;

ii) bid-ask spread;

iii) traded volumes in relation to physical consumption;

iv) open interest in relation to physical consumption.

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."

4. Assessment

4.1 Introduction

10. For the Dutch bidding zone, ACM carries out the assessment of whether the electricity forward market offers sufficient hedging opportunities in the concerned bidding zones. NVE-RME carries out this assessment for the Norwegian bidding zone(s).
11. As also indicated in the chapter on the legal framework, the assessment of Article 30, paragraphs 3 and 4 of the FCA Regulation consists of at least two elements. The first element is a consultation among market participants (hereafter: consultation) about their needs for cross-zonal risk hedging opportunities on the concerned bidding zone borders. The second element is an evaluation investigating the functioning of wholesale electricity markets.
12. The evaluation also consists of at least two elements: an analysis of whether the products or combination of products offered (i) represent a hedge against the volatility of the day-ahead price of the concerned bidding zone, and (ii) are efficient.
13. The below sections discuss the following aspects:
 - a. the question as to why market participants hedge against price volatility and how this, in general, can take place (section 4.2);
 - b. the results of the consultation and the conclusion thereof (section 4.3);
 - c. an analysis of whether the products offered on forward markets represent a hedge against the volatility of the day-ahead price of the concerned bidding zone (see section 4.4);
 - d. an analysis as part of the evaluation of whether the products offered on forward markets are efficient (see section 4.5); and
 - e. a final conclusion about the question of whether the electricity forward market provides sufficient hedging opportunities for the Dutch bidding zone (see section 4.6).

4.2 Hedging opportunities

14. Market prices for electricity can vary significantly, and this creates uncertainty and risks for market participants that wish to produce or buy electricity in the future. Market participants may use hedging products to hedge against this price volatility. These market participants may include producers,

suppliers, traders, or large-scale users that buy electricity directly on the wholesale market. These market participants trade such products with each other.

15. Trade in these contracts may take place on exchanges, over-the-counter (hereafter: OTC) or bilaterally. On exchanges, market participants can trade in standardized contracts where the risk of non-payment (of the counterparty) is covered. These contracts are called futures. EEX and ICE Endex are exchanges that offer futures for the Dutch bidding zone. Settlement of these contracts may take place financially or physically (by means of supply).
16. Another option is to trade in products through brokers (OTC). These products are called forwards. Intermediaries are used in that context. In OTC trading, the risk of non-payment of the counterparty is not covered, unless it has been agreed on clearing the contract through an exchange. It is also possible to conclude contracts bilaterally.
17. The traded products have maturities of a weekend, a week, a month, a quarter, a season, a year, or multiple years.

4.3 Consultation

18. ACM carried out a consultation within the framework of Article 30, paragraph 3, under a, of the FCA Regulation about the need of market participants for instruments with which they are able to hedge against price fluctuations on the electricity market. ACM held this consultation online (on its website) between 5 September 2023 and 3 October 2023.²
19. The consultation questions concerned the need for hedging opportunities for (i) the bidding zone border NO2-NL (for example through transmission rights) and (ii) the Dutch bidding zone.
20. ACM has received six responses to the consultation. Five responses came from market participants that are active on the electricity market, which are Shell Energy Europe, SEFE Marketing & Trading Ltd., Ørsted Wind Power Netherlands Holding, EDF, and Eneco. One response came from the European Federation of Energy Traders (EFET).
21. ACM published the non-confidential versions of these responses on its website on 18 December 2023.³
22. Below is a summary of the responses to the consultation grouped per topic of the consultation. This is followed by ACM's conclusion, based on these responses, regarding the needs among market participants for cross-zonal risk hedging opportunities for the bidding zone border NO2-NL.

4.3.1 Responses to the consultation

Hedging products used

² See [ACM consultation regarding long-term hedging opportunities \(FCA Regulation\) | ACM.nl](#).

³ See [Reacties consultatie ACM LT indekkingsmogelijkheden \(FCA Verordening\) | ACM.nl](#).

23. All market participants indicate they use various long-term hedging products. These are monthly, quarterly, and yearly products. One market participant indicates they also buy weekly, weekend, and day-ahead products. These products are purchased by all market participants through exchanges, brokers, or bilaterally. The five market participants all use transmission rights.

Purpose of the hedging products used

24. Three market participants indicate that they use hedging products for hedging against price risks (price volatility). Other reasons that are given for the use of hedging products include management of their trading positions or of risks in the hedging portfolio.
25. Multiple market participants indicate that they use hedging products for both speculative trading and asset-backed trading. One market participant indicates that they only use hedging products for asset-backed trading.

Need for cross-border hedging

26. On the basis of the answers of all five market participants, it can be concluded that they have a need for cross-zonal risk hedging opportunities for the bidding zone border NO2-NL.
27. Two market participants indicate that there is a need for cross-border hedging because the long-term market for the Dutch bidding zone is (relatively) illiquid. Four market participants indicate that liquidity increases if cross-border hedging opportunities are offered on the bidding-zone border NO2-NL. Three market participants indicate that competition or the market efficiency will increase if cross-border hedging opportunities are offered on the bidding-zone border NO2-NL.

Are there sufficient hedging opportunities?

28. Four of the five market participants indicate that the Dutch bidding zone experiences liquidity problems. One market participant indicates that the liquidity for the Dutch bidding zone is not always sufficient for trading. Another market participant indicates that hedging products are available, but that there is a lack of liquidity. One market participant indicates that the long-term market offers adequate hedging opportunities for the Dutch bidding zone.
29. Two market participants indicate that the collateral requirements that are currently demanded are too high. One of these market participants indicates that excessive regulatory impediments (such as expansive requests for securities) should be removed in order to keep the current market participants and to attract new ones. One market participant indicates that “market making” could improve the situation.

Long-term transmission rights

30. As indicated in recital 23, the five market participants all use transmission rights. One market participant indicates that transmission rights are crucial for appropriate hedging, and help improve liquidity. Another market participant indicates that transmission rights are a good additional instrument to have

as hedging tool, which creates extra liquidity. A third market participant indicates that they are in favor of introducing transmission rights because they facilitate competition and improve the hedging opportunities. A fourth market participant indicates that they believe that offering transmission rights for NO2-NL would result in a material improvement, given the relatively poor forward market liquidity in the Netherlands. A fifth market participant indicates that transmission rights are a useful instrument for hedging the cross-border market price difference between two bidding zones.

31. One market participant indicates that transmission rights with a duration of two years offer Dutch market participants the opportunity to buy electricity from renewable energy sources in Norway. This market participant indicates that this will help market participants in Norway as they will be able to sell their renewable production on the market, and that, in addition, it will help lower CO2 emissions in the Netherlands.
32. Various market participants have indicated to be in favor of transmission rights with durations longer than one year. One market participant also indicates to be in favor of the European Commission's proposal to introduce transmission rights that have a minimum duration of three years. Another market participant indicates that they believe that offering transmission rights with durations of a week, a month, a quarter, and multiple years better enable market participants to connect the rights they wish to hedge to the availability of transmission rights. One market participant suggests increasing the cross-border capacities, and also to offer the right hedging products since, at the moment, these do not always match with the products within the relevant bidding zone.

4.3.2 Conclusion

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

4.4 Analysis of products that serve as hedging opportunities against volatility

34. Article 30, paragraph 4, under a, of the FCA Regulation stipulates that an assessment is to be carried out in order to assess whether the products or combination of products offered on forward markets represent a hedge against the volatility of the day-ahead price of the concerned bidding zone. Such product or combination of products will be considered as an appropriate hedge against the risk of change of the day-ahead price of the concerned bidding zone where there is a sufficient correlation between the day-ahead price of the concerned bidding zone and the underlying price against which the product or combination of products are settled.
35. The purpose of the analysis at hand 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. For the Dutch bidding zone, various products are available that represent a complete hedge against the Dutch day-ahead price. That is why ACM has chosen not to include in the analysis any combinations of domestic and/or international products that could represent appropriate hedges against the price volatility of the Dutch bidding zone. In this context, ACM assumes that there is not any legal obligation either to include in the analysis at hand proxy hedging where, for example, products from adjacent bidding zones are used for hedging.

