



Trading and hedging across borders

- The keys to manage portfolios at a regional scale

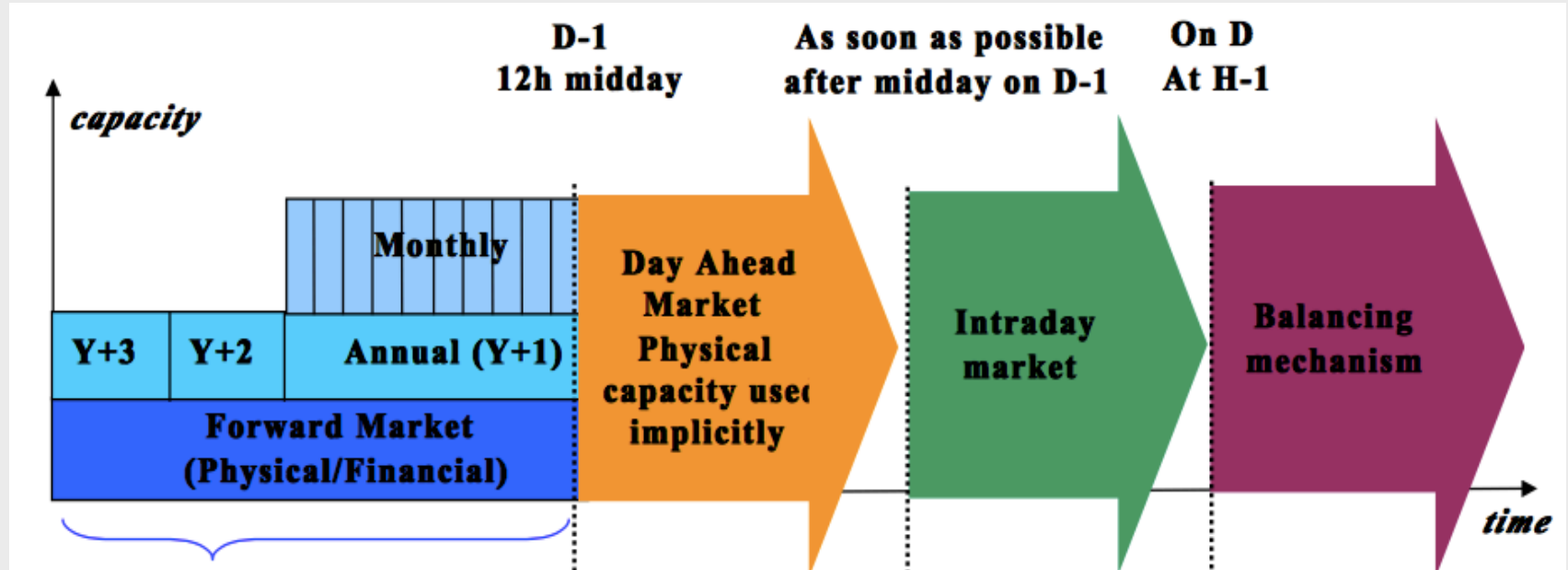
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- 2 Hedging risks in the market
- 3 The importance of cross-border access

TRADING IN THE ELECTRICITY MARKET

Trading horizons



Source: European Commission

Market instruments: Spot, Forwards & Futures



- **Spot contract:** an agreement to buy or sell an asset today, for a certain price.
 - > In the case of, for example, gas and electricity, this typically means day-ahead.
- **Forward contract:** an agreement to buy or sell an asset at a specific moment in time, for a certain price.
 - > Normally traded *over-the-counter* (OTC); a deal between two institutions.
- **Future contract:** an agreement to buy or sell an asset at a specific moment in time, for a certain price.
 - > Normally traded on an *exchange*; the exchange is the counterparty for both participants.

Trading OTC vs. on an Exchange



- Normally, *forwards* are traded *over-the-counter* (OTC) and *futures* are traded on an exchange.

- When trading on the **exchange** ...

- The contract is highly standardized, as defined by the exchange.
- The two parties may be anonymous.
- Settlement is via the exchange, making use of *margining*.

