

Introduction

- **Concerning the documents referred to in this presentation:**
 - ✓ **At *houmollerconsulting.dk*, you can download the documents from the sub-page *Facts and findings*.**
- **Concerning the terms and acronyms used in this presentation:**
 - ✓ **You'll find explanations in appendix 2 of the PowerPoint presentation *Financial prices and spot prices – annual contracts 2002-2017*.**
- **This PowerPoint presentation is animated**
 - ✓ **It's recommended to run the animation when viewing the presentation.**
- **On most computers, you can start the animation by pressing F5.**
 - ✓ **Now the presentation moves one step forward, when you press Page Down. It moves one step backward, when you press Page Up.**

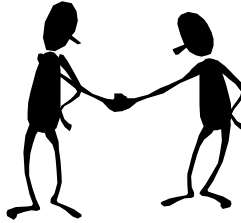
This presentation



- **This presentation compares**
 - ✓ **physical long-term trading of electricity**
- **with**
 - ✓ **trading of power derivatives.**
- **Trading of electricity is used as the case.**
- **However, the conclusions at the slides 4-8 apply to trading of gas or other commodities also.**
- **Appendix 1 gives examples of the development of liquidity at selected European electricity markets.**

A bilateral physical long-term contract

For a given area/country



- **Assume a producer and a retailer enter into a bilateral physical contract for next year:**
- **The producer will sell the retailer 100 GWh at 40 €/MWh.**
- **Suppose the average market price the next year turns out to be 42 €/MWh.**
- **With or without an electricity exchange, a "market price" of 42 €/MWh means:**
 - ✓ **The producer could have sold the 100 GWh at 42 €/MWh, as this is the price the buyers are willing to pay.**
 - ✓ **The retailer would have had to pay 42 €/MWh, as this is the price at which the sellers are willing to sell.**
- **Hence, due to the bilateral long-term contract, the producer has a loss of 2 €/MWh, and the retailer has a corresponding gain.**

A bilateral physical long-term contract

For a given area/country. Price 40 €/MWh

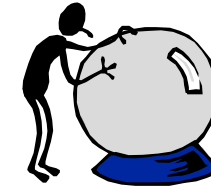
- **The consequence of a market price of 42 €/MWh: the bilateral physical contract gave a loss for the producer and a gain for the retailer of 2 €/MWh.**
- **If the area/country has an electricity exchange with a reliable spot price, the spot price will faithfully reflect the true market price**
 - ✓ **Per definition, this is a "reliable" spot price.**
- **Hence, in this case the spot price will be 42 €/MWh.**
- **Assume the parties instead of the bilateral physical contract have a financial contract with hedging price 40 €/MWh**
 - ✓ **With the exchange's spot price as the underlying reference.**
- **In this case, with a spot price of 42 €/MWh, the parties will have exactly the same loss & gain (2 €/MWh).**
- **Conclusion: a reliable spot price plus a financial market can replace bilateral long-term contracts.**

Prerequisites for a successful financial electricity market

- **First establish a reliable, trustful spot price**
 - ✓ **Then build a financial electricity market on this spot price (i.e. a power derivatives market).**
- **The market players will under no circumstances hedge against the spot price unless they trust that the electricity exchange's spot price is equal to the true market price on the whole-sale electricity market.**



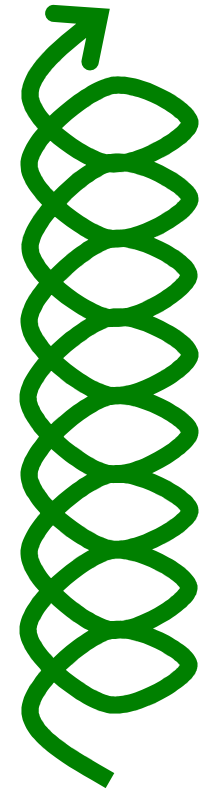
Price transparency at the long-term whole-sale market



- **The price transparency is enhanced by the standardisation of the long-term contracts provided by the financial exchanges**
 - ✓ **By quoting a limited number of standard contracts, the liquidity is drawn to these contracts.**
 - ✓ **Thereby the price discovery is greatly simplified.**
 - ✓ **“Price discovery” is the process of determining the price of an asset in the marketplace through the interactions of buyers and sellers.**
- **In contrast: the price discovery is impeded – or perhaps even blocked – if the trading is done by means of bilateral, tailor-made contracts between producers and retailers**
 - ✓ **In this case, for a given area, you may have a situation, where only the local incumbent has a (relatively) clear picture of the fair market price.**

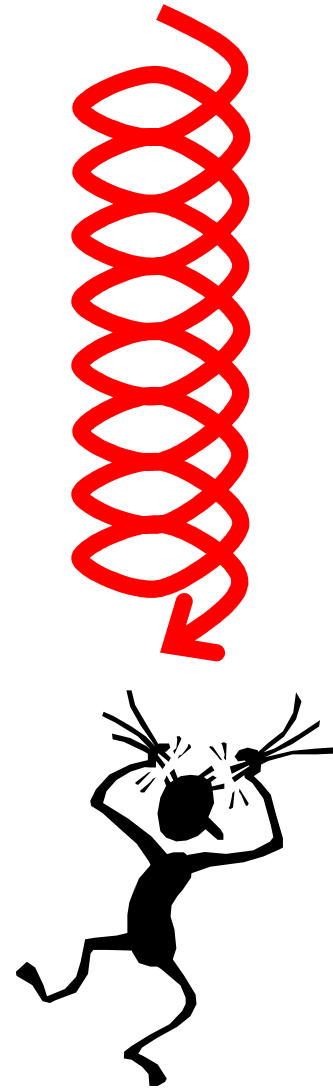
The importance of exchange liquidity – 1

- **A necessary condition for reliable exchange prices is high liquidity**
 - ✓ **Among other things, high liquidity implies individual players' decision to buy or sell will not affect the exchange's prices.**
- **The virtuous circle where liquidity creates liquidity:**
 - ✓ **High liquidity → Reliable exchange prices → Players feel confident trading at the exchange → More players choose to trade at the exchange → exchange's liquidity increases.**



The importance of exchange liquidity – 2

- **Without high exchange liquidity, a few players' decision to trade can change the exchange prices a lot – thereby creating volatility unrelated to the market situation.**
- **In turn, this brings about a feeling the exchange is a casino best avoided by sane players**
 - ✓ **This is the vicious circle, where lack of liquidity creates lack of liquidity.**



Naturally, both at a spot exchange and the financial exchange, you can have the virtuous and the vicious circle.

Appendix 1

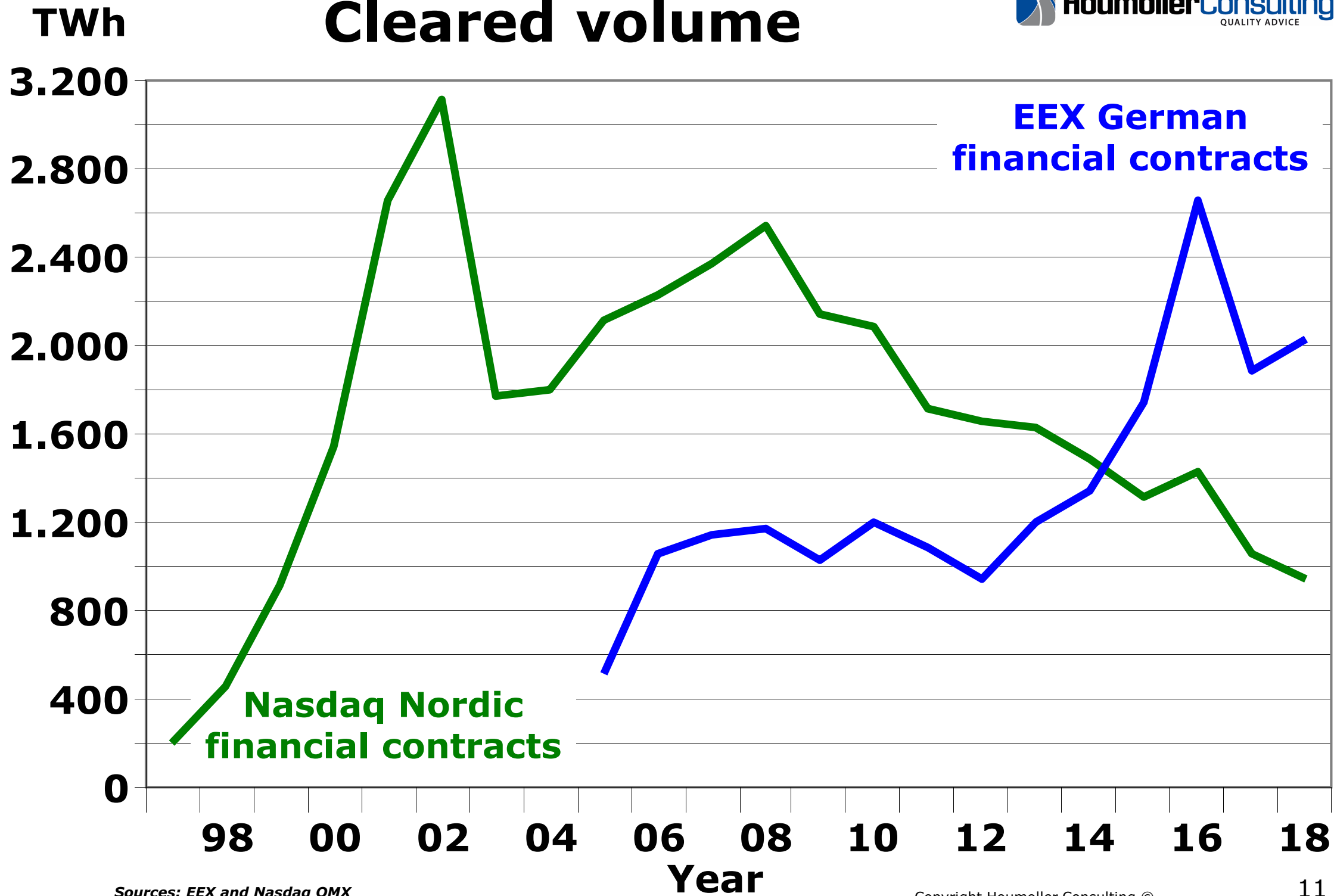
Liquidity Cases from Europe's electricity markets

Liquidity

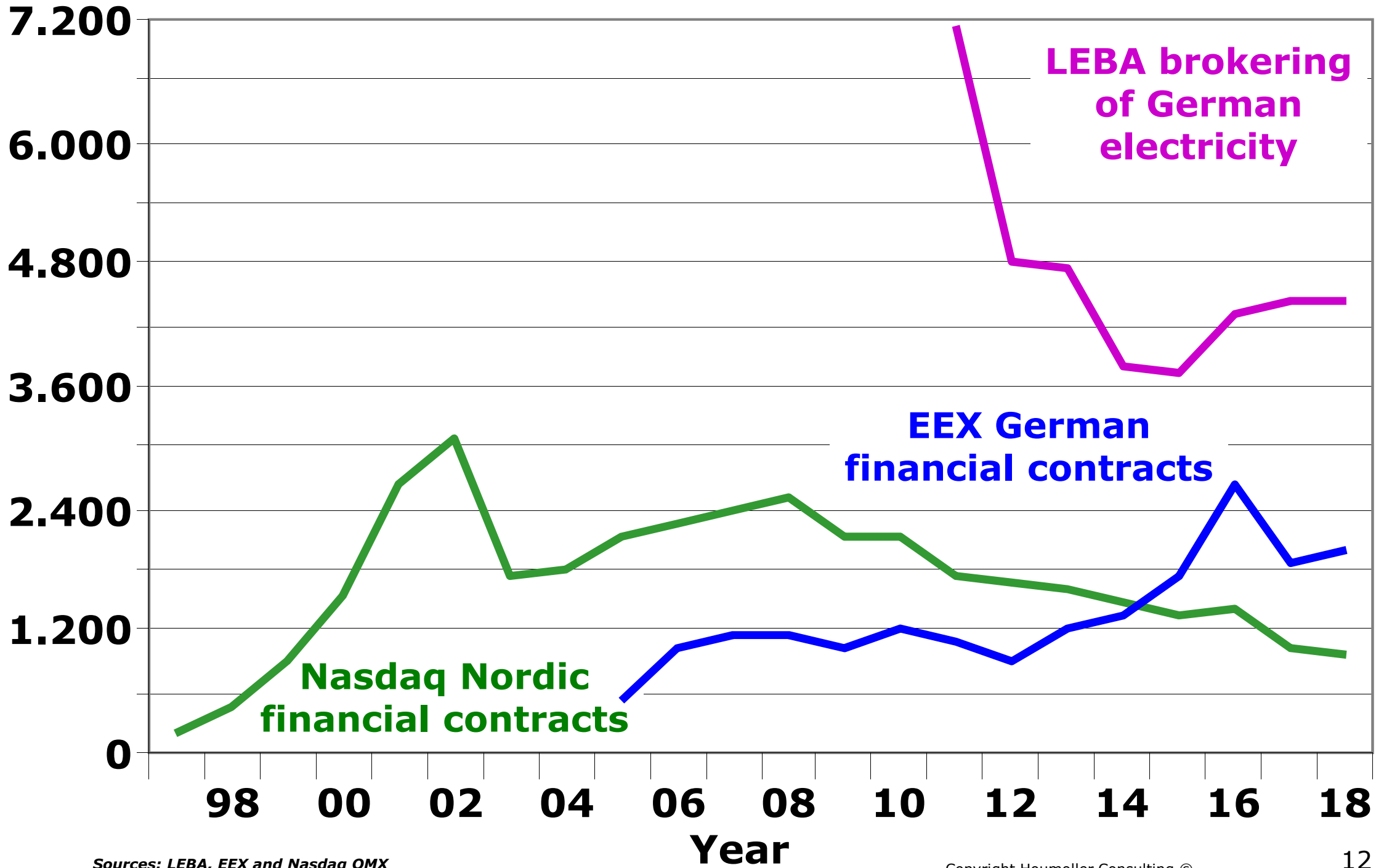
Cases from Europe's electricity markets

- **At the two following slides, 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":**
 - ✓ **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).**
- **The LEBA curve includes all physical forward contracts for power arranged by the LEBA OTC brokers**
 - ✓ **The LEBA curve illustrates the total OTC bilaterally settled volume.**
 - ✓ **The LEBA curve does not include financially settled contracts**
 - **LEBA is London Energy Brokers' Association. See the web site lebaltd.com.**

Cleared volume



TWh Cleared volume and LEBA OTC trading



Thank you for your attention!

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