36. For the analysis at hand, ACM has specifically looked at the following products of EEX:
- Dutch-Base-Month-Future Q0BM (EEX Dutch Power Base Month Future Q0BM);
 - Dutch-Base-Quarter-Future Q0BQ (EEX Dutch Power Base Quarter Future Q0BQ);
 - Dutch-Base-Year-Future Q0BY (EEX Dutch Power Base Year Future Q0BY);
 - Dutch-Peak-Month-Future Q0PM (EEX Dutch Power Peak Month Future Q0PM);
 - Dutch-Peak-Quarter-Future Q0PQ (EEX Dutch Power Peak Quarter Future Q0PQ); and
 - Dutch-Peak-Year-Future Q0PY (EEX Dutch Power Peak Year Future Q0PY),
37. For the analysis at hand, ACM has specifically looked at the following products of ICE Endex:
- DPA-Dutch Power Peak Load (8-20) Futures;
 - DPB-Dutch Power Base Load Futures;
 - NLB-Dutch Power Financial Base Future; and
 - NLP-Dutch Power Financial Peak Future.
38. For the analysis at hand, ACM has specifically looked at the yearly, quarterly, and monthly products that are traded via OTC.⁴
39. The abovementioned futures of ICE Endex and EEX offer a complete hedge against the volatility of the day-ahead price of the Dutch bidding zone since these are either settled against the Dutch day-ahead price or provide for a physical settlement. The products that are offered OTC for the Dutch bidding zone represent a complete hedge against the Dutch day-ahead price, too.
40. In the analysis at hand, any direct bilateral trade is not taken into account because no such data is available through public sources.
41. ACM considers products of the exchange and OTC with maturities shorter or longer than a month, quarter, or a year also to be appropriate, but has not included these in the assessment of the products' efficiency due to the reason mentioned in recital 46.

4.4.1. Conclusion

42. Based on the above, ACM comes to the conclusion that the products mentioned in recitals 36 through 38 that are offered for the Dutch bidding zone represent appropriate hedges against the risk of change of the Dutch day-ahead price.

4.5 Evaluation: assessment of efficiency of products

43. For the purpose of the evaluation of the functioning of the electricity markets, as referred to in Article 30, paragraph 3, under b, of the FCA Regulation, ACM carries out, pursuant to Article 30, paragraph 4, under b, of the FCA Regulation, an analysis of whether the products or combination of products offered on forward markets are efficient. To that end, ACM, pursuant to Article 30, paragraph 4, under b of the FCA Regulation, looks at, at least:
- the trading horizon;
 - the bid-ask spread;

⁴ The data about these products come from ICIS.

- iii) the traded volumes in relation to physical consumption; and
- iv) the open interest in relation to physical consumption.

44. The FCA Regulation does not contain a definition or an explanation regarding the used term of “efficient.” The indicators that need to be considered for the assessment of whether the products are efficient are all liquidity indicators (four of them). That is why ACM assumes that the products are considered to be efficient if there is sufficient liquidity of the products that are offered for the Dutch bidding zone.
45. ACM makes this assessment for the products that have been identified on the basis of Article 30, paragraph 4, under a, of the FCA Regulation (see recitals 36 through 38).
46. ACM considers the products with maturities of a year, a quarter, and a month to be sufficiently defined for assessing the efficiency of the products. ACM did not include any products with maturities longer than a year. It is expected that inclusion of such products would result in a lower degree of liquidity. Taking that into account, the conclusion in recital 65 would not have changed if these products had been included in the assessment. In addition, ACM did not look at maturities shorter than a month (such as weekly and weekend products) because these types of products are less meant for long-term risk hedging.
47. ACM has decided to base its assessment of the degree of liquidity on the indicators that the FCA Regulation puts forward. ACM considers this interpretation to be sufficient for an assessment of the efficiency of the products. Inclusion of any other indicators offers little to no added value, according to ACM.
48. As indicated in recital 6, the annex to this assessment contains a technical description of the analysis into the efficiency of the products. The annex contains figures and a table for the (i) trading horizon, (ii) bid-ask spread, (iii) traded volumes in relation to physical consumption, and (iv) open interest in relation to physical consumption.
49. Using the four liquidity indicators, it will be assessed what conclusion can be drawn regarding the degree of liquidity and, as such, regarding the efficiency of the products (within the meaning of Article 30, paragraph 4, under b, of the FCA Regulation).
50. In this context, it is important to note that there are no objective or science-based thresholds to determining whether or not a market is sufficiently liquid. The indicators constitute separate indications that need to be assessed as a whole.⁵

4.5.1. Trading horizon

51. The trading horizon indicates what maturities can be traded. This gives an idea of the hedging opportunities.⁶ Section 1.5.1 of the annex to this assessment contains an overview of the maturities of

⁵ See European Electricity Forward Markets and Hedging Products – State of Play and Elements for Monitoring, Final Report, ECA Consulting Associates, September 2015 (hereafter: ECA (2015)), page 66 (ACM/INT/485575).

⁶ See Methods for evaluation of the Nordic forward market for electricity, Analyses in accordance with the FCA GL, EC Group, 8 December 2016 (hereafter: EC Group (2016)), pages 41 and 42 (ACM/INT/485575).

the products that are offered by the exchanges (EEX and ICE Endex), OTC and bilaterally. This shows that there is a wide range of maturities of products that are offered through the various trading platforms.

4.5.2. Bid-ask spread

52. The bid-ask spread is the difference between the highest bid price (of market participants that are interested in buying) and the lowest ask price (of market participants that are interested in selling). This price difference represents the direct transaction costs for market participants.⁷ No hard threshold regarding the bid-ask spread and liquidity is mentioned in the literature on the basis of which it can be determined whether a certain bid-ask spread can suggest a sufficient or insufficient degree of liquidity. However, one study does indicate that, in a liquid market, the bid-ask spread tends to be lower than 1% compared with the reference price.⁸ ACM has studied whether a bid-ask spread could be analyzed as a percentage of the reference price. However, it turned out that the combination of high market prices during the energy crisis and a high percentage of values that touched the 1-euro cap⁹ (see table 1 of the annex to the assessment) resulted in less reliable results. That is why ACM decided to analyze the bid-ask spread in absolute values only. In general, the lower the bid-ask spread is, the higher the degree of liquidity is, and vice versa.
53. The figures about the bid-ask spread in the annex to this assessment have been based on ICIS data, and therefore only relate to OTC. In this context, it is important to note that ICIS uses a 1-euro cap for the bid-ask spread. That means that, if the bid-ask spread on any given day is higher than 1 euro, this value is set at 1 euro. Table 1 in the annex to this assessment shows that, for the yearly OTC baseload products with settlement in 2023, the cap was hit in 55% of the bid-ask spread values. For products with settlement in 2024, too, the cap was hit in 80% of the bid-ask spread values. For products with settlement in 2025, this percentage was 76%. For these products with settlement in 2025, the last half year before delivery has not been taken into account, as only data until July 2024 has been analyzed. This makes it difficult to compare the percentage to that of other years. For the delivery years 2020-2022, this varied between 8-18%. For the yearly OTC peak-load products, the percentage varied between 57% and 96% for the delivery years 2020-2024. In the years with high (or higher) percentages, the cap probably resulted in an undervaluation of the bid-ask spread, and therefore in an overvaluation of liquidity.
54. Figure 1 and figure 2 show that, for yearly OTC baseload and peak-load products for settlement in the period 2021-2025, the average bid-ask spread has increased. Looking at the bid-ask spread for monthly, quarterly, and yearly products for OTC baseload and peak load (taking the average per trading year) in figures 3 and 4 in the annex to this assessment, it can be observed that the values of the average bid-ask spread per year have increased since 2020.

⁷ See Analysis of Electricity Forward Market Hedging Opportunities in Finnish, Estonian, Latvian and Lithuanian Bidding Zones Borders, Commissioned by the Finnish Energy Authority, Thema Consulting Group, 18 February 2021 (hereafter: Thema 2021), page 32 (ACM/INT/485582).

⁸ See ECA (2015), page 136: "Although there are no hard and fast rules, bid-ask spreads in liquid markets tend to be under 1%."

⁹ See recital 53 for an explanation of the 1-euro cap.

4.5.2.1. Interim conclusion

55. ACM concludes that the bid-ask spread has been increasing over the past four years. This is an indication of a negative development in the degree of liquidity. On the basis of this analysis, ACM cannot draw any conclusion as to the absolute level of the bid-ask spread, and whether or not this is an indication of a sufficient degree of liquidity.

4.5.3. Traded volumes in relation to physical consumption

56. The indicator “traded volumes in relation to physical consumption” is often called the churn rate. The churn rate is defined as the ratio between the total traded volume of a hedging product and the total consumption of electricity in a certain period. This ratio gives an idea how many times a volume of 1 MWh of electricity is traded before it is delivered to the end-user.¹⁰ In a report that looks into the churn rate and liquidity, among other aspects, a value of at least 3 is mentioned as target value.¹¹
57. Figures 5, 8 and 9 in the annex to this assessment show that the total volume of traded electricity has been decreasing over the years 2020-2022 with an increase in 2023 compared to 2022. In the graph, data until July 2024 has been used, therefore it cannot be said if the traded volume increases or decreases in 2024 compared with 2023. Figure 9 shows that the traded volume of OTC is larger than for the exchanges combined. In this context, it must be noted that there is a category of transactions that take place OTC, but which are settled (clearing) through the exchanges. OTC transactions with involvement of a broker that are settled via an exchange are included in the OTC volume. These transactions are currently not included in the figures with the volumes for EEX. It was not possible to exclude from the volume of ICE Endex the OTC transactions with involvement of a broker that are settled via an exchange. This means that there is some level of double counting in determining the total volume of traded electricity. This can lead to an overestimation of the churn rate.¹²
58. Figure 7 in the annex to this assessment shows that the churn rate has been going down over the years. In 2020 and 2021 it was respectively 2.4 and 2.3, and in 2022, it was 2. For 2023, it dropped to 1.6. In the first half of 2024, the value of the churn rate remains at 1.6.

