

GREEK ELECTRICITY SYSTEM RESTRUCTURING AND PRIVATIZATION



A HERCULEAN TASK

S. TRAVLOS – NOVEMBER 2013

Greek Electricity Market Background

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- In the early 1950s the Greek Electricity System was nationalized under a vertical organization by the name Public Power Corporation (PPC - ΔΕΗ), wholly owned by the Greek State.
- During the period 1950 to 2000 the Greek Electricity system expanded from a small, inefficient system to a fully developed Grid to become a full member of the UCTE (the European Electricity Transmission System).
- This development was characterized by corporatism and political favoritism and as in all protected state monopolies strong unions emerged and in effect co-managed the company. Their power grew stronger during the 1980s.
- Based on the European Directives for the Energy sector in 1999 the Greek Electricity System was partially liberalized, PPC became a Societe Anonyme (SA) and 49% of its shares were offered in the Athens and London Stock Exchanges. An independent Transmission System Operator (HTSO) was established. The 1999 liberalization was superficial and the adopted measures were cosmetic while PPC fully guaranteed the lucrative pension rights of employees.
- In 2011 the Greek Electricity Market was unbundled even further with the creation of independent companies for the Transmission and Distribution systems.

PPC – past, present and future

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- From 1950 to the year 2000 PPC (ΔΕΗ) was a vertically integrated Electricity company wholly owned by the Greek State. PPC was a monopoly owning all power generation stations (approx. 11,000 MW), the electricity grid (10,000 kms), the distribution system (200,000 kms), and was the only electricity supplier (7 million customers).
- Following market liberalization in the year 2000 and until 2011, PPC remained a vertically integrated electricity company, however during this period a number of private (thermal) power generators emerged with a total of approx. 2,000 MW of new generation.
- A number of private electricity suppliers also emerged during this period capturing a portion of the market. However in the end of 2011 a major fraud scandal related to the 2 major independent players had as a result the collapse of this market and almost all customers returned to PPC.
- In the end of 2011 based on the new European directives PPC was split in three parts. PPC itself which kept the generation portfolio and the supply activity, ADMIE, which is the owner and operator of the power grid and DEDDIE, which is the owner and operator of the distribution system.
- **The next step of liberalization scheduled to be implemented by the end of 2014, will consist of the privatization of 70% of ADMIE and the creation of a, so called, “small PPC”, which will be a mixed bundle of generation assets.**

The Renewables Sector

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- From the end of the 90s power generation from Renewables has gradually increased at a very rapid pace, initially wind and later solar.
- Currently generation from Renewables accounts for almost 40% of installed capacity in the country, almost equally divided between wind and solar.
- Wind generation started early in this period, but due to heavy subsidization solar generation emerged after 2005 as a very strong player. This heavy subsidization eventually lead to a serious deficit in the renewables account held by LAGIE, the Market Operator. Subsidies for solar have been reduced dramatically in the last few years, driving the development of new solar generation to a halt.
- Wind generation also faces an obstacle in the form of grid constraints, due to the remote location of wind farms. A number of major projects are underway to alleviate this obstacle and allow a further increase in wind generation in the Peloponnese area and Crete island.

Greek Electricity Market Structure

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According to Law 4001/2011, which is based on Directive 2009/72/EC the main Greek Electricity Market players are:

ADMIE:

- Undertakes the activities carried out by the Transmission Business Unit of PPC and certain activities of the HTSO as part of its role as the TSO (system control, system development, auctions, balancing market, ancillary services, capacity certificates, settlements and all other activities, excluding Day Ahead Scheduling ("DAS") and Renewable Energy Sources (RES)).
- Owns, operates, develops and maintains the Transmission Network and the relevant assets.
- Provides development and maintenance services to third parties (PPC, the subsidiary of PPC which will operate the Distribution Grid, producers).

LAGIE (IMO – formerly HTSO):

- Is an independent entity, responsible for the operation of the Electricity market, especially the Day Ahead Scheduling (DAS) and Renewable Energy Sources (RES).

