

Introduction

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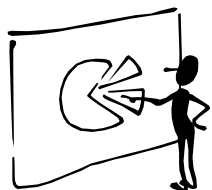
- ▶ **This PowerPoint presentation is animated**
 - **It's strongly recommended to run the animation when viewing the presentation.**
- ▶ **On most computers, you can start the animation by pressing F5.**
 - **Now the presentation moves one step forward, when you press Page Down. It moves one step backward, when you press Page Up.**



The European spot market

This presentation contains information on the current spot markets in Northern Europe

Plus proposals for the future governance and regulation of Europe's common spot market



The future, common spot market will be an important element of The Single European Electricity Market.

Appendix 1 outlines how a well governed and well regulated European spot market can provide user influence, economic efficiency and transparency.

Appendix 2 explains how the current spot price calculation in Northern Europe works.

Appendix 3 contains a list of the terms and acronyms used in this presentation.

Concerning the documents referred to in this presentation:

At *houmollerconsulting.dk*, you can download the documents from the sub-page *Facts and findings*.

The Baltic-Nordic spot chaos 5 August 2013

For Monday 5 August 2013, Nord Pool Spot's re-calculation of the spot prices crashed again.



**However, for the settlement of the spot trading:
Instead of using the reliable spot prices, the
exchange re-used the spot prices from Friday 2 August**

**Thereby using wrong spot prices in the settlement of
the spot trading.**

**And leaving the market players with imbalances
in their trading of electrical energy.**

**This is baffling, as the reliable spot prices are known to
Nord Pool Spot**

**The spot prices calculated by EMCC could simply
have been used.**

Using the right spot prices

In the settlement of the spot trading

The spot exchanges have claimed, they cannot use EMCC's calculation result to figure out the trading done by individual players.

They have claimed this is impossible due to the redundant pre-processing, the spot exchanges themselves insist on doing (see appendix 2).

However, the claim is not true:

Even with the current, redundant pre-processing, the spot exchanges can use EMCC's calculation to figure out the trading done by individual players

This only requires the spot exchanges' IT systems can receive EMCC's prices plus the list of accepted block bids and accepted flexible hourly bids.



Usage of EMCC's prices as the fall-back solution was first proposed after the crash of Nord Pool Spot's re-calculation of the prices for 1 December 2009. However, due to lack of regulation, the spot exchanges could to block the idea.

Due diligence: how the losses could have been avoided

**In contrast to the spot exchanges' track record,
EMCC's spot price calculation has never failed**

**Since the launch in November 2009, EMCC's calculation has
daily delivered reliable spot prices within the agreed deadline.**

**There would have been no Baltic-Nordic spot chaos 5 August 2013,
if the spot exchanges in due time had prepared their IT systems
and rule books for usage of EMCC's calculation result**

**And we would have avoided all the other losses inflicted by
crashes of the spot exchanges' re-calculations.*)**

**Focus on the customers' need would have ensured
such due diligence**

**However, the spot exchanges have not bothered to ask their
customers and regulators for permission to use EMCC's prices.**

**Naturally the obvious solution is simply to do away with the
redundant pre-processing and re-calculations**

**And use the reliable EMCC calculation as the single calculation
setting the spot prices, the cross-border energy flows and the
spot trading done by each player.**

***) For a summary of the crashes and the losses inflicted by the redundant re-calculations,
please refer to the PowerPoint presentation *Market coupling and spot price calculation*.**

Lack of transparency

Even after the Baltic-Nordic spot chaos 5 August 2013, the spot exchanges still fight against the publication of EMCC's spot prices

Thereby preventing the market from knowing the reliable spot prices

**This is new in the history of exchanges:
Exchanges fighting against transparency.**

Also, after the crash of Nord Pool Spot's re-calculation of the spot prices for 5 August 2013

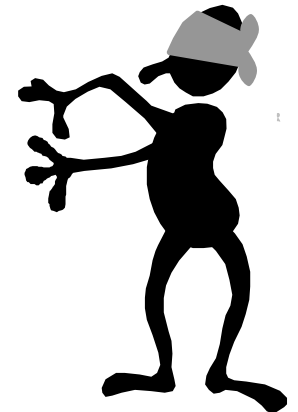
No Exchange Information with information on the source of the error and the remedies:

Which steps will be taken in order ensure we do not have such chaos again?

