



Workshop  
**Developing Albania's  
Hydroelectric Potential**

**The Greek Power Market – A shifting landscape**

**Upcoming regulatory changes, new challenges and cross-border trading opportunities**

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## **The Greek Market: Current Electricity Market Mechanism**

**Market** officially liberalized (7 producers, 17 suppliers, 23 trading companies)

**PPC S.A.** Former vertically integrated Greek Electricity Utility, currently also Universal Service Supplier and Last Resort of the Greek Market

**Mandatory Pool System** (in the Interconnected System) regulated by RAE (The Greek Regulator)

- All wholesale market participants must be registered in the market pool and make all transactions through the Day-Ahead Market

### **Day-Ahead Market**

- Market participants must submit Unit bids and/or Load Declarations on day D-1
- **LAGIE's** (Market Operator) software draws up the Day Ahead Schedule (DAS) and calculates the System Marginal Price (SMP) for day D
- ADMIE (System Operator) sets up the Dispatch Schedule for day D
- No Intraday Market (only intraday Schedule) – without calculation of a price
- No Forward Market, No OTC, Bilateral Contracts

### **Ex-post (balancing) System Marginal Price**

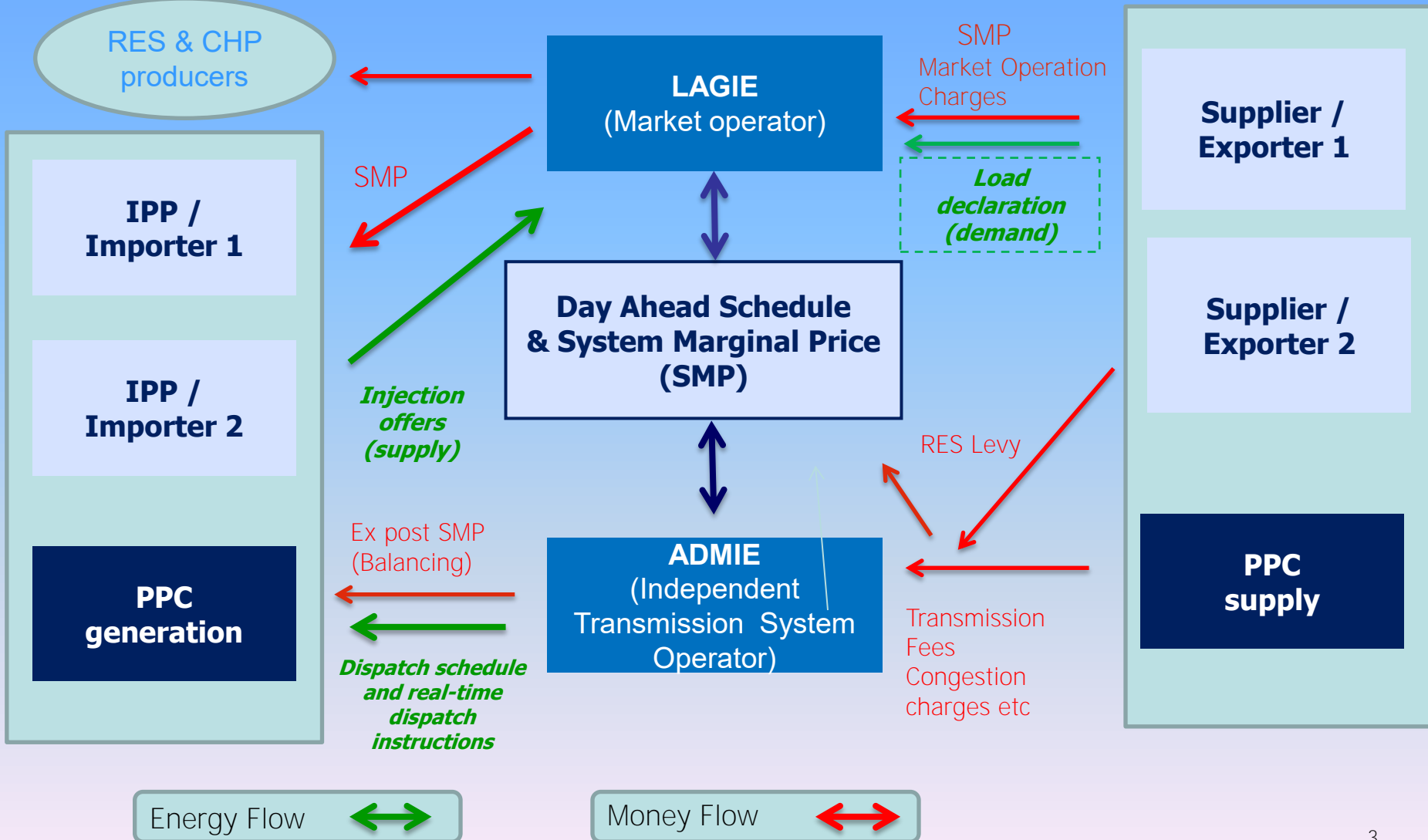
- On day D, ADMIE performs real-time dispatching of available generation plants, adjusting for generation-demand imbalances.

