



**PUBLIC POWER CORPORATION**

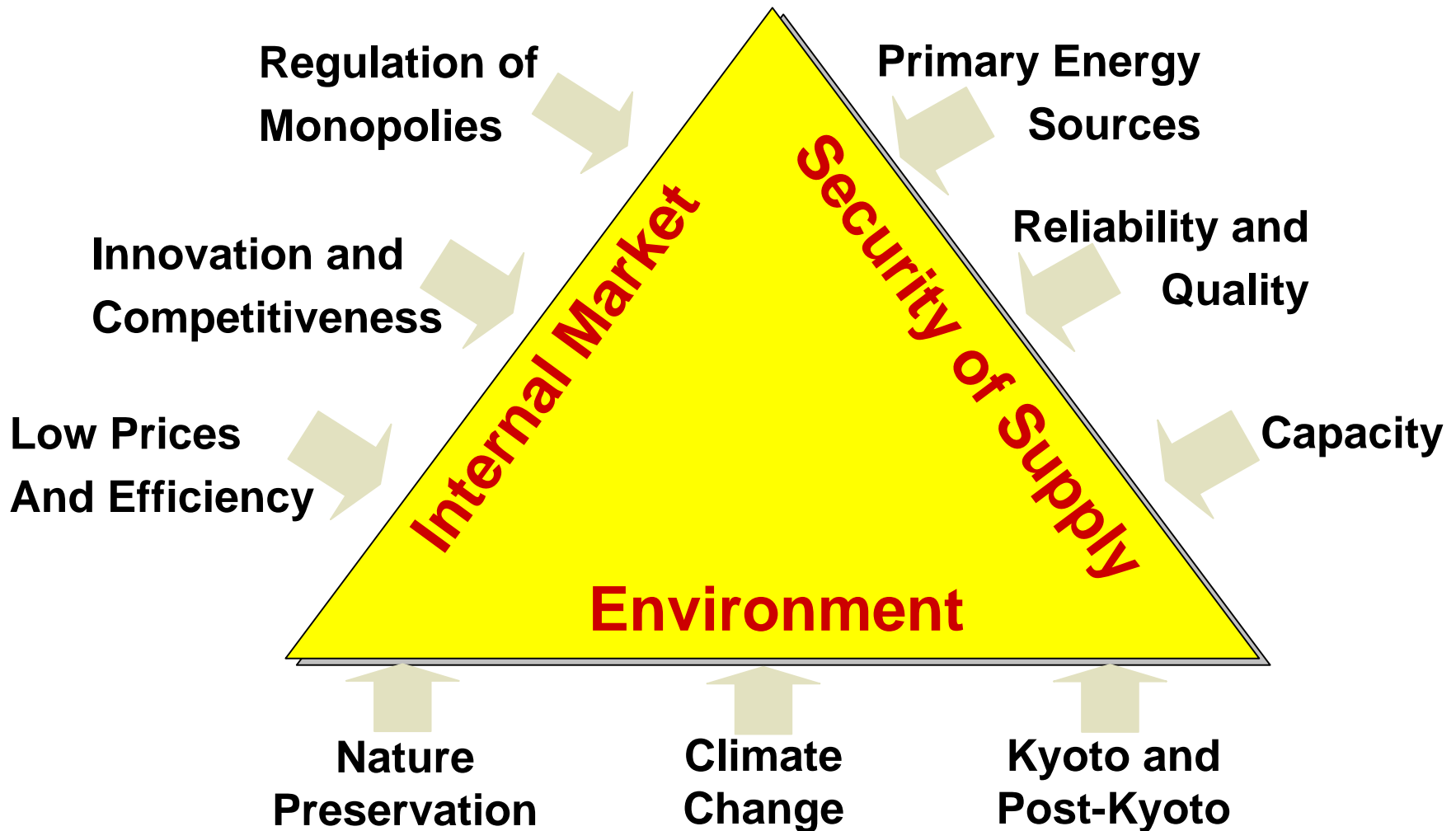
# **PPC's Development Plan**

**Prof. Nikos Hatziargyriou  
Executive Vice-Chair & Deputy CEO**

*"2<sup>nd</sup> South East Europe Energy Dialogue" International Conference,  
Therssaloniki, 21-22 May 2008*



# Energy Policy Drivers





# The Vision<sup>2</sup>



# Profile of the Greek Electricity Market Trends

- Demand expected to grow by 2,5 % p.a.
- 10.000 MW additional new capacity (including Renewables) in Greece by 2020
- CO<sub>2</sub> costs to rise, starting from 2008
- Increased penetration by other generators and suppliers
- Emission limits to tighten further
- PPC's ageing and inefficient plants need urgently to be replaced
- PPC's lignite mines stripping ratio increasingly unfavorable



# 2008-2014 Investments

**Generation**

**Transmission System**

**Distribution Networks**



# PPC Power Plant Portfolio (exceeding 12.7 GW)

Installed Capacity  
(in MW)

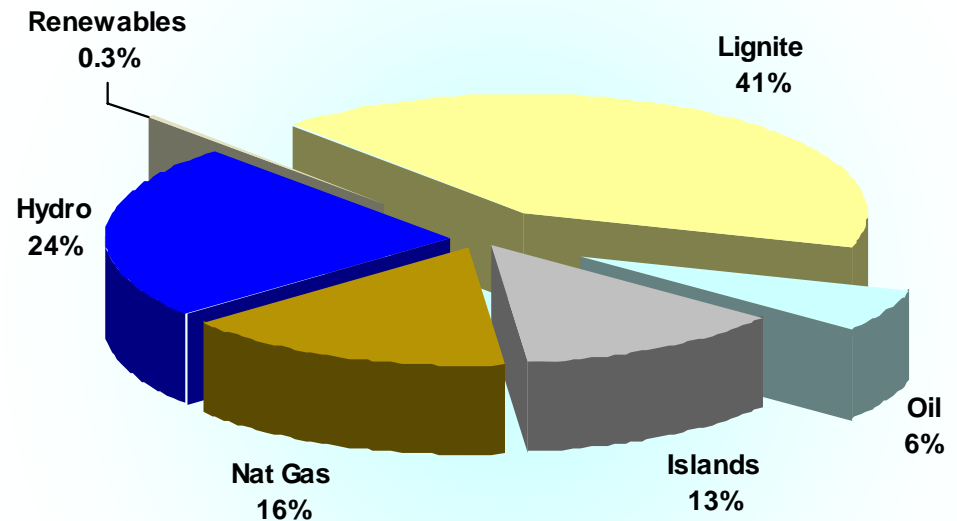
Vintage  
(Weighted Age in Years)

Interconnected System		
Hydro	3.017	28
Lignite	5.288	25
Fuel Oil	750	36
Nat Gas	1.966	11
<b>Total</b>	<b>11.021</b>	

Islands		
Crete	770	15
Rhodes	234	14
Small islands	651	36
<b>Total</b>	<b>1.655</b>	

Renewables	
Total	91

<b>Grand Total</b>	<b>12.767 MW</b>
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Installed Power Capacity by Fuel Type



# PPC is determined to be an efficient and competitive generator in the liberalized electricity environment

## Objectives

- PPC to have a power plant portfolio that:
  - Ensures reliability and efficiency
  - Reduces generation costs
  - Sustains competitiveness
  - Respects the environment



## Strategies

