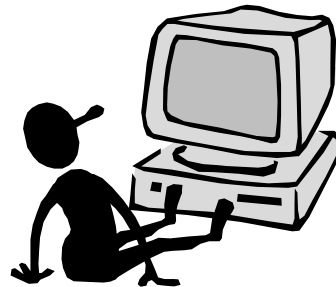


# Introduction

**Anders Plejdrup Houmøller**  
***Houmoller Consulting ApS***

- **In the appendix, you'll find an explanation of the terminology and acronyms used in this presentation.**
- **Concerning the documents referred to in this presentation:**
  - ✓ **You can download the documents at <https://houmollerconsulting.dk/facts-findings/>**
- **This presentation is animated**
  - ✓ **It's strongly recommended to run the animation when viewing the presentation.**



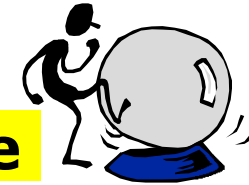
# Coping with the electricity market's price volatility

- **It has been suggested, electricity consumers should be encouraged to enter into fixed-priced, long-term contracts.**
- **The well-intentioned plan is to reduce the consumers' price volatility**
  - ✓ **And to provide lower energy prices.**
- **The spot market's price volatility is extreme indeed. You may refer to the PowerPoint presentations**
  - ✓ ***Hungarian spot prices 2010-2024.***
  - ✓ ***Nordic System Price 1992-2024.***
- **However, as history shows, fixed-priced, long-term contracts are not good for electricity consumers.**



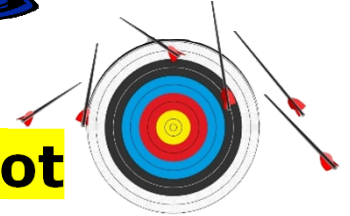
# Long-term contracts are not good for consumers

➤ Many years of experience show the futures market for electricity has these features:



➤ The futures market is not good at predicting the future spot prices.

➤ The futures market has a strong tendency to overshoot



✓ Meaning: the estimates of the future spot prices are too high.

✓ Consequently, on the average, entering into futures contracts is expensive for consumers.



➤ The futures market's price volatility is as extreme as the spot market's price volatility



✓ The price of a futures contract will vary wildly, depending on when you enter into the contract!

✓ Hence, long-term contracts offer no escape from the electricity market's price volatility.

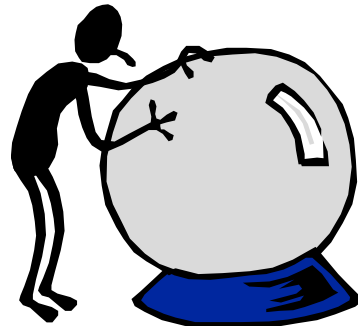


➤ The year 2022 shows these features can be tremendously magnified during periods of turbulence.

# Estimates of the future prices of electricity

## Using Germany as the case

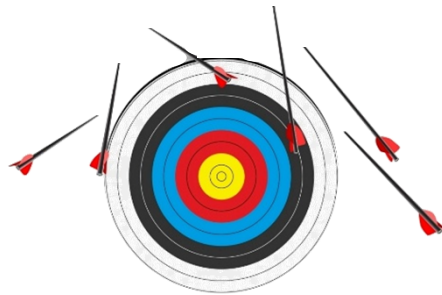
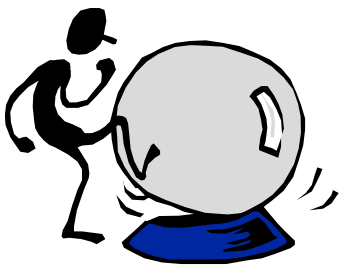
- **The following slides present the market's estimates of the future whole-sale prices of electricity**
  - ✓ **i.e. estimates of the future spot prices.**
- **We'll discuss the German prices.**
- **The German prices constitute a benchmark for Continental Europe because:**
  - ✓ **Germany is Europe's biggest and most liquid electricity market.**
  - ✓ **Germany has a central position with electrical connections to 11 other countries.**



