



Hellenic Power Market Reform

Tuesday December 4th | 6th Cyprus Energy Symposium

Key drivers for change

The Energy Exchange Group

GROUP CORPORATE STRUCTURE



The EnEx Group

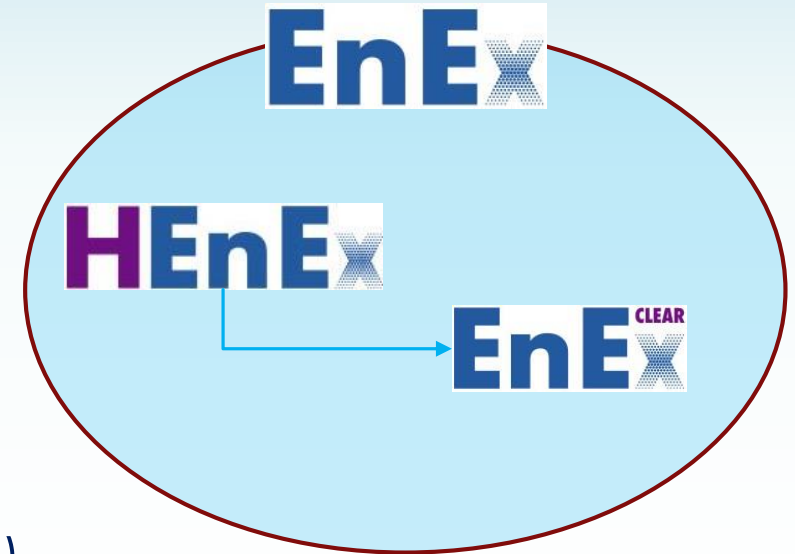
▶ EnEx group

▶ HEnEx (Hellenic Energy Exchange S.A.)

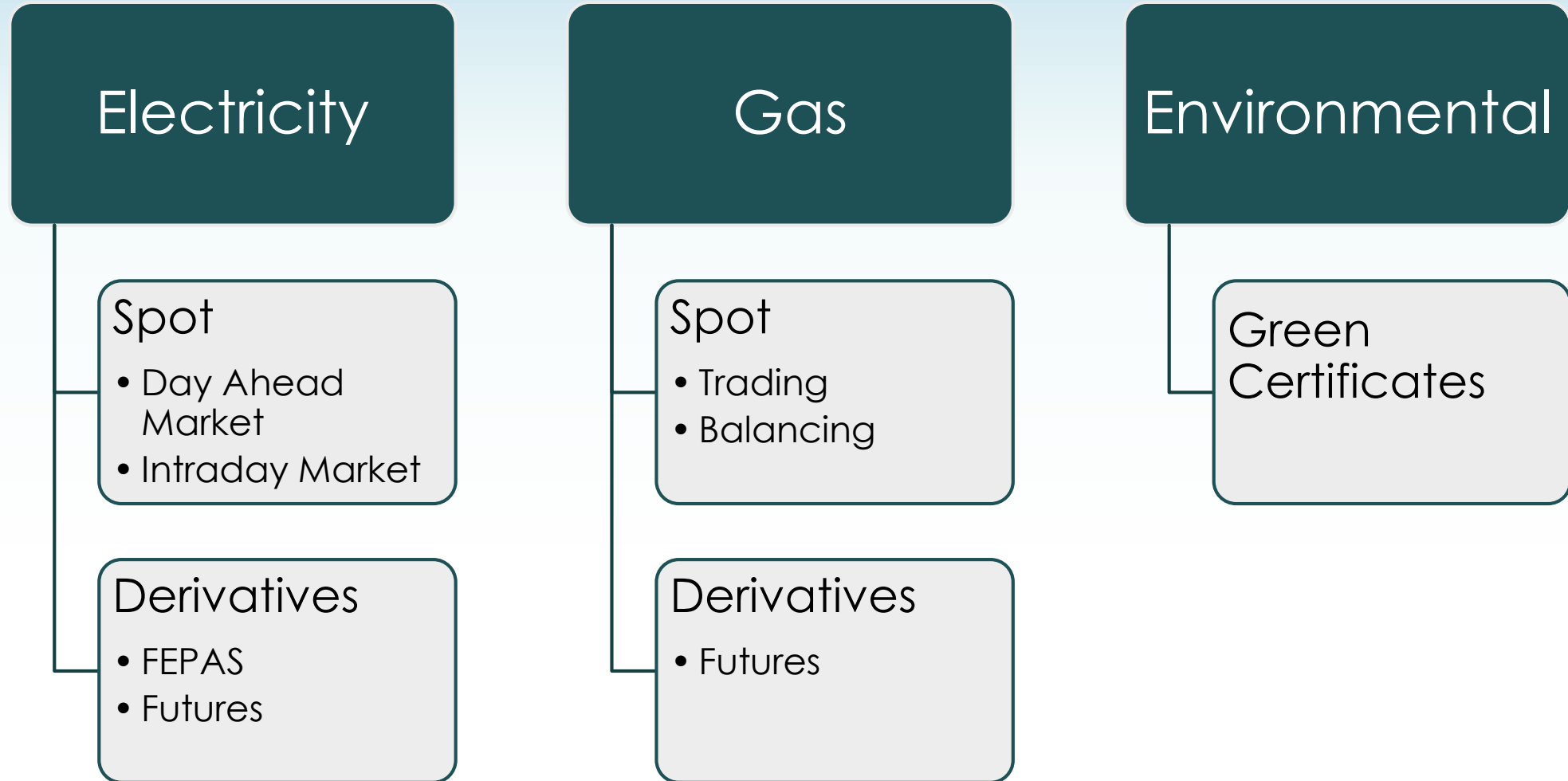
- ▶ Private company operating Spot & Derivatives energy markets