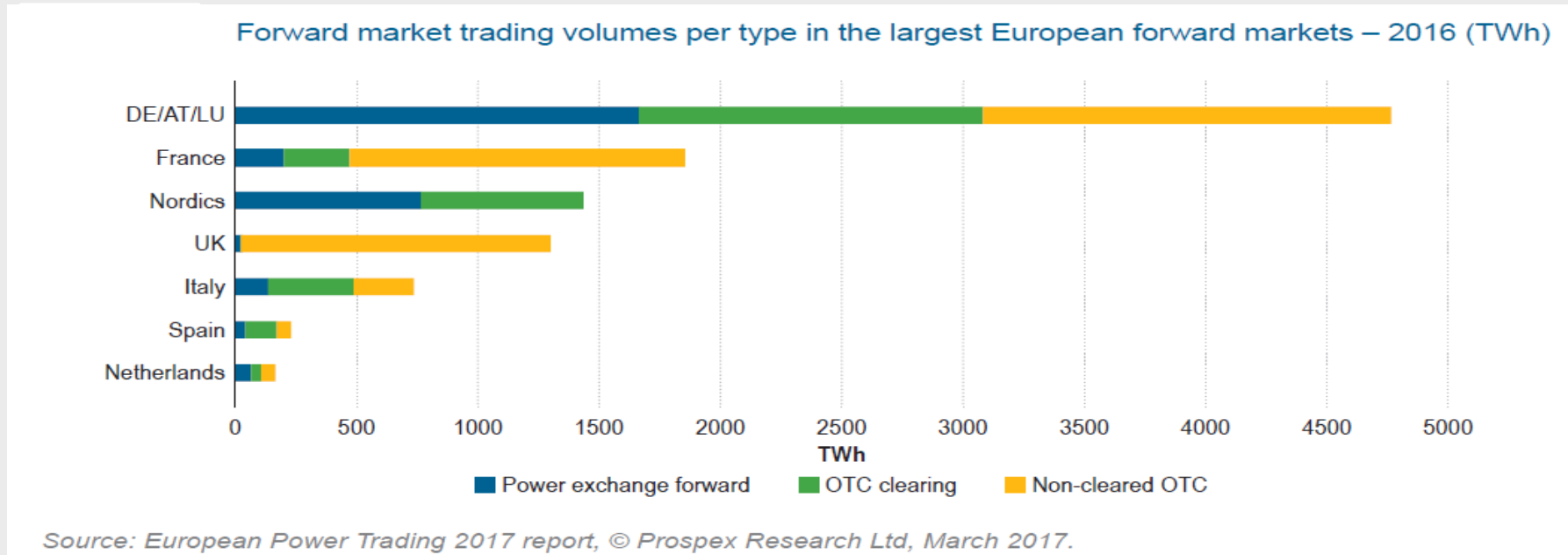


- When trading **over-the-counter** ...

- The contract can be less standard; so more instruments are possible.
- The deal is done directly between two parties; perhaps facilitated by a broker.
- Both parties are exposed to *credit risk*.



Traded volumes OTC vs. Exchange



Source: ACER

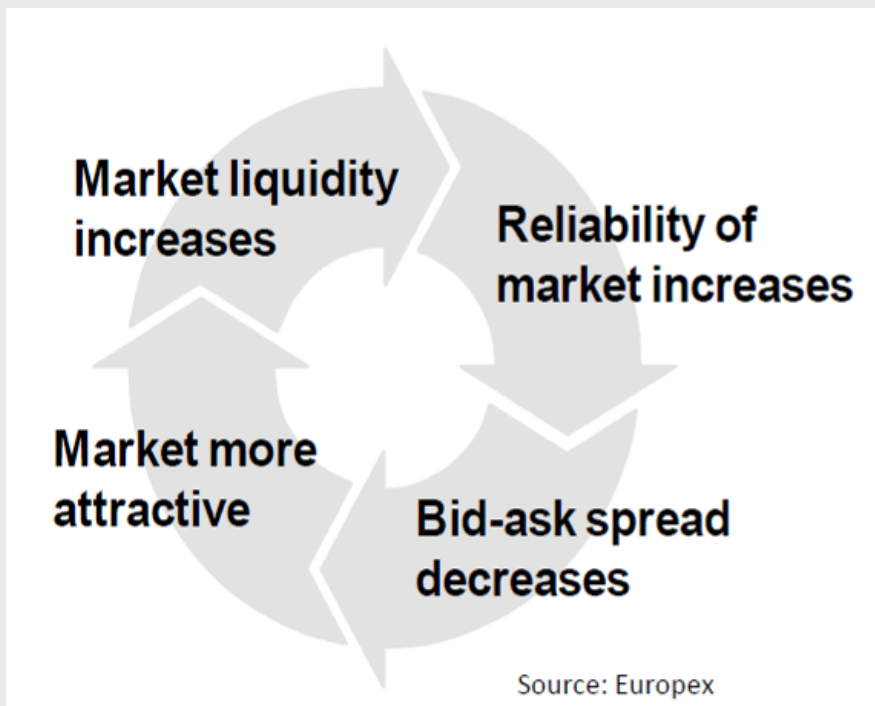
Physical & Financial Contracts

Contracts can be physical or financial ...

