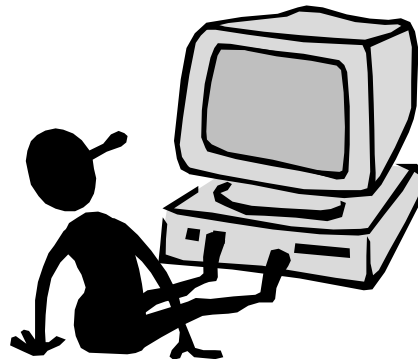


# Introduction

- **In the appendix, you'll find a list of the terms and acronyms used in this presentation.**
- **Concerning the documents referred to in this presentation:**
  - ✓ **Unless otherwise stated, you can download the documents from [www.houmollerconsulting.dk/facts-findings/](http://www.houmollerconsulting.dk/facts-findings/).**
- **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.**





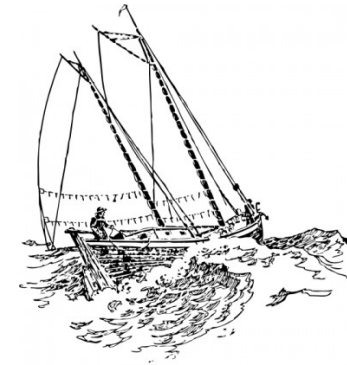
# Liberalizing EU's electricity markets

➤ One of the things distinguishing electricity from other commodities is this:

➤ The transportation system is a monopoly  
✓ We're not going to have competing electricity grids.

➤ Historically, the consequence was that producing and selling electricity was also monopolies.

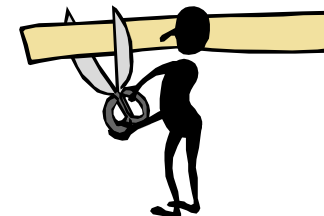
➤ In EU, we are currently on a journey  
✓ Moving towards market economy for the production and sale of electricity.



➤ Identifying and regulating the remaining monopolies is a part of this journey

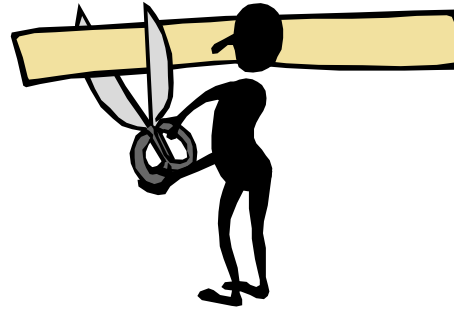
✓ The remaining monopolies must be identified and separated from commercial companies.

✓ Separating monopoly tasks and commercial tasks is called *unbundling*.



➤ Suitable regulation must be established for the monopolies.

