

New Challenges in Financial and Energy Markets: Math, Data & Al

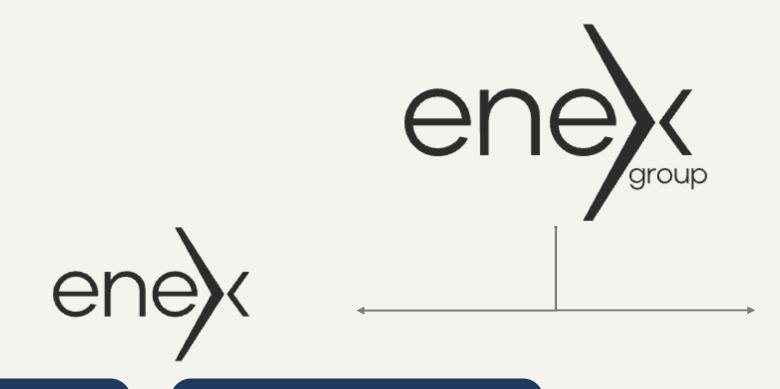
Friday, 31st of October 2025

Introduction to the Hellenic Energy Exchange

Manolis Kalaitzakis Strategy & Business Development Director



Hellenic Energy Exchange — Overview





Nominated Electricity Market Operator for Power Spot Market

Operator of the Natural Gas Trading Hub

Operator of the Energy Derivatives Market

Operator of the PPA Platform

Risk management, clearing and settlement for power & gas spot markets

Clearing and settlement of positions in the Balancing Market for Power (operated by IPTO)



Hellenic Energy Exchange



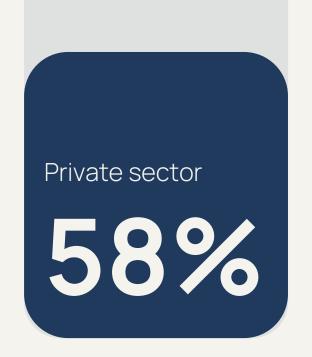


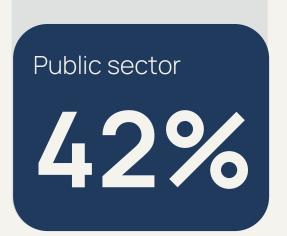














Natural Gas **Energy Derivatives SPOT Electricity Markets** Trading Market (Electricity) **Platform Natural Gas Trading Energy Derivatives** Market Day-Ahead Balancing Intraday **Platform** Market **Cash Settlement with** optional Physical Type of Market Physical **Physical Physical Physical** Delivery ene **¥**ipto ene)< ene)< ene) **Market Operator** ipto **ATHEX** Clearing & Risk ene)< ene)< ene)< Management ene Athens Stock Exchange ipto Platforms & **ATHEX ATHEX ATHEX ATHEX** Technical **ATHEX** Athens Stock Exchange Athens Stock Exchange Athens Stock Exchange Athens Stock Exchange Services Athens Stock Exchange



Hellenic Energy Markets

Electricity

Gas

Other

Spot

- Day-Ahead Market
- Intraday Market

Spot

- Daily Contracts (D+1, D+2, D+3)
- Intraday Market

Derivatives

> Futures

Derivatives

> Futures (under investigation)

RES PPA Platform







Hellenic Energy Markets — Products

Energy Exchange / Market Operator

System Operator

Longer-term

Short-term scheduling

Real-time operation

Derivatives Market

- Medium to long-term planning
 - Hedging
 - Speculation
 - Yearly/quarterly/ monthly contracts

Day-Ahead Market

- Main arena for trading power
 - Auction on D-1
- Nominations for longterm contracts with physical delivery

Intraday Market

- Combination of three auctions (IDAs) & 24/7 Continuous trading (XBID)

Balancing Market

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

Real-time power supply

Year / 3 -1 Month BL: All day PL: 9AM - 8PM D-1

D-1 until D

Real-time during D



Day-ahead Market

Single Auction

15' MTUs

Asset-based Participation

- > Single auction per delivery day with marginal pricing
- > 15' Market Time Units
- > Algorithm: EUPHEMIA (Pan-European Hybrid Electricity Market Integration Algorithm)
- > Allocation of interconnection capacities
 - Implicit with coupled borders: IT, BG
 - Explicit with noncoupled borders: AL, NMK, TR
- > Asset-based participation
- > Mandatory participation for producers



