

# Introduction

- ⇒ **For the market coupling, this document first presents the losses inflicted due to lack of EU regulation.**
- ⇒ **And a solution to the problem is presented.**
- ⇒ **In appendix 1, you'll find a short introduction to the so-called interim tight volume coupling carried out by EMCC (European Market Coupling Company)**
  - ✓ **And it's explained why the spot exchanges' redundant re-calculation of the spot prices can produce awful results.**
- ⇒ **In appendix 2, you'll find a list of the terms and acronyms used in this PowerPoint presentation.**
- ⇒ **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.**

# The losses inflicted – 1

**By the spot exchanges' redundant re-calculation of the spot prices**

- ⇒ **September 2008, the EMCC market coupling was first launched as a volume coupling between Germany and Denmark.**
- ⇒ **After only 10 days, the volume coupling had to be stopped due to repeated, severe mismatch between the published spot prices and the market coupling flows**
  - ✓ **EMCC's market coupling software performed as planned.**
  - ✓ **The problem: Nord Pool Spot's re-calculation software was unable to produce reliable spot prices!**
- ⇒ **Unfortunately, Nord Pool Spot insisted on having a redundant re-calculation of the spot prices**
  - ✓ **For Nord Pool Spot, it took more than one year to patch up the re-calculation software, so it does not produces big errors every day.**
- ⇒ **For Germany and Denmark, the **socio-economic losses** due to the delay of the EMCC market coupling was **more than EUR 24 mill.****

# The losses inflicted – 2

By the spot exchanges' redundant re-calculation of the spot prices

⇒ **November 10<sup>th</sup>, 2009, when the calculations for the following day were carried out:**

- ✓ **Due to a technical problem, EMCC's calculation was delayed – but not more than what was agreed acceptable**
  - **At EMCC, the problem was solved and the EMCC calculation was ready within the agreed deadline.**
- ✓ **However, in Paris EPEX Spot did not wait the agreed time for the EMCC result**
  - **Instead, EPEX Spot started its re-calculation of the German spot prices with the EMCC market coupling flows set to zero – and published the resulting spot prices**
    - **Thereby inflicting an as yet uncalculated loss on market players, who were left with unreliable spot prices.**

# The losses inflicted – 3

By the spot exchanges' redundant re-calculation of the spot prices

⇒ **For 1 December 2009 Nord Pool Spot's re-calculation of the spot prices in Eastern Denmark failed spectacularly**

✓ **The buyers' loss due to the unreliable spot prices was  
**EUR 223 000****

- **A big daily loss for an area, where the consumption is 14 TWh/year!**

⇒ **For 28 March 2011, the CWE re-calculation of the spot prices for the whole CWE area crashed**

✓ **The so-called shadow auction system was activated.**

✓ **However, this fall-back system failed to fix the problem**

- **Leaving the buyers paying up to 2999 EUR/MWh, although the market situation did not justify such prices.**

- **Inflicting an as yet uncalculated loss on market players.**

# The losses inflicted – 4

By the spot exchanges' redundant re-calculation of the spot prices

- ⇒ **For 12 October 2011 Nord Pool Spot's re-calculation of the spot prices in Eastern Denmark failed drastically**
  - ✓ **The buyers' loss due to the unreliable spot prices was **EUR 457 000.****
  
- ⇒ **For 13 August 2012 Nord Pool's re-calculation of the spot prices in the whole Baltic-Polish-Nordic area crashed again**
  - ✓ **The crash inflicted a loss of **EUR 900 000** on Baltic-Nordic sellers of electricity**
    - **As the crash blocked the planned spot export from the Baltic-Nordic area to Poland.**
  - ✓ **Due to lack of transparency, the analysis can not include this, but:**
    - **The buyers in Poland have necessarily suffered a similar loss.**