# Unbundling the DSOs



**Unbundling is the separation of monopoly tasks and commercial tasks**

# Unbundling of the DSOs – 1

## The electricity supply business

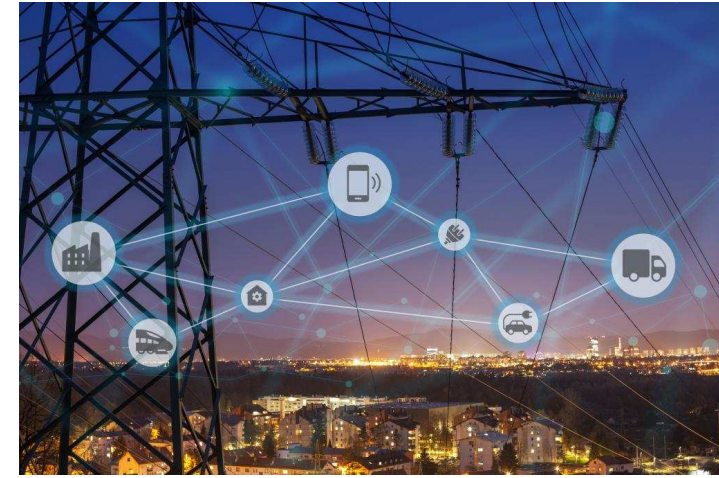


- **In the European Union, the TSOs have been unbundled**
  - ✓ **In most Member States, this means the TSOs have been separated from the incumbent power producer(s).**
- **However, the DSOs have not yet been unbundled**
  - ✓ **For virtually all Member States, the DSOs are still embedded in organizations, which have commercial tasks.**
- **With the new power supply business, this is unsustainable**
  - ✓ **Concerning the new power supply business: see the PowerPoint presentation *Nodal and zonal pricing*.**