Intraday Market

3 Auctions

15' MTUs

Asset-based Participation

- > 3 auctions per delivery day with marginal pricing
- > 15' Market Time Units
- > Algorithm: EUPHEMIA (Pan-European Hybrid Electricity Market Integration Algorithm)
- > Allocation of interconnection capacities
 - 1st phase : LIDA no capacity allocation
 - 2nd phase : CRIDA (regional coupling) implicit with IT
 - 3rd phase : IDA (European coupling) implicit with IT, BG
- > Asset-based participation
- > Participation is not mandatory



Intraday Market — XBID

Continuous Trading

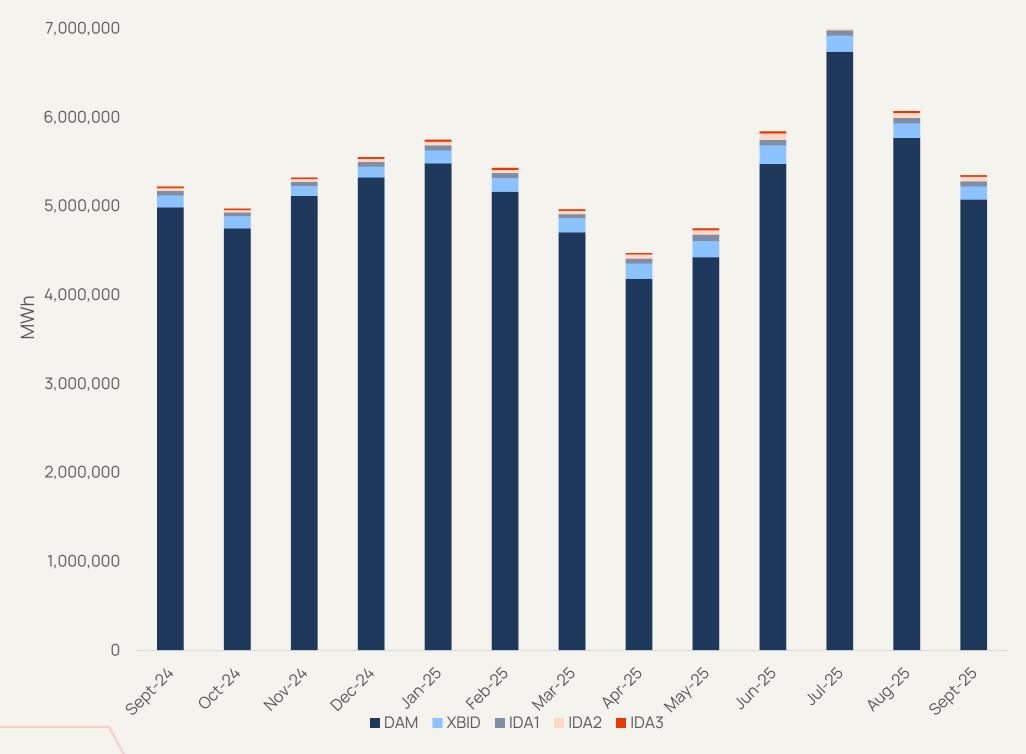
15' MTUs

Asset-based Participation

- > Continuous intraday trading
- > Algorithm: Cross-border Intraday Solution XBID
- > Products
 - 15-minute, 30-minute, 60-minute products
 - User-defined blocks
- > Allocation of IT, BG interconnection capacity via continuous trading matching algorithm
- > Asset-based participation
- > Participation is not mandatory