How could a few flexible bids crash Nord Pool Spot's re-calculation?

Obviously, EMCC's software had no problems calculating the spot prices.

What was the problem, which severely delayed Nord Pool Spot's re-calculation of the spot prices for 26 June 2013?

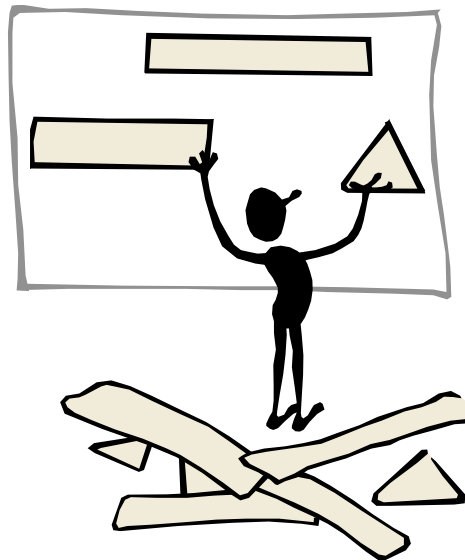


Fleeing forwards

- ▶ **For the future European spot price calculation and market coupling, the spot exchanges have been promoting PCR (Price Coupling Regions).**
- ▶ **However, please note that the spot exchanges with PCR are spending millions of euro trying to re-invent the wheel**
 - **As the TSOs are financing PCR, the money is paid by grid users in Northern Europe (ie, by captive customers).**
- ▶ **The PCR project is redundant, as we have a ready-made solution:**
 - **Simply by using EMCC's calculation, Europe will have a reliable and cost-efficient spot price calculation and market coupling.**
- ▶ **The EMCC solution contrasts with PCR. The PCR project has so far been extremely costly**
 - **And PCR is aiming at using software with no proven reliability.**