RAE:

- Remains the independent regulatory authority.
- However, certain provisions of Law 4001/2011 foresee the broadening of responsibilities and the enhancement of independence of RAE.
- The Greek government has transferred to RAE all regulatory powers assigned to EU energy regulators in the third Energy Package (licensing, network access, network charges, market monitoring, etc).

PPC:

- PPC remains the main electricity producer. The company has transferred approximately 15% of its fixed assets to ADMIE and no longer performs any duties related to electricity transmission activity.

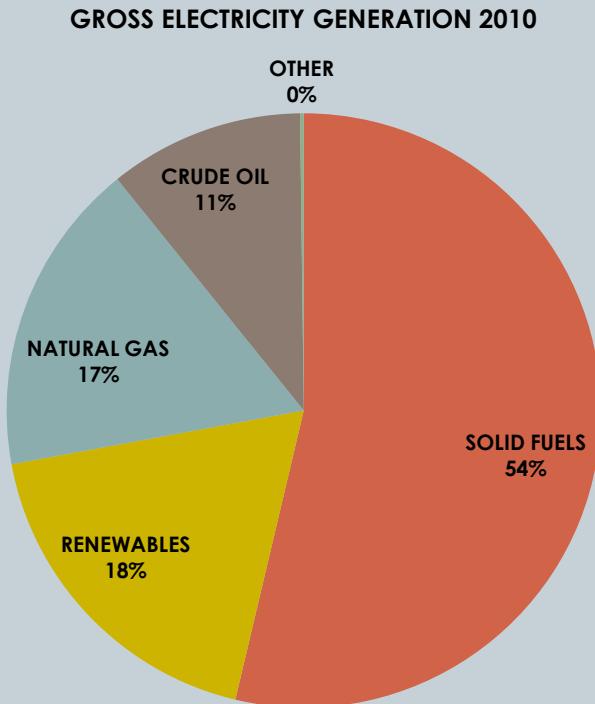
DEDIE:

- Owns, operates maintains and develops the Electricity Distribution Network and is owned 100% by PPC.

Main features of the Greek Electricity Market

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GROSS ELECTRICITY GENERATION



KEY MARKET INDICATORS

Basic data	Value
Number of companies representing at least 95% of net power generation.	4
Number of main power generation companies (those producing more than 5% of the national total)	1
Market share of the largest power generation company	85.1%
Number of electricity retailers	11
Number of main electricity retailers (those selling more than 5% of the national total)	1
Herfindahl-Hirschman Index power generation (very high concentration if index is above 5000)	6844
Herfindahl-Hirschman Index retail market (very high concentration if index is above 5000)	8616

High Concentration but Increasing Competition

WHOLESALE MARKET

- Regarding generation, PPC S.A. accounts for 75% of total electricity production, which is a pronounced decrease from almost 100% in 2009.
- Independent producers achieved a share of 20%, mostly from the use of gas-fired power generation.
- The wholesale market is also still highly concentrated, but some competition is emerging.
- The 2011 annual average wholesale price in Greece was EUR 59.36/MWh (corresponding to a 30% increase compared to 2010), which is above most wholesale prices in the EU.

RETAIL MARKET

- The retail market remained highly concentrated in 2010. Only about 7% of industrial and commercial customers connected to the medium voltage network switched supplier (a volume of 8.42%).
- By the end of 2011, nearly 6.18% of industrial and commercial customers connected to the medium voltage network had switched supplier.
- At the beginning of 2012, the licenses of the two main competitors of the incumbent supplier, PPC, were suspended following criminal investigations and the freezing of the bank accounts of these suppliers.

Obligations of Hellenic Republic under the Troika Memorandum and Third Package

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- **The Government is continuing its implementation of the Third Energy Package.** With regard to electricity, Greece should pursue efforts to develop a competitive and open electricity market. This should include:
 - Phasing-out blanket price regulation until June 2013, also for household customers, while taking into account universal service obligation and effective protection of vulnerable customers, in line with the roadmap adopted by the Greek government,
 - Introducing measures to increase competition,
 - Developing a power exchange,
 - Improving the efficiency of the incumbent company PPC and,
 - Reforming the renewables system.
- The transmission system operators have been certified, while a reform of the electricity market with a view to the adoption of the EU target model in the medium term is underway.
- ADMIE shareholding must be owned and managed by a different state entity than PPC.