4.5.3.1. Interim conclusion

59. ACM concludes that, over the past few years, the churn rate has been decreasing, and that the values are below 3. This is an indication of an insufficient degree of liquidity.

4.5.4. Open interest in relation to physical consumption

60. Open interest refers to all open positions with a clearing house at a given point in time. It corresponds with the total amount of open positions for products that have not yet been (i) closed by an offsetting trade, (ii) fulfilled by means of physical delivery or (iii) executed via cash settlement.¹³ Looking at the

¹⁰ See Thema (2021), page 19.

¹¹ See ECA (2015), page 56,

¹² See also section **Fout! Verwijzingsbron niet gevonden.** in the annex to this assessment.

¹³ See EC Group (2016), page 43.

ratio between open interest and the physical consumption forms an indication of the part of the physical consumption for which hedging takes place by means of hedging products.¹⁴

61. When looking at the total open interest for baseload products of EEX and ICE Endex, it is noteworthy that these varied these past few years between 40-60 Twh with an increase above it by the end of 2023 and at the beginning of 2024 (see figure 18 in the annex to the assessment).¹⁵ The total open interest for peak-load products of EEX and ICE Endex has clearly decreased over the past several years with an increase end of 2023 and at the beginning of 2024 (see figure 19 in the annex to the assessment).¹⁶
62. Figure 10 shows the open interest for monthly, quarterly, and yearly baseload products of EEX in relation to the physical consumption. The ratio of open interest in relation to the physical consumption for monthly products has generally gone up these past few years. In late 2022 and early 2023, the open interest of monthly products represents approximately 40% in relation with the physical consumption. There is a strong increase in the ratio of open interest in relation to physical consumption for monthly products end of 2023 and at the beginning of 2024. When looking at peak-load monthly products of EEX, there seems to be an increase in the ratio until mid-2022, followed by a decline (see figure 11 in the annex to the assessment) in 2023 and an increase in 2024. For yearly products, an increase can be observed over the years.
63. Figure 12 shows the open interest in relation to the physical consumption for monthly baseload products of ICE Endex. This varies between approximately 9 and 15 percent, with an outlier end of 2022, followed by a steep decline. For peak load monthly products of ICE Endex, a significant decrease can be observed in early 2022, followed by an upward trend, which, in early 2023, significantly drops again (see figure 13 in the annex to the assessment).

4.5.4.1. Interim conclusion

64. Based on the analysis of the open interest and the physical consumption, ACM cannot draw any conclusion regarding the absolute level of this ratio, and whether or not it is an indication of a sufficient degree of liquidity.

4.5.5. Conclusion regarding whether the products are efficient

65. Based on the previous assessment, it is determined that:
- (i) the increase in the bid-ask spread of the past few years is an indication of a negative trend for the degree of liquidity;

¹⁴ See also Evaluating Hedging Possibilities on NordLink, NorNed and North Sea Link, Commissioned by RME-NVE, May 2021, page 50 (ACM/INT/485575).

¹⁵ Figure 14 in the annex to the assessment shows that the size of open interest in baseload products of EEX has, in general, increased since early 2022. For baseload products of ICE Endex, the open interest has significantly decreased over the past few years (see figure 16 in the annex to the assessment).

¹⁶ The open interest for peak-load products of EEX has been somewhat more volatile over the past few years (see figure 15 in the annex to the assessment). In the second half of 2020, the open interest for those products appears to have decreased. There is an increase end of 2023. Figure 17 in the annex to the assessment shows that, for peak-load products of ICE Endex too, the open interest has decreased significantly.

- (ii) a decreasing trend in the churn rate can be observed over the past few years, and that the values are below 3, which is an indication of an insufficient degree of liquidity; and
- (iii) based on the analysis of the ratio between the open interest and the physical consumption, ACM cannot draw any conclusion about whether or not the level of the ratio between the open interest and the physical consumption is an indication of a sufficient degree of liquidity, ACM comes to the conclusion 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 products are efficient.

4.6 Final conclusion regarding hedging opportunities

66. Since ACM has concluded that:
- a. there is a need for cross-zonal risk hedging opportunities for the bidding zone border NO2-NL (see recital 33);
 - b. the products (mentioned in recitals 36 through 38) that are offered for the Dutch bidding zone represent appropriate hedges against the risk of change in the Dutch day-ahead price (see recital 42); but
 - c. ACM cannot conclude that these products are efficient (see recital 65),
- ACM comes to the conclusion that there is insufficient basis to be able to conclude that the electricity forward market provides sufficient hedging opportunities for the Dutch bidding zone.

5. Final conclusion of the assessment

67. Considering the final conclusion in the previous recital, ACM must, in accordance with Article 30, paragraph 5, of the FCA Regulation, request TenneT (i) to issue transmission rights, or (ii) to make sure that other long-term cross-zonal hedging products are made available to support the functioning of wholesale electricity markets.
68. The responses to the consultation have unequivocally shown that the market participants that have responded are favorable to transmission rights (see recital 30). In addition, an introduction of transmission rights on the NO2-NL bidding zone border is also a logical step given the presence of transmission rights on all other Dutch bidding zone borders.

Annex: Technical description of ACM's assessment prescribed by Article 30(4)(b) FCA Regulation

1.1 About this annex

Article 30(4)(b) of the Forward Capacity Allocation Regulation (hereafter FCA Regulation) stipulates that the national regulatory authority (NRA) shall analyse whether the products or combination of products offered on forward markets are efficient. For this purpose, at least the following indicators must be assessed: (i) trading horizon, (ii) bid-ask spread, (iii) traded volumes in relation to physical consumption and (iv) open interest in relation to physical consumption.

This document contains a technical description of the assessment that ACM performed in accordance with Article 30(4)(b) of the FCA Regulation. It also contains the results of the assessment of the indicators in the form of a table and visualisations.

This document is an appendix to ACM's assessment on the basis of Article 30(2) of the FCA Regulation. The assessment of indicators must be considered an integral part of the assessment.

Methodological choices regarding the assessment of indicators are explained in the main text of this document. Interpretation of the results of the assessment of indicators and the conclusion can also be found in the main text of this document.

1.2 The products offered on forward markets

In the decision ACM lists the products offered for the Dutch bidding zone that have been analysed in ACM's assessment (see recital 36-38 of the decision). ACM performs the assessment of indicators for monthly, quarterly and yearly products for the Dutch bidding zone. Combinations of products are not included.

1.3 The indicators to be assessed

ACM assesses the indicators that are listed in Article 30(4)(b) of the FCA Regulation, which are:

- i. trading horizon;
- ii. bid-ask spread;
- iii. traded volumes in relation to physical consumption; and
- iv. open interest in relation to physical consumption.

1.3.1 Trading horizon

The trading horizon shows what maturities can be traded and cleared for different listed contracts. Trading horizon is thus an indicator of hedging opportunities.¹⁷

1.3.2 Bid-ask spread

Bid-ask spreads are the difference between the highest bidding (buying) price and the lowest asking (selling) price. This spread represents a direct transaction cost for market participants. In markets with low bid-ask

¹⁷ Source: Methods for evaluation of the Nordic forward market for electricity, Analyses in accordance with the FCA GL, EC Group, 8 December 2016 (hereafter: EC Group (2016)), page 41.-42 (ACM/INT/485575).

spreads, a contract can be bought and then sold at very little cost. Conversely, in markets with large bid-ask spreads, buying and then immediately selling a contract will result in a significant loss.¹⁸

1.3.3 Traded volumes in relation to physical consumption: churn-rate

The indicator traded volumes in relation to physical consumption is often called the churn rate. ACM follows this common terminology in this appendix. The churn rate is defined as the ratio between total traded volumes of a power derivative and total electricity consumption in a given period. This ratio provides an indication of how many times a MWh of power is traded before it is delivered to the final consumer.¹⁹ ACM has calculated the churn rate per year in line with an ECA recommendation.²⁰

1.3.4 Open interest in relation to physical consumption

Open interest refers to all open positions with a clearing house at a given point in time. It corresponds to the total amount of energy in derivatives contracts that have not yet been (i) closed out by an offsetting trade, (ii) fulfilled by means of the physical delivery of the underlying asset or (iii) executed via cash settlement.²¹

1.4 Sources for assessment of indicators

ACM uses data from four different sources for its assessment of indicators. ACM used data from the period 1 July 2018 until and including 30 June 2024 for its assessment of the indicators.

1.4.1 ICIS

ICIS (Independent Commodity Intelligence Services) is an independent news and reporting company. ICIS data is based on the OTC trading through brokers. ICIS describes its methodology of price determination in the European Daily Electricity Markets Methodology.²²

1.4.2 ICE-ENDEX

ICE-ENDEX is an exchange for gas and electricity, among other things. The data from this source is based on trades, orders and in specific cases on their modelled calculations when there was not enough liquidity in a product to determine the exact price on a given day. In addition, the clearing bank of this exchange also offers services to OTC clients to settle transactions (clearing).