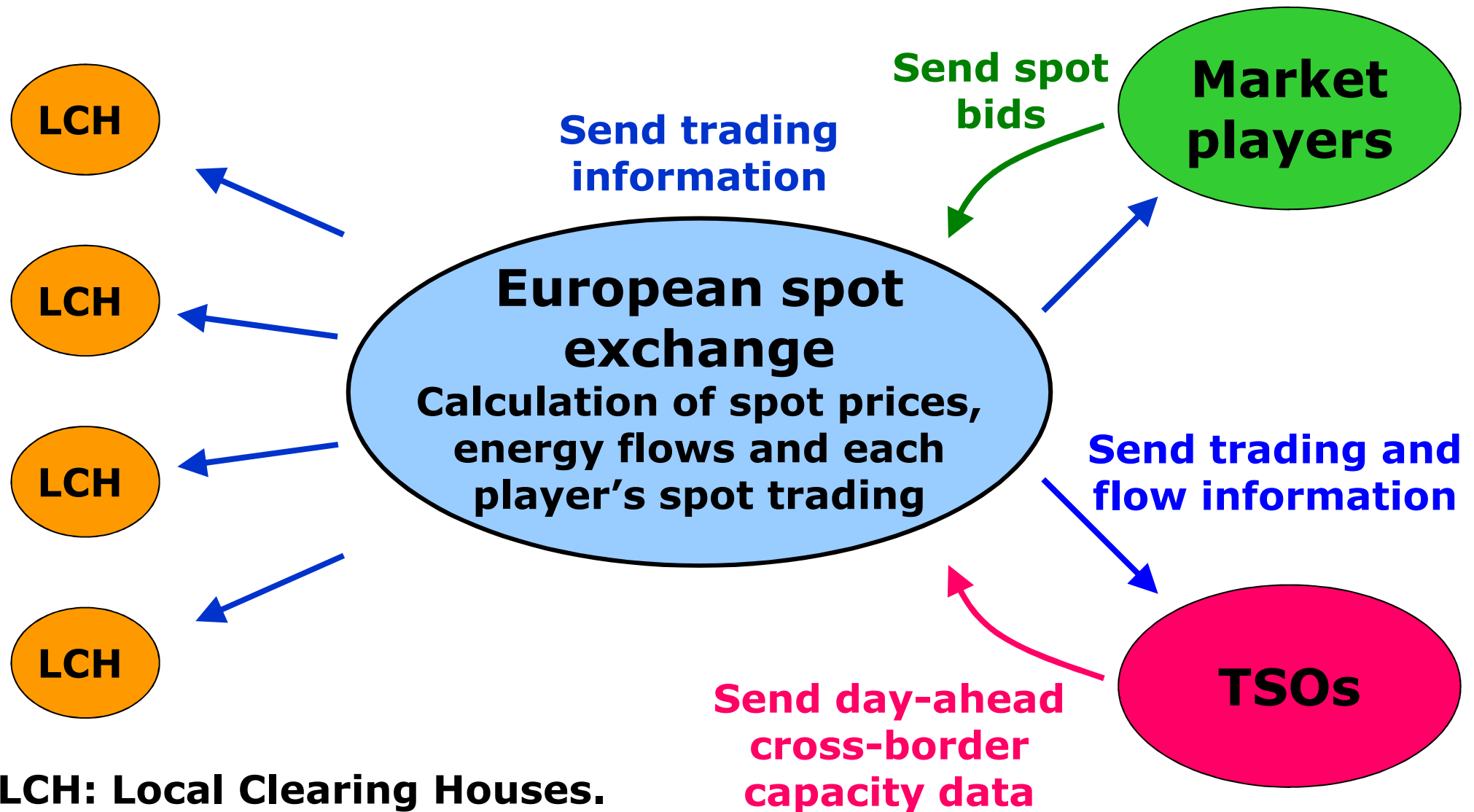
Appendix 1

A proposal for the future spot market operation and governance



The future daily operation – a proposal

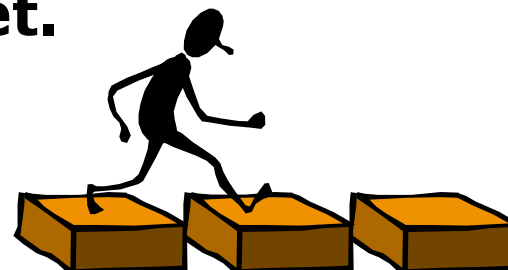
A single spot exchange for The Single Market



**LCH: Local Clearing Houses.
Settlement of the spot trading**

Spot clearing and settlement

- ▶ **Eventually, the spot settlement must also be consolidated into a single spot clearing house**
 - **Thereby enabling the players to net their spot positions over a large, geographical area.**
 - **For example, cross-border traders will no longer face huge, redundant collateral calls**
 - **As you'll have the same spot clearing house on both sides of all borders in the coupled area.**
 - **Thereby, we avoid this redundant binding of capital.**
- ▶ **However, in order to keep things simple, it'll probably be easier first to establish a single spot price calculation**
 - **Doing just this will be a huge leap towards The Single European Electricity Market.**



Spot exchange regulation

Introducing the rule of law

- ▶ Unfortunately, when you introduce market coupling, the spot exchanges become monopolies *)
- ▶ The rule of law: monopolies must be regulated
 - In this case, a clear, pan-European regulation framework is required.
- ▶ Automatically, the proposed governance structure and the regulation will deal with the vested interests, which currently are causing the losses
 - Thereby taking Europe to a well functioning and transparent Single Electricity Market.

*) Please refer to the PDF document *Unbundling of spot exchanges and associated clearing houses* and the PowerPoint presentation *Market coupling makes real competition betw. spot exchanges unfeasible*.



Spot market governance

Establishing democratic oversight and user influence

- ▶ **Question**: for Europe's spot markets – why all the current losses and redundant processing, staff & IT equipment?
- ▶ **Answer**: as always in business, *the root of the problem is bad governance*
 - In this case: absence of a pan-European governance
 - Which is very bad, as market coupling and the common spot market is a pan-European issue.
- ▶ This appendix contains a proposed governance providing:
 - Democratic oversight and national influence for countries participating in the common spot market.
 - Formalized, real influence for the users of the spot market.