# German futures prices for electricity

## For the second quarter of 2023

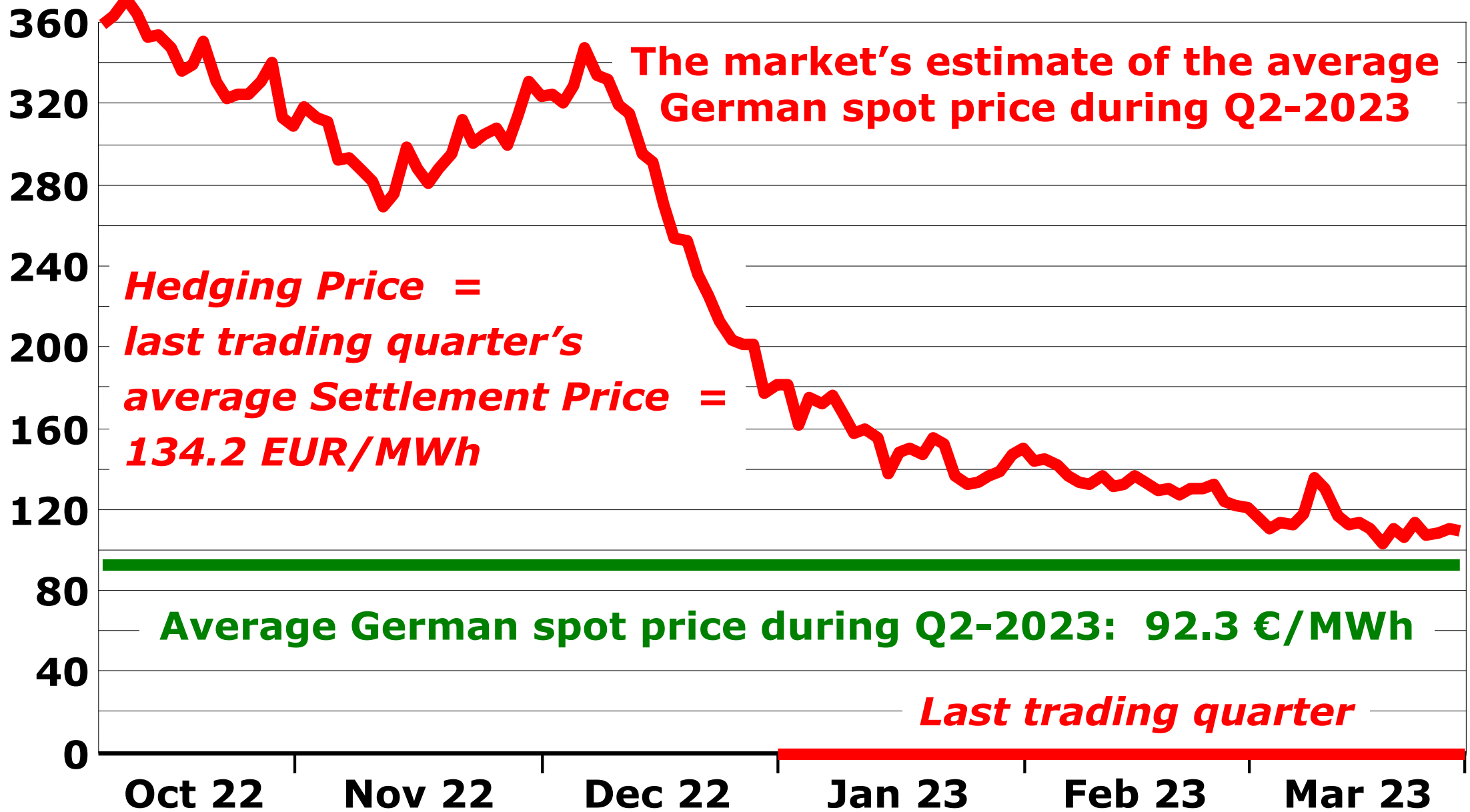
- **At the next slide, the red curve shows the daily Settlement Prices for the futures contract hedging against the average German spot price during the second quarter of 2023**
  - ✓ **The red curve shows the estimates made from 7 October 2022 to the end of March 2023.**
- **This slide – and the following, similar slides – illustrates the features of the futures market listed previously.**