- **Physical contracts:** the underlying asset is the physical delivery of a given commodity at the contract price.
 - For example, a physical electricity forward mean that physical electricity will be delivered at a specified point in time, to a defined market area, against the agreed contract price.

- **Financial contracts:** the contract is settled financially based on the difference between the agreed contract price and specified index.
 - For example, a EEX financial electricity future will be settled based on the difference between the agreed contract price and the spot price published by the EEX for each day during the defined delivery period. The buyer receives the spot price minus the contract price for each MWh. If the value is negative, he pays this amount.

The virtuous circle of liquidity



Benefits of liquid markets:

- Better liquidity is an indication of effective competition
- Clarity on value of investments
- Greater ability to hedge positions
- Low transaction cost of the hedges that are available

Development of power volumes in Europe (Spot+Futures+OTC), 2012-2016:

Germany: + 30%	(4.996 TWh)
France: + 293%	(1.962 TWh)
Nordic: -9%	(1.825 TWh)
Total: + 35%	(11.804 TWh)

Source: prospex study „European Power Trading 2017“

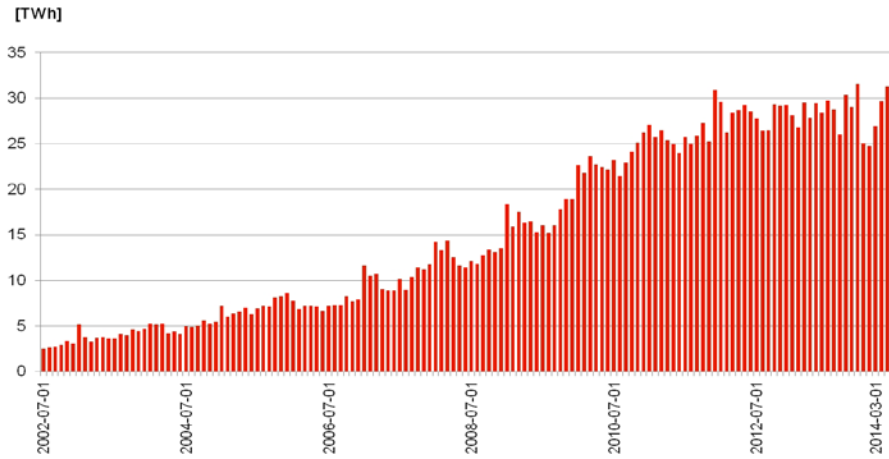
Source: EEX

HEDGING RISKS IN THE MARKET

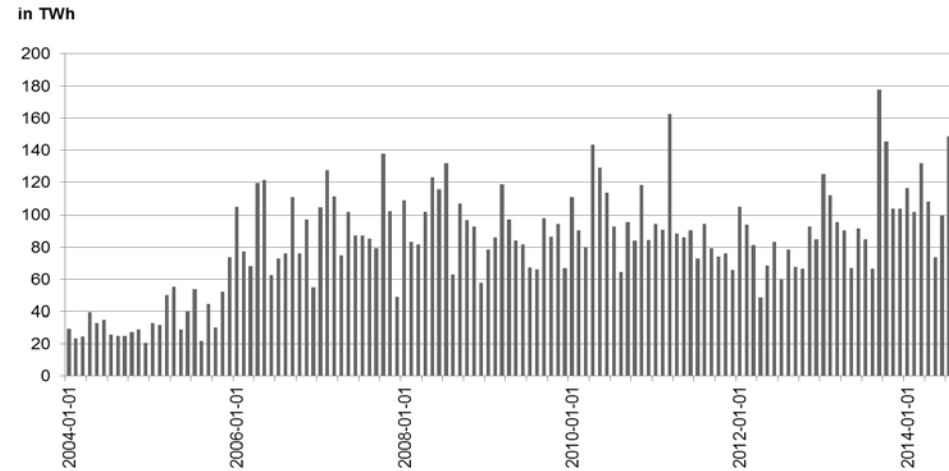
More short-term trading \neq less forward hedging