Re-designing the Market

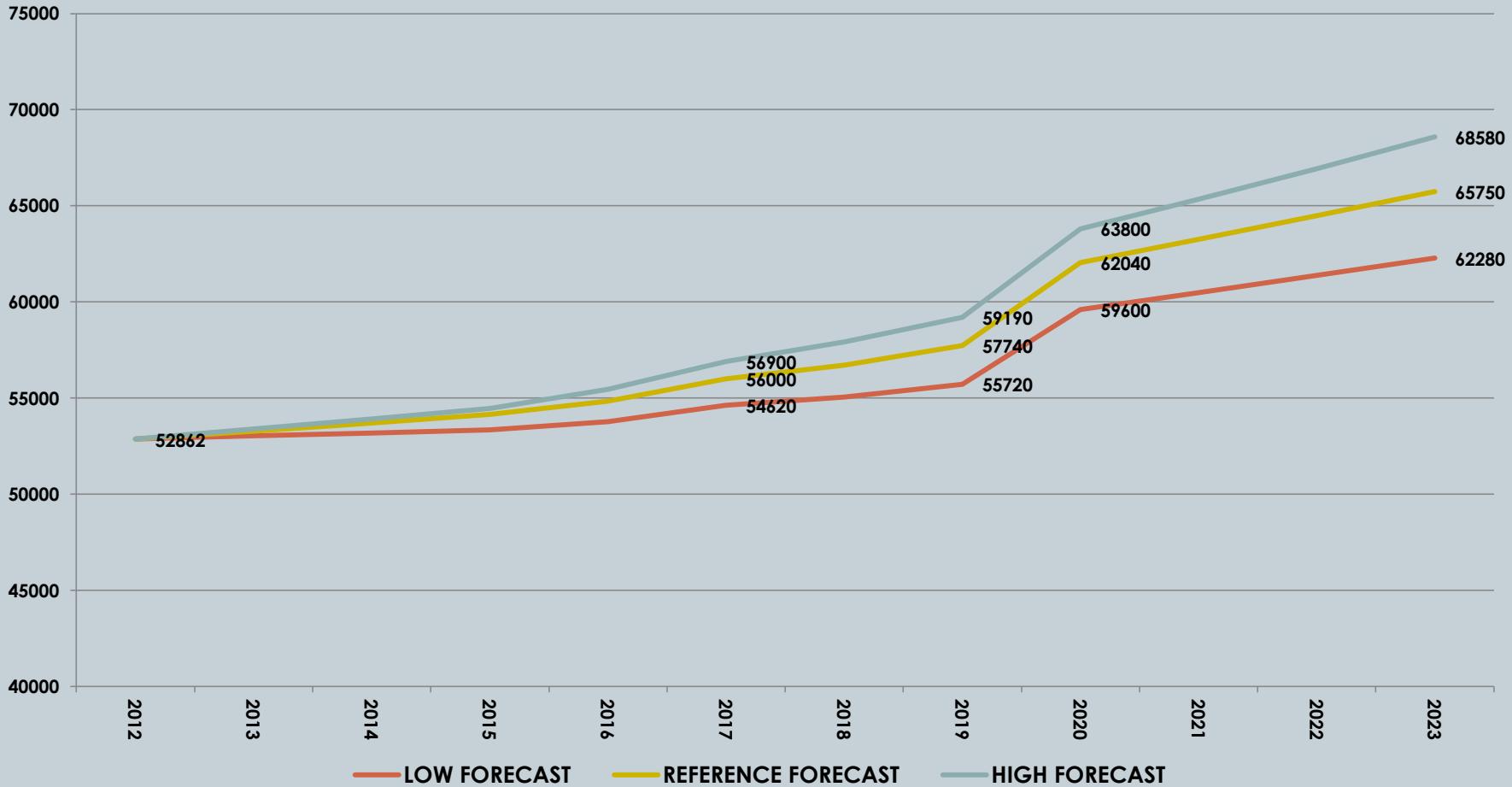
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- RAE has submitted a proposal for the restructuring of the market. RAE recommendations focus on increasing competition reducing the cost of transmission and removing tariff distortions.
- The proposal for the wholesale market is based on the French NOME model.
- Ensuring access for all participants, with an equivalent way, available energy resources in the country, primarily the lignite and hydro, so as to create portfolios reflecting the corresponding energy cost.
- Remove distortions and cross-subsidies in retail tariffs, particularly in low-voltage tariffs which remain regulated, by rational allocation of costs among different types of consumers, so as to ensure the long term development of the electricity sector, based on the economic viability of the investments and infrastructure, which should be developed and used in the most efficient manner.