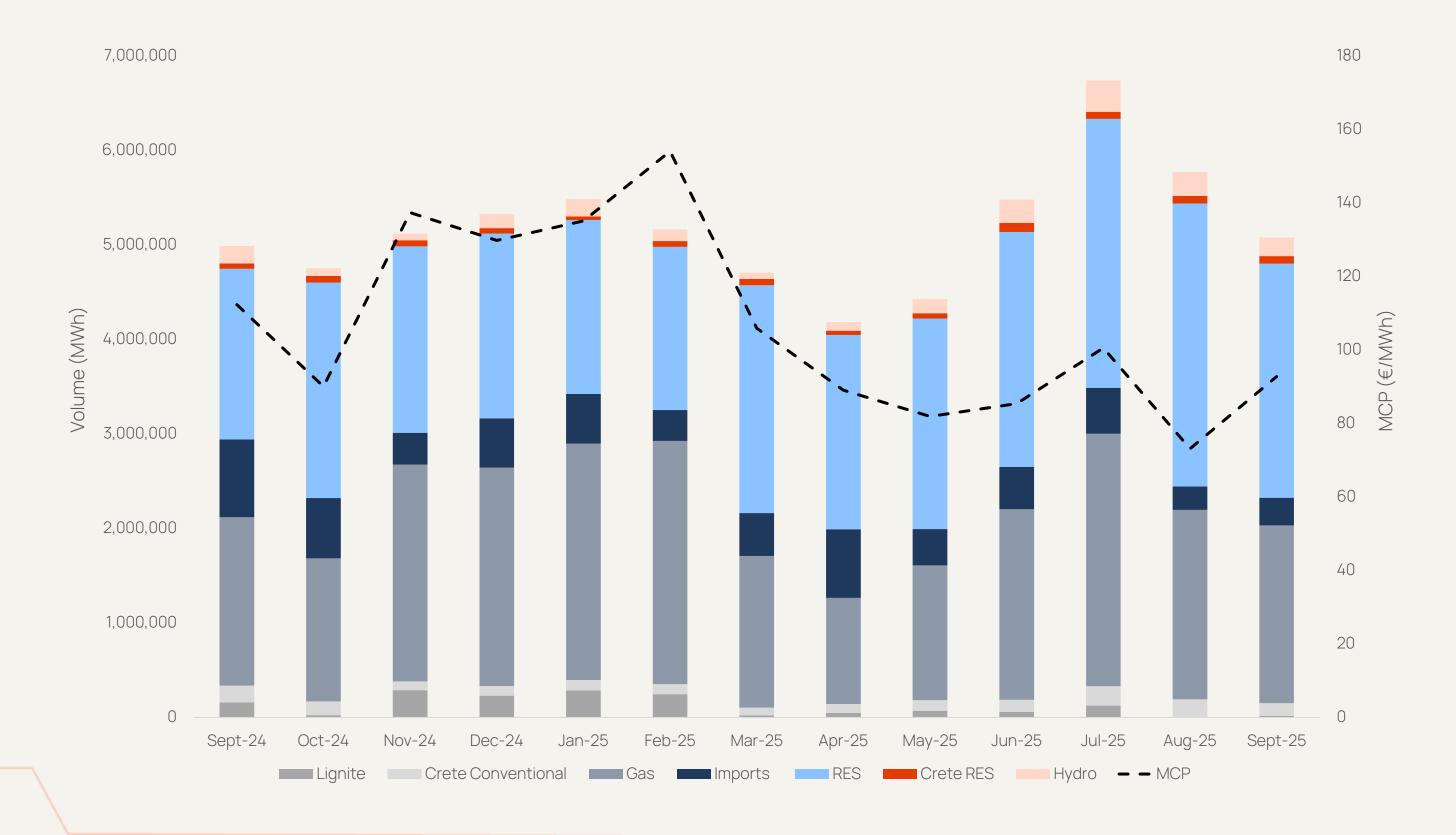
Traded Volumes per Market



Market	Trades (MWh)	% GT
DAM	67,239,335	95.0%
XBID	2,011,015	2.8%
IDA1	726,761	1.0%
IDA2	572,812	0.8%
IDA3	288,841	0.4%
Total	70,838,763	100%



