Energy Transition & the Hellenic Electricity Market

Thursday, June 6th 2019  |  Vienna Energy Transition Forum
“\textit{The establishment of the Hellenic Energy Exchange}”

Eva Papadionysiou, \textit{Markets’ Operation}
\textit{HEnEx S.A.}
Energy Transition: Key challenges and drivers

- **Decarbonization** – social pressure to take measure increases
- **Electrification** – power to heat/cold - power to mobility – power to gas
- **Decreasing costs** for clean – energy technologies
- **Decentralization** – from vertically integrated monopolies to small scale active players
- **Digitalization** – more efficient coordination between supply and demand
- **Increasing demand for** Market Integration and cross-border cooperation.
- **Demographic impact** – need for social acceptance
- **Fixed-costs** technologies prevail in the future

NEW BUSINESS MODEL

June 2019
Recent Regulatory Developments

The adoption of the four remaining files of the **Clean Energy for All Europeans Package** by the EU Council of Ministers, completes EU’s energy policy framework:

- **Electricity Directive & Regulation**
  - Competitive, consumer-centred and flexible Electricity Market.
  - Active participation of consumers.
  - New trading & balancing responsibilities.
  - New framework for capacity mechanisms.

- **Risk Preparedness Regulation**
  - New framework to prepare for electricity crises in EU.
  - Member States obligation to prepare risk-preparedness plans.
  - Efficient cooperation between Member States in electricity crisis.

- **ACER Regulation**
  - Enhanced role in network codes development and regional decision making.
  - New tasks on supervision of NEMOs, generation adequacy & risk preparedness.
The role of wholesale energy markets

Efficient and transparent wholesale energy markets will play a key role in order to achieve cost-efficient decarbonization.

Efficient & Integrated Internal Energy Market

- Strong price signals for investment & fair competition
- Level playing field for all players
- Increased security of supply
- Liquidity – trading efficiency
Towards that end the Hellenic Energy Exchange S.A. was established in June 2018 as a spin-off from the electricity market branch of LAGIE S.A. which was a public company.

- **EnEx Group (Energy Exchange Group)**
  - HEnEx (Hellenic Energy Exchange S.A.)
    - Private company operating Spot & Derivatives energy markets
  - EnExClear (EnEx Clearing House S.A.)
    - 100% owned by HEnEx
    - Private company clearing Spot energy markets Derivatives energy markets cleared by ATHEX Clear (company of ATHEX Group)

### Hellenic Energy Exchange S.A. Shareholders

<table>
<thead>
<tr>
<th>Public sector</th>
<th>Private sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cypriot Ministry of Energy and Environment</td>
<td>Athens Stock Exchange</td>
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<tr>
<td>22%</td>
<td>21%</td>
</tr>
<tr>
<td>Ministry of Infrastructure and Development</td>
<td>European Bank for Reconstruction and Development</td>
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<tr>
<td>20%</td>
<td>20%</td>
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<tr>
<td>HEnEx</td>
<td>Cypriot State Railways Corporation</td>
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<tr>
<td>42%</td>
<td>10%</td>
</tr>
<tr>
<td>EnEx Group</td>
<td>Other</td>
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<tr>
<td>58%</td>
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Greece: Steps forward

- **Regulatory and legislative reforms**
  - transformation of the Greek Day-Ahead Scheduling (DAS) electricity market (mandatory pool model)
  - coupling with neighboring countries.

- **HEnEx full PCR member**
  - as of Jun-18
  - PXs of day–ahead electricity markets in 24 countries
  - > 90% of European power consumption.

- **Italian Borders Working Table (IBWT) project**
  - HEnEx and the Hellenic TSO (ADMIE)
  - Impact assessment & Project Roadmap have been approved by the IBWT SC in May 2019.
The new Electricity Markets in Greece

**HEnEx (Market Operator)**
- Long-term planning
- Short-term scheduling

**ADMIE (System Operator)**
- Real-time operation

**Derivatives Market & Bilateral OTC Contracts**
- Long-term planning
- Hedging
- Speculation
- Yearly-quarterly-monthly-weekly contracts

**Day-Ahead Market**
- Main arena for trading power
- Auction on D-1

**Intraday Market**
- Auction and/or continuous trading
- Usually accounts for 5-10% of spot transactions

**Balancing Market**
- Balancing Capacity/Reserve Market
  - Balancing Energy Market
  - Imbalances Settlement
- Close to real-time system operation

**Year until Week**
- **D-1**
- **D-1 until D**
- **Real-time during D**
Derivatives Market (1)

**Products**

**Power Futures** on the average **Day-Ahead Market (DAM)**

**Clearing Price** of the respective Delivery Period

**Option of physical delivery**, through the submission of **Priority-Price-Taking-Orders** in DAM.

**Trading Methods**

a. **Continuous Automated Matching Method**, Monday to Friday (excl. holidays).

b. **Pre-Agreed Method**: Bilateral Trading in HEnEx's Trading Platform with a price/quantity pre-agreed between the counterparties, Monday to Friday (excl. holidays).