# The losses inflicted – 5

By the spot exchanges' redundant re-calculation of the spot prices

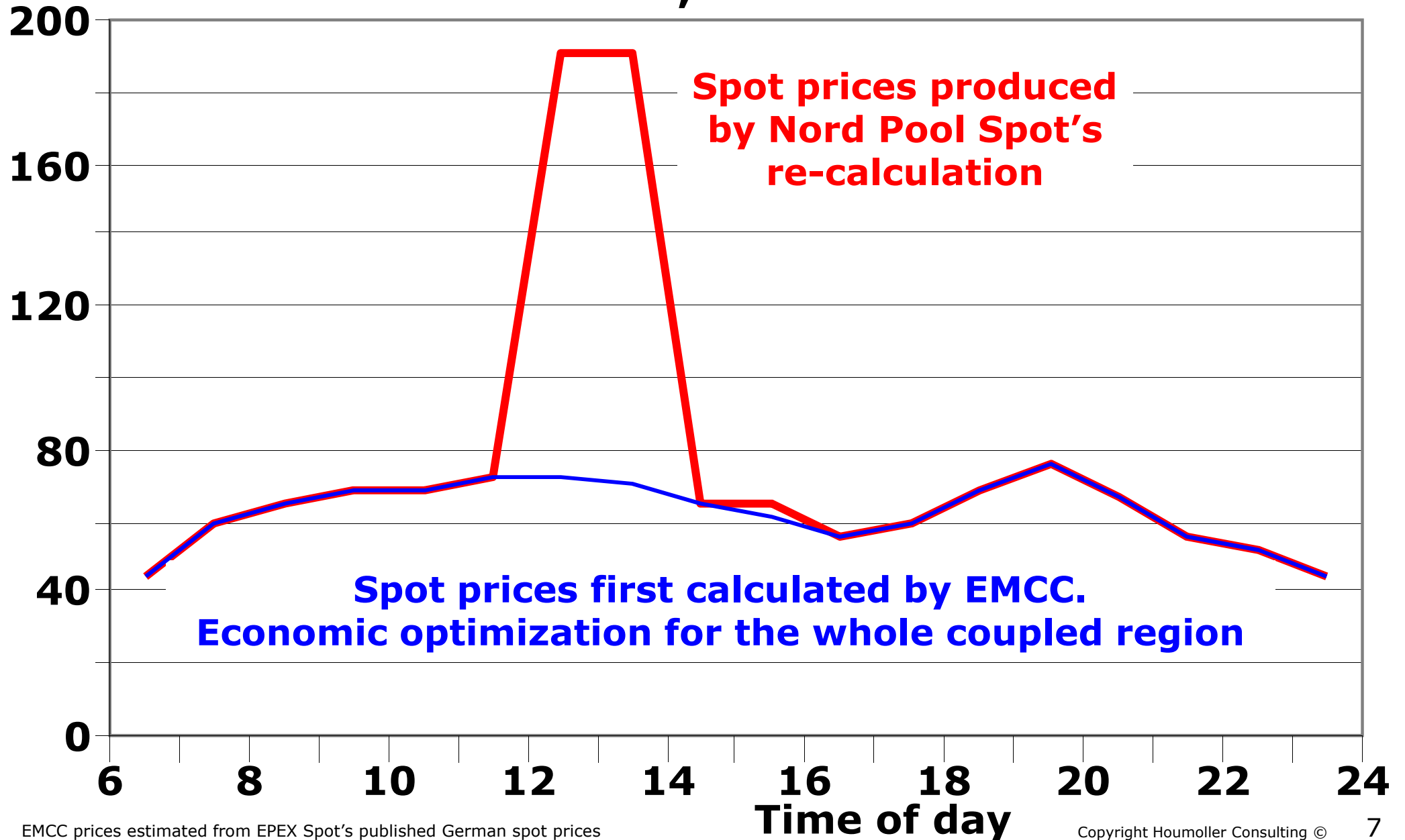
⇒ **For all these days – as for all other days – the EMCC software produced reliable spot prices**

**✓ Market players and societies would have had no losses, if the spot settlement had been done using EMCC's spot prices.**

# Spot prices in Eastern Denmark

EUR/MWh

October 12<sup>th</sup>, 2011



# Transparency lacking

- ⇒ **After the accident 1 December 2009, Nord Pool Spot promised to introduce an emergency procedure**
  - ✓ **Whenever the re-calculation goes awry, Nord Pool Spot will intervene manually in the price calculation in order to try to remedy the situation.**
- ⇒ **At a meeting for market players 4 March 2010, this was presented orally**
  - ✓ **However, the promise was not kept, as was demonstrated 12 October 2011.**
- ⇒ **Now Nord Pool Spot claims, an emergency procedure has been introduced.**
- ⇒ **However, in contrast to the normal process used when other emergency procedures have been introduced, there has been**
  - ✓ **No public consultation.**
  - ✓ **No documentation of the procedure in Nord Pool Spot's rule book.**
- ⇒ **This ditching of transparency and due diligence is regrettable.**