Governance: national influence

And democratic oversight

- ▶ Every country participating in the common European spot market must own a share of the European spot exchange
 - This is also necessary due to the close link between spot market and market coupling. *)
- ▶ 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 spot exchange's board
 - Subsidiarity principle: different countries will make different decisions.
- ▶ This ensures **national influence and democratic oversight.**

*) For a description of the link between spot market and market coupling, see the PowerPoint presentation *Maximizing the economic value of market coupling and spot trading.*

Influence for the users

- ▶ **The users of the spot market and market coupling are TSOs, consumers, producers and traders.**
- ▶ **In order to ensure user influence, a European Spot Market Council must be set up, where the stakeholders are represented**
 - **With formal influence granted to the Spot Market Council**
 - **It's not just an advisory body.**
 - **To some degree, this may be similar to the German rules for an exchange council (*Börsenrat*).**
- ▶ **Note: local market councils do not make sense**
 - **The Single Market requires a single algorithm for the European spot price calculation**
 - **Therefore, local deviations from the single algorithm are not possible**
 - **Hence, local spot products deviating for the pan-European norm are not possible, for example.**
 - **This is positive: the harmonization promotes the creation of a level playing field for the competition**
 - **Which is one of the basic principles for The Single Market.**

Governance structure

ACER and national regulators

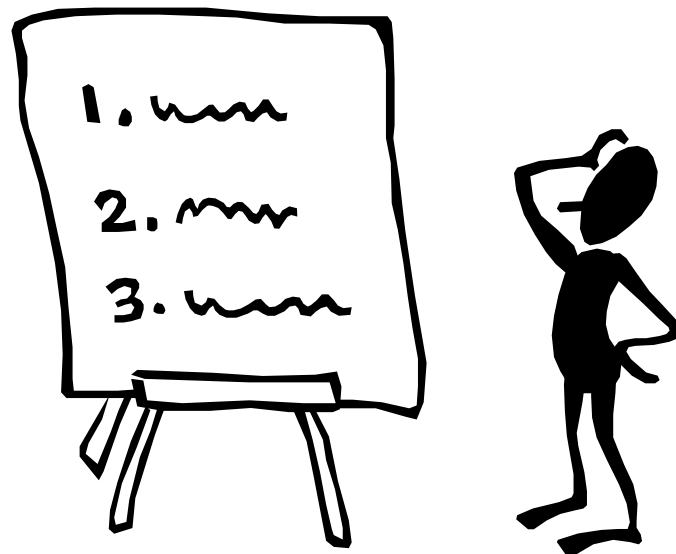
Board
National representation

European spot exchange

Spot Market Council
User representation

Appendix 2

The current calculation of spot prices in Northern Europe



Calculation of the spot prices in Northern Europe – 1

The current daily operation

- ▶ **The slides no. 19-20 outline the daily operation of the spot price calculation.**
- ▶ **As can be seen: as part of the daily operation, the spot exchanges send EMCC information on their bids.**
- ▶ **However, before the spot exchanges send their bids to EMCC, the spot exchanges have insisted on aggregating and making the bids anonymous:**
 - **The block bids and the flexible hourly bids are made anonymous, so EMCC cannot see from which player a given bid originate.**
 - **As for the standard single-hour purchase bids: for each hour and for each price zone, the purchase bids are aggregated to a demand curve.**
 - **As for the standard single-hour sales offers: for each hour and for each price zone, the sale offers are aggregated to a supply curve.**
- ▶ **This anonymized & aggregated information is then sent to EMCC.**

Calculation of the spot prices in Northern Europe – 2

The current daily operation

- ▶ **Via their spot trading fees, the market players pay for the redundant pre-processing.**
- ▶ **Naturally, the anonymizing & aggregation makes it impossible for EMCC to return information on individual players' spot trading**
 - **This is a situation the spot exchanges have themselves created by the redundant pre-processing!**
- ▶ **However, even with the current pre-processing, it is still possible for the spot exchanges to work out each player's spot trading by using EMCC information:**
 - **This only requires the spot exchanges' IT systems can receive EMCC's prices plus the list of accepted block bids and accepted flexible hourly bids.**
- ▶ **However, for obvious reasons, this is just a lot of superfluous work. The simple and cost-efficient solution is plainly to enhance the procedure by skipping the pre-processing.**