- RAE conclusions November 2012:
 - *"The economic crisis, with the consequent increase in borrowing costs, increasing arrears, reducing consumption and increasing the cost of Public Utilities Obligations (due to increased taxes on oil fuel for the islands etc) combined with the continuous increase of the Special Duty on RES, create significant upward pressure on the overall cost of electricity, resulting in the overcharge of the household sector and the loss of competitiveness of the Greek economy. The effort to control these pressures should focus on increasing competition, cost control, and removal of tariff distortions".*

Electricity Demand Forecasts

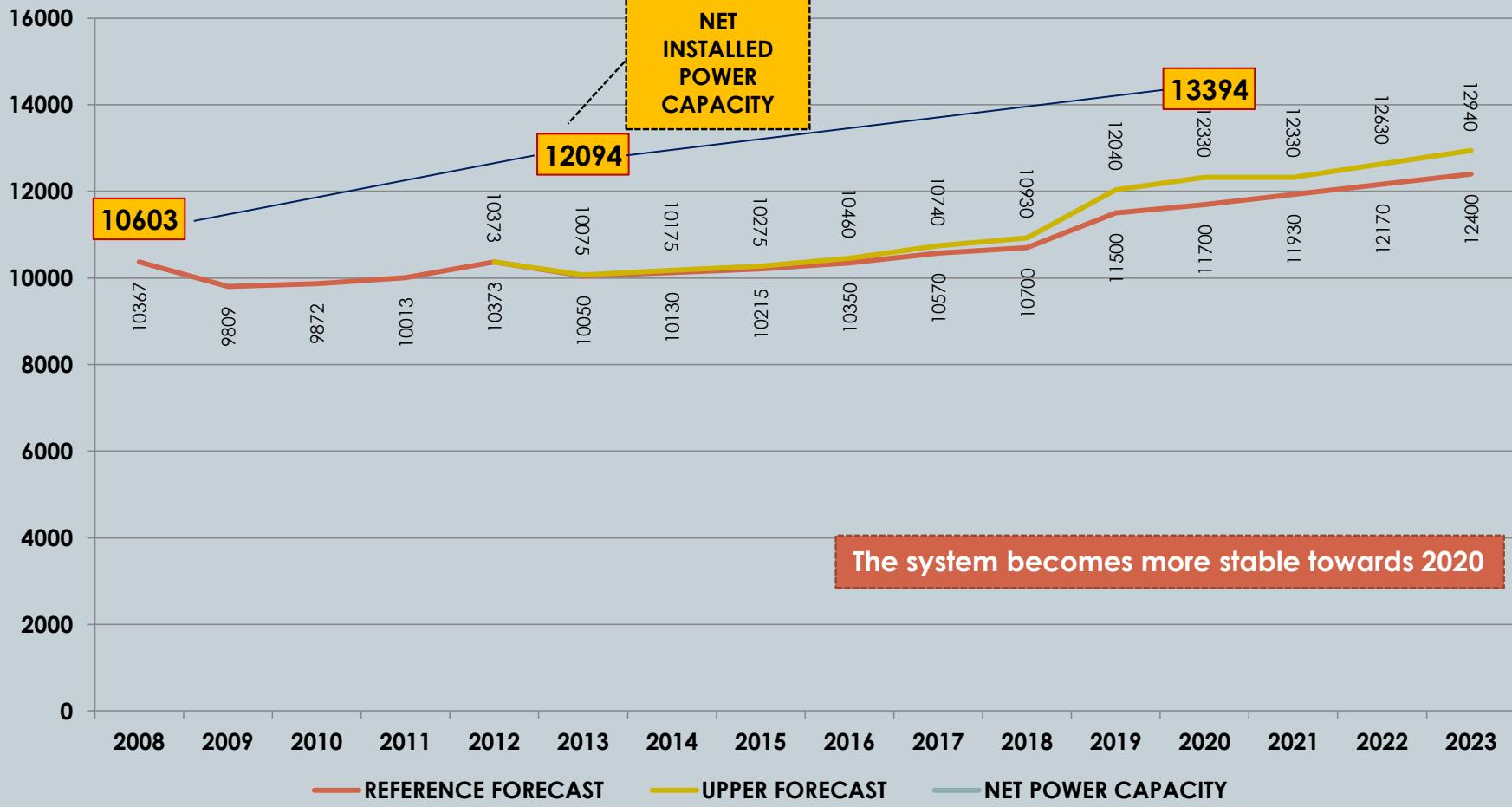
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Annual Peak Load Forecasts