1.4.3 EEX

EEX is an exchange for gas and electricity, among other things. The data from this source is based on trades, orders and in specific cases on their modelled calculations when there was not enough liquidity in a

¹⁸ Source: Analysis of Electricity Forward Market Hedging Opportunities in Finnish, Estonian, Latvian and Lithuanian Bidding Zones Borders, Commissioned by the Finnish Energy Authority, Thema Consulting Group, 18 February 2021 (hereafter: Thema 2021), page 32 (ACM/INT/485582).

¹⁹ Source: Thema (2021), page 19.

²⁰ Source: European Electricity Forward Markets and Hedging Products – State of Play and Elements for Monitoring, Final Report, September 2015, ECA Consulting Associates. Source: ECA (2015), page 56 (ACM/INT/485575).

²¹ EC Group (2016), page 43.

²² ACM/INT/485601.

product to determine the exact price on a given day. In addition, the clearing bank of the exchange also offers services to OTC clients to settle those transactions (clearing).

1.4.4 ENTSO-E

ENTSO-E is the organization that, on behalf of the European National Grid Operators, is committed to realizing a harmonized electricity market, coordinates implementations related to different time periods within different regions and is committed to development and management of transparency towards stakeholders. The data from the ENTSO-E transparency website comes from National Grid Operators and the program responsible parties. Here are links to the data and description of ENTSO-E Load: [Link ENTSO-E Load](#) & [Data View \(entsoe.eu\)](#).

1.5 Assessment of indicators

1.5.1 Trading horizon

ACM looked at the trading horizon on the two exchanges ICE-ENDEX and EEX, because these are the two exchanges that offer products for the Dutch bidding zone. ICE-ENDEX offers up to 156 consecutive month contracts. Quarterly, seasonal, calendar, and any period of consecutive monthly contracts can be registered as a strip. Trading will cease at the close of business two Business Days prior to the first calendar day of the quarter, season or calendar year. EEX offers contracts for the respective next 34 days and the next five weekends, the current and the next four weeks, the current month and the next six months, seven quarters and six years.

Via OTC (brokers) products are offered for several years, quarterly, seasonally, monthly, weekly, weekend, daily and hours.

Bilaterally agreed contracts can have the same product maturities as available as for the exchange and OTC. Also non-standard contracts such as Power Purchase Agreements can be agreed upon.

1.5.2 Bid-ask spread

ACM uses data from ICIS to assess the bid-ask spread. The bid and ask values that ICIS publishes are the values at the close of the day (in the Netherlands typically at 16:00 CET). It is important to note that ICIS publishes bid-ask spreads that are higher than 1 EUR/MWh as 1 EUR/MWh. The effect of this cap is that this can lead to an underestimation of the bid-ask spread. Also a minimum for bid-ask spreads is used of 0,05 EUR/MWh.²³

In this section, ACM presents visualisations of the bid-ask spread assessments:

- figure 1 shows the average bid-ask spread OTC baseload yearly products;
- figure 2 shows the average bid-ask spread OTC peak load yearly products
- figure 3 shows the average bid-ask spread of OTC monthly quarterly and yearly baseload products
- figure 4 shows the average bid-ask spread of OTC peak load yearly products; and
- table 2 shows the percentage of bid-ask spreads that reached the 1-euro cap per year of delivery for respectively baseload and peak load yearly products.

²³ For more information from ICIS about the range of assumptions made in calculating the bid-ask spread values see ICIS, European Daily Electricity Markets Methodology (ACM/INT/485601).

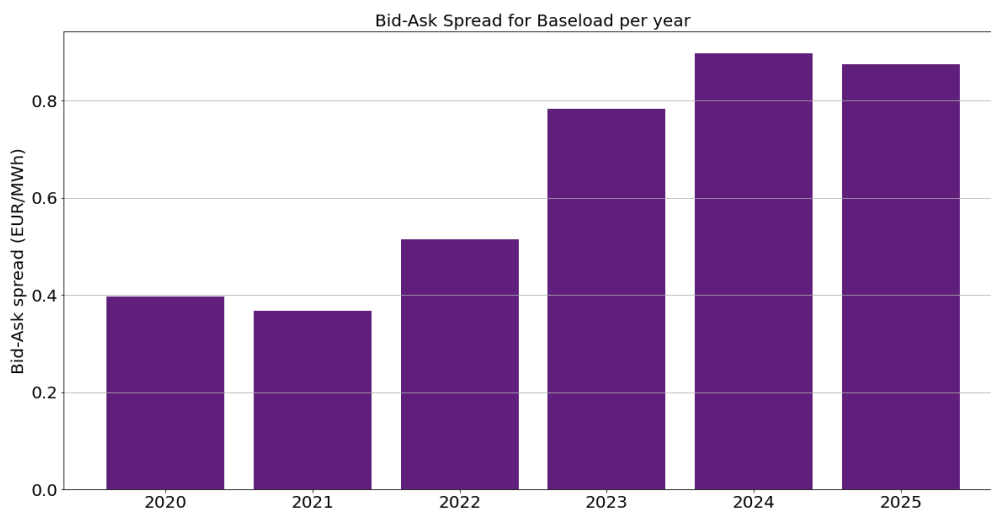


Figure 1 shows the average bid-ask spread of OTC baseload yearly products for the Dutch bidding zone per year of delivery in the period 2020-2025. Source: ICIS.

The average bid-ask spread is calculated by taking the average of daily values throughout the period from 18 to 0 months before the start of delivery. ACM used data from July 2018 until July 2024 to calculate yearly averages for delivery in the years 2020-2025.

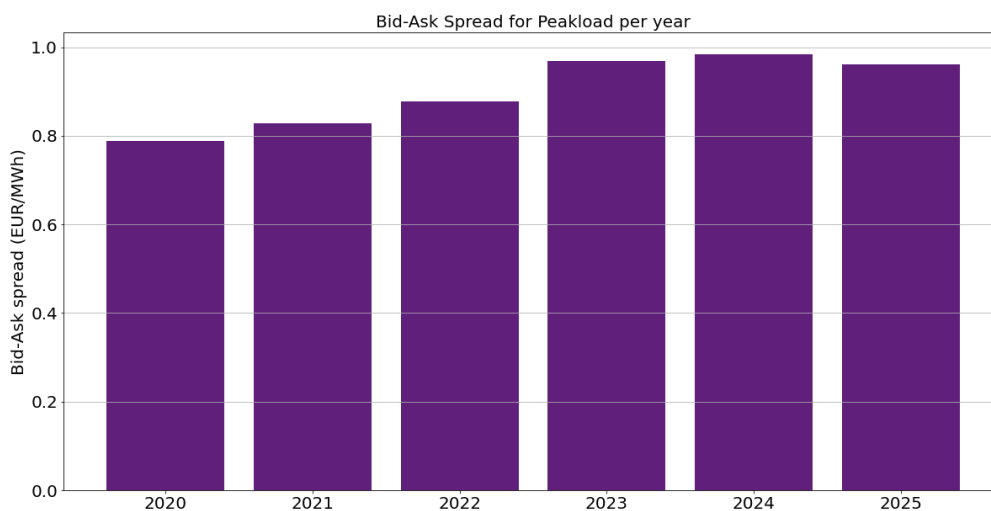


Figure 2 shows the average bid-ask spread of OTC peak load yearly products for the Dutch bidding zone per year of delivery in the period 2020-2025. Source: ICIS.

The average bid-ask spread is calculated by taking the average of daily values throughout the period from 18 to 0 months before the start of delivery. ACM used data from July 2018 until July 2024 to calculate yearly averages for delivery in the years 2020-2025.

	2020	2021	2022	2023	2024	2025
percentage cap baseload	8	8	18	55	80	76
percentage cap peak load	57	64	76	93	96	89

Table 1 shows the percentage of bid-ask spreads that reached the 1-euro cap per year of delivery for respectively baseload and peak load yearly products for the Dutch bidding zone. Source: ICIS.

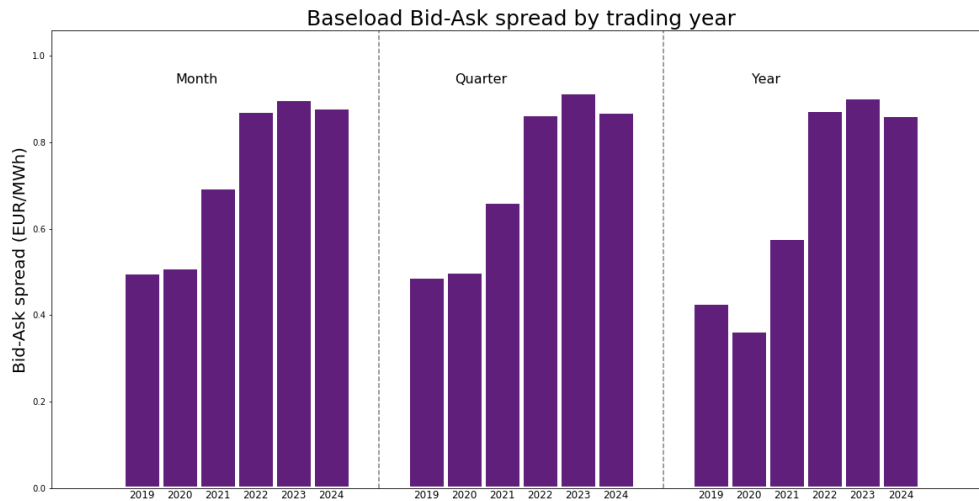


Figure 3 shows the average bid-ask spread of OTC monthly quarterly and yearly baseload products for the Dutch bidding per year of delivery in the period 2019-2024. Source: ICIS.