Intraday market DE 2004-2014



Forward market DE 2004-2014



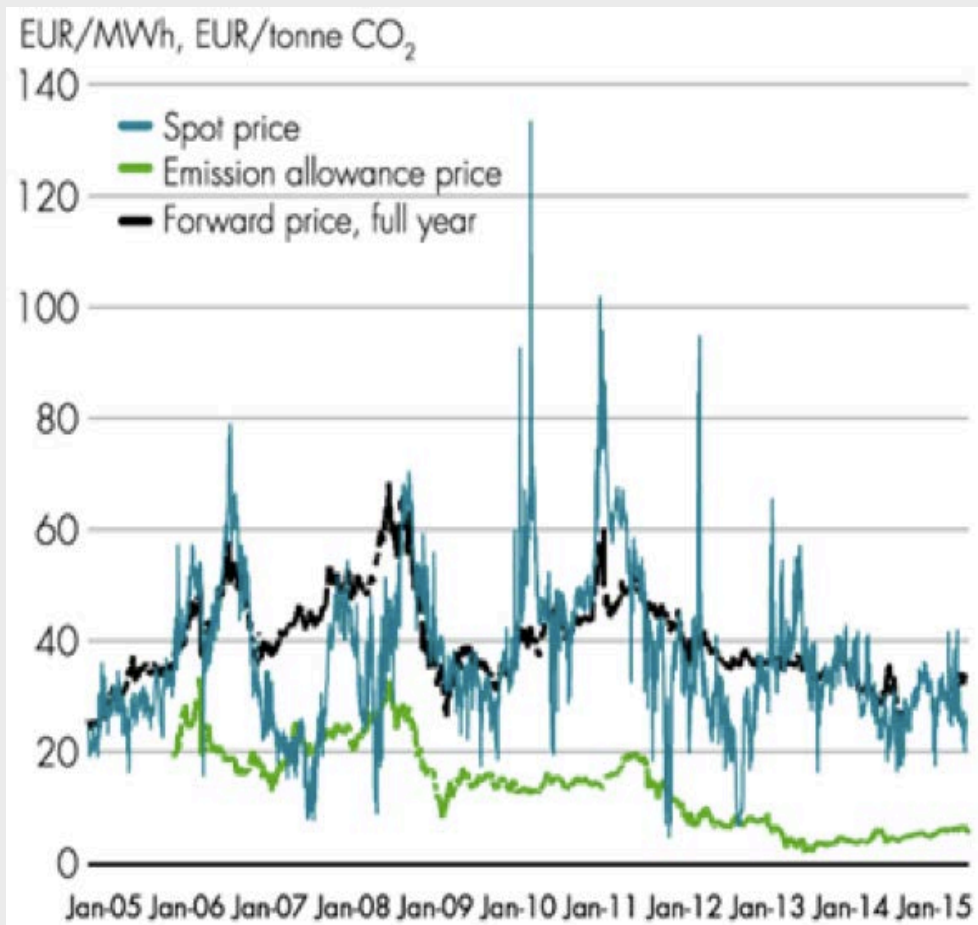
Source: EEX

Risk mapping and hedging

- A portfolio of assets is **by definition “risky”**
 - Price risk
 - Volume risk:
 - ✓ Uncertainty about the RES production
 - ✓ Uncertainty about the consumption
 - ✓ Possible outages of power plants
 - ✓ ...
 - Regulatory risk
 - Counterparty risk
 - ...

- First step when trying to mitigate risks is to **identify and classify/organize the risk factors**
- Second step is to accurately forecast the positions for each of **these risk factors**
- To mitigate the price and volume risks, market participants can then perform **hedging actions**

Hedging against price risks



Source: Svensk Energi

Example: hedging a CCGT plant



Example:

Power plant with 50% efficiency: input of 2 units of gas to produce 1 unit of power (no CO₂)

(1) Strategy “*hedge and sleep*”

- T1: forward gas 22 €/MWh ; power 50 €/MWh
⇒ Forecast: Plant margin: 6 €/MWh => plant will run
⇒ Hedging: Sell power, buy gas, margin of 6 €/MWh
- T2: forward gas 24 €/MWh ; power 45 €/MWh
⇒ Forecast: Plant margin: -3 €/MWh, but already hedged at 6 €/MWh
- T3: forward gas 23 €/MWh ; power 48 €/MWh
⇒ Forecast: Plant margin: 2 €/MWh, but already hedged at 6 €/MWh