** Tradable Delivery Periods**

**Month, Quarter & Year** (up to the next year).

a. **Baseload Index**: The average Clearing Price of DAM for the hours between 00:00 and 24:00 for all days of the respective Delivery Period.

b. **Peakload Index**: The average Clearing Price of DAM for the hours between 08:00 and 20:00 from Monday to Friday of the respective Delivery Period.

**Underlying Asset**

Energy Exchange Group
### Derivatives Market (2)

**Options on HEnEx’s Power Baseload Futures** – European Style (exercised only at the Expiry Day).

**Trading Methods**

- **Continuous Automated Matching Method**, Monday to Friday (excl. holidays).
- **Pre-Agreed Method**, Monday to Friday (excl. holidays).

** Tradable Delivery Periods**

- Options on the corresponding Month, Quarter & Year (up to the next year).

**Underlying Asset**

- Option on HEnEx’s Future on the **Baseload Index**.

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- MiFID II Organized Derivatives Market
- Option of physical delivery - increased liquidity
- **Clearing** by an EMIR Compliant CCP (ATHEX Clear)
# Day-Ahead Market features

## Current Day-Ahead Market Model
- Mandatory pool model
- **Asset-based participation** in the market
- **Co-optimization** of energy & ancillary services
- Unit commitment - 24h **social welfare maximization problem with constraints**
- Order Types (Buy/Sell)
- Producers submit **Techno-economic/Non-Availability** declarations
- Suppliers submit non-priced Load Declarations for demand
- Settlement of imbalances from ADMIE
- No bilateral agreements
- Explicit allocation of interconnection capacities (ST-PTRs)

## New Day-Ahead Market Model
- Semi-compulsory Market
- Bidding on a physical asset basis - Portfolio bidding for RES Units & RES Aggregators
- Pan-European market clearing algorithm – **EUPHEMIA**
- Only **energy products** (Day-ahead hourly energy contracts are traded) - no ancillary services
- Orders compatible with PCR standards
- Exchange-based Futures and **OTC Contracts** with the option of physical delivery
- Implicit allocation of interconnection capacities with coupled Bidding Zones (no Daily PTRs)
Day-Ahead Market benefits

- Stable EU market model,
  - compatible with existing developed regional market models, allowing for seamless integration with developing neighboring markets;
  - well understood by local & foreign Participants.

- **Robustness of DAM results** for reference price that will:
  - provide strong and reliable signals for further viable and competitive investments.
  - provide for healthy competition among Participants in favor of end-consumers;

- **Position correction** after the Derivatives Market.
Intra-Day Market

- Optional Participation
- Unit-based Market
- 2 Implementation phases:
  - **1st Phase**: Local Intra-Day Auctions (LIDAs)
  - **2nd Phase**: Complementary Regional Auctions (CRIDAs) & Continuous Trading (XBID)
- Fine tuning positions prior Balancing and mitigating financial exposure to the Balancing Market
- Position correction after the Day-Ahead Market.
- Submit more accurate short-term forecasts
  - for Renewable Energy Resources (RES);
  - for consumers demand.
# High-level Implementation Roadmap

- Spot markets Trading Rulebook – Approved by the Regulator
- Spot markets Clearing Rulebook – Pending approval by the Regulator
- IT spot trading & clearing infrastructure for DAM & IDM – ongoing
  - ✔ Application Programming Interface (API) with the Energy Trading Spot System (ETSS) available early June
- Spot Markets Participant Training: starting Q3 2019
- Spot Markets System Testing: starting Q3 2019 for own systems
- Spot Markets System Testing for interface with the TSO upon completion of the Balancing Platform
- Derivatives Market Regulatory & Licensing: Q4 2019
- Derivatives Market Trading System (ETSD): Q4 2019
Hellenic Gas Market - Developments & Prospects
Working towards the new Gas Market

- **Our vision**
  - Establishment of a Gas Trading Platform
    - HEnEx as a Trading Platform Operator (TPO)
    - EnExClear as a Gas Clearing House
  - Investigation of synergies for a Regional Gas Market
    - Creation of regional indices and price signals

- **First Step: Feasibility study**
Thank you for your attention!

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