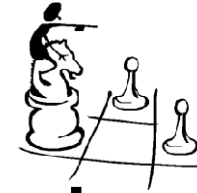


# Lack of understanding



- ⇒ **Unfortunately, Nord Pool Spot's explanation of the 12 October accident reveals a lack of understanding of how the linear optimization proceeds when you have block bids**
  - ✓ **Focusing on the price calculation for individual hours is wrong, when you have block bids.**
  - ✓ **The selection of block bids is a process covering all 24 hours of the next day**
    - **Selecting the right family of block bids is crucial!**
- ⇒ **It's like having a choice between a huge number of set menus**
  - ✓ **Choose the wrong menu, and you wind up with some very unappetising dishes**
    - **ie, single hours where the selection of this family of block bids necessarily gives unreliable spot prices**
      - **Prices completely unconnected with the market situation (which was normal 12 October 2011).**
- ⇒ **Note: with its own bids included, EMCC calculated reliable spot prices for 12 October 2011!**

# The way forward



- ⇒ Again, this lack of understanding emphasises **The Single European Electricity Market needs a well-governed, well-regulated single spot price calculation centre**
- ✓ The centre must be equipped with experts, who understand economics, computer science and linear optimization.
  - ✓ And who know their job is to **service the customers of the price coupling**
    - By providing information and advice
      - And thereafter let the customers of the market coupling make the decisions
        - Decisions on the specifications of the market coupling software and on the procedures applied in the price setting.
- ⇒ **Those whose money is at stake, must make the decisions!**
- ⇒ In contrast: each spot exchange can/should not afford such a team of highly skilled experts.

# Lessons not learnt

- ⇒ **In the spring 2011, Nord Pool Spot claimed no manual emergency procedure was needed:**
  - ✓ **Despise the track record, no big accidents could occur again for the re-calculation software...**
- ⇒ **In CWE, for 28 March 2011 it was clearly demonstrated the fall-back system “shadow auctions” is useless**
  - ✓ **Even so, the spot exchanges refuse to use the EMCC prices as the back-up solution for spot settlement, when their redundant re-calculations fail!**
    - **In spite of the fact that the EMCC calculations has consistently yielded reliable spot prices**
      - **Also when the spot exchanges’ redundant re-calculations fail**
        - **Reliable spot prices have always calculated by EMCC – also for the dates 10 November 2009, 1 December 2009, 28 March 2011, 12 October 2011 and 13 August 2012.**

# PCR – one more blow from vested interests...

With impunity, the spot exchanges are dishing out these heavy losses to market players and societies.

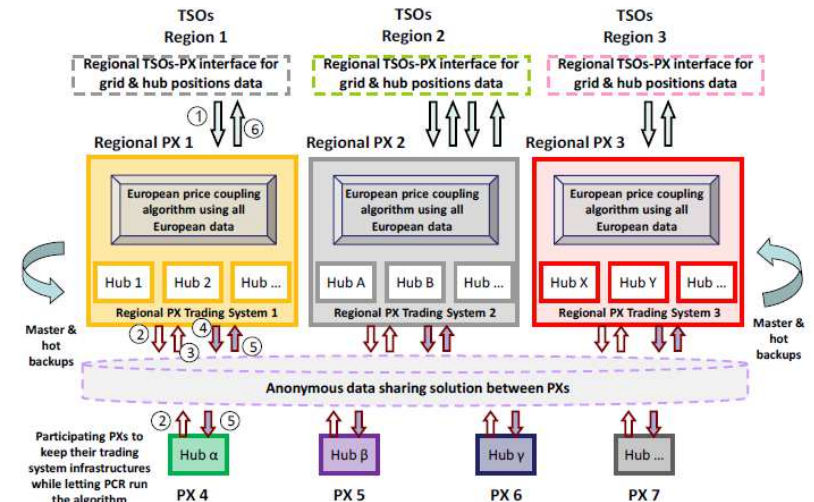
On top of this track record, the spot exchanges have even proposed the so-called PCR as the future, European price coupling system.