P&L: 6 €/MWh

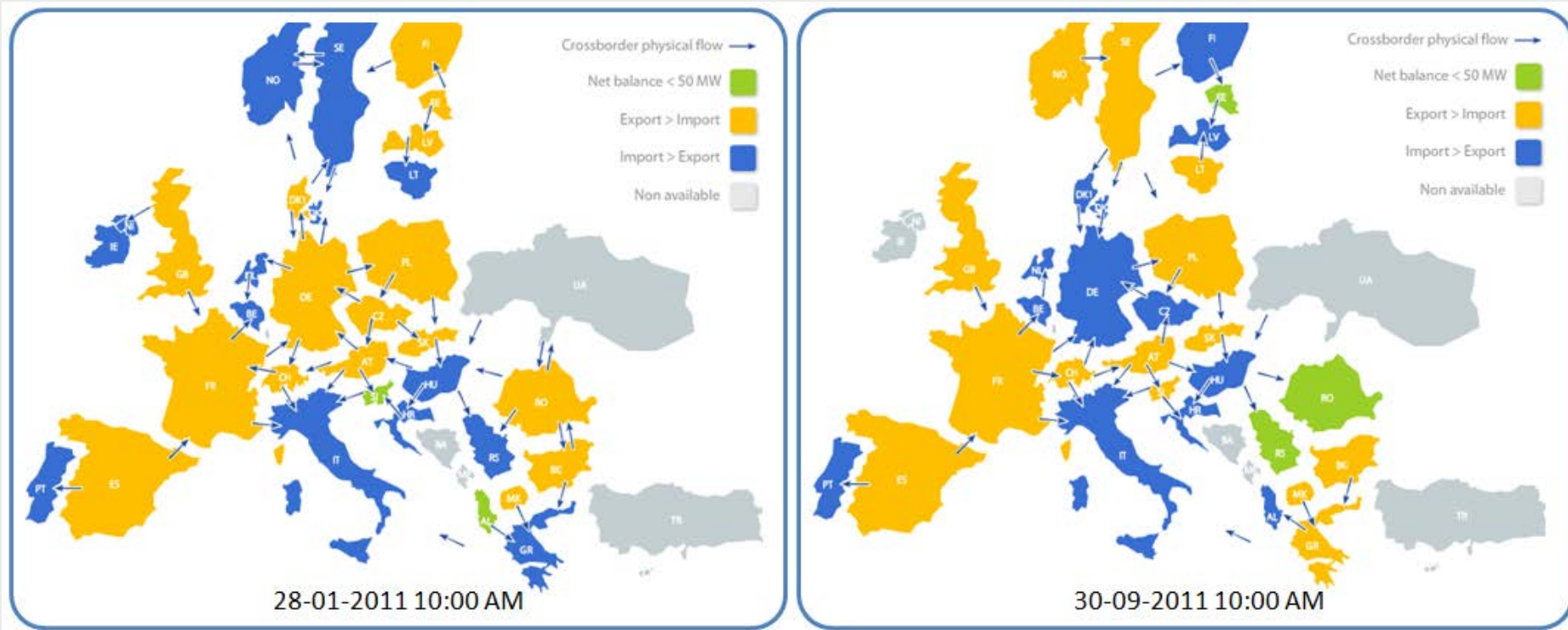
(2) Strategy “**Option Value**”

- T1: forward gas 22 €/MWh ; power 50 €/MWh
⇒ Forecast: Plant margin: 6 €/MWh => plant will run
⇒ Hedging: Sell power, buy gas, margin of 6 €/MWh
- T2: forward gas 24 €/MWh ; power 45 €/MWh
⇒ Forecast: Plant margin: -3 €/MWh
⇒ Sell gas, buy power, additional margin 3€/MWh
- T3: forward gas 23 €/MWh ; power 48 €/MWh
⇒ Forecast: Plant margin: 2 €/MWh
⇒ Sell power, buy gas, additional margin 2€/MWh

P&L: 11 €/MWh

THE IMPORTANCE OF CROSS-BORDER ACCESS

Interconnection of networks



Source: ENTSO-E

Accessing cross-border capacity

Forward



**Forward
transmission
rights**

FCA Regulation

Day-ahead



**Explicit auctions of
capacity or
market coupling**

CACM Regulation

Intraday



**Explicit auctions of
capacity or
market coupling**

PTRs and FTRs needed for XB forward trading



Forward transmission rights corresponding to trading horizon

- > Spot price for transport = unhedged cross-border positions
- > PTRs/FTRs help foster competition and liquidity

Rights must be financially firm

- > (like any other commodity)

TSOs must sell sufficient rights

- > Nordic EPADs don't provide the same hedge to the market
- > Don't overly fragment delivery points

Regulatory framework should provide TSOs with incentives:

- > To maximise sales of cross-border capacity
- > To ensure firmness of capacity