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NET
INSTALLED
POWER
CAPACITY



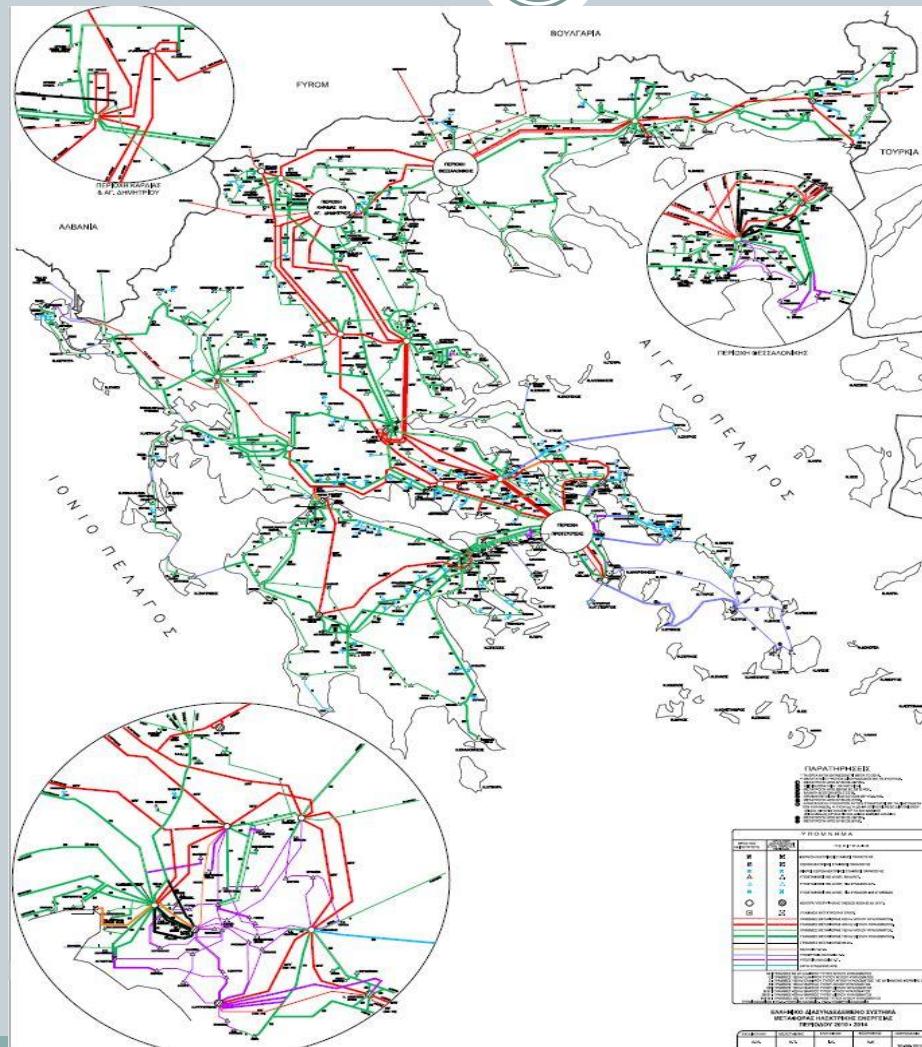
ADMIE the Greek Electricity Grid

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- The backbone of the National Interconnected transmission system consists of three overhead double-circuit 400 kV lines, which transmit electricity mainly from the power plants of West Macedonia and are considered to be of utmost importance for the whole country.
- In this region, approximately 70% of the country's total electricity is generated, which in turn is transmitted to the main consumption centers in Central and Southern Greece, where about 65% of the electric energy is consumed.
- Moreover, the National Interconnected transmission system consists of overhead and underground lines of 400 kV and 150 kV respectively, as well as of 66 kV and 150 kV submarine cables, which connect the Islands of Andros, the Ionian islands of Corfu, Lefkada, Kefallonia and Zakynthos, whereas an expansion of the submarine interconnections towards the bigger Cyclades islands has been scheduled.