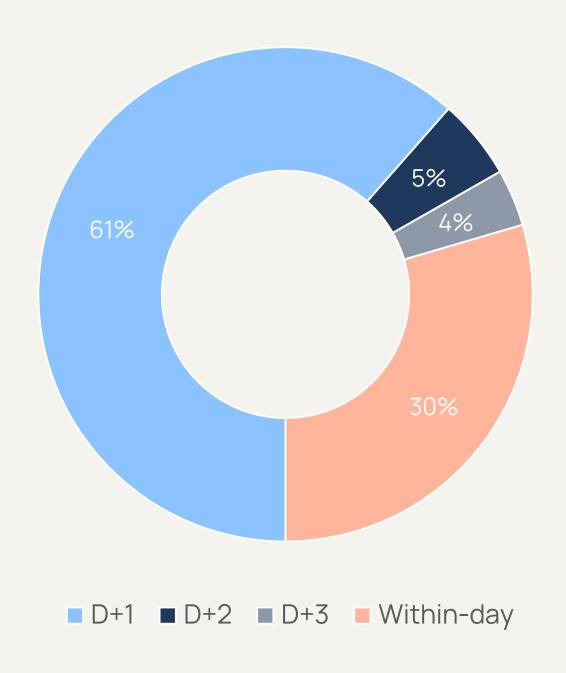
Day-Ahead Market: Energy Mix & Market Clearing Price







Trading Products & Methods



Trading Model

Continuous
Trading
98%

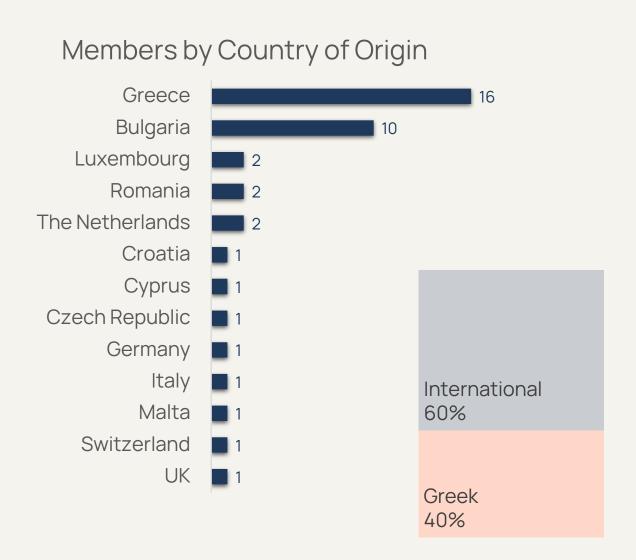
Auctions

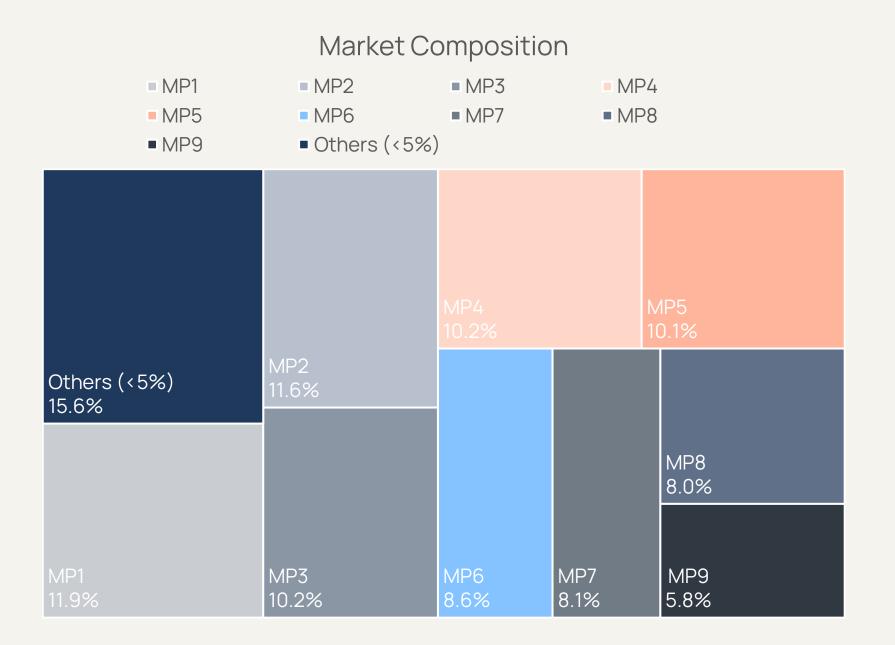
2%

✓ Trade registration for the clearing and settlement of pre-agreed trades between participants is also supported by EnExClear