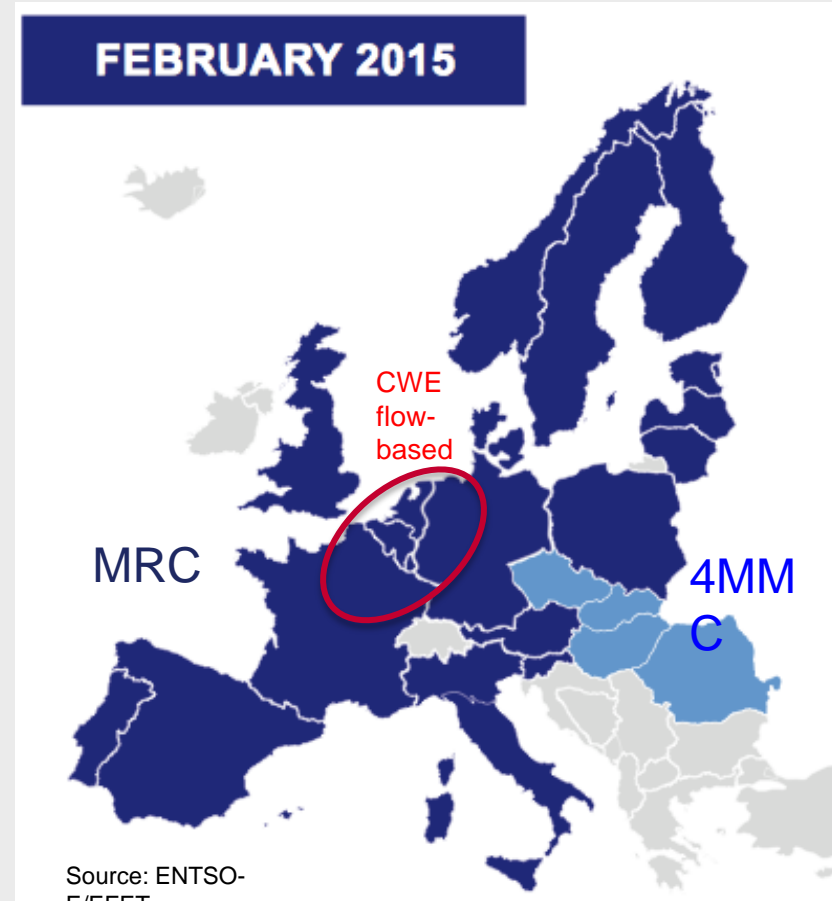
Coupling of markets in day-ahead

Well advanced project (MRC, 4MMC)

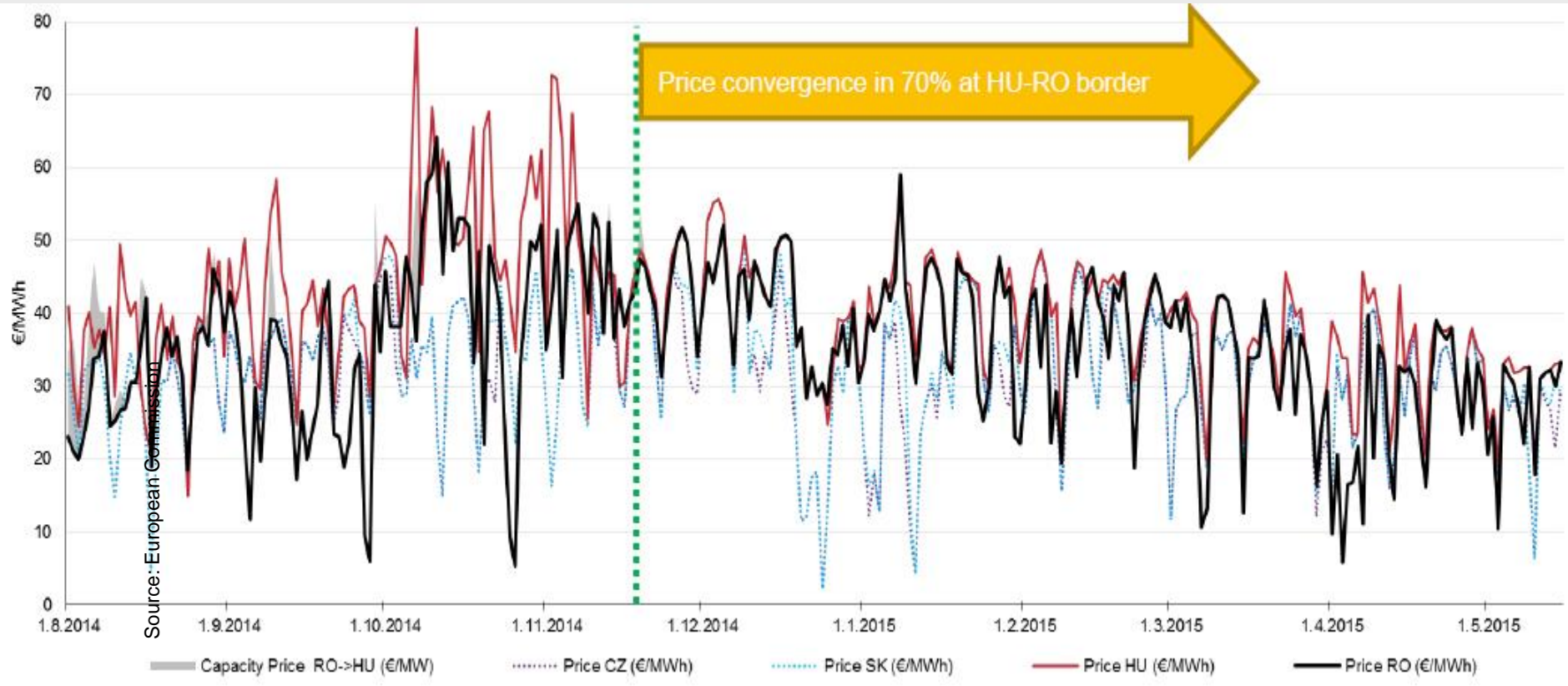
- > Implicit allocation of capacity
- > Greater competition across borders
- > Increased price convergence