# German futures prices for electricity

## For the second quarter of 2023 (Q2-2023)

€/MWh





# German futures prices for electricity

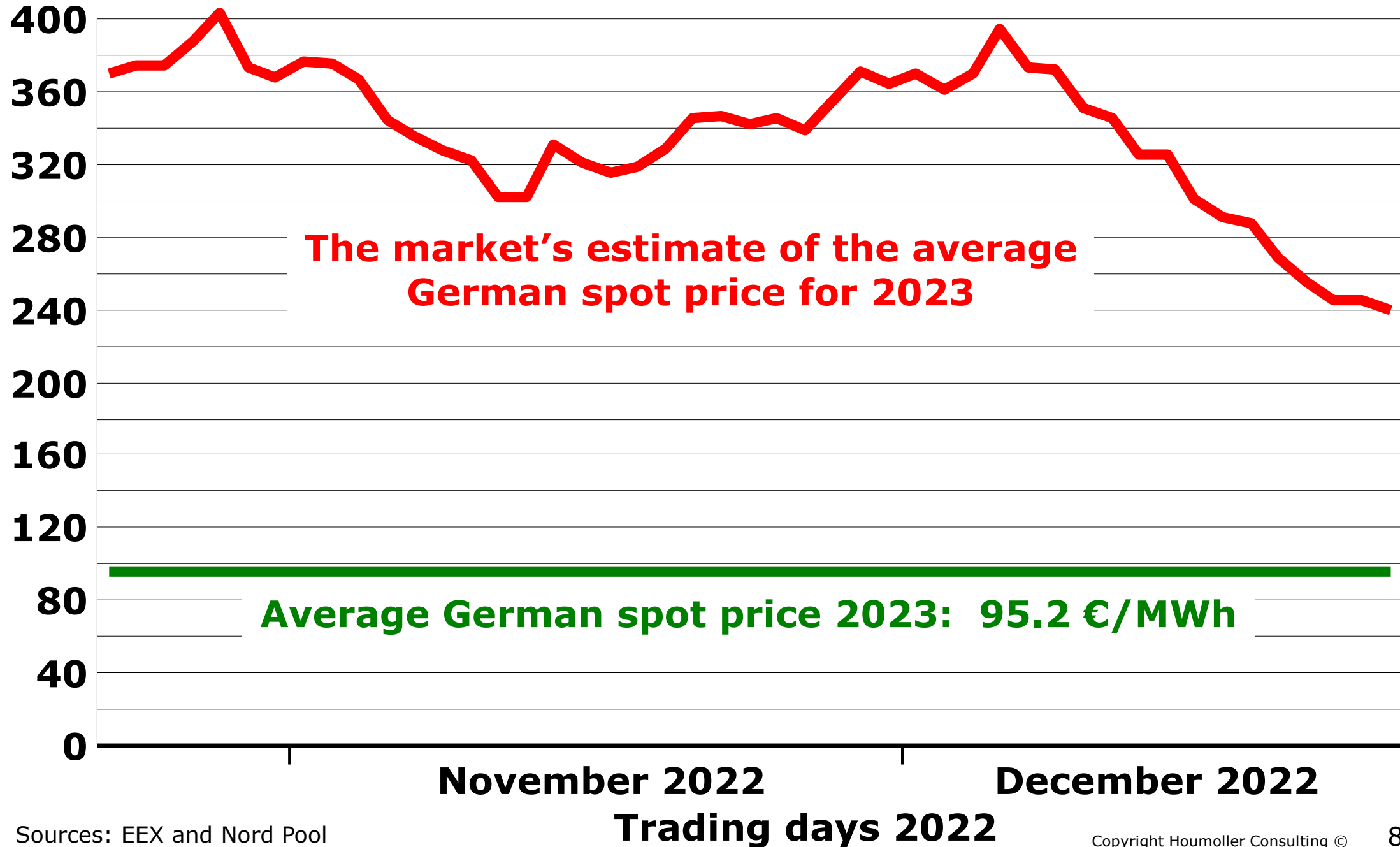
## For the years 2023 and 2024

- **At the next two slides, the red curves show the market's estimates of the average German spot price for the years 2023 and 2024, respectively**