Members Evolution & Activity Overview

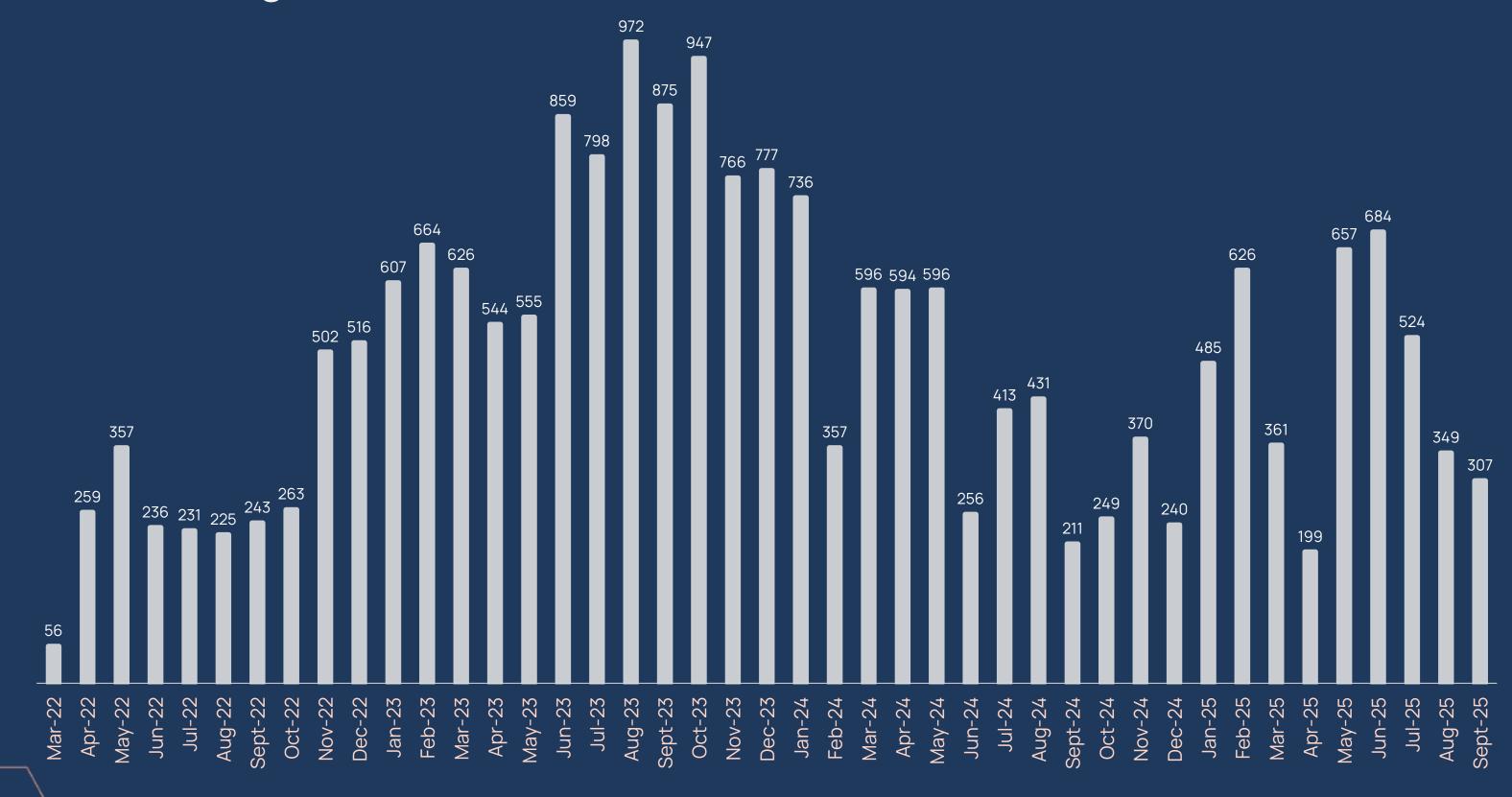




- Trading activity is distributed across several participants
- 9 participants held a market share higher than 5%
- 20 participants accounted for 15.6% of traded volumes