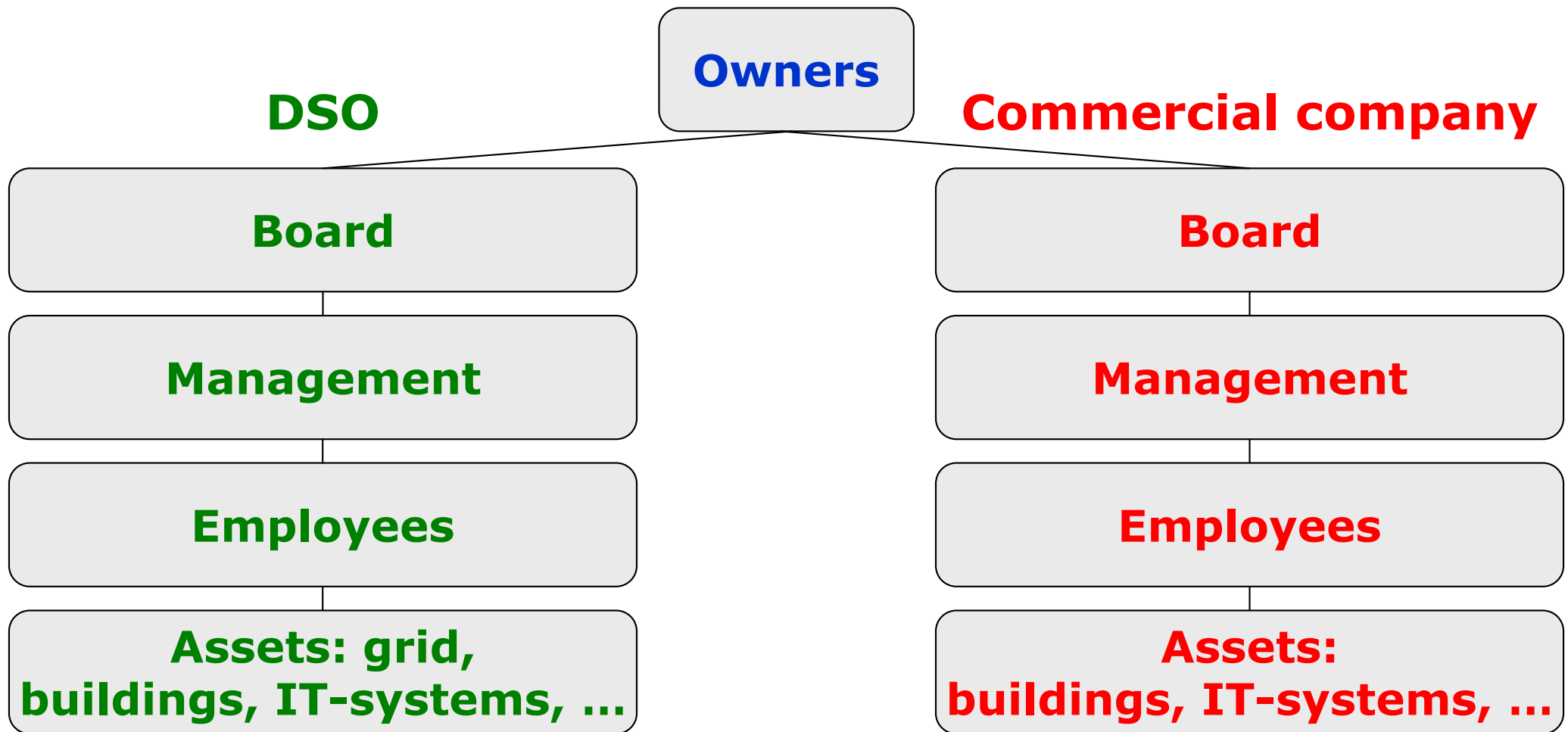
# Unbundling of the DSOs – 2

## Consequences of the new power supply business

- With the new power supply business, the DSOs get a new role as **neutral market facilitators**.
- This is also noted in the European Energy Regulators' White Paper # 2: *The Role of the DSO*
  - ✓ [https://ec.europa.eu/energy/sites/ener/files/documents/wp\\_acer\\_02\\_17.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/wp_acer_02_17.pdf)
- Obviously, the DSOs cannot be neutral market facilitators, if they are embedded in commercial companies.
- About 20 years ago, the TSOs were unbundled
  - ✓ This enabled the TSOs to be neutral facilitators for flexibility markets for the transmission grids, for example.
- The arguments promoted against unbundling of DSOs are copy-paste of the arguments used some 20 years ago against unbundling of TSOs.
- For the DSOs, the following slide illustrates the so-called "full functional unbundling".