For every product, the average bid-ask spread within a trading year is taken. For trading year 2024, only data until July 2024 has been used.

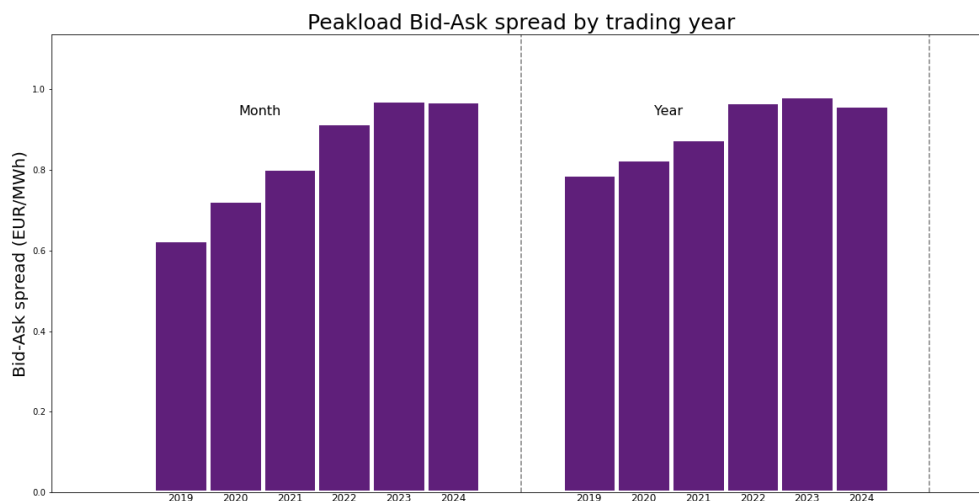


Figure 4 shows the average bid-ask spread of OTC monthly quarterly and yearly peak load products for the Dutch bidding per year of delivery in the period 2019-2024. Source: ICIS.

For every product, the average bid-ask spread within a trading year is taken. No data was available from ICIS for quarterly peak load products. For trading year 2024, only data until July 2024 has been used.

1.5.3 Churn rate

For calculation of the churn rate, ACM used data on traded volumes from the data sources EEX, ICE Endex and ICIS.

For EEX, the following monthly, quarterly, and yearly products are used:

- Dutch-Base-Month-Future Q0BM (EEX Dutch Power Base Month Future Q0BM);
- Dutch-Base-Quarter-Future Q0BQ (EEX Dutch Power Base Quarter Future Q0BQ);
- Dutch-Base-Year-Future Q0BY (EEX Dutch Power Base Year Future Q0BY);
- Dutch-Peak-Month-Future Q0PM (EEX Dutch Power Peak Month Future Q0PM);
- Dutch-Peak-Quarter-Future Q0PQ (EEX Dutch Power Peak Quarter Future Q0PQ); and
- Dutch-Peak-Year-Future Q0PY (EEX Dutch Power Peak Year Future Q0PY),

This data includes only trades that are traded on the exchange. In the following figures, this is named “EEX PR”. OTC trades that are cleared on the exchange are not taken into account. The reason for this is to avoid double counting, because OTC cleared transactions with involvement of a broker are included in the ICIS data.²⁴

For ICE Endex, the following monthly products are used:

- DPA-Dutch Power Peak Load (8-20) Futures;
- DPB-Dutch Power Base Load Futures;
- NLB-Dutch Power Financial Base Future; and
- NLP-Dutch Power Financial Peak Future.

This data includes trades that are traded on the exchange. OTC trades that are cleared on the exchange are taken into account, because it was not possible to distinguish in the ICE Endex data between OTC cleared trades that are agreed on (i) directly between counterparties or (ii) via a broker. This means that there is a certain amount of double counting in the ICIS and ICE Endex data because OTC cleared transactions with involvement of a broker are also included in the ICIS data. This could lead to an overestimation of the churn rate.

For ICIS, monthly, quarterly, and yearly products are used.

Thus all assessments include only long-term contracts. The plotted totals are totals for long-term contracts from our data sources.

ACM uses ENTSO-E data on the total actual load for the Dutch bidding zone for determination of the consumption in the Dutch bidding zone.

In this paragraph, ACM presents visualisations of the following churn-rate assessments:

- Figure 5 shows total traded volume;
- Figure 6 shows traded volume versus total volume actual load;
- Figure 7 shows the churn rate per year.

²⁴ ACM/IN/828889.

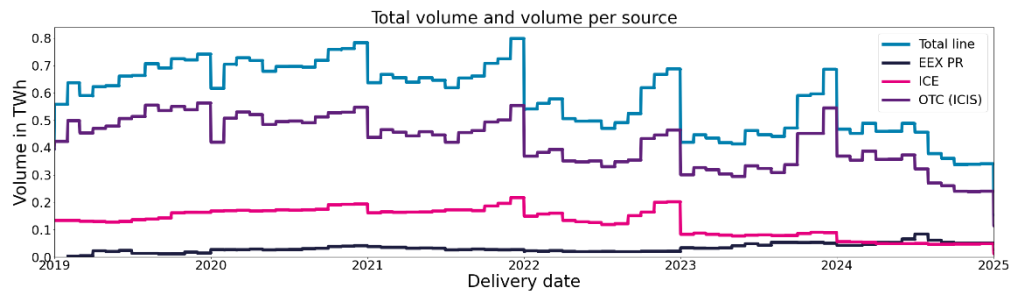


Figure 5 shows traded volumes for respectively ICE Endex, EEX, ICIS and the total of traded volumes (for the products mentioned above in this paragraph) for ICE Endex, EEX and ICIS from 1 January 2019 through 30 June 2024. For each date, it is calculated how much is traded with a delivery date on that exact date.

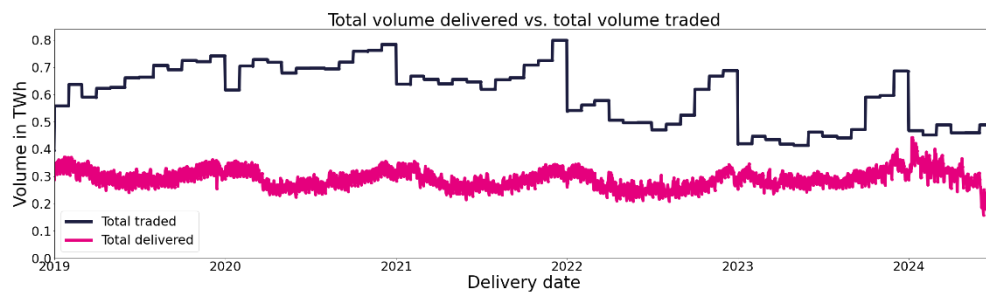


Figure 6 shows the total volume traded which is the same as in figure 7. This figure also shows the total volume actual load based on ENTSO-E data for the period 1 January 2019 through 30 June 2024.

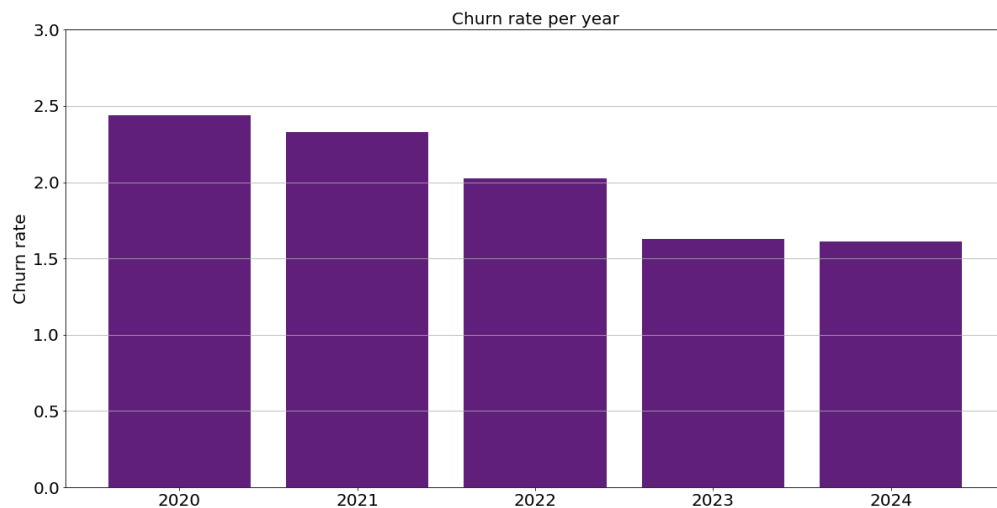


Figure 7 shows the churn rate per year for the period 2020 until July 2024. The churn rate is calculated as follows: $\text{churn rate} = \text{volume traded} / \text{volume consumed}$. Daily churn rates are averaged over the year.