The Greek Electricity Grid Map

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ADMIE – Financial Framework

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- As the owner of the Transmission System, ADMIE collects an annual rent (Transmission System Rent) that covers the annual cost of physical operation, maintenance & development, the annual depreciation/amortization of the Transmission-owned fixed assets plus a return (8%) on the capital invested by ADMIE in the Transmission System, as specified in article 275 of the Grid Code.
- The Transmission System Rent (E1) is the main source of revenue for T/DI and is calculated through the following formula:

$$E1 = O + A + (V - D) * \rho$$

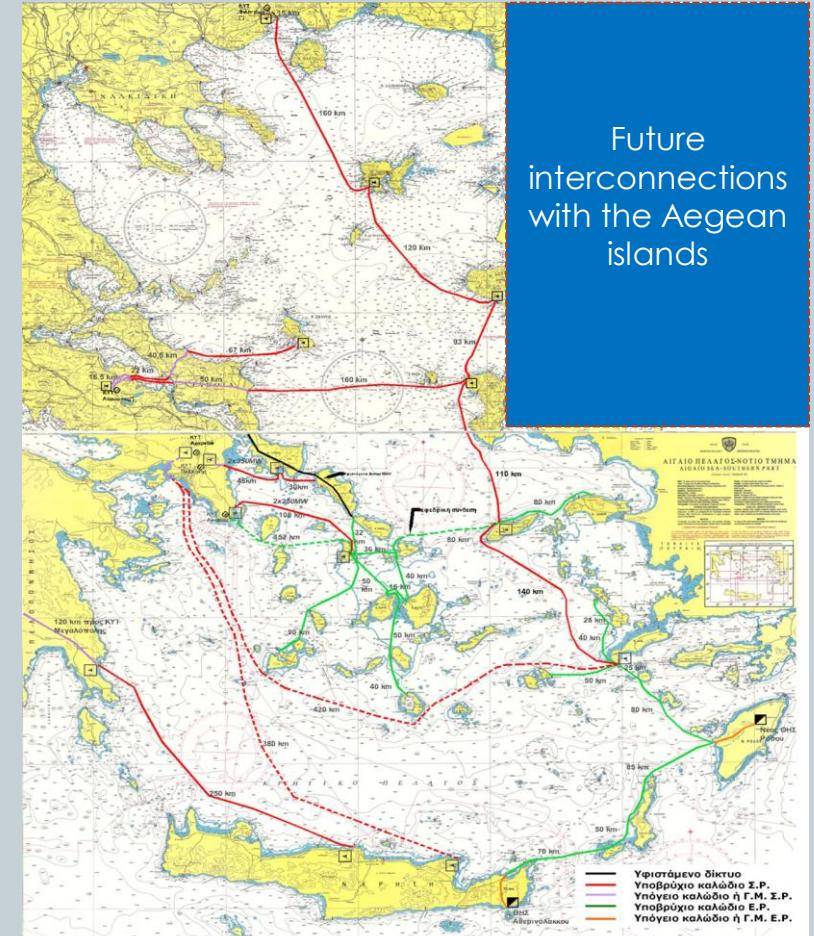
- O = OPEX;
- A = Annual Depreciation;
- V-D = Regulated Asset Base, (RAB) where:
- V = the budgeted two-year average book value of the system's assets
- D = the budgeted two-year average depreciation of the system's assets
- ρ = nominal, pre-tax Allowed Rate of Return.