  - ✓ **The red curves show the daily Settlement Prices from 24 October 2022 to the start of the year in question.**



# German futures prices for the year 2023

€/MWh





# German futures prices for the year 2024

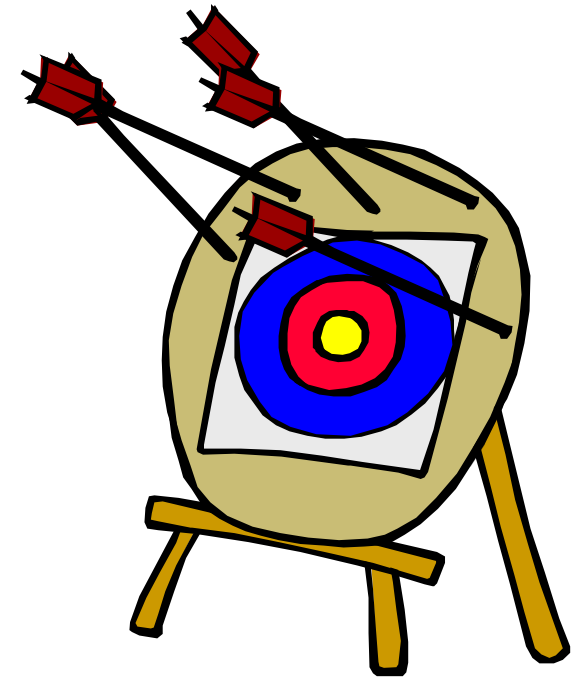
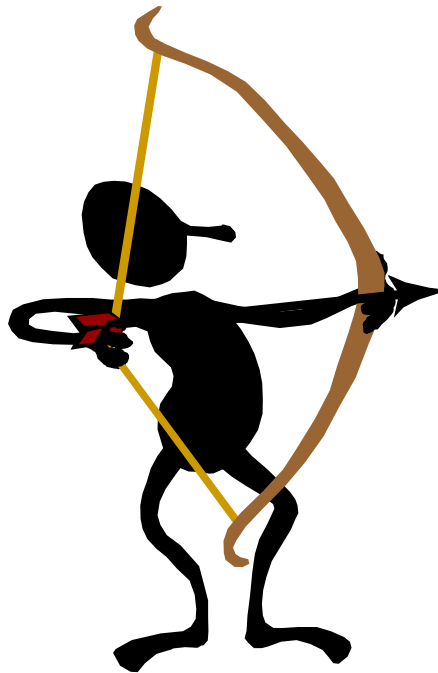
€/MWh