1.5.3.1 Trade volumes divided by product and by source

In this paragraph, ACM presents visualisations of traded volumes:

- Figure 8 shows the traded volumes per product;
- Figure 9 shows the traded volumes per source.

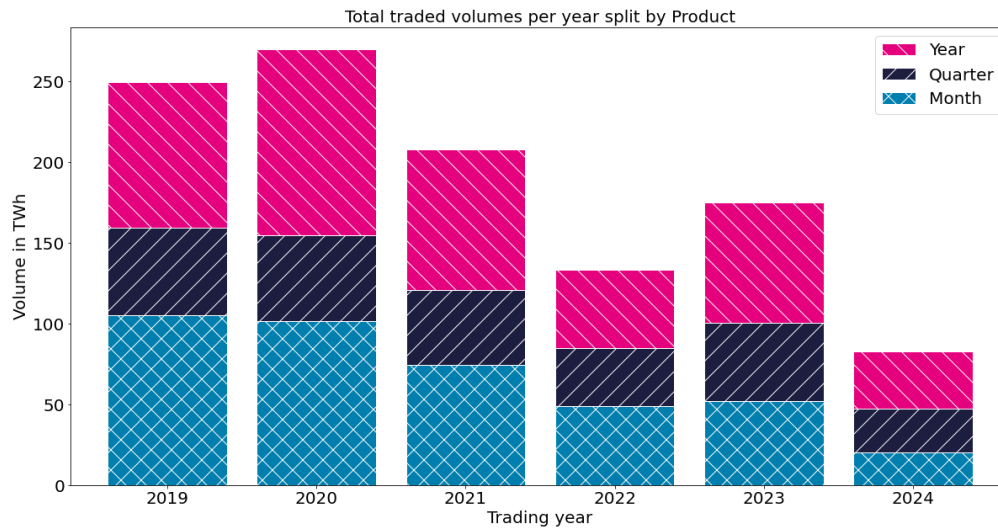


Figure 8 shows the total volumes traded per year split in monthly, quarterly and yearly products for the period 2019 until July 2024. The total traded volumes per year consist of traded volumes for the products from ICE Exend, EEX and ICIS as mentioned before in section 1.5.3.

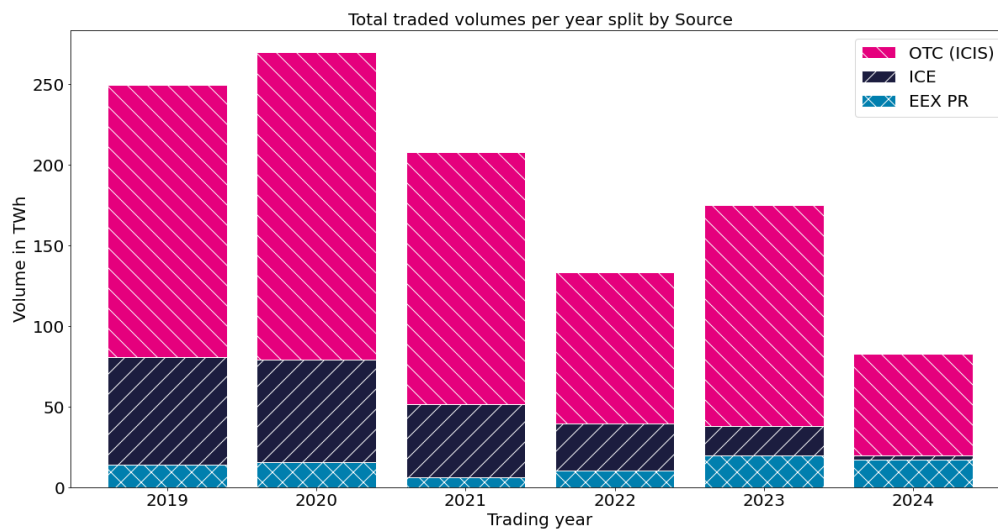


Figure 9 shows the total volumes traded per year based on the trading places (ICE Exend, EEX and OTC (ICIS). for the period 2019 until July 2024.

1.5.4 Open interest in relation to physical consumption

For the analysis of open interest in relation to physical consumption, ACM uses data on the following monthly, quarterly and yearly products from EEX:

- Dutch-Base-Month-Future Q0BM (EEX Dutch Power Base Month Future Q0BM);
- Dutch-Base-Quarter-Future Q0BQ (EEX Dutch Power Base Quarter Future Q0BQ);
- Dutch-Base-Year-Future Q0BY (EEX Dutch Power Base Year Future Q0BY);
- Dutch-Peak-Month-Future Q0PM (EEX Dutch Power Peak Month Future Q0PM);
- Dutch-Peak-Quarter-Future Q0PQ (EEX Dutch Power Peak Quarter Future Q0PQ); and
- Dutch-Peak-Year-Future Q0PY (EEX Dutch Power Peak Year Future Q0PY),

This data includes trades that are traded on the exchange and OTC trades that are cleared on the exchange.

ACM also used data on the following monthly products for ICE Endex:

- DPA-Dutch Power Peak Load (8-20) Futures; and
- DPB-Dutch Power Base Load Futures;

This data includes both trades that are traded on the exchange, and OTC trades that are cleared on the exchange²⁵

ACM did not use data for the following ICE Endex monthly products:

- NLB-Dutch Power Financial Base Future; and
- NLP-Dutch Power Financial Peak Future.

The reason for not including the financial products is that they will cease trading at the close of business one business day prior to the last calendar day of the contract delivery period, whereas the non-financial products will cease at the close of business two Business Days prior to the first calendar day. Therefore, the relation between non-financial and financial products is different between trading and delivery periods. This makes adding those values for open interest in relation to physical consumption difficult to interpret when adding financial products. Also, the volume of these financial products are low compared with the volumes of the non-financial products so that it would not have made any difference to the graphs and conclusions.

In this section, ACM presents the following visualisations:

- figure 10 shows the open interest in relation to physical consumption for EEX baseload products;
- figure 11 shows the open interest in relation to physical consumption for EEX peak load products;
- figure 12 shows the open interest in relation to physical consumption for ICE Endex baseload products; and
- figure 13 shows the open interest in relation to physical consumption for ICE Endex peak load products.

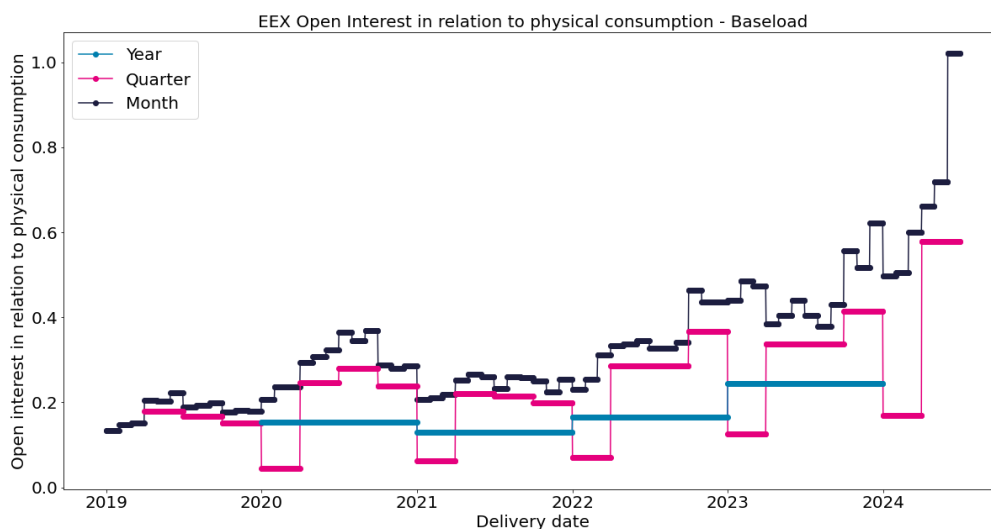


Figure 10 shows for monthly, quarterly and yearly baseload products from EEX the open interest in relation to physical consumption in the period from 1 January 2019 through 30 June 2024.

For each type of contract (monthly, quarterly, and yearly) the open interest is recorded shortly prior to the delivery date.²⁶ This is divided by the total physical consumption in the delivery period for that product. For

²⁵ ACM/IN/826854.

²⁶ The moment just before closing gives the best indication of the total open interest for a specific product.

example, for the month product February 2023, open interest is recorded on 31 January 2023. This volume of open interest is divided by the total electricity consumed in the month of February for the Dutch bidding zone based on ENTSO-E data.