# Full functional unbundling of DSOs

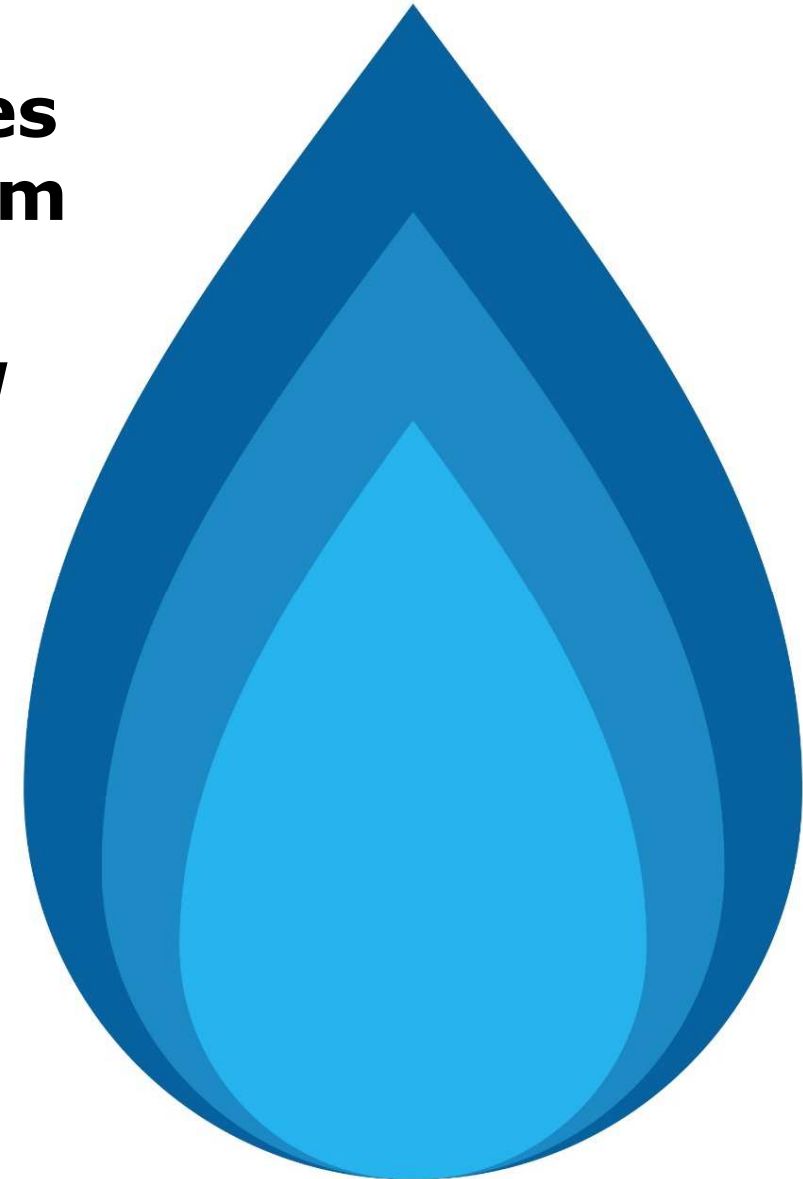


**This is similar to the unbundling of the Swedish and Norwegian TSOs. In both Sweden and Norway, the state owns the TSO. The state owns a big commercial player also.**

**The TSOs and the commercial players are separated as illustrated.**

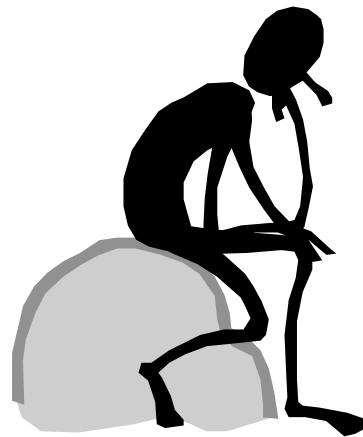
# Gas distribution system operators

- **This PowerPoint presentation does not discuss EU's gas supply system (apart from this slide).**
- **However, the slide *Full functional unbundling of DSOs* can also be applied to the gas distribution system operators**
  - ✓ **As they must unbundle also.**



# Unbundling of spot exchanges

**Why EU's market coupling render competition between spot exchanges meaningless**





# Unbundling of spot exchanges

**The grid monopoly causes a spot exchange monopoly**

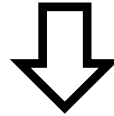
- **As mentioned previously: a special feature of the electricity supply business is the monopoly transportation system.**
- **Consequently, for each hour, each zone must have one, unique spot price**
  - ✓ **The unique spot price will set the day-ahead plan for the cross-border energy flow:**
    - **Should the grid be used to ship energy into the zone or out from the zone?**
  - ✓ **Further, the need for a common spot price necessitates coordination of the spot exchanges' settlement.**
- **However, the settlement and the spot prices are the products delivered by the spot exchanges**
  - ✓ **Without delivery of different spot prices and independent settlement, competition between spot exchanges does not make sense.**
- **The British experience illustrates "competing" spot exchanges must to coordinate their settlement and merge their delivery of spot prices, when we have market coupling.**



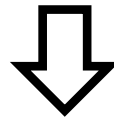
# The monopoly

➤ **Hence, we arrive at this picture:**

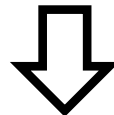
**Only one grid (the grid monopoly)**



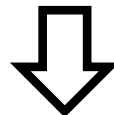
**Only one day-ahead grid congestion management system**



**Only one spot price per hour per bidding zone**



**Spot exchanges cannot deliver different spot prices,  
must have a common calculation of prices & flows  
and must coordinate their settlement**