# German futures prices for electricity

## For the 8 quarters from Q1-2023 to Q4-2024

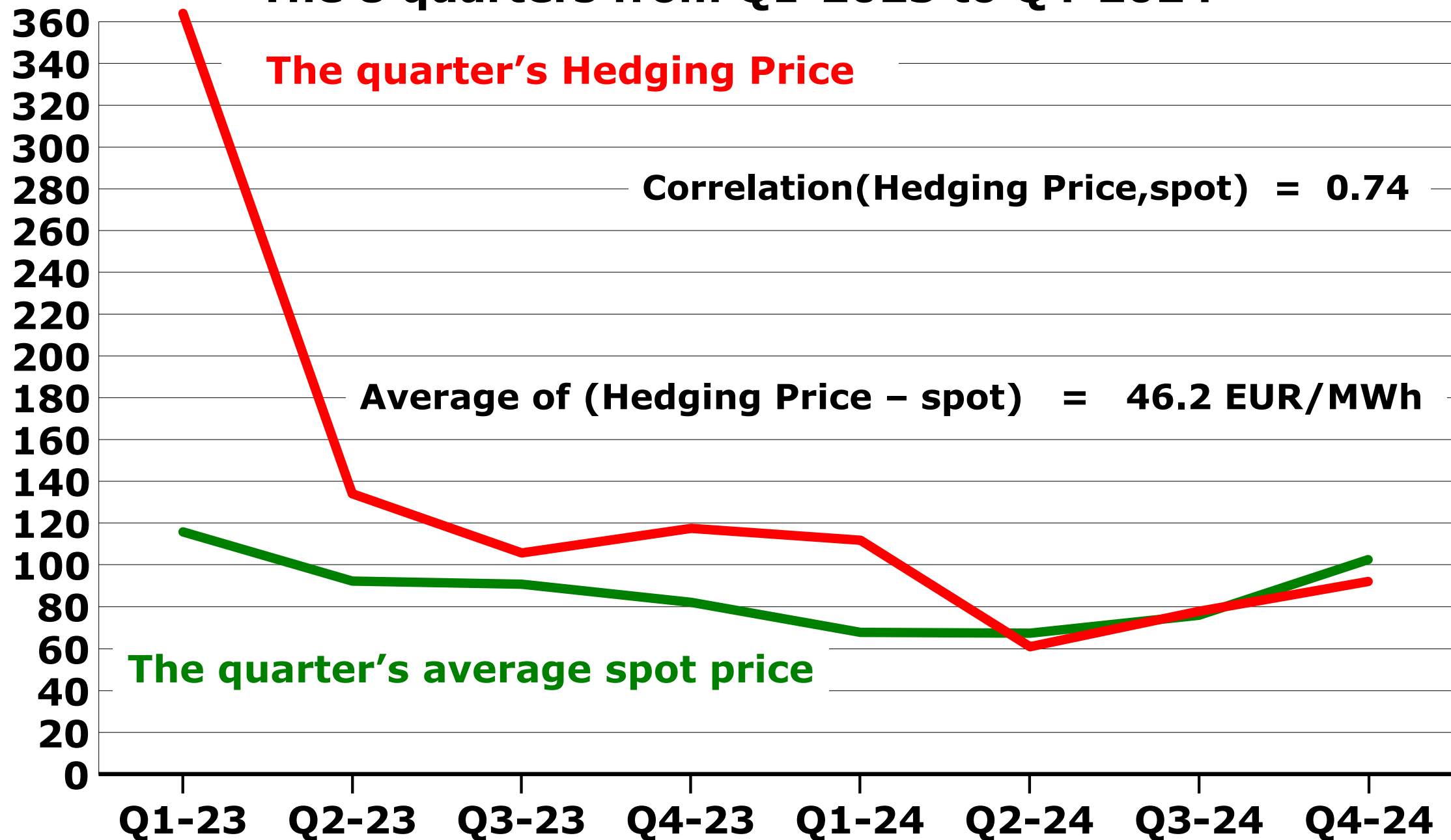
- **At the next slide, for each of the quarters, the red curve shows the quarter's Hedging Price**
  - ✓ **The *Hedging Price* is defined in the appendix.**