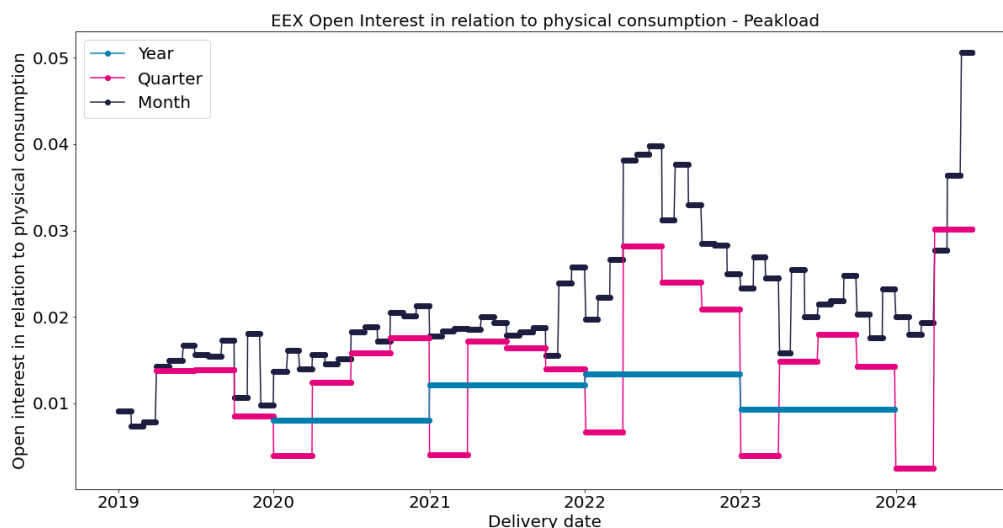


Figure 11 shows for monthly, quarterly and yearly peak load products from EEX the open interest in relation to physical consumption in the period from 1 January 2019 through 30 June 2024.

For each type of contract (monthly, quarterly, and yearly), the open interest is recorded shortly prior to the delivery date. This is divided by the total physical consumption in the delivery period for that product.

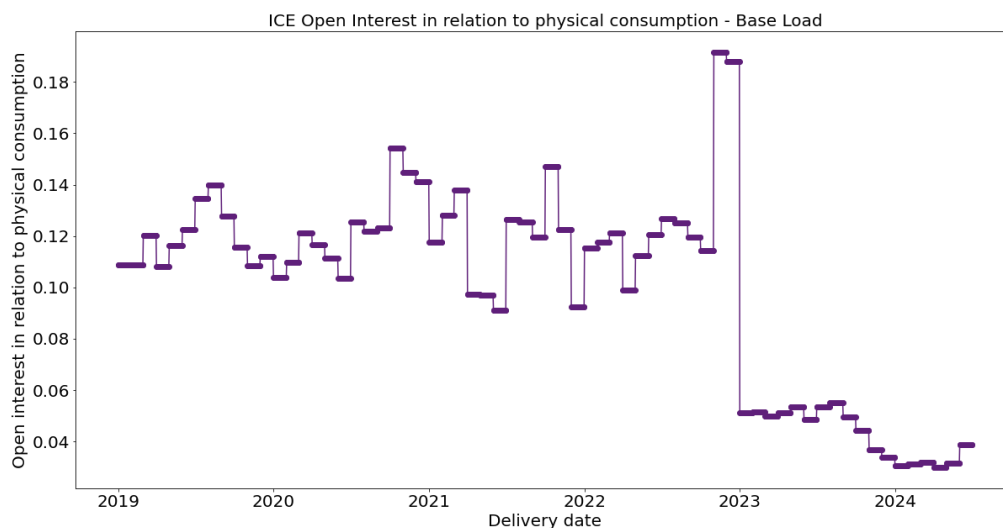


Figure 12 shows for monthly baseload products from ICE Endex the open interest in relation to physical consumption in the period from 1 January 2019 through 30 June 2024.

For each monthly baseload product, the open interest is recorded shortly prior to the delivery date. This is divided by the total physical consumption in the delivery period for that product.

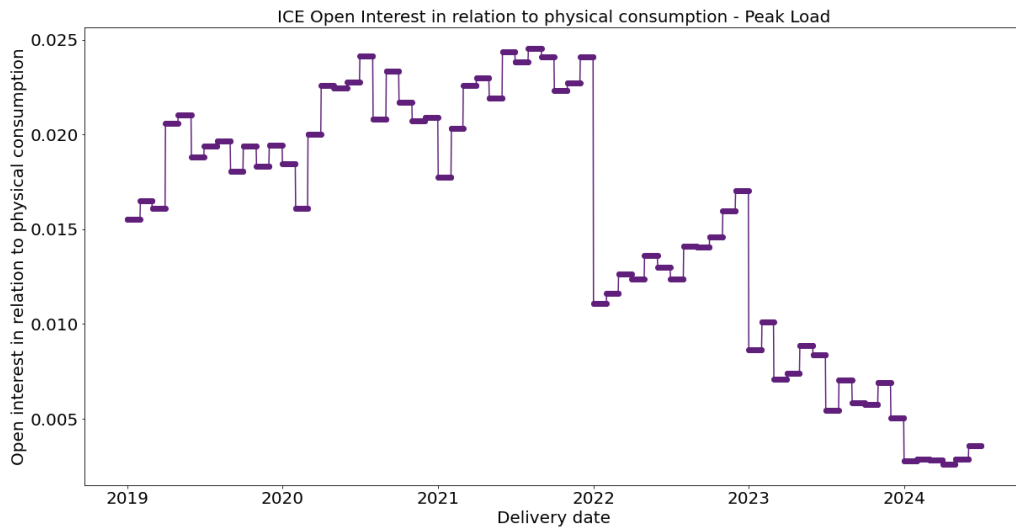


Figure 13 shows for monthly peak load products from ICE Endex the open interest in relation to physical consumption in the period from 1 January 2019 through 30 June 2024.

For each monthly peak load product, the open interest is recorded shortly prior to the delivery date. This is divided by the total physical consumption in the delivery period for that product.

1.5.4.1 Open interest

In this section, ACM presents the following visualisations:

- figures 14 shows the open interest for EEX baseload products;
- figure 15 shows the open interest for EEX peak load products;
- figure 16 shows the open interest for ICE Endex baseload products;
- figure 17 shows the open interest for ICE Endex peak load products;
- figure 18 shows the combined open interest for EEX and ICE Endex baseload products; and
- figure 19 shows the combined open interest for EEX and ICE Endex peak load products.

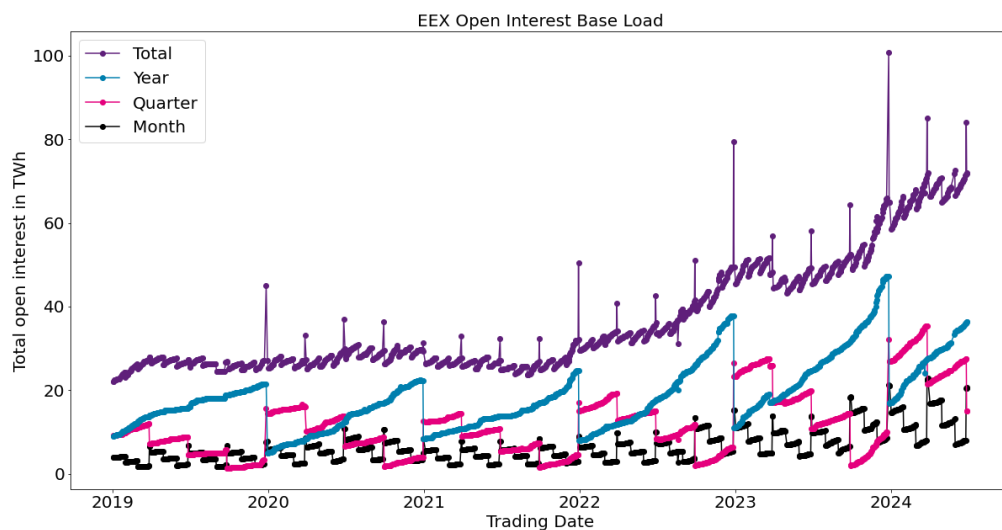


Figure 14 shows for monthly, quarterly and yearly baseloads products from EEX the open interest in the period from 1 January 2019 until and including 30 June 2024. Figure 14 also shows the combined value (total) of open interest for monthly, quarterly and yearly products from EEX.

Figure 14 shows the effect of cascading, namely that yearly products are replaced by quarterly products and quarterly products are replaced by monthly products.

The peaks/outliers correspond with the cascading dates. The peaks/outliers are caused by the inability in the dataset to separate the open interest volumes during the day of cascading causing artificial double counting.