▶ EnEx Clear (Energy Exchange Clearing House S.A.)

- ▶ 100% owned by HEnEx
- ▶ Private company clearing Spot energy markets
 - ▶ Derivative energy markets cleared by Athex Clear (company of Athex group)



EnEx group – target markets



Towards the European Target Model

MARKET CHANGE & ITS DRIVERS



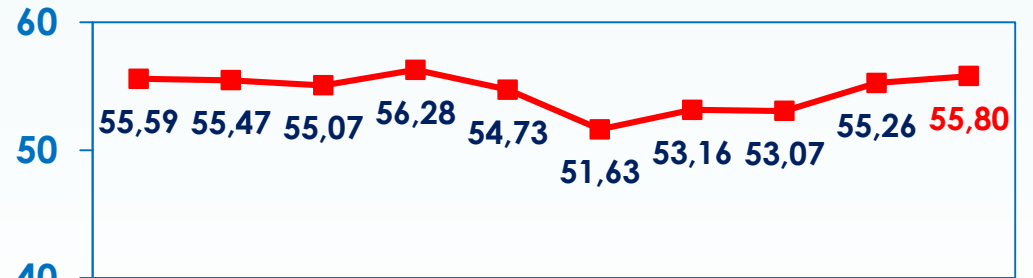
Hellenic Electricity Market key figures



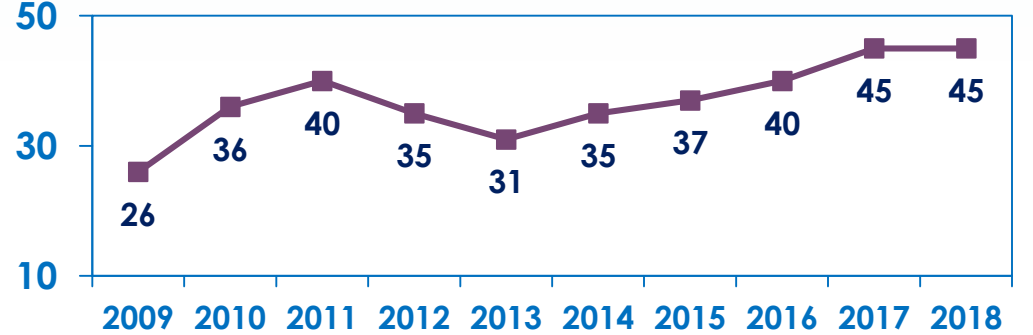
Price
(€/MWh)



Volume
(TWh)



Participants



Power Market Reform: Market Model

High Level Design

Current High Level Market Design

- ▶ Forward market
 - ▶ With Physical delivery
- ▶ Day Ahead Scheduling
 - ▶ Mandatory
 - ▶ Power
 - ▶ Primary, Secondary/Tertiary reserve
- ▶ Ex-post calculation of Imbalance prices
- ▶ Imbalance Settlement (TSO)

New High Level Market Design

- ▶ Derivatives market (New Market)
 - ▶ With Physical delivery
 - ▶ Without Physical delivery
- ▶ Day Ahead Market
 - ▶ Mandatory
 - ▶ Power
- ▶ Intraday market (New Market)
- ▶ Balancing market (TSO)

Power Market Reform: Market Model

Day Ahead Market

Current Day Ahead Market Model

- ▶ Mandatory Pool
- ▶ Unit Commitment model
- ▶ Techno – economical bids/offers
 - ▶ Representation of multiple operational constraints
- ▶ Co-optimization of power and reserves