# Hedging Prices and spot prices

The 8 quarters from Q1-2023 to Q4-2024

€/MWh





# Liquidity



# German and Nordic liquidity

- **At the following slide, for EEX and Nasdaq OMX, the blue and the green curves illustrate the cleared volume:**
  - ✓ (contracts traded off-exchange and subsequently cleared) + (contracts traded at the exchange).
- **Concerning the volume for “German financial contracts”:**
  - ✓ Please refer to *Cleared volume* in the appendix.
- **Concerning the LEBA curve:**
  - ✓ Please refer to *LEBA* in the appendix.
- **A quote from an ACER report:**
  - ✓ ***A churn rate exceeding 10 usually indicates a liquid market (...). By this standard, only the German forward electricity market qualifies as liquid in the EU.\*)***



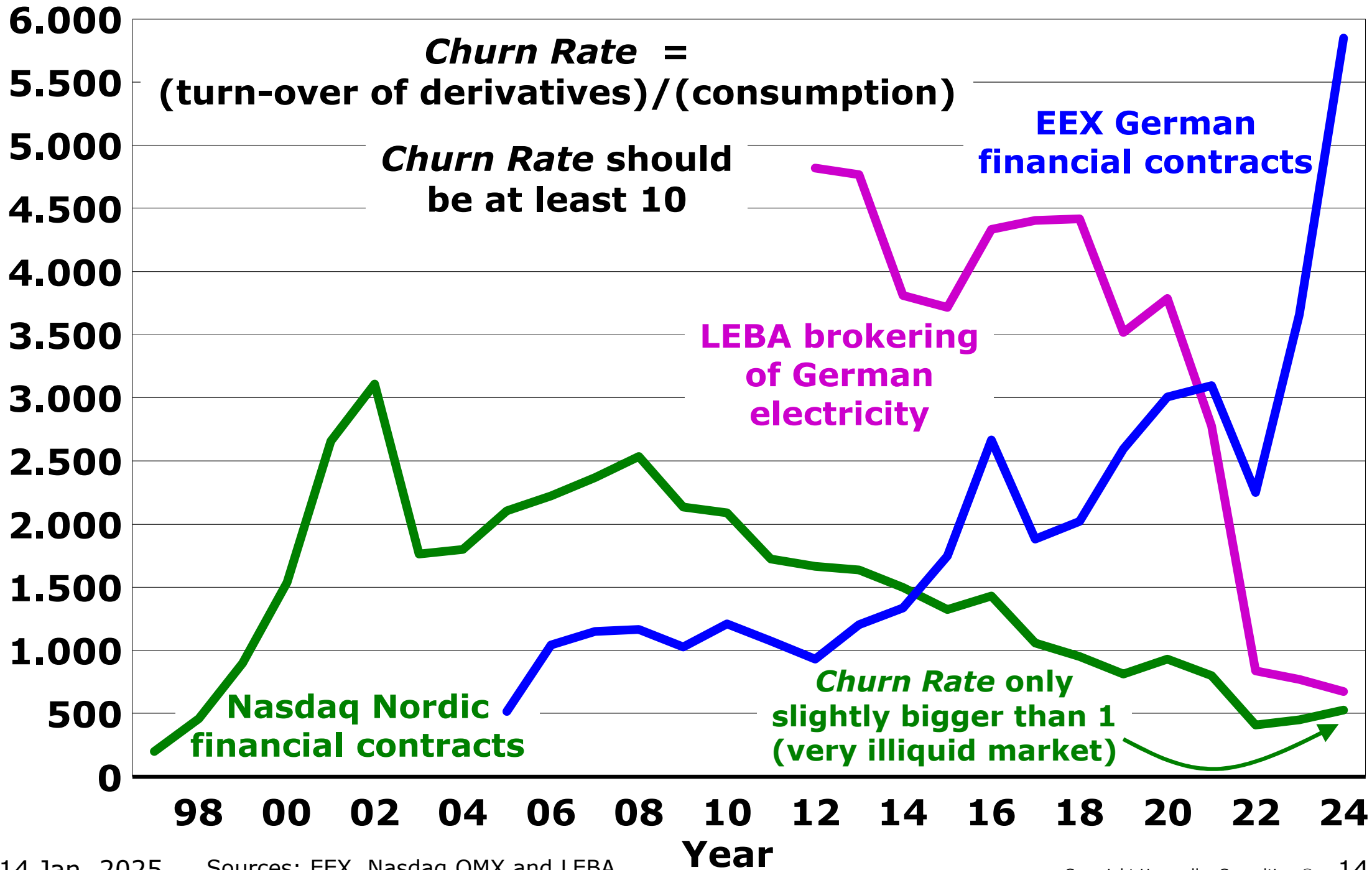
\*) ACER's Market Monitoring Report 14 Nov. 2024, page 24