CWE region coupled with flow-based

- > Expected greater availability of capacity (market closer to physics)
- > Still issues with transparency
- > To be extended throughout Core and Nordic regions



Example of price convergence in 4MM (DAMC)



Source: ENTSO-E

Coupling of markets in intraday

XBID:

- algorithmic continuous matching of ID bids and offers across borders run by PXs (“NEMOs”)
- single order book
- availability of XB transmission capacity provided by TSOs.

Go-live in June 2018, extension to new borders every year



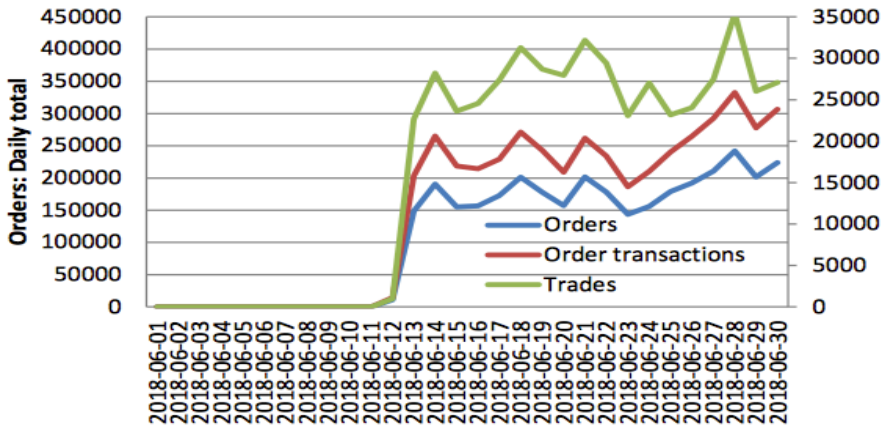
Source: XBID Project Parties

Liquidity benefits of continuous ID trading



Based on Service Boundary report data, the following figures have been created:

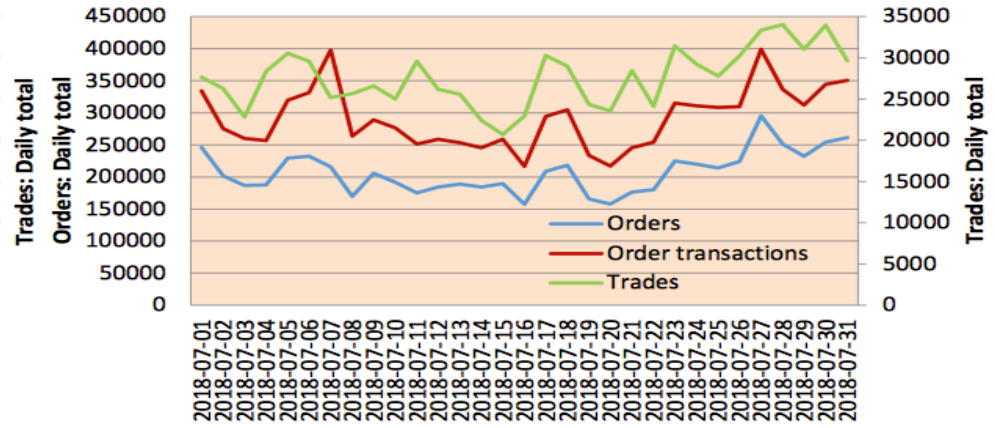
Orders and trades



June averages per day, since Go-Live

- 174 k orders
- 235 k order transactions
- 26 k trades

Orders and trades



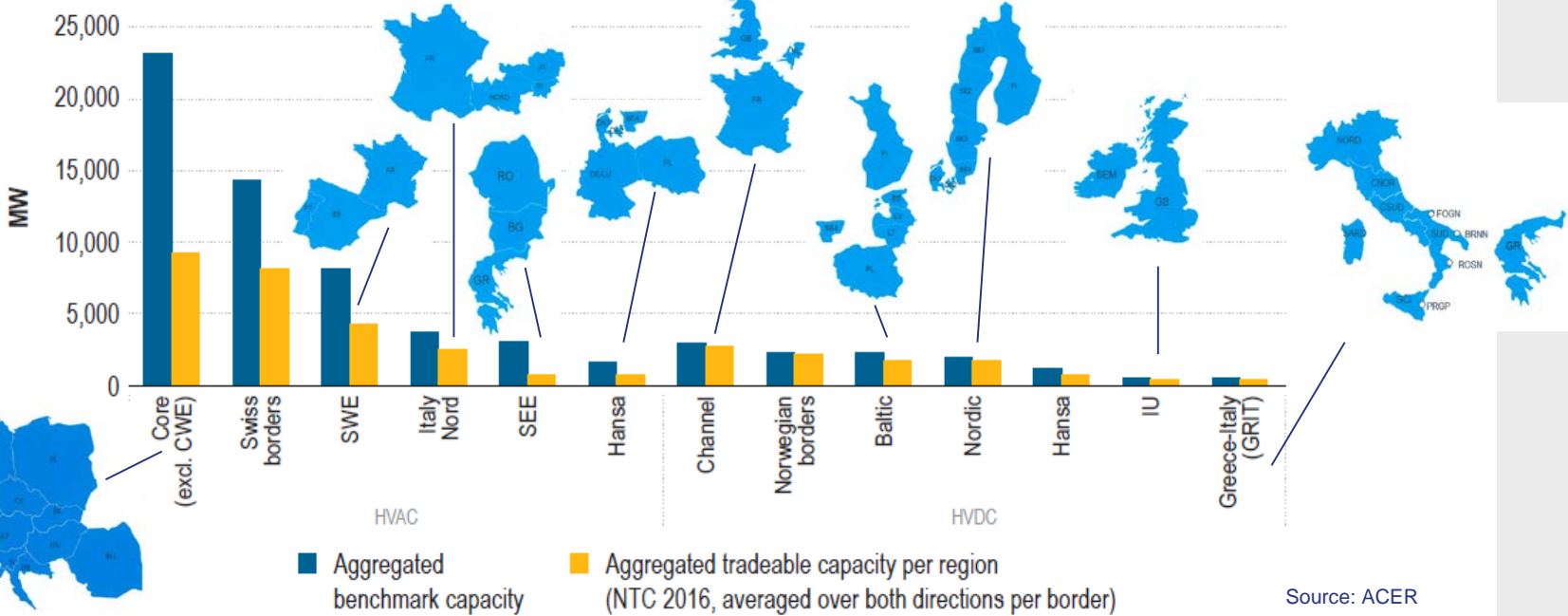
July averages per day

- 207 k orders
- 291 k order transactions
- 28 k trades

Source: XBID Project Parties

Availability of cross-border capacities

Aggregated available tradable capacity (NTC) compared to aggregated benchmark capacity of interconnectors per Region – 2016 (MW)



Source: ACER

CACM, ACER Rec, CEP, what is happening with cross-border capacity calculation?



- **CACM (Third Energy Package):** Capacity Calculation Methodologies (CCMs) are supposed to be implemented in each region to harmonise what are currently bilateral processes.
 - > Problem: CCMs are only being developed now (and not yet implemented), 9 years after the adoption of the Third Package
- **ACER Recommendation:** Capacity should be maximised even in case of loop flows unless it is proven it does not make economic sense. Remedial action costs should be attributed to where congestions are (polluter pays principle)
 - > Problem: TSOs won't apply this until they agree on cost sharing
- **Clean Energy Package:** Commission wanted to detail ACER Rec in legislation
 - > Problem: Parliament and Council want a simpler solution, proposed a one-size fits all threshold – and many exemptions to it

Article 14.7 Electricity Regulation (CEP)

Current situation

Parliament proposal

Council proposal