Calculation of the spot prices in Northern Europe – 3

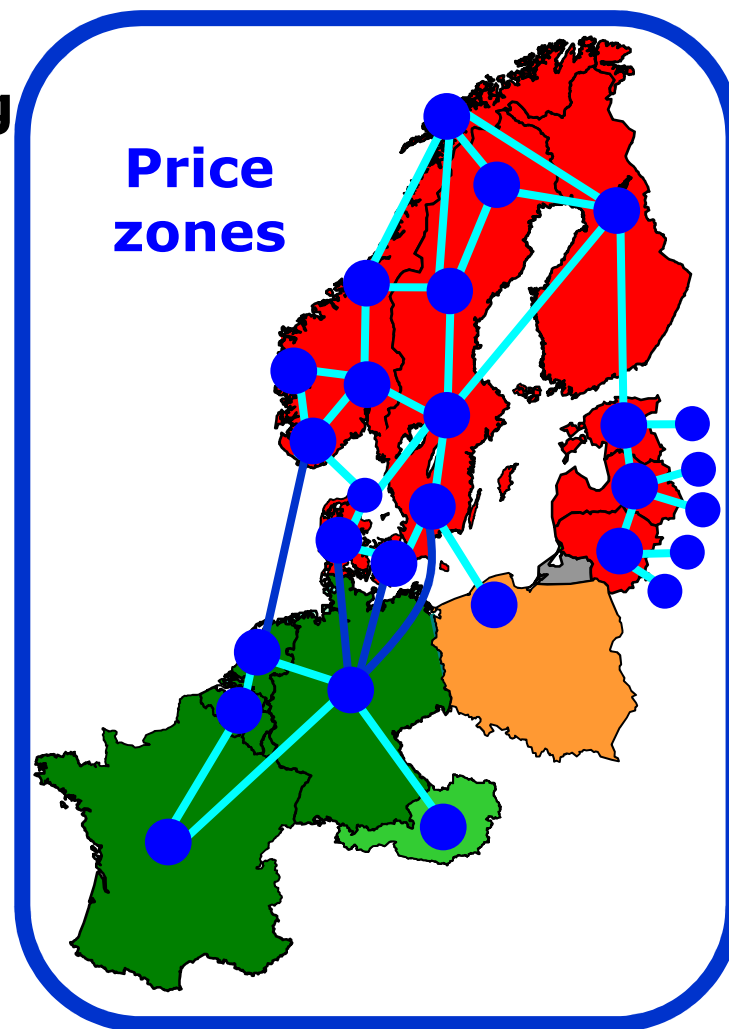
The current daily operation

First, based on the spot bids and the trading capacities between all the price zones: EMCC calculates the spot prices and the flows for all the price zones in the CWE-Baltic-Nordic-Polish area.

CWE (Central Western Europe): green area. However, EMCC's spot prices and most of EMCC's flows are kept secret and never published (note the lack of transparency). Only EMCC's flows on **the four inter-connectors linking CWE and Scandinavia** are published.

For each hour for each of these four links: based on EMCC's flows, a price-taking purchase bid is submitted to the exchange at one side of the link.

A corresponding price-taking sales offer is submitted to the exchange at the other side of the link.



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

Calculation of the spot prices in Northern Europe – 4

The current daily operation

As an example for one hour for the NorNed link between Norway and the Netherlands:

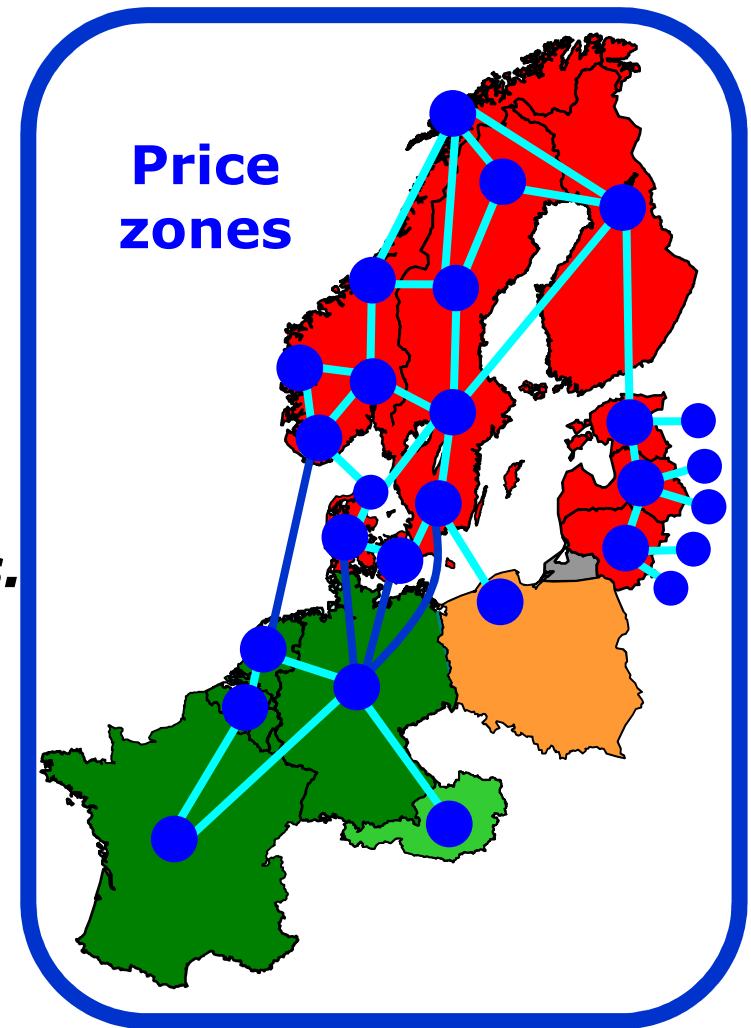
Assume EMCC's calculation gives a southbound flow of 700 MW.