[https://www.acer.europa.eu/sites/default/files/documents/Publications/ACER\\_2024\\_MMR\\_Market\\_Integration.pdf](https://www.acer.europa.eu/sites/default/files/documents/Publications/ACER_2024_MMR_Market_Integration.pdf)



TWh

# Cleared volume 1997–2024





# More information

- For more information, see the PowerPoint presentations
  - ✓ ***Nordic financial prices and spot prices – annual contracts 2002-2017.***
  - ✓ ***Nordic financial prices and spot prices – quarter contracts 2006-2017.***
- **These presentations give you the experiences from the Nordic market for power derivatives.**





# Appendix

## Terminology and acronyms

# Terminology and acronyms – 1

- **ACER** See <https://www.acer.europa.eu/the-agency/about-acer>
- **Cleared volume** Concerning the volume for “German financial contracts” at the slide on cleared volume:
  - ✓ For 2006-2016, this is Phelix futures.
  - ✓ For 2017, this is (Phelix DE/AT futures) + (Phelix DE futures).
  - ✓ For 2018, this is (Phelix DE/AT futures) + (Phelix DE futures) + (Phelix AT futures).
  - ✓ From 2019 and onwards, this is Phelix DE futures.
- **Correlation** Given two data sets, the correlation measures the degree to which the two data sets move in lockstep. Please refer to the slide on correlation.
- **EEX** See [www.eex.com](http://www.eex.com)
- **Futures contract** See [www.eex.com](http://www.eex.com) for a specification of EEX’s futures contracts.
- **Futures market** See Wikipedia *futures contract*.
- **Futures price** The price of a futures contract. See Wikipedia *futures contract*.
- **Futures Q2-2023** In this document, this is the name of the futures contract, which hedged against the average German spot price during Q2-2023.



In the financial world’s terminology: the average German spot price during Q2-2023 was the “Underlying” of the contract *Futures Q2-2023*. For more information, you may see <https://www.investopedia.com>

- **Hedging Price** (with capital H and P) In this document, for a given futures contract, this is the average of the *Settlement Prices* during the last quarter where the contract was traded. See also the slide on the second quarter of 2023 (Q2-2023).

However, for the quarter Q1-2023, the *Hedging Price* is the average of the *Settlement Prices* from 7 October 2022 to the end of December 2022.

# Terminology and acronyms – 2

- **LEBA** London Energy Brokers' Association. See the web site [www.lebaltd.com](http://www.lebaltd.com).

For the LEBA curve at the slide on liquidity, the number for 2024 is the LEBA turn-over during the 12 months from December 2023 to November 2024.

The LEBA curve at the slide on liquidity includes all physical forward contracts for European power arranged by contributing OTC brokers including contracts that are registered on clearing platforms. The LEBA curve does not include contracts executed directly on exchange screens and does not include financially settled contracts for power.

For more information on the LEBA curve, see <https://www.lebaltd.com/monthly-volume-reports/>

- **Market's estimate of the future spot price** In this document, for each trading day, this is EEX's *Settlement Price* for the futures contract in question.

For example, consider the second quarter of 2023 (Q2-2023). The futures contract, which in this document is called *Futures Q2-2023*, was the contract hedging against the average German spot price during Q2-2023. The 8 December 2022, the *Settlement Price* of this contract was 333 €/MWh. Hence, in this document, 333 €/MWh is considered this trading day's estimate of the average German spot price during Q2-2023.