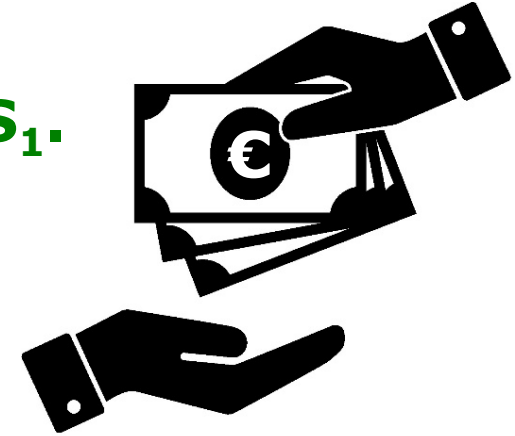


**Competition between spot exchanges rendered meaningless**

**For more information, see the PowerPoint presentation *Europe's electricity market*.**

# Forced co-ordination of spot trading settlement

- Imagine a bidding zone has two spot exchanges  $S_1$  and  $S_2$ .
- **First, for simplicity, for a given day, assume the zone has no exchange of energy with other zones.**
- **Further, assume all the zone's buyers buy from  $S_1$ .**
- **And all the zone's sellers sell to  $S_2$ .**
- **Now  $S_1$  must transfer the buyers' money to  $S_2$** 
  - ✓ **To make it possible for  $S_2$  to pay the sellers.**
- **In general, there will be a daily exchange of money between "competing" spot exchanges' clearing houses**
  - ✓ **As they seldom will have a balanced position.**
- **Hence, the spot exchanges' settlement systems are just cost-increasing middle layers**
  - ✓ **At the bottom, you find the real settlement system.**
- **For more information, see the PowerPoint presentation *Market coupling makes real competition between spot exchanges unfeasible.***



# Good governance



- **The stakeholders cannot “vote with their feet”**
  - ✓ **They cannot choose between competing spot prices and competing market coupling systems.**
- **Being captive customers of the market coupling service, the stakeholders must have another type of vote.**
- **This means we must ensure fair and real influence for both nations and market players.**
- **As the spot calculation daily moves vast sums of money between nations and between market players.**
- **Note: the Single Market reduces local exchange councils to dummy influence**
  - ✓ **The common spot market requires a pan-European spot calculation with a pan-European algorithm**
    - **Therefore, the stakeholders can only wield meaningful influence at the European level.**

