Kurzfristhandel in Europa –
Day-Ahead & Intraday Märkte der EPEX SPOT

Bundesministerium für Wirtschaft und Energie
Strommarkttreffen, Europäische Strommarktintegration
Berlin, 02. Juni 2017
Patrick Adigbli, Head of Public & Regulatory Affairs, EPEX SPOT
Shareholder structure

EEX Group

51%

HGRT

49%

100%

EPEX SPOT

100%

EPEX SPOT

BELGIUM SA

EPEX SPOT

SCHWEIZ AG

Source: EPEX SPOT
Role of EPEX SPOT in the electricity market

- **DERIVATIVES**: Years/months/weeks before delivery
  - Price variations are **HEDGED**

- **DAY-AHEAD**: One day before delivery
  - Optimization of **GENERATION**

- **INTRADAY**: <1 hour before delivery
  - Valuation of **FLEXIBILITY**

- **BALANCING**: Real-time
  - Ensuring **SYSTEM SECURITY**

**INTEGRATED CLEARING SOLUTION**

Source: EPEX SPOT
WIDEST RANGE OF OPERATION AND SERVICES IN EUROPE
COVERING 50% OF EU POWER CONSUMPTION
OVER 275 EXCHANGE MEMBERS
530 TWH OF TRADED VOLUMES IN 2016
## Volumes 2016

<table>
<thead>
<tr>
<th>Region</th>
<th>Total Volumes (TWh)</th>
<th>Intraday Volumes (TWh)</th>
<th>Share in Consumption (%)</th>
<th>Delivery Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>DE/AT/LU</td>
<td>275</td>
<td>41</td>
<td>50</td>
<td>50Hertz, Amprion, APG, TenneT, TransnetBW</td>
</tr>
<tr>
<td>FR</td>
<td>115</td>
<td>4</td>
<td>24</td>
<td>RTE</td>
</tr>
<tr>
<td>NL</td>
<td>36</td>
<td>1</td>
<td>33</td>
<td>TenneT</td>
</tr>
<tr>
<td>UK</td>
<td>57</td>
<td>13</td>
<td>17</td>
<td>National Grid</td>
</tr>
<tr>
<td>BE</td>
<td>20</td>
<td>1</td>
<td>24</td>
<td>Elia</td>
</tr>
<tr>
<td>CH</td>
<td>26</td>
<td>2</td>
<td>40</td>
<td>Swissgrid</td>
</tr>
</tbody>
</table>

Source: EPEX SPOT
European Market Coupling

DAY-AHEAD MARKET COUPLING

- Multi-Regional Coupling
- 4M Market Coupling

Both driven by the Price Coupling of Regions (PCR) solution

INTRADAY MARKET COUPLING

Source: EPEX SPOT

CACM Regulation (EU) 2015/1222

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 Transformation of the electricity sector

RENEWABLE GROWTH

- China: +15.2
- Germany: +1.5
- Japan: +11
- United States: +7.3
- Italy: +0.3
- United Kingdom: +3.7
- France: +0.9
- Spain: +0.1
- India: +2.0
- Australia: +0.9

Sources: REN21, IEA, BMWi, BDEW

DECENTRALISATION

Sources: REN21, IEA, BMWi, BDEW
Flexibility challenges and intraday trading

**GENERATION RAMPS**
- Generation
- 15mn products profile
- Hourly products profile

**FORECAST DEVIATIONS**
- Day-ahead forecast
- Intraday forecast
- Real Feed-in

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 or renewable forecast errors**
4. **Enable arbitrage between neighboring countries, provide opportunities for cross-border trading**
5. **Offer flexibility to manage ramping constraints or intra-hour variation, adjust from hourly to sub-hourly positions**

*Source: EPEX SPOT*
Timeline of EPEX SPOTs markets

(*) Both local and cross-border lead times are country-specific. In the majority of EPEX SPOTs markets, local lead times are 30min or less, and cross-border lead times are generally 60min.

Source: EPEX SPOT
EPEX SPOTs cross-border intraday markets

Years represent the launch of the respective market and/or cross-border trading solution.

Source: EPEX SPOT

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Increasing intraday liquidity

OVERALL INTRADAY MARKETS (TWH)

DE INTRADAY CONTINUOUS (TWH)

FR INTRADAY CONTINUOUS (TWH)

Source: EPEX SPOT
Sub-hourly contracts

15MIN & 30MIN VOLUMES – AUCTION VS. CONTINUOUS (TWH)

15MIN PRICES – CONTINUOUS (EUR/MWH)

Source: EPEX SPOT
Lead time reduction on continuous intraday

VOLUMES DISTRIBUTED BY TIME TO DELIVERY IN % OF TOTAL

EPEX SPOT INTRADAY LEAD TIMES

<table>
<thead>
<tr>
<th>Trading</th>
<th>Before 2015</th>
<th>Since 2015/16</th>
</tr>
</thead>
<tbody>
<tr>
<td>within BE</td>
<td>5 minutes</td>
<td></td>
</tr>
<tr>
<td>within NL</td>
<td>5 minutes</td>
<td></td>
</tr>
<tr>
<td>within DE</td>
<td>45 minutes</td>
<td>30 minutes (*)</td>
</tr>
<tr>
<td>within FR</td>
<td>45 minutes</td>
<td>30 minutes</td>
</tr>
<tr>
<td>within AT</td>
<td>75 minutes</td>
<td>30 minutes</td>
</tr>
<tr>
<td>within CH</td>
<td>75 minutes</td>
<td>60 minutes</td>
</tr>
<tr>
<td>within UK</td>
<td></td>
<td>75 minutes</td>
</tr>
<tr>
<td>between DE-FR</td>
<td>60 minutes</td>
<td>60 minutes</td>
</tr>
<tr>
<td>between DE-AT</td>
<td>75 minutes</td>
<td>60 minutes</td>
</tr>
<tr>
<td>between DE-CH</td>
<td>75 minutes</td>
<td>60 minutes</td>
</tr>
<tr>
<td>between FR-CH</td>
<td>75 minutes</td>
<td>60 minutes</td>
</tr>
<tr>
<td>between BE-NL</td>
<td></td>
<td>60 minutes</td>
</tr>
<tr>
<td>between DE-NL (**)</td>
<td></td>
<td>60 minutes</td>
</tr>
<tr>
<td>between BE-FR</td>
<td></td>
<td>60 minutes</td>
</tr>
</tbody>
</table>

(*) As of 2017, 5 minutes before delivery within four DE TSO areas
(**) Indirect link

Source: EPEX SPOT
Automated trading

IT’S NO SCIENCE FICTION…

… AND IT’S NOT THAT SCARY
Thank you for your attention!

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