New Day Ahead Market Model

- ▶ Semi compulsory
- ▶ Unit based
- ▶ Purely economical bids/offers
 - ▶ Simple Step-wise or Linear and Block (incl. Linked / Exclusive)
- ▶ Solved with the EUPHEMIA/PCR Algorithm in Isolated or Coupled mode

Power Market Reform: Corporate Change

Market Operator



Previous Market Operator (NEMO)

- ▶ 100% state owned Societe Anonyme
- ▶ Founded in 2000 as Hellenic Transmission System Operator S.A. (HTSO)



Current Market Operator (NEMO)

- ▶ Private company
 - ▶ Public Sector - 49%
 -  ▶ DAPEEP (Hellenic RES & GoO) 22%
 -  ▶ ADMIE (Hellenic Power TSO) 20%
 -  ▶ DESFA (Hellenic Gas TSO) 7%
 - ▶ Private Sector - 51%
 -  ▶ ATHEX Group (Athens Exchange) 21%
 -  ▶ EBRD (European Bank) 20%
 -  ▶ CSE (Cyprus Exchange) 10%

Power Market Reform: Key drivers

Market design & Corporate

Market Design

- ▶ Conversion with the EU-Target Model
 - ▶ Intraday market
 - ▶ Balancing market
 - ▶ Price coupling with other bidding zones
 - ▶ Usage of Euphemia
 - ▶ Separation of ancillaries

Corporate

- ▶ Corporate flexibility
- ▶ Activities in multiple commodities / markets
- ▶ Formation of partnerships
 - ▶ Locally & Internationally
 - ▶ Common usage of resources
- ▶ Selection & Allocation of resources according to needs / developments

Discrete Steps towards the new Power market

		Finished Advanced Started Not started
TRADING RULEBOOK	Drafting	
	HEnEx approval and submission to RAE	
	Consultation	
	Re-Drafting submission to RAE	
	RAE approval	
CLEARING RULEBOOK	Drafting	
	HEnEx approval and submission to RAE	
	Consultation	
	Re-Drafting submission to RAE	
	RAE approval	
SPOT IT SYSTEMS	Analysis Phase	
	PCR testing Environment setup	
	System Implementation	
	UAT, Training	
	Dry Run	
DAY AHEAD MARKET IMPLEMENTATION	PCR evaluation - Order types impact	
	Dry Run Start	
	Local Go-Live	
	Application to IBWT SC	
	Market Coupling GR - IT & GR - BG	
INTRADAY MARKET IMPLEMENTATION	Setup regional intraday auctions with IT	
	Local Auctions Go-Live	
	Market Coupling GR - IT & GR - BG	

Goals

Mid 2019

End 2019

Mid 2019

End 2019

Lessons learned & New Challenges

Lessons learned & New Challenges 1/2

➤ Risk Management

- Credit Risk
 - Market participant defaults
 - Cost allocation to other participants and/or to the society
- Business Risk
 - Uncontrolled expansion of key accounts (e.g. Renewables)

Lessons learned & New Challenges 2/2

➤ Disruptive technologies

- Cost Characteristics
 - High Investment Cost
 - Very Low or Zero Marginal Cost
- Challenges
 - Price signal formation
 - Subsidy Schemes
 - Investment incentives
 - Capacity & Flexibility Markets

Natural Gas Market

TAKING THE NEXT STEP



Hellenic Gas Market – Developments & Prospects

Forming the basis for a liquid Gas Market

- **TAP pipeline**
 - 10 bcm (20 bcm) / year
- **IGB pipeline**
 - 3 bcm (5 bcm) / year
- **LNG Terminals**
 - **Revithousa**
 - Upgrade
 - Storage (+73%)
 - 130 → 225 Km³
 - Regasification Capacity (+40%)
 - 1000 → 1400 m³ LNG/h
 - LNG carrier size (+68%)
 - 155 → 260 Km³
 - **FSRU Terminals**
 - Alexandroupolis
 - Storage: 170 Km³ | Cap.:6,1 bcm/year
 - Kavala
 - Storage: 150 Km³ | Cap.:5 bcm/year



Working towards the new NG market

▶ Our vision

- ▶ Establishment of a Gas Trading Platform
 - ▶ HEnEx as a Trading Platform Operator (TPO)
 - ▶ EnEx Clear as a Gas Clearing House
- ▶ Investigation of synergies for a Regional Gas Market
 - ▶ Creation of regional indices and price signals

▶ First Step: Feasibility study

- ▶ Analysis and presentation of the European landscape
- ▶ Analysis of the Greek Natural Gas sector
- ▶ Suggestion for an NG exchange-based Trading and Clearing Model
- ▶ Potential for creation of a regional market
- ▶ Financial analysis of HENEX's activity as NG Trading Platform Operator (TPO)
- ▶ Implementation Plan



Thank you for your attention