# Good governance and regulation

## ACER and national regulators

**Democratic control: each country's share can be determined by the Lisbon treaty's voting weights, for example.**

**Each country's government decides who will represent the country in the board (subsidiarity principle).**

**Board  
National representation**

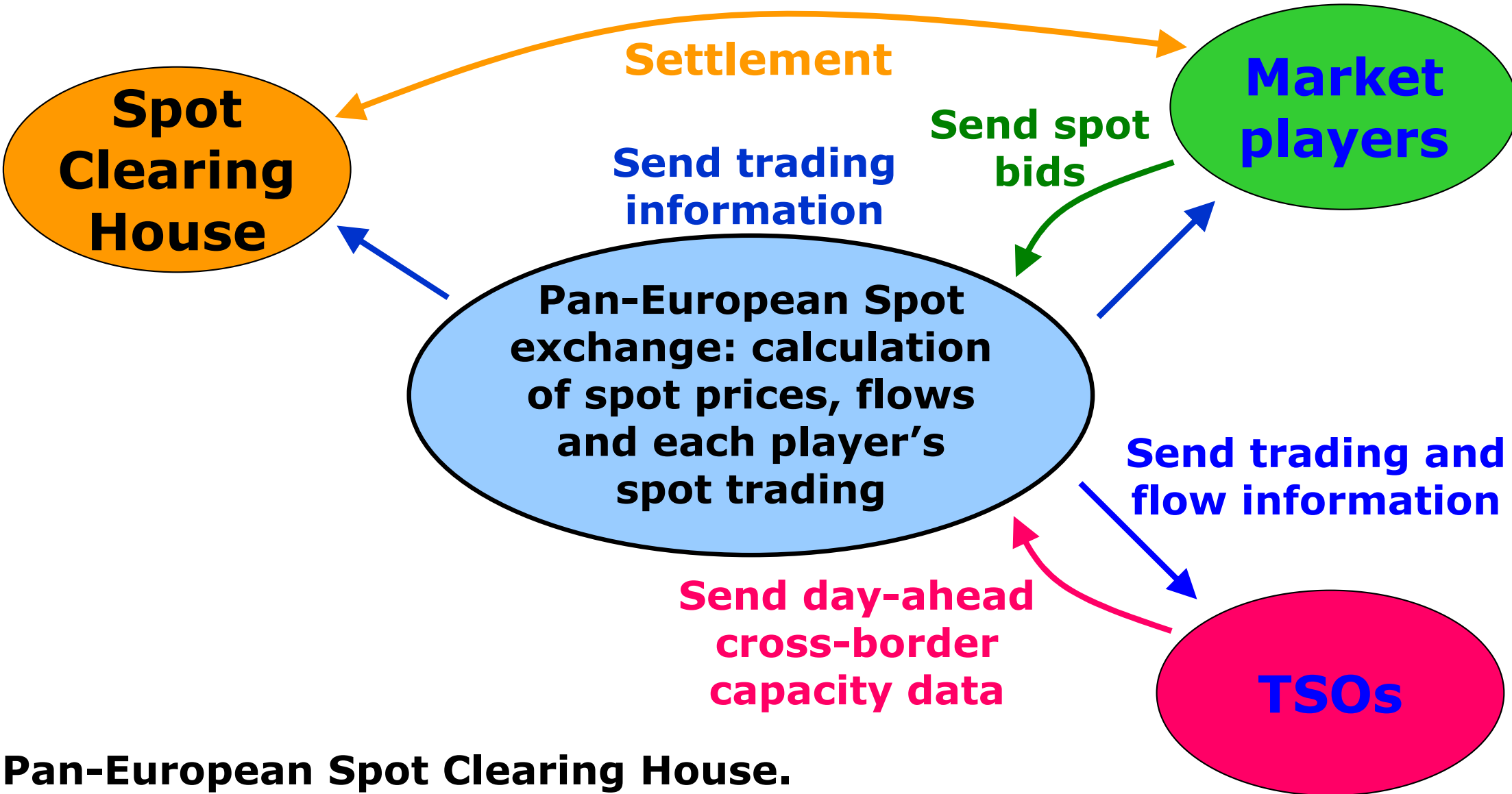
**Pan-European  
spot exchange  
Administration**

**Spot Market Council  
Consumers, producers,  
traders, TSOs**



# Cost-efficient daily operation

## A single spot exchange for the Single Market



**Pan-European Spot Clearing House.  
Settlement of spot trading.**

# Regulating the monopoly

- In a positioning paper, the Nordic energy regulators call for a pan-European regulation of the market coupling monopoly
  - ✓ <https://www.nordicenergyregulators.org/2017/12/nordregs-perspective-on-the-development-of-competition-among-nemos/>
- Quotations:
  - ✓ *The responsibility of monitoring and supervising the MCO functions should be moved from National Regulatory Authorities to ACER.*
  - ✓ *NordREG encourages the Commission to use its competence to create or appoint an entity to perform monopoly functions such as managing, running and developing the MCO function.*



# The merits

- **Good governance and regulation will enable Europe to have a spot market with transparency, cost efficiency, accountability, market surveillance and a high reliability**
  - ✓ **Concerning reliability: good governance can ensure the installation of back-up procedures giving a high security against a situation, where the spot calculation crashes**
    - **A high degree of protection against a European repetition of the Baltic-Nordic spot chaos 5 August 2013.**
    - **Against episodes like the crash of Nord Pool's calculation of the spot prices for 5 February 2020.**
    - **And the chaos caused by the crash of EPEX Spot's calculation of the spot prices & flows for 8 June 2019**
    - **And the decoupling of Italy, Croatia, Slovenia and Greece for the delivery day 14 January 2021.**
      - **For more information, see the PowerPoint presentation *Europe's electricity market*.**