In this case, EMCC submits a price-taking purchase bid of 700 MWh to Nord Pool spot in Norway – and a price-taking sales offer of 700 MWh to APX in the Netherlands.

Next, after reception of the price-taking bids:

For the CWE price zones, the spot prices and the internal CWE flows are re-calculated by the CWE spot exchanges.

For the Baltic-Nordic-Polish price zones, the spot prices and the internal flows are re-calculated by Nord Pool Spot.



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

Problems with the re-calculations

Problem no. 1: the re-calculations are sub-optimizations for sub-regions of the coupled area

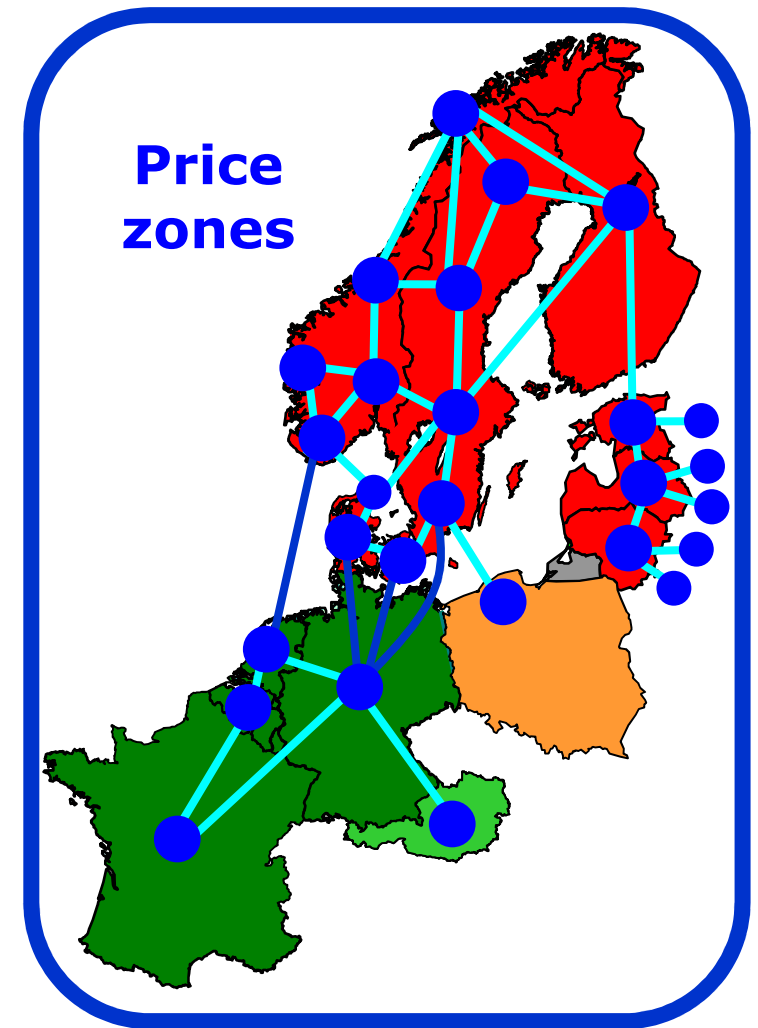
Hence, the re-calculations are not only redundant

Because they are sub-optimizations, they can fail to reproduce the prices calculated by EMCC for the whole area

As the re-calculation track record testify.