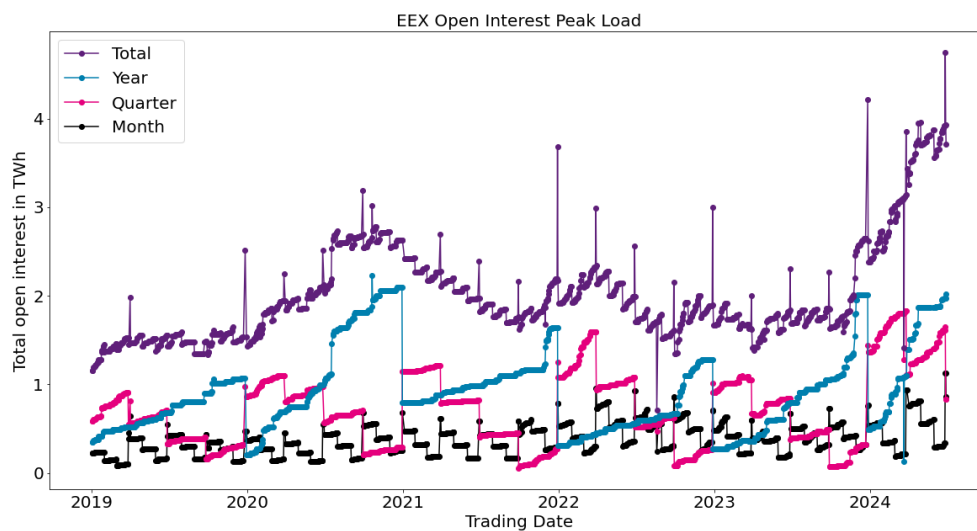


Figure 15 shows for monthly, quarterly and yearly peak loads products from EEX the open interest in the period from 1 January 2019 through 30 June 2024. Figure 15 also shows the combined value of open interest for monthly, quarterly and yearly products.

Figure 15 shows the effect of cascading, namely that yearly products are replaced by quarterly products and quarterly products are replaced by monthly products.

The peaks/outliers are caused by differing closing and starting dates of yearly, quarterly and monthly products.

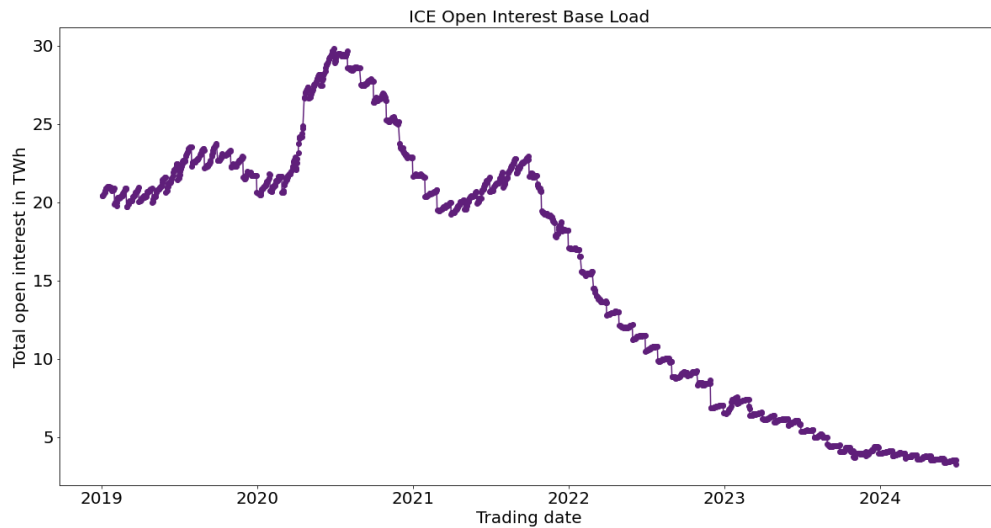


Figure 16 shows for monthly baseload products from ICE Endex the open interest in the period from 1 January 2019 through 30 June 2024.

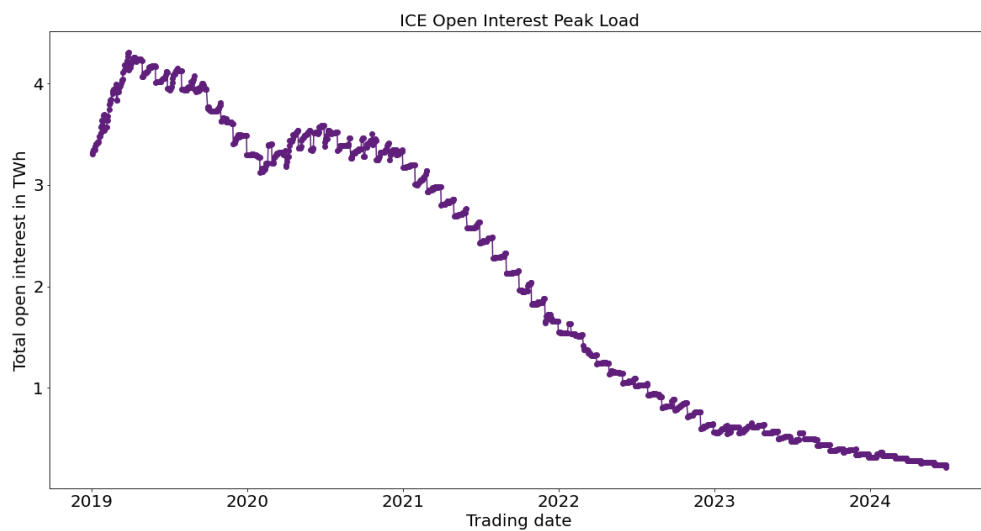


Figure 17 shows for monthly peak load products from ICE Endex the open interest in the period from 1 January 2019 through 30 June 2024.

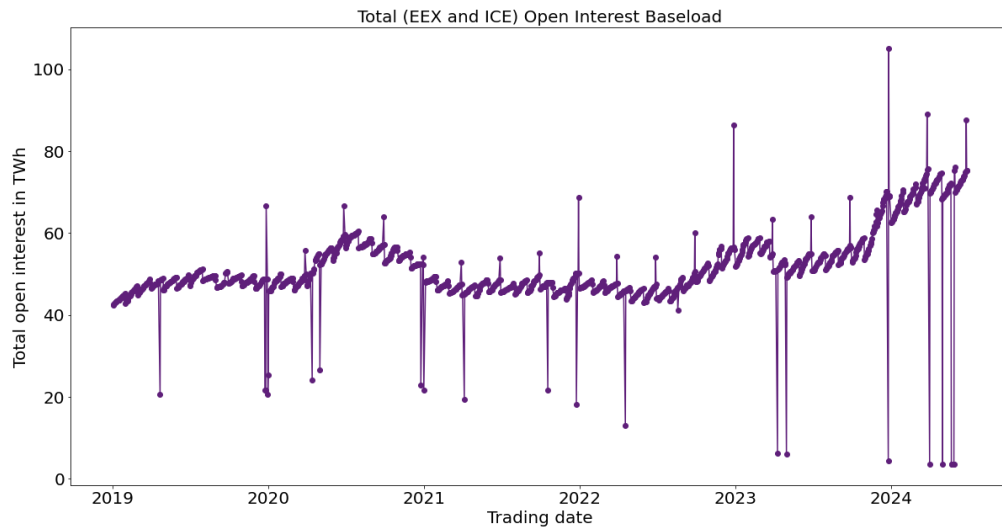


Figure 18 shows for baseload products from EEX and ICE Endex the combined open interest in the period from 1 January 2019 through 30 June 2023.

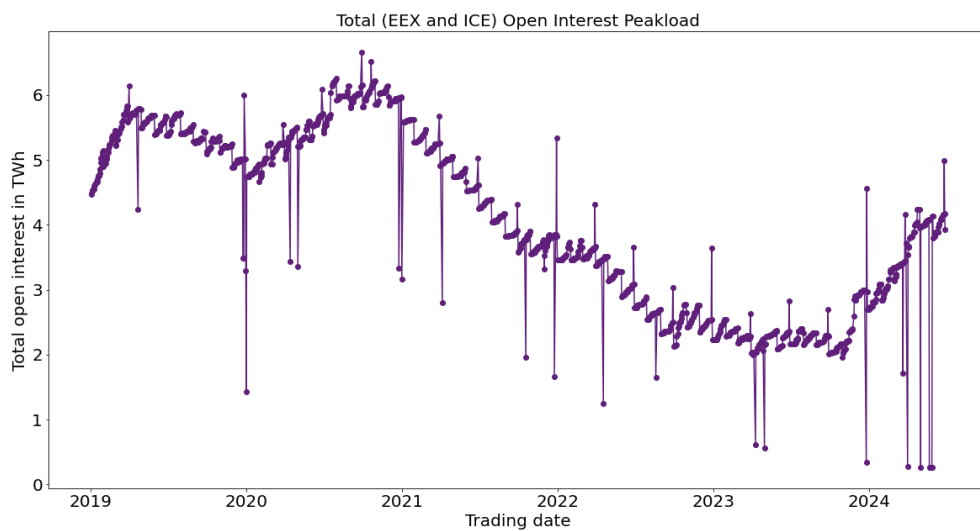


Figure 19 shows for peak load products from EEX and ICE Endex the combined open interest in the period from 1 January 2019 through 30 June 2024.