Flexibilisierung der Märkte: Einfluss der Erneuerbaren auf den Handel an der Börse

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Paris, 19/06/2019
1. A dynamic intraday market at finer granularities
2. Trading closer to real-time
3. Direct marketing works
4. Local flexibility markets
5. Further trends and innovation
A truly European Power Exchange

- 20+ nationalities in staff
- 285 members in 21 EU countries
- 7 European shareholders
  - 51% private, 49% TSOs
- 8 European markets operated
  - 8 new planned
- 21 borders
  - market-coupled
- 7 local offices across Europe
- 14 EEX Group

Markets covered under the roof of the Clearing House

Current EPEX markets

Coming soon

Serviced Power Exchanges

Local EPEX / EEX Group offices

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One gateway to value the whole chain of power trading

<table>
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<tr>
<th>FUTURES MARKET</th>
<th>CAPACITY MARKET</th>
<th>DAY-AHEAD AUCTION</th>
<th>INTRADAY CONTINUOUS</th>
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<td>Year/Month/Week before delivery</td>
<td>Year(s) before/after delivery</td>
<td>One day before delivery</td>
<td>Until 5 min before delivery</td>
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- **HEDGE fluctuations**
- **Value**
  - CAPACITY & DEMAND RESPONSE
  - PRODUCTION CONSUMPTION
  - FLEXIBILITY

Integrated & Secure Clearing Solution
Power markets successfully integrate considerable amounts of renewables

Germany Installed capacity (in GW)

- 75 GW renewables are marketed under feed-in premium (Direktvermarktung)
- 95% of wind and 25% of solar are marketed under feed-in premium.

France Installed capacity (in GW)

- In France, the "complément de rémunération" scheme startet in 2016.

Source: REN21 (2019)
**Intraday market is used to balance forecast errors**

**Traditionally**, main reasons for intraday trading are:

1. Adjust purchase and sale based on the results of the day-ahead auction
2. Run and plan power generation closer to delivery
3. Manage unforeseen events such as power plant outage
4. Enable arbitrage between neighboring countries

Today with increased share of renewables, **new reasons** for intraday trading are:

5. **Balance forecast errors**

6. **Handle generation ramps with finer granularity products**
A dynamic Intraday market, trading closer to real-time, at finer granularities
Subhourly contracts: products responding to market needs

Volumes of selected 15- and 30min products on EPEX SPOT markets (in TWh)

Success of 15-min products
25% of German intraday volumes traded on 15-min contracts in 2018

Clean Energy Package
confirms high priority for 15min products for intraday and day-ahead (Art. 7 Electricity Regulation)
A dynamic Intraday market, trading closer to real-time

Lead time of all trades of 60min products in the German Intraday market

Source: EPEX SPOT
Two « Target Models » for market integration, now set in EU Law

Day-Ahead Market Coupling

Intraday Market Coupling

CACM Regulation (EU) 2015/1222

1st wave – 12-13/06/2018
2nd wave – Q4 2019
3rd wave – TBC

MRC coupling
4MMC coupling
PCR member (non coupled)

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Rise of aggregators

Volumes (in TWh) of aggregators on the German spot market

Five biggest aggregators in DE are *(source: E&M 2019)*:
1. Statkraft Markets 11,478 MW
2. Quadra Energy 6,500 MW
3. Vattenfall Energy Trading 5,610 MW
4. WET/BKW Energie 4,828 MW
5. Eon Energie Deutschland 4,200 MW
Direct marketing works

Aggregated curve on a windy day 26/12/2016, hour 7, price – 67 EUR/MWh

Wind plateau ~ 12GW
The size of the wind plateau is highly correlated to wind forecast.
Congestions are slowly appearing in Europe

Redispatch costs in the TenneT control area, spreading from the North-West to the South-East of Germany

2017 real-time (up to 1 hour) reported congestions

Source: ENTSO-E Regular Reporting on Bidding Zone Configuration – Technical Report 2018

€1 billion

Source: ENTSO-E Transparency platform
Local flexibility markets to complement the EU market

**FLEXIBILITY SUPPLY**

**FLEXIBILITY MARKET PLACE**

**FLEXIBILITY DEMAND FROM SYSTEM OPERATORS**

**Flexibility providers:**
- Power plants
- Aggregators
- Virtual power plants
- Storage
- Renewables

**Market-based congestion management**

Trading systems
Standards
Transparency
Coordination
Neutrality

TSOs
Mid-voltage DSOs
Low-voltage DSOs

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The first local trade in Germany

On 4/2/2019 at 15h25: first trade between EWE Netz and VW Kraftwerk

- Delivery on the same day at 17:00-18:00 in the market area SOET1 (Sögel)
- 2 MW traded at -45.50€/MWh

What triggered the transaction

- EWE NETZ forecasts a congestion in a few hours due to high feed-in and needs downwards flexibility to alleviate it
- It sends a corresponding flexibility demand order for 2 MW at -45.50 €/MWh
- Audi disposing of a Power-to-Gas asset in the area judges the SO’s flexibility demand to be acceptable
- It submits a matching flexibility offer order which is matched.

Physical impacts

- Based on this trade, Audi has the obligation to deliver the flexibility and will increase its consumption at a given time and at the chosen location.
- This localized physical impact allows EWE NETZ to alleviate, in a safe and competitive way, a congestion before it occurs.
A trend supported by more automated and performant trading solutions

Average number of orders per day (in thousands)

- +300%

Number of connections via EPEX API

- ca.40% API-generated trades for 60min Intraday products
- ca.60% API-generated trades for 15min Intraday products

API = Application Programming Interface
Thank you for your attention!

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