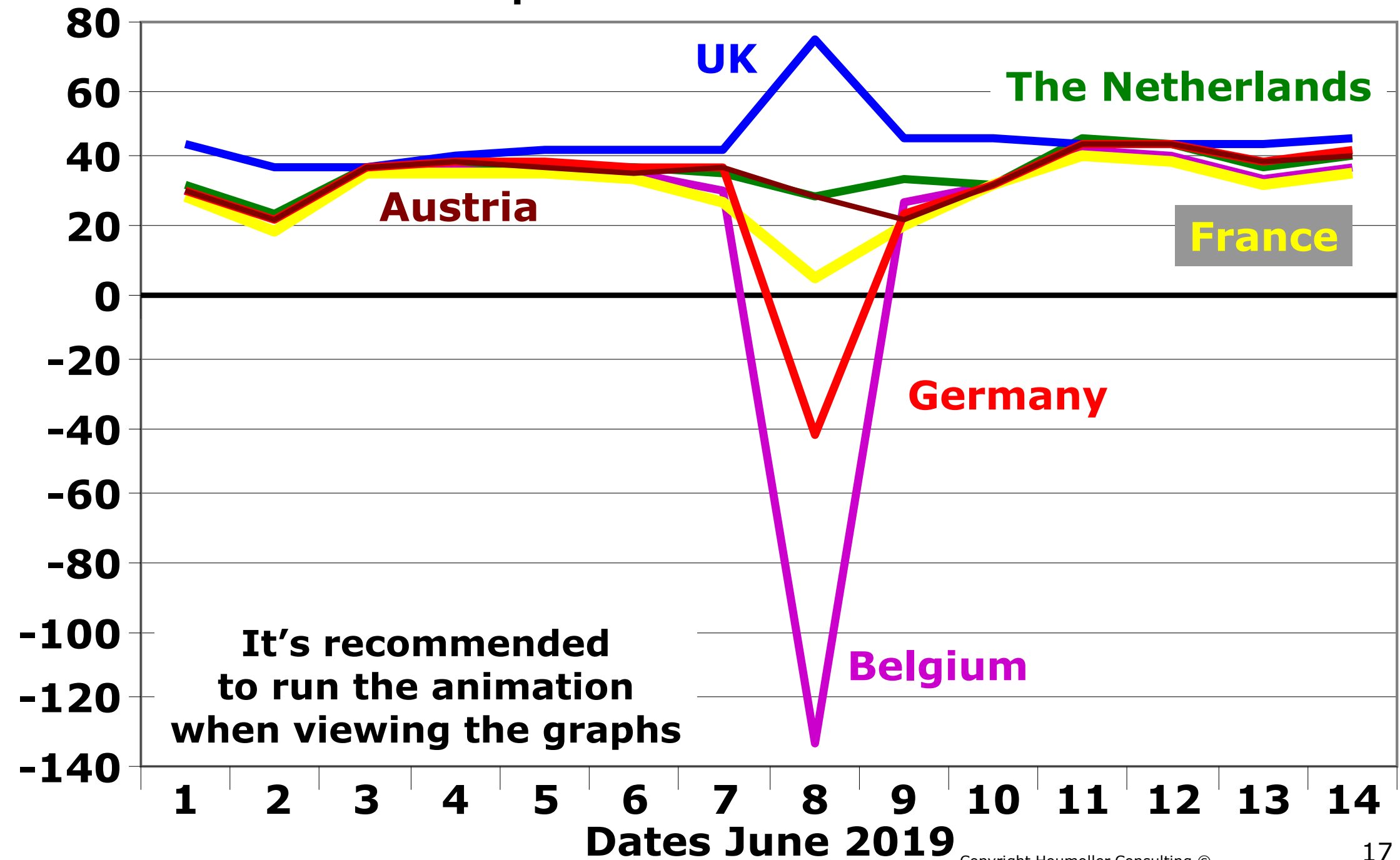




# Spot prices 1-14 June 2019

## Crash of the spot calculation for 8 June 2019

€/MWh



It's recommended  
to run the animation  
when viewing the graphs



# Appendix

## Terminology and acronyms

# Terminology and acronyms – 1

## As used in this presentation

- **ACER** See [https://www.acer.europa.eu/en/The\\_agency/Pages/default.aspx](https://www.acer.europa.eu/en/The_agency/Pages/default.aspx)
- **Bidding zone** A geographical area, within which the players can trade electricity day-ahead without considering grid bottlenecks.
- **Border** Means a border between two bidding zones.
  - ✓ Hence, it need not be a border between two countries. It may be a border between two bidding zones inside a country.
- **Coupled region** A geographical area, in which you have a common IT system calculating the area's spot prices and day-ahead plans for the cross-border energy flows by using:
  - ✓ The market players' spot bids.
  - ✓ Information on the day-ahead cross-border trading capacities.
- **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" and the PDF document "The Liberalized Electricity Market".
- **DSO** Distribution System Operator. An organization operating a distribution grid (i.e. a low voltage electricity grid).
- **Electricity** Short for electrical energy.
- **Energy flow** In this document, this is short for "day-ahead plan for cross-border energy flow".
- **EPEX Spot** See <http://www.epexspot.com/en/>.
- **Flow** Short for *energy flow*.

# 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 electricity exchanges meet. The day-ahead plans for the cross-border energy flows are calculated using the market players' spot bids and information on the day-ahead cross-border trading capacity. See the PowerPoint presentation "Maximizing the economic value of market coupling and spot trading" and the PDF document "The Liberalized Electricity Market".

For simplicity, in this presentation, the term *market coupling* is used for both market coupling and market splitting.

- ***Market splitting*** A day-ahead congestion management system, you can have on a border, where you have the same electricity exchange on both sides of the border. The day-ahead plans for the cross-border energy flows are calculated using the market players' spot bids and information on the day-ahead cross-border trading capacity. See the PowerPoint presentation "Maximizing the economic value of market coupling and spot trading" and the PDF document "The Liberalized Electricity Market".