With PCR, via their trading fees, the spot exchanges' customers are supposed to finance lots of redundant staff, computers and software installations.

And EU is supposed to have a costly and risky system with a number of semi-autonomous calculation sites.

One of the inherent risks of such a system was demonstrated 10 November 2009.

**In your organisation, try asking your IT director: *is PCR a safe & sound system configuration?***

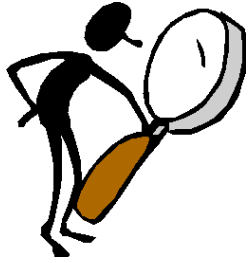




***The purpose of PCR is to service  
our customers and societies.***

***PCR will be good for them.***

***The re-calculation of spot prices shows how  
we are committed to providing high-quality,  
low-cost service to our captive customers.***



# What is PCR?

- ⇒ **From the Encyclopædia Britannica:**
- ⇒ ***Cartel, association of independent firms or individuals for the purpose of exerting some form of restrictive or monopolistic influence on the production or sale of a commodity.***
  - ✓ ***The most common arrangements are aimed at regulating prices or output or dividing up markets.***
  - ✓ ***Members of a cartel maintain their separate identities and financial independence while engaging in common policies.***
  - ✓ ***They have a common interest in exploiting the monopoly position that the combination helps to maintain.***

# We better not take the plunge...



**Unregulated monopolies is a very bad thing.  
Very expensive, as the PCR proposal and the  
re-calculation track record testify.**

# Question: How are these losses possible?

## Answer: no EU regulation in place!

- ⇒ Unfortunately, when market coupling is introduced as the day-ahead congestion management system, you cannot have competition between the spot exchanges
  - ✓ For each zone, there must be one spot price per hour.
- ⇒ This requirement of a unique spot price makes competition between the spot exchanges unfeasible
  - ✓ As explained in the PowerPoint presentation "Market coupling makes real competition betw. spot exchanges unfeasible".
- ⇒ However, when you cannot have competition, you must have regulation.
- ⇒ The problem: in EU we have a legal limbo (ie, a legal vacuum)
  - ✓ **A regulation corresponding to the spot exchanges' monopoly is not in place!**
  - ✓ And this legal limbo is abused by the spot exchanges.
  - ✓ As the PCR proposal and the redundant re-calculations demonstrate.



# Unregulated monopolies

- ⇒ **Clearly, providing reliable spot prices and low fees is not a concern for the spot exchanges.**
- ⇒ **However, this behaviour is to be expected**
  - ✓ **You can not expect unregulated monopolies to be concerned about quality and cost**
    - **The situation would have been entirely different, if it had been possible to establish competition from new spot exchanges offering low fees and using the EMCC spot prices for the settlement...**
- ⇒ **However, a Europe in dire economic straits can not afford having unregulated monopolies inflicting heavy losses on market players and societies.**

# EU regulation needed!

**This lack of regulation is a major design error of EU's liberalized electricity market!**



# **We have price coupling today**

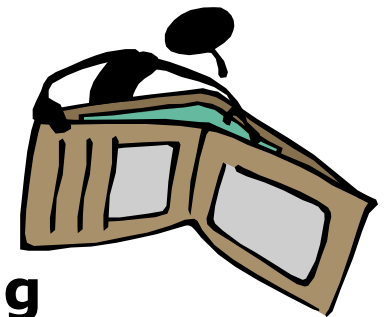
**So what are we waiting for?**

- ⇒ **Every day, the price coupling prices for the whole CWE-Baltic-Nordic-Polish region are calculated by EMCC.**
- ⇒ **Problem: the price coupling prices are not used in the spot settlement**
  - ✓ **Because the spot exchanges insist on having their redundant re-calculation of the spot prices.**
- ⇒ **Via the trading fees, the captive customers are financing the spot exchanges' redundant re-calculation systems**
  - ✓ **In return for the increased cost, the captive customers get spot prices of lower quality...**