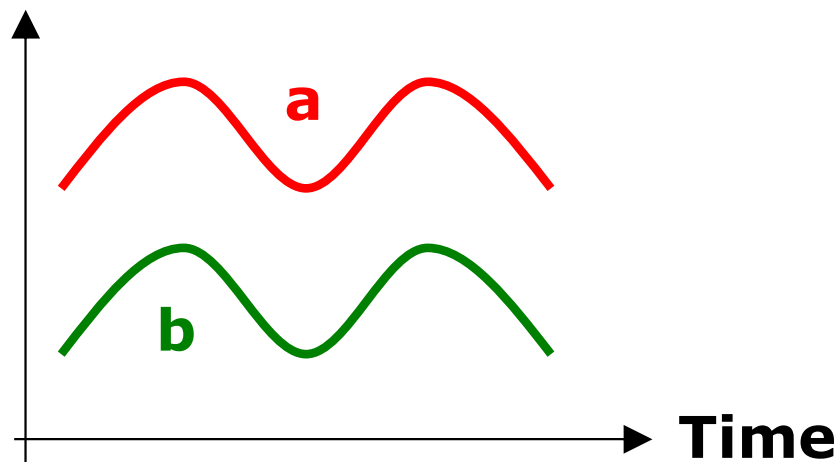
- **Nasdaq OMX** An exchange, where the players can trade Nordic power derivatives (and other products). Please refer to <https://www.nasdaq.com/solutions/european-commodities>.
- **Nordic and Nordic area** In this document, this refers to the four countries Denmark, Finland, Norway and Sweden.
- **Nordic financial contract** In this document, this is a financial contract, where the underlying reference is a Nordic spot price or the Nordic System Price.
- **Nordic System Price** See *System Price*.
- **OTC** Over-The-Counter. Trading taking place without the supervision of an exchange. This is also called bilateral trading.

# Terminology and acronyms – 3

- **Phelix AT spot price** See *Phelix DE/AT spot price*.
- **Phelix DE spot price** See *Phelix DE/AT spot price*.
- **Phelix DE/AT spot price** The common spot price for Germany and Austria. From October 2018, there was no longer a common spot price for Germany and Austria. Hence, from October 2018, there was a Phelix DE spot price for Germany and a Phelix AT spot price for Austria.
- **Power derivative** See the PDF document *The Liberalized Electricity Market*. For more information on derivatives, you may see <https://www.investopedia.com>
- **Price hedging** As a consumer or producer of electricity in a large part of Europe: if you choose to trade at the spot price, you'll first learn your price for the next day's consumption/production of electricity after 12 o'clock Central European Time.  
However, by using a physical or financial contract, you can fix your electricity price at an earlier point in time. This early fixing of the price is called "price hedging".
- **Settlement Price** At EEX, for each power derivative, a Settlement Price is set at the end of every trading day. In effect, at the end of the trading day, the Settlement Price is the financial market's forecast of the future spot price. (At Nasdaq OMX, this price is called the *Daily Fix*.)
- **Spot price** Please refer to the PowerPoint presentation "Maximizing the economic value of market coupling and spot trading" (or the PDF document with the same name).  
You may also refer to the PDF document *The Liberalized Electricity Market*.
- **System Price** A virtual spot price. It's the theoretical, common spot price we would have in the Nordic area, if there were no grid bottlenecks in the area covered by the four countries.  
For an overview over the historical values of the System Price, please see the PowerPoint presentation "Nordic System Price 1992-2024" (or the PDF document with the same name).

# The correlation function

- **The correlation function measures the correlation between two variables.**
- **If the two variables move in lockstep, the value of the correlation function is 1.**
  - ✓ **A value of 0 means there is no correlation at all.**



**In this example  
 Correlation(a,b) = 1  
 as a and b move  
 in lockstep**



# **Thank you for your attention!**

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