For simplicity, in this presentation, the term *market coupling* is used for both market coupling and market splitting.

- ***MCO*** Market Coupling Operator. An organization operating the market coupling for the coupled region.

# Terminology and acronyms – 3

## As used in this presentation

- **NordREG** An organisation for the Nordic energy regulators. See <https://www.nordicenergyregulators.org/>
- **Spot bid** A purchase bid or a sales offer submitted to a spot exchange.
- **Spot calculation** The simultaneous calculation of spot prices and energy flows. See the PowerPoint presentation “Maximizing the economic value of market coupling and spot trading” and the PDF document “The Liberalized Electricity Market”.
- **Spot exchange** In this document, a spot exchange is an electricity exchange where
  - ✓ Electrical energy is traded day-ahead.
  - ✓ The exchange’s day-ahead prices are calculated by means of double auction. See the PowerPoint presentation “Maximizing the economic value of market coupling and spot trading” and the PDF document “The Liberalized Electricity Market”.
- **Spot price** A day-ahead price used by a spot exchange (or the spot exchange’s associated clearing house) to settle the participants’ trading at the exchange. The spot price is calculated using double auction. See the PowerPoint presentation “Maximizing the economic value of market coupling and spot trading” and the PDF document “The Liberalized Electricity Market”.

# Terminology and acronyms – 4

## As used in this presentation

➤ **TSO** Transmission System Operator.

**In EU, each TSO has two tasks:**

- ✓ **Operate the high-voltage grid (the transmission grid) in the TSO's so-called control area.**
- ✓ **Be responsible for the security of supply in the TSO's control area.**

**Most EU Member States have only one TSO. Hence, the TSO's control area is the whole country.**

**However, some Member States have more than one TSO (e.g. Germany).**

➤ **Zone** Short for *bidding zone*.

# **Thank you for your attention!**

**Anders Plejdrup Houmøller**

***Houmoller Consulting ApS***

**Tel. +45 28 11 23 00**

**anders@houmollerconsulting.dk**

**Web houmollerconsulting.dk**