Please refer to the PowerPoint presentation *Market coupling – European price coupling.*

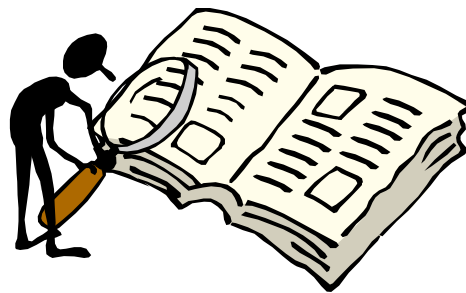
Problem no. 2: the re-calculations have repeatedly crashed due to errors in the exchanges' re-calculation software or operational errors made at the exchanges!



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

Appendix 3

Terminology and acronyms



Terminology and acronyms – 1

- ▶ **ACER** Agency for the Cooperation of Energy Regulators. An EU body established in 2010.
- ▶ **Block bids** Please refer to the PowerPoint presentation “*Market coupling – European price coupling*”.
- ▶ **CWE** Central Western Europe. At the outset, CWE is the five countries Belgium, France, Germany, Luxembourg and the Netherlands. However, in this document, the term includes Austria also.
- ▶ **Double auction** A calculation method whereby an exchange’s price is set by using the exchange’s supply curve and the exchange’s demand curve. See the PowerPoint presentation *Maximizing the economic value of market coupling and spot trading*.
- ▶ **EMCC** European Market Coupling Company. EMCC operates the market coupling between CWE and the Baltic-Nordic area. See marketcoupling.com.
- ▶ **Energy flow** Actually, in this presentation, “energy flow” means “day-ahead plans for cross-border energy flow”.

Note that market coupling/splitting does not create energy flows. It merely creates day-ahead plans for the cross-border energy flows. Later, these plans may be modified by market players’ intra-day, cross-border trading and/or the TSOs’ cross-border trading of regulating energy.

Terminology and acronyms – 2

- ▶ ***Flexible hourly bid*** A sales offer sent to a spot exchange with a threshold price P and an energy volume V . The next day, the seller will for one hour sell the volume V , if the spot price during the hour is at least P . The seller has not specified the hour.

If one or more flexible hourly bids are accepted: among the high-price hours of the next day, the spot price calculation software will allocate the flexible bids in a way, which maximizes the economic value of the spot trading. See the PowerPoint presentation *Welfare criterion*.

- ▶ ***Flow*** Short-term for energy flow.
- ▶ ***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.

For simplicity, apart from appendix 3, in this presentation “market coupling” is used as a short-hand for “market coupling/splitting”.

Terminology and acronyms – 3

- ▶ ***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.

For simplicity, apart from the appendix 3, in this presentation “market coupling” is used as a short-hand for “market coupling/splitting”.

- ▶ ***Price zone*** A geographical area, within which the players can trade electrical energy day-ahead without considering grid bottlenecks.
- ▶ ***Price-taking bid*** The common term for a price-taking purchase bid and a price-taking sales offer.
- ▶ ***Price-taking purchase bid*** A purchase bid sent to a spot exchange, where the buyer is willing to buy at any price – even the exchange's maximum price.

Terminology and acronyms – 4

- ▶ ***Price-taking sales offer*** A sales offer sent to a spot exchange, where the seller is willing to sell at any price – even the exchange's minimum price.
- ▶ ***Scandinavia*** Denmark, Norway and Sweden.
- ▶ ***Spot exchange*** In this document, a spot exchange is an electricity exchange where
 - **Electrical energy is traded day-ahead.**
 - **The day-ahead prices are calculated by means of double auction.**
- ▶ ***Spot market*** A market operated by a spot exchange.

Many European countries have spot markets and use market coupling/splitting as their day-ahead congestion management system. For a description of the close link between spot market and market coupling/splitting, see the PowerPoint presentation *Maximizing the economic value of market coupling and spot trading*.
- ▶ ***Spot price*** A price calculated by a spot exchange. Either by the spot exchange itself or by a company, to which the calculation has been outsourced.
- ▶ ***TSO*** Transmission System Operator.

Thank you for your attention!

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