# More redundancy

## More losses...

- ⇒ **Also, because we do not have a single spot clearing house for the coupled region, every cross-border trader has to post redundant collaterals when trading**
  - ✓ **However, when you buy a given quantity of energy from the spot exchange on one side of a border and sell it to the spot exchange on the other side, your net position is close to zero**
    - **Unless the prices on the two sides of the border are very different.**
  - ✓ **Therefore, in this case, your collateral call should be close to zero.**
- ⇒ **However, due to the redundancy of spot clearing houses, cross-border traders have to post huge, redundant collaterals.**
- ⇒ **In a Europe, where risk-bearing capital is becoming scarce, **this huge, redundant binding of capital is unacceptable.****



# Cleaning up the Augean stables



- ⇒ **Fortunately: fixing the mess is not rocket science.**
- ⇒ **Locally, each national regulator can decide:**
  - ✓ **The spot settlement must be done using the EMCC prices.**
- ⇒ **This decision can be taken per country (subsidiarity principle)**
  - ✓ **It's not necessary for all countries in the coupled region to take the decision simultaneously.**
- ⇒ **Now the market players have spot settlement at reliable prices**
  - ✓ **And they're only financing **a single calculation centre** via their trading fees.**
- ⇒ **In the next step, the spot settlement for the whole coupled region can be put out to tender**
  - ✓ **With the banks eager for business, the market players now have spot settlement at competitive fees.**
  - ✓ **And no redundant binding of capital**
    - **As the coupled region now does not have redundant spot clearing houses.**

# National influence

## And democratic oversight

- ⇒ Also, the system presented on the preceding slide gives us a market coupling, which is extremely easy to expand geographically.
- ⇒ Every (new) country participating in the coupling is given a share in EMCC.
- ⇒ For example, the shares can be allocated in accordance with the Lisbon treaty's voting weights.
- ⇒ Each national government will decide who will represent the country in the market coupler's board
  - ✓ Subsidiarity principle: different countries will make different decisions.
- ⇒ This ensures national influence and democratic oversight.

# Influence for – and co-operation between – the users

- ⇒ **The users of the market coupling are TSOs, consumers, producers and traders.**
- ⇒ **In order to ensure user influence, a Price Coupling Council must be set up, where these stakeholders are represented**
  - ✓ **With formal influence granted to the Price Coupling Council**
    - **It's not just an advisory body.**
  - ✓ **To some degree, this may reflect the German rules for an exchange council (*Börsenrat*).**



# Regulatory oversight

- ⇒ **Decisions taken in the market coupler's board and in the Price Coupling Council must be approved (or rejected) by the regulators.**
- ⇒ **When the board and/or the Council are split in slim majorities and big minorities, the decisions will in effect be taken by the regulators.**
- ⇒ **Probably, the regulators will be spear-headed by ACER.**





# Governance structure

**ACER and national regulators**

**Market coupler  
Board  
National representation**

**Market coupler  
Administration**

**Price Coupling  
Council  
User representation**

# **Appendix 1**

## **The EMCC volume coupling**

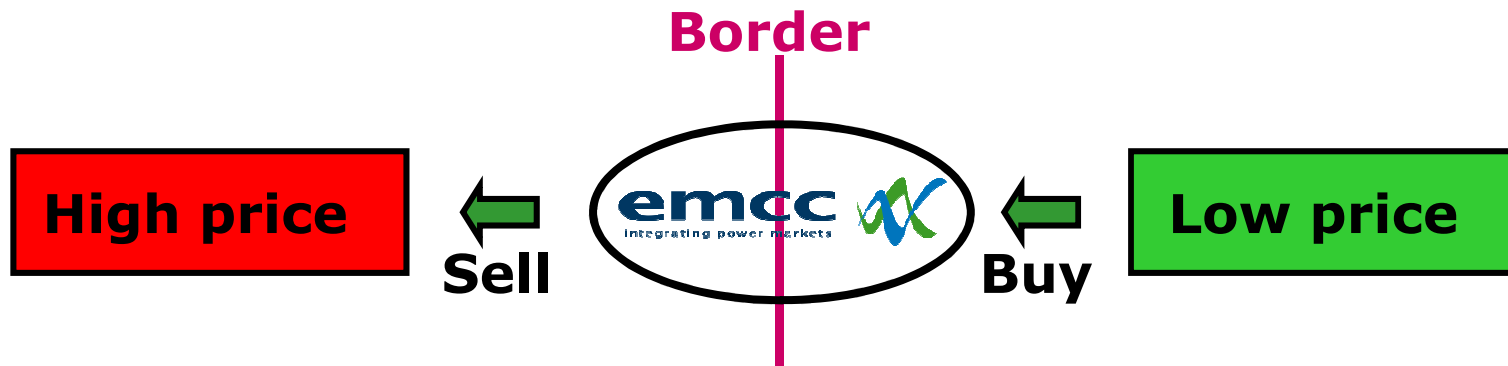
# **EMCC European Market Coupling Company**