### **Feed-in Tariffs**

- For generation from Renewables (RES) and Combined Heat & Power (CHP) plants

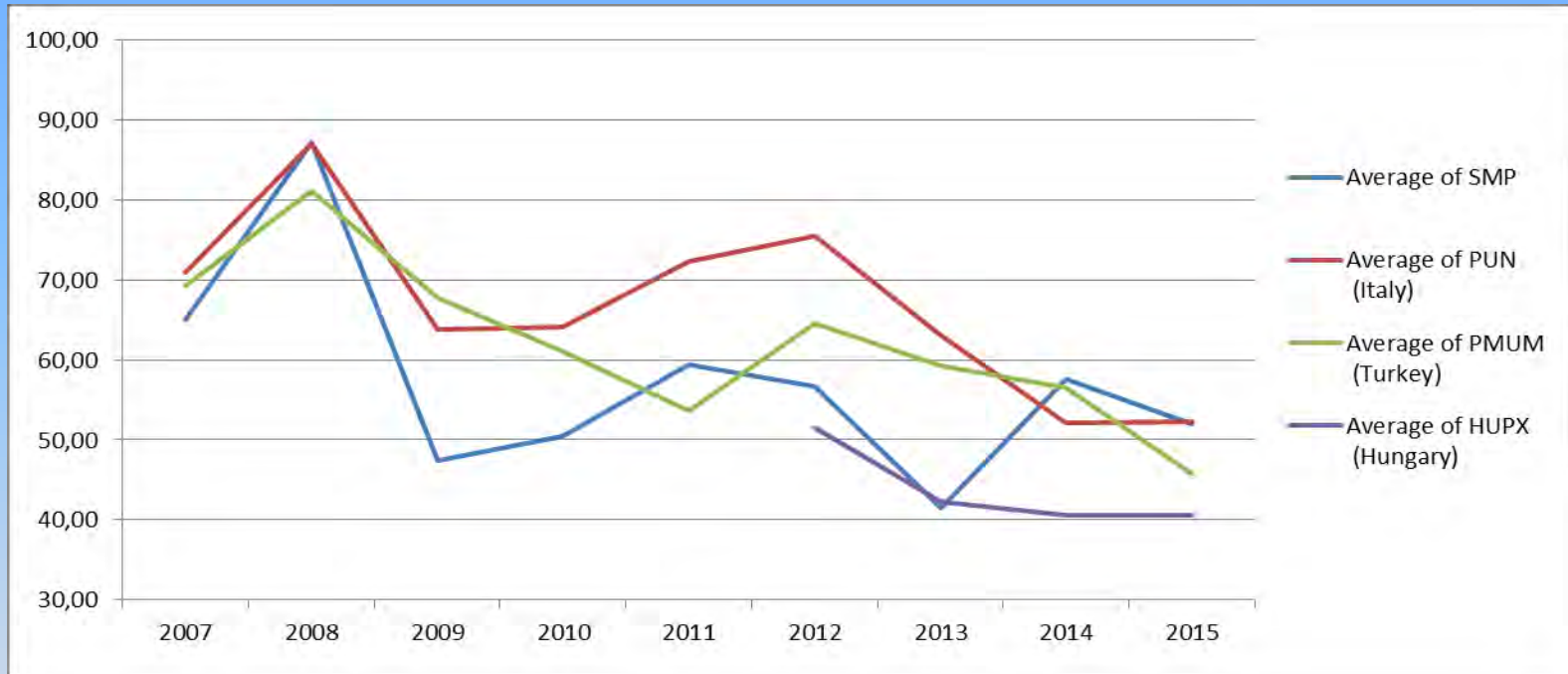


## Current Greek Electricity Market in a snapshot





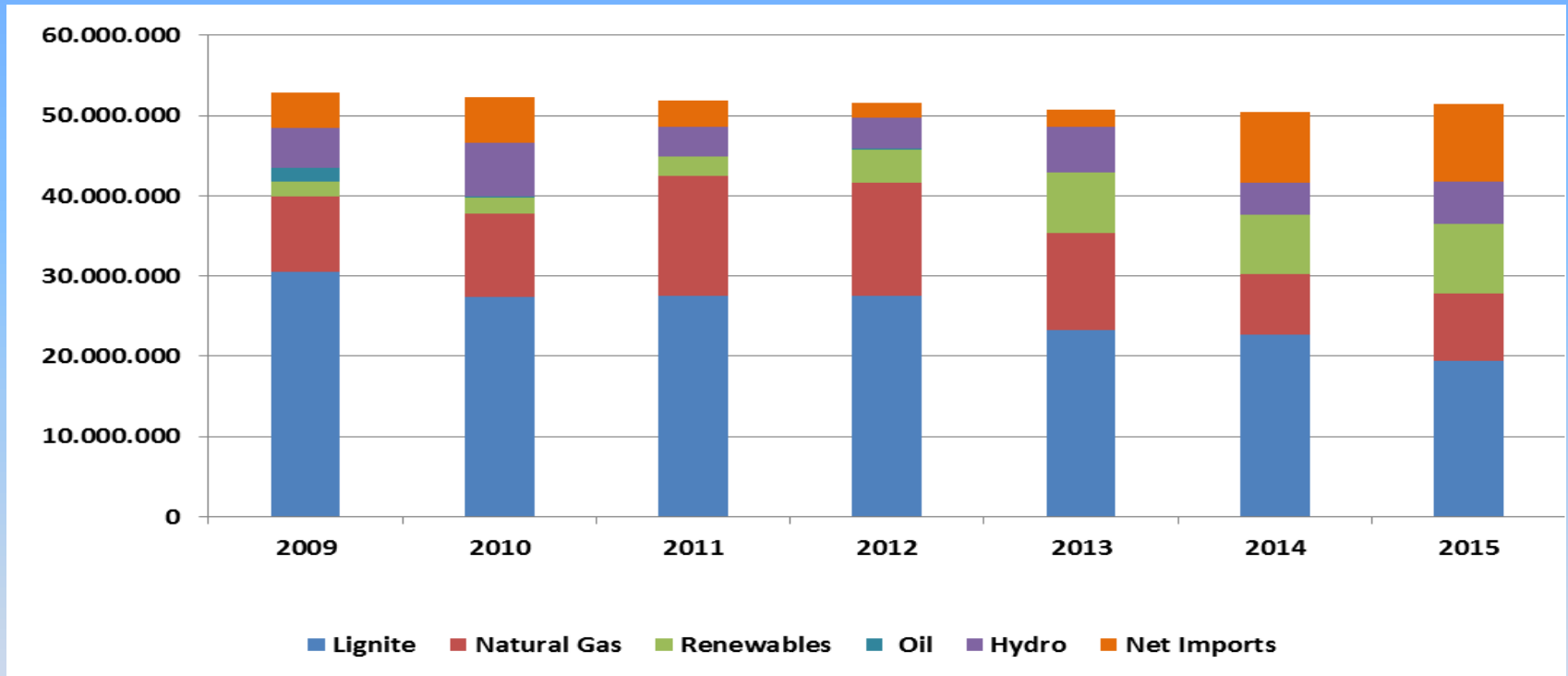
## Greek System Marginal Price (SMP) vs Other Markets



- Traditionally, SMP lower than PUN and PMUM
- Reverse Trend from 2014 onwards
- HUPX prices lower than all other markets



## Greek System - Evolution of Gen Mix over time (MWh)

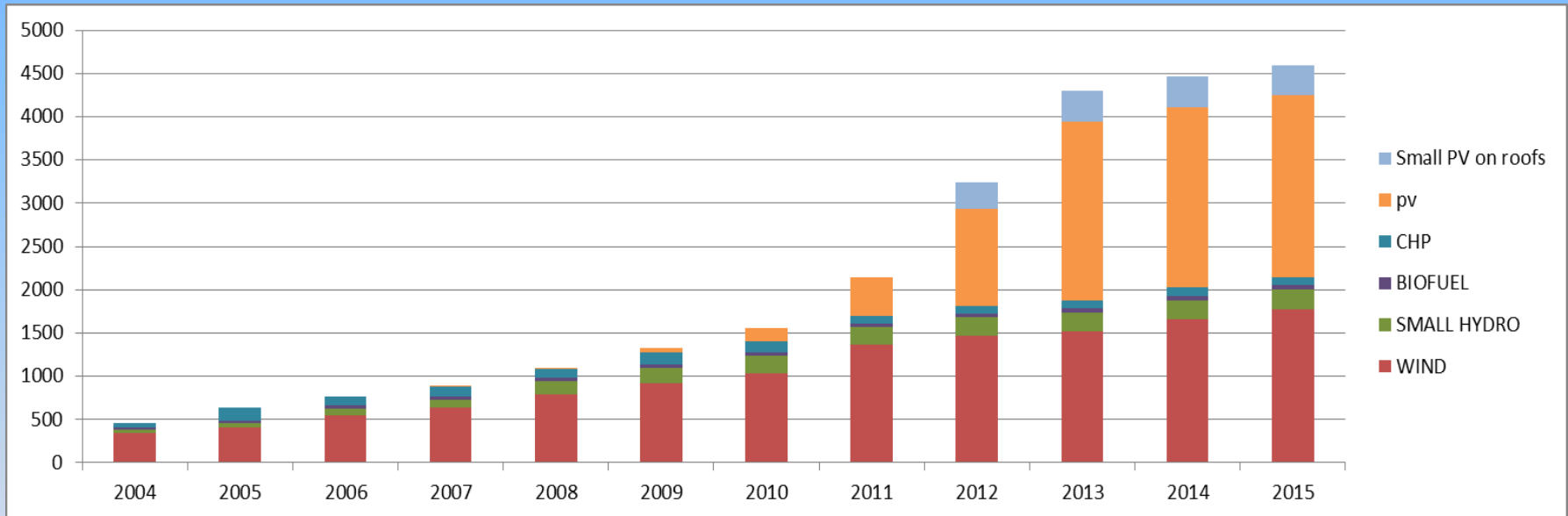


- ✓ Gradual decline in Lignite contribution within the Greek system
- ✓ Exponential increase in RES Production (mainly PV)
- ✓ Nat. Gas production high in 2011-2012 mainly due to lower production from renewables and also market distortions related to cost recovery mechanism, abolished in 2014



## Electricity Production from Renewable Sources over time

Installed Capacity (MW)



Exponential growth of PV capacity

- huge increase from 2010 onwards, from 50MW to over 2.500MW, ~4000%

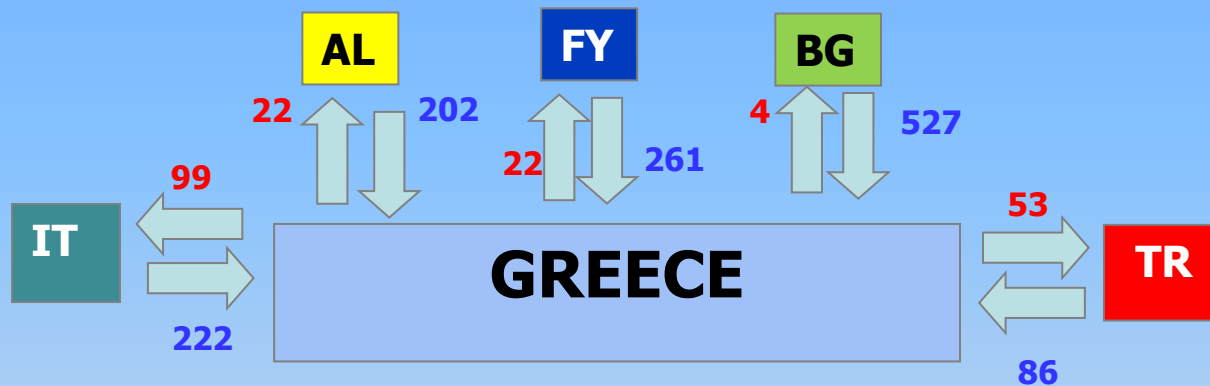


# Mapping of Cross-Border Trading in the SEE Region



## Electricity cross-border trading in the Greek borders

Commercial Flows in **2015** (average MWh/h)



### Minimal exports from Greece to neighboring countries

#### ➤ Opportunities

Gradual Upgrade of transmission cables /grid systems

Opening of ATC among SEE countries

Launch of CAO common auctions → one price per auctioned product, availability of more products (daily, weekly etc)  
transparency, co-ordinated & coherent auction schedule

#### ➤ Impediments

Still long way to go until full regional integration is achieved

ATC stabilization in the region required

Need for more transparency (REMIT)

Need for more auctioned products (e.g yearly in FY-GR ,GR – TR etc)

More regional TSOs to concede responsibilities to CAO



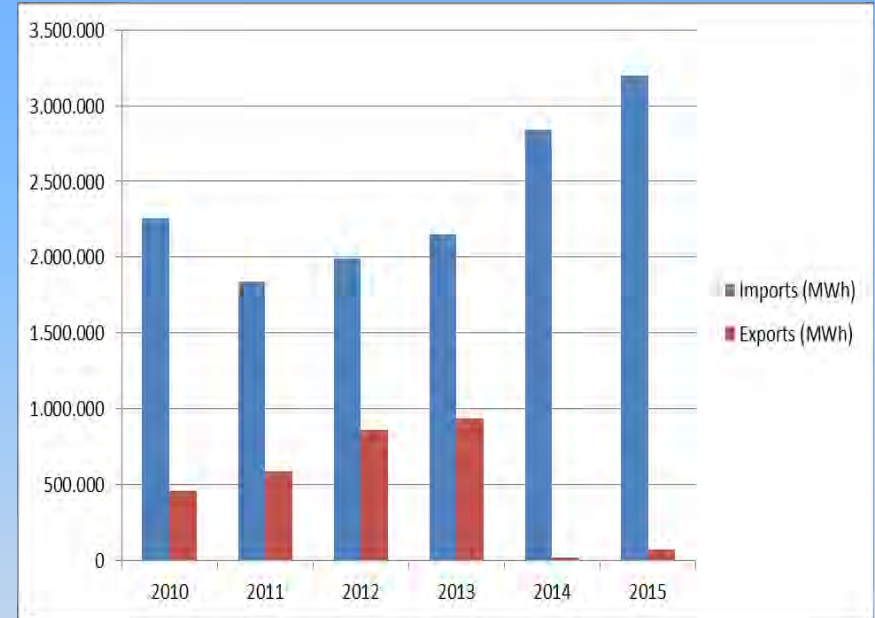


## PPC Imports to – Exports from Greece over time

Electricity Imports /Exports (through Greece) in MWh					
PPC	Imports	Exports	Net Imports	% of total Imports	% of total Exports
2010	2.255.401	455.772	1.799.629	27%	17%
2011	1.840.103	585.173	1.254.930	31%	20%
2012	1.994.765	863.673	1.131.092	31%	19%
2013	2.153.239	935.541	1.217.698	37%	24%
2014	2.840.502	22.928	2.817.574	29%	2%
2015	3.195.368	72.627	3.122.741	28%	4%

### AL - GR 2016 (5 months)

	Imports (MWh)	Exports (MWh)	Net (MWh)
<b>TOTAL (1/1-31/5/16)</b>	676.576	51.676	624.900
<b>PPC (~ 12%)</b>	76.170	0	76.170

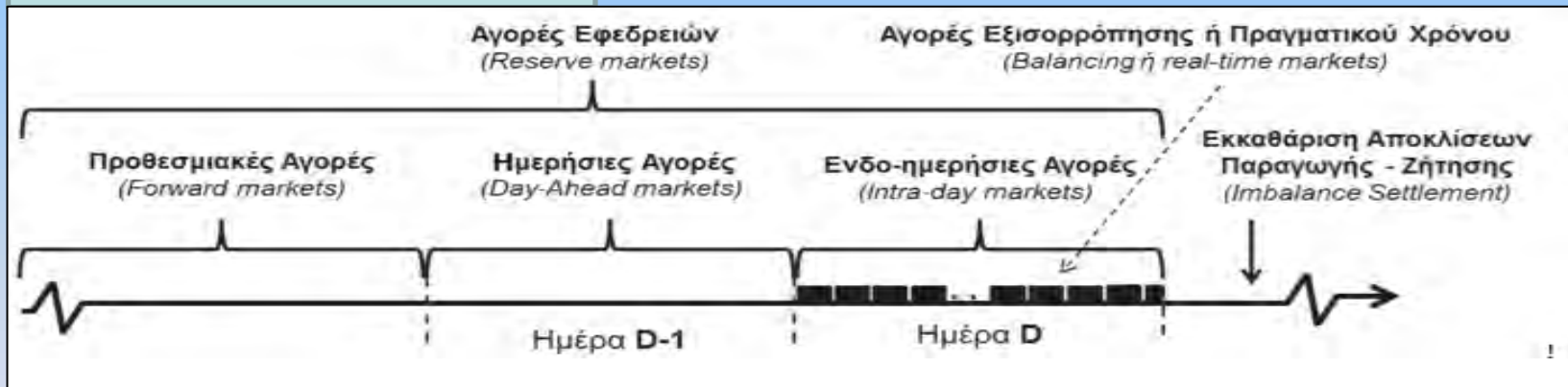


- Largest part of PPC Imports Portfolio negotiated and formed on an annual basis  
-> hedging of supply: provide energy to clients as a supplier of last resort e.g. in case of unexpected rise of demand or other emergency event
- Exports usually executed on a tactical basis, either as a hedge to the annual imports exposure or in order to exploit short-term profit opportunities.
- At the moment, PPC not active in trading in other borders, beyond the Greek ones.  
This is about to change in the near future with the establishment of PPC subsidiaries in the broader area

## Towards a new Electricity Market Mechanism 1/2

Regulatory directive under consultation regarding the gradual **Implementation of the EU Target Model** (in the Interconnected System)

- *Forward Market*
- *Intra-day Market*
- *Bilateral OTC markets*
- *Imbalance Settlement Market*
- *Balancing/real-time Market*
- *Reserve Market*



- Greece still has to undergo reforms to move towards the Target Model.

=> Current design market model is not sustainable in the long run, neither for PPC nor for other players  
=> upcoming regulatory changes may completely change market dynamics, if implemented



## **Towards a new Electricity Market Mechanism 2/2**

### **And a more liquid exchange-based electricity market in the broader SEE area**

- Need for:
  - unification of fragmented markets
  - more coordination of Regional TSOs regarding CBC auctions => SEE CAO and JAO
  - more Power Market Couplings in the near future to consolidate local markets
  - better regulatory harmonization regarding local subsidy schemes
    - e.g:
      - heavy industry
      - RES (integration and sustainability)
      - CAM (capacity adequacy mechanism)
      - CO<sub>2</sub> allowances regime



## Major on-going electricity market reforms and upcoming events

### ADMIE

- ✓ Provisions for the full ownership unbundling of IPTO S.A. from PPC S.A., with the State retaining control over IPTO S.A.

### NOME

- ✓ Gradual introduction of NOME type auctions for lignite and hydro powered generation of PPC with the target of lowering PPC's retail market share to below 50% by 2019.

### tCPM

- ✓ Establishment of a new Transitory Capacity Payment Mechanism for one year ending 30.4.2017. Amount of compensation: € 45,000 per MW of available capacity with a maximum remuneration fee of € 15 million per generation unit. Eligible units: All natural gas fired units (both open and combined cycle) and limited capacity of dispatched hydro units.

### TARGET MODEL

- ✓ Compliance of the Greek power market with the Target Model



## **Concluding thoughts for the Consolidation of fragmented local Markets**

- SEE/Balkans/Turkish electricity markets liberalized -> rapidly changing environment
  - => Greece still has to undergo reforms to move towards the Target Model.
- Creation of Power Exchanges (EPIAS, SEEPEX, IBEX already operational)
  - => Increase of Liquidity & Transparency
  - => Significant opportunities in electricity trading in the region
- Cross-border trading to be further developed in the area
  - => Further increase of ATC to boost trading
  - => Need for more transparency,
  - => Better CBC coordination and market couplings



**Thank you for your attention**