- Other revenues (sales of optical fibers & disposal of materials).

ADMIE Investment Plan

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- ADMIE has submitted its 10 year investment plan 2014-23 to RAE with an analysis of the main requirements.
- The total cost for the 2014-16 period is estimated at 871 mil euro.
- The major projects include:
 - The Cyclades interconnection expected to be completed by 2016 is estimated to cost 400 mil euro with a NPV of -143.709.333 euro and IRR 0.24% based on financial analysis.
 - The Crete interconnection expected to be completed by 2019.



Privatization of ADMIE

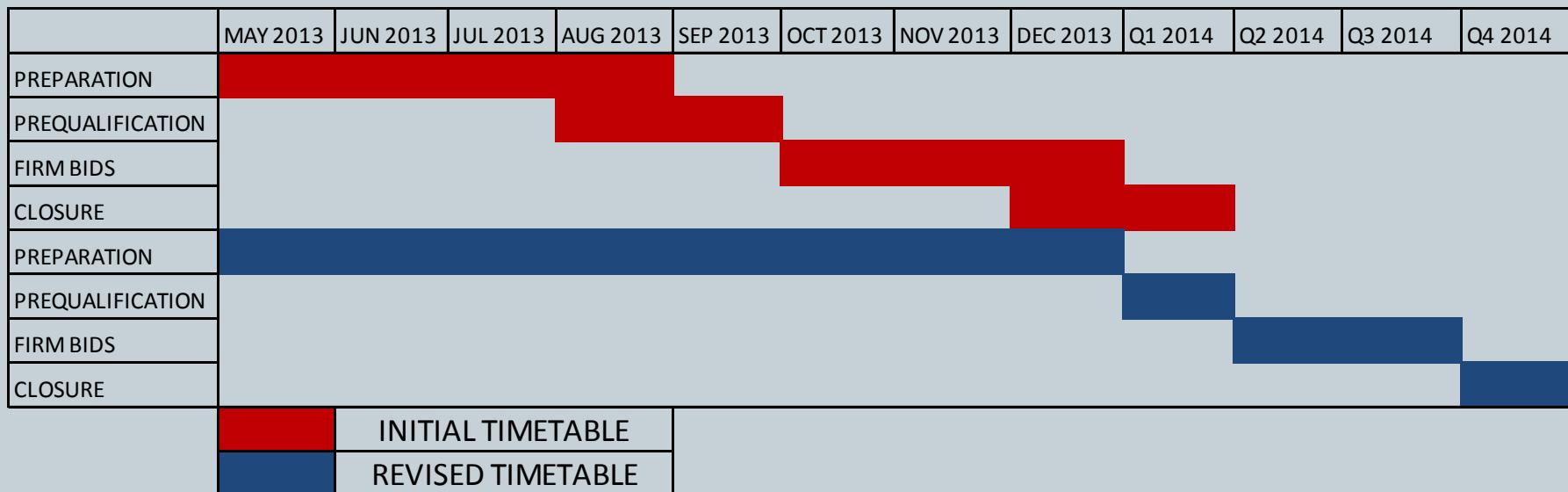
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- The privatization was initially envisaged to take place by December 2013 from start to closure.
- The initially proposed timetable has a high risk of falling behind schedule due to poor preparation and legal action.
- The first legal contest was submitted by the union of retired PPC personnel on the grounds of protecting their pension and social insurance benefits fully guaranteed in the past by the PPC, the guarantee inscribed in law. The outcome of the legal action is not expected to be negative for the government but may lead to delays.
- For the privatization to continue with success a revision of code pricing should be enacted giving an extra incentive to investors who are now reluctant to invest in Greece under current risk conditions.
- RAE has commissioned a study to a specialist consultant covering this issue. That study is expected to be submitted by early December and will address the methodology of regulating the revenue of ADMIE paving thus the way for better returns to the prospective investors.
- According to market sources following the review retail prices are expected to increase over the next 2-3 years.
- Following this step the HRADF will start privatization procedures in the usual two stages: prequalification and firm bids.