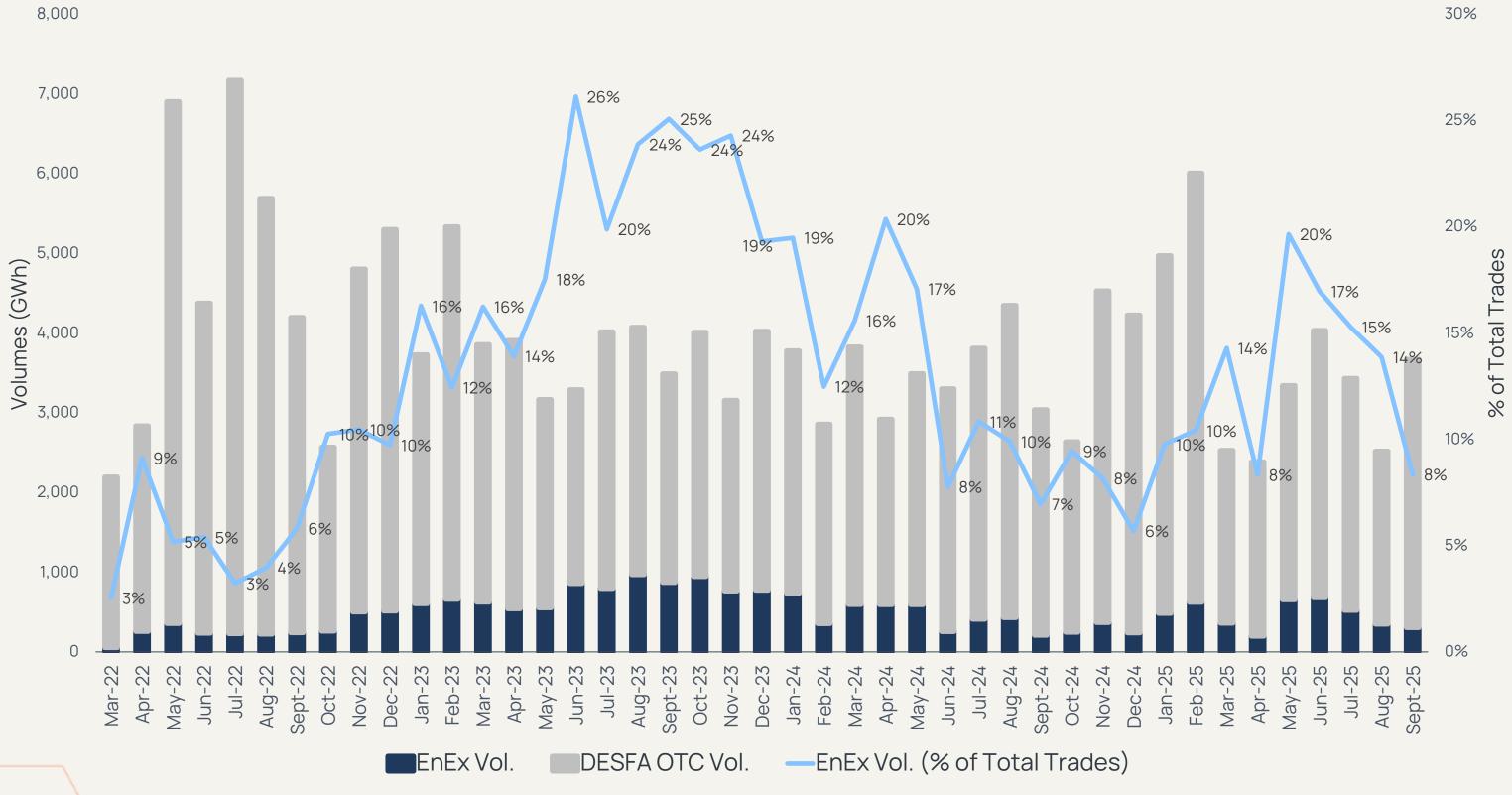


Natural Gas Trading Hub: Traded Volumes in GWh





Natural Gas Trading Hub: Platform Share in Greek VTP Volumes





Friday, 31st of October 2025

18

Types of challenges for Math, Finance and Data Science Majors

Long and Mid-Term Planning

Short-term market participation

Close to real-time

- > Investment evaluation of generating, energy storage, and network assets (LTP)
- > Fuel procurement (L&MTP)
- Hedging against price fluctuation with energy derivative products (MTP)
- > Asset optimization in the spot power market (STMP)
- > Opportunity exploration between cascading markets (STMP & CTRT)





THANK YOU!

Manolis Kalaitzakis

Strategy&BusinessDevelopment@enexgroup.gr