- ⇒ **EMCC carries out the market coupling on the interconnectors between CWE and Scandinavia**
  - ✓ **CWE Central Western Europe: Germany, France, Belgium, the Netherlands, Luxembourg.**

# EMCC daily tasks – 1

## What does the EMCC do?

- The EMCC has two daily tasks
  - ✓ **First:** for the CWE-Baltic-Polish-Nordic region, calculate the day-ahead prices for all prize zones and day-ahead plans for flows on all links connecting the prize zones in the region.



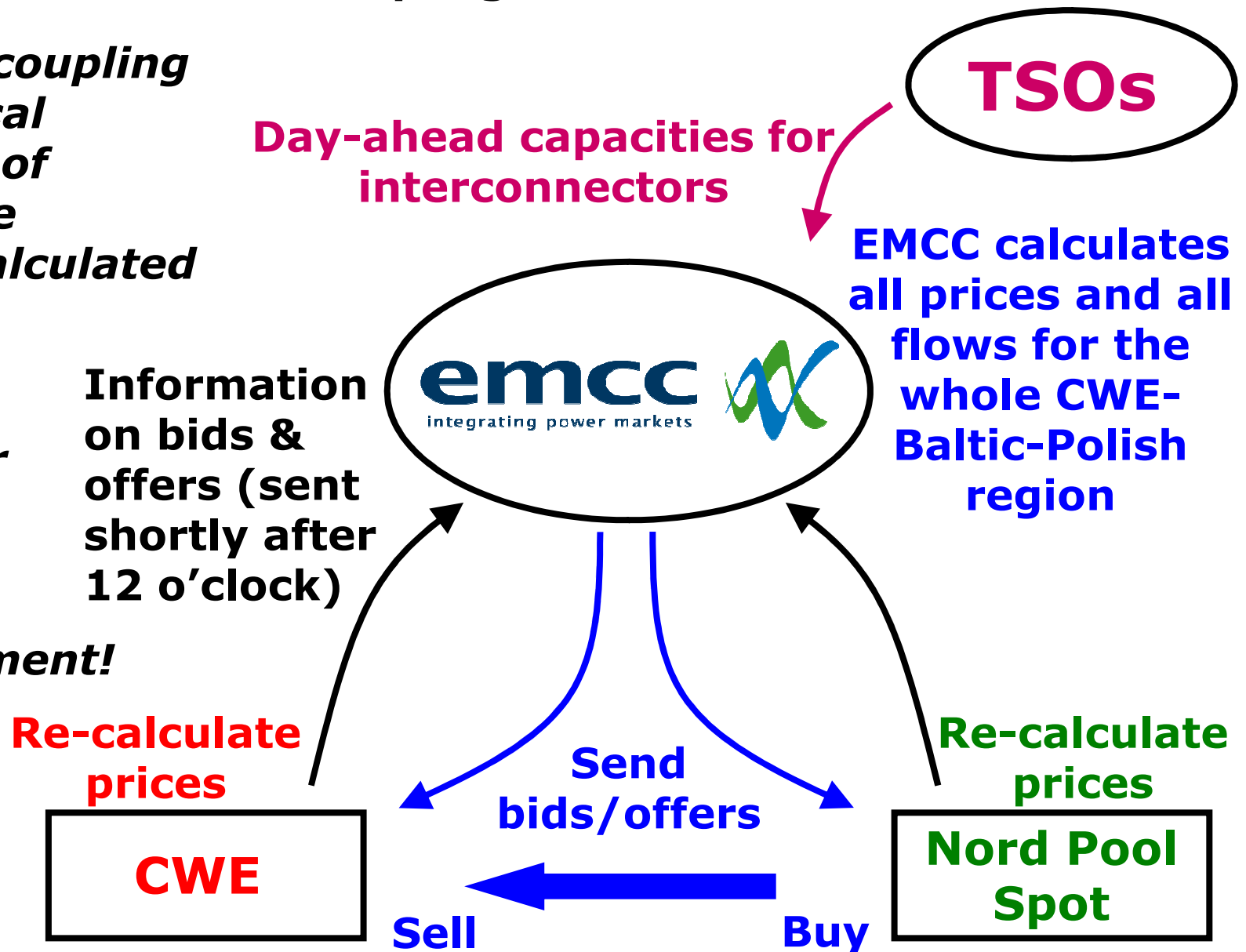
- ✓ **Second:** Be the cross-border trader at CWE-Scandinavian links
  - Buying low from one exchange and selling high to the other exchange.

# The daily operation

Example: the market coupling flow is southbound

*This is volume coupling as there are local re-calculations of prices that have already been calculated*

*Note: we have price coupling today. However the price coupling prices are not used in the spot settlement!*



# The local re-calculations can produce wrong prices!

**Nord Pool Spot re-calculation: sub-optimization for the red area only**

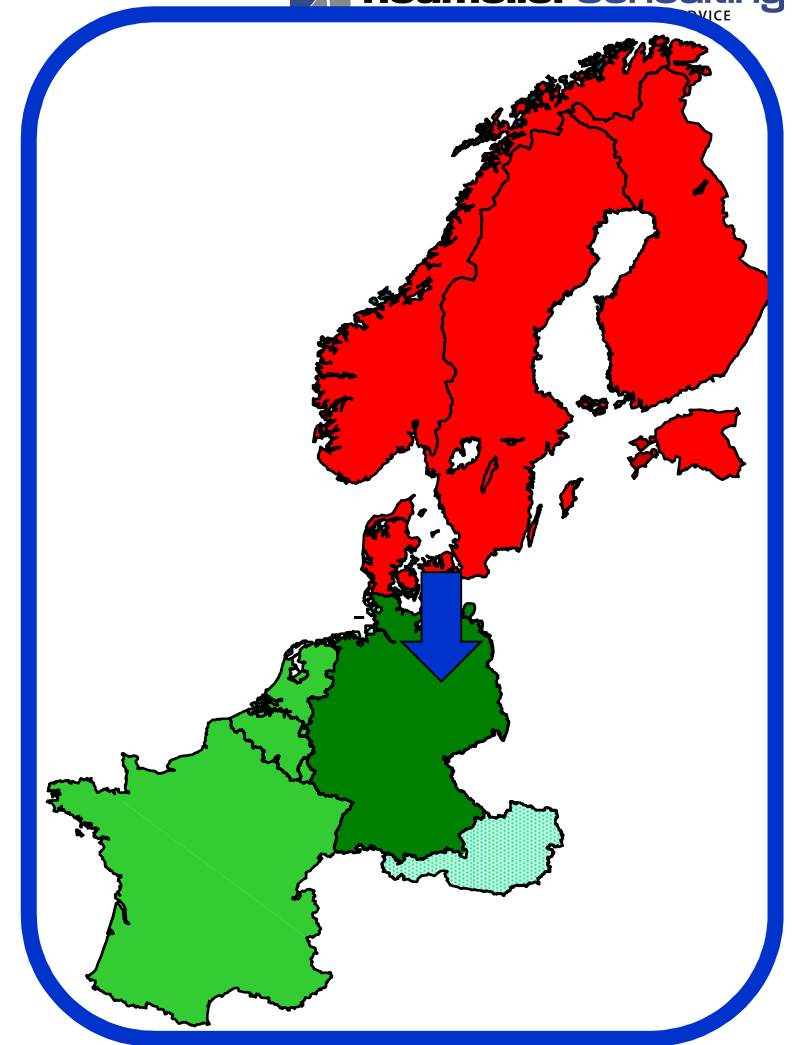
**CWE re-calculation: sub-optimization for the CWE only**

**For 12 October 2011: EMCC calculated prices in Eastern Denmark lower than the prices in Germany (also when EMCC's own bids were taken into account).**

**EMCC duly sent the energy south – buying in Eastern Denmark, selling in Germany.**

**BUT: for some hours, Nord Pool Spot's re-calculation of the prices in Eastern Denmark gave wrong prices – much higher than the German prices.**

**The exchanges call it "adverse flow", when prices and flows do not fit. However, it is the exchanges' re-calculated prices that are wrong...**



**EMCC calculation: economic optimization of the whole coupled region**

# Appendix 2

## Terms and acronyms

# Terminology and acronyms – 1

## As used in this presentation

- ⇒ **ACER** Agency for the Cooperation of Energy Regulators. An EU body established in 2010.
- ⇒ **Border** means a border between two prize zones
  - ✓ Hence, it need not be a border between two countries. It may be a border between two prize zones inside a country.
- ⇒ **Customers** In this document, the “customers” of the price coupling are the producers & consumers of electricity, traders and the TSOs.
- ⇒ **CWE** Central Western Europe: Belgium, France, Germany, Luxembourg and the Netherlands.
- ⇒ **Double auction** A calculation method whereby an exchange’s price is set by calculating the intersection between the exchange’s supply curve and the exchange’s demand curve.
- ⇒ **EMCC** European Market Coupling Company.
- ⇒ **EU** European Union.



# Terminology and acronyms – 2

## As used in this presentation

- ⇒ ***Implicit auction*** The common term for market coupling and market splitting.
- ⇒ ***Market coupling*** A day-ahead congestion management system, you can have on a border, where two spot exchanges meet. The day-ahead plans for the cross-border energy flows are calculated using the two exchanges' bids and information on the day-ahead cross-border trading capacity.
- ⇒ ***Market splitting*** A day-ahead congestion management system, you can have on a border, where you have the same spot exchange on both sides of the border. The day-ahead plans for the cross-border energy flows are calculated using the exchange's bids and information on the day-ahead cross-border trading capacity.
- ⇒ ***Nordic and Nordic area*** refer to the countries Denmark, Finland, Norway and Sweden.

# Terminology and acronyms – 3

## As used in this presentation

- ⇒ **PCR** Price Coupling Regions. A market coupling system proposed by some European power exchanges. Unfortunately, PCR would mean market coupling with a lot of redundant staff, computers and software installations – financed by captive costumers.
- ⇒ **Price zone** A geographical area, within which the players can trade electrical energy day-ahead without considering grid bottlenecks.

# Terminology and acronyms – 4

## As used in this presentation

- ⇒ ***Scandinavia*** The countries Denmark, Norway and Sweden.
- ⇒ ***Spot bid*** A purchase bid or a sales offer submitted to a spot exchange.
- ⇒ ***Spot exchange*** In this document, a spot exchange is an exchange where
  - ✓ **Electrical energy is traded day-ahead.**
  - ✓ **The day-ahead prices are calculated by means of double auction.**
- ⇒ ***Spot price*** A price calculated by a spot exchange. Either by a calculation performed by the spot exchange itself, or by a calculation performed by a body, to which the calculation has been outsourced.

# Terminology and acronyms – 5

## As used in this presentation

- ⇒ **Volume coupling** A market coupling scheme, where a central body first calculates the spot prices and the day-ahead plans for the cross-border energy flows for the whole coupled region. However, the centrally calculated spot prices are not used. Instead, there are local re-calculations of the spot prices.
- ✓ If you have volume coupling, the prices and the energy flows may mismatch (energy flows apparently going from high-price zones towards low-price zones).
  - ✓ This can happen because the spot prices for each prize zone are calculated twice. First, the central body calculates all spot prices for the whole coupled area. Next, for some interconnectors in the coupled area, the market coupler sends price-taking purchase bids to the prize zone on the interconnector's low-price side; and corresponding price-taking sales offers to the interconnector's high-price side. After having received the market coupler's bids, the local spot exchanges re-calculate the local spot prices. However, the redundant, local re-calculations are economic sub-optimizations for sub-areas of the coupled area. Therefore, the local re-calculations may fail to reproduce the prices calculated in the global optimization performed by the central body. In turn, the wrong re-calculations may cause a mismatch between the prices and the energy flows. However, the glaring mismatch is not the most serious effect of the redundant re-calculations. By far, the most serious effect is the fact that the market is supplied with unreliable spot prices.
- ⇒ **TSO** Transmission System Operator.

# **Thank you for your attention!**

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