Timetable of ADMIE privatization phase 1

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Phase 1 investor will participate through a capital increase with 49% and management.



The timetable for the first phase will be adjusted and may lead to a merging with phase 2.

Phase 2 investor will purchase the remaining 51% from PPC.

The Privatization of Small PPC

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- Creation of a vertically integrated Electricity Corporation with 30% of existing PPC assets consisting of:
 - 14000 MW of lignite operated units
 - 500MW hydroelectric
 - 500 MW natural gas operated units.
- The new EC will undertake part of the debt and other financial assets of the existing PPC.
- PPC will oversee the privatization of the small PPC with the assistance of the HRDAF.

Timetable for the Privatization of small PPC

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	MAY 2013	JUN 2013	JUL 2013	AUG 2013	SEP 2013	OCT 2013	NOV 2013	DEC 2013	Q1 2014	Q2 2014	Q3 2014	Q4 2014	Q1 2015	Q2 2015
PREPARATION														
PREQUALIFICATION														
FIRM BIDS														
CLOSURE														

At this stage it is very difficult to predict the actual timetable since there is a lot of preparation to be made and some reluctance on behalf of the government to start the break up of the PPC.

HRADF will have to decide how and when to dispose the 17% of PPC shares it currently holding.

The Privatization of large PPC

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- Following the privatization of the small PPC by the end of 2015 HRADF will initiate the procedure for the sale of the 17% of the large PPC to a strategic investor.
- At this stage HRADF has not clarified whether they will proceed in one or two stage tender process.

PRELIMINARY TIMETABLE					
	Q1 2015	Q2 2015	Q3 2015	Q4 2015	Q1 2016
PREPARATION					
PREQUALIFICATION					
FIRM BIDS					
CLOSURE					

Major Risks associated with the Electricity Privatization

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- **Political risk** is very high as the extended duration of the privatization of the various assets may destabilize the process especially prior to regional or national elections. The existence of a strong highly politicized union complicates even further the situation. The opposition is expected to take a strong anti-privatization stand.
- **Technocratic managerial process risk** as the restructuring is of a large scale unprecedented in Greece. Experience has shown that in the triangle Government-HRADF-Management of Public Companies major frictions develop that could undermine the effort.

- The SYRIZA leader Mr. A. Tsipras has declared on the 22nd of October from the headquarters of ADMIE:
 - ✓ “Under these conditions will be very difficult for some people to plan and prepare such a crime. Even if they commit this crime they must know that they will be held accountable”.
 - ✓ “Those who come to speculate endangering the energy security of the country they must think twice. They will lose their money and they will face the consequences of the law”.
 - ✓ “SYRIZA will cancel such troika related decisions and stop the further privatization of PPC”.

All privatizations are running behind schedule by 6/12 months as legal regulatory and purely procedural complications arise and the HRADF is unable to cope. The strain on the Board of Directors of PPC will be even harder.

Conclusions

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- The electricity market in Greece presents considerable investment opportunities.
- The privatization of ADMIE seems manageable and can be completed within 2014.
- The restructuring and break up of PPC requires considerable political effort at a time of dwindling support for the government and may be shelved.
- Troika and the EU may on the other hand at some stage make the privatization of PPC a precondition for further financial support forcing the Greek government to act.

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3. A framework for the implementation of the target model in the Greek market can be found here (in english): <http://www.rae.gr/site/file/system/docs/misc1/20102011/08112012>
4. The investment plan of ADMIE can be found here (in greek):
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5. The RAE recommendations for the restructuring of the market can be found here (in greek):
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6. A presentation of ADMIE can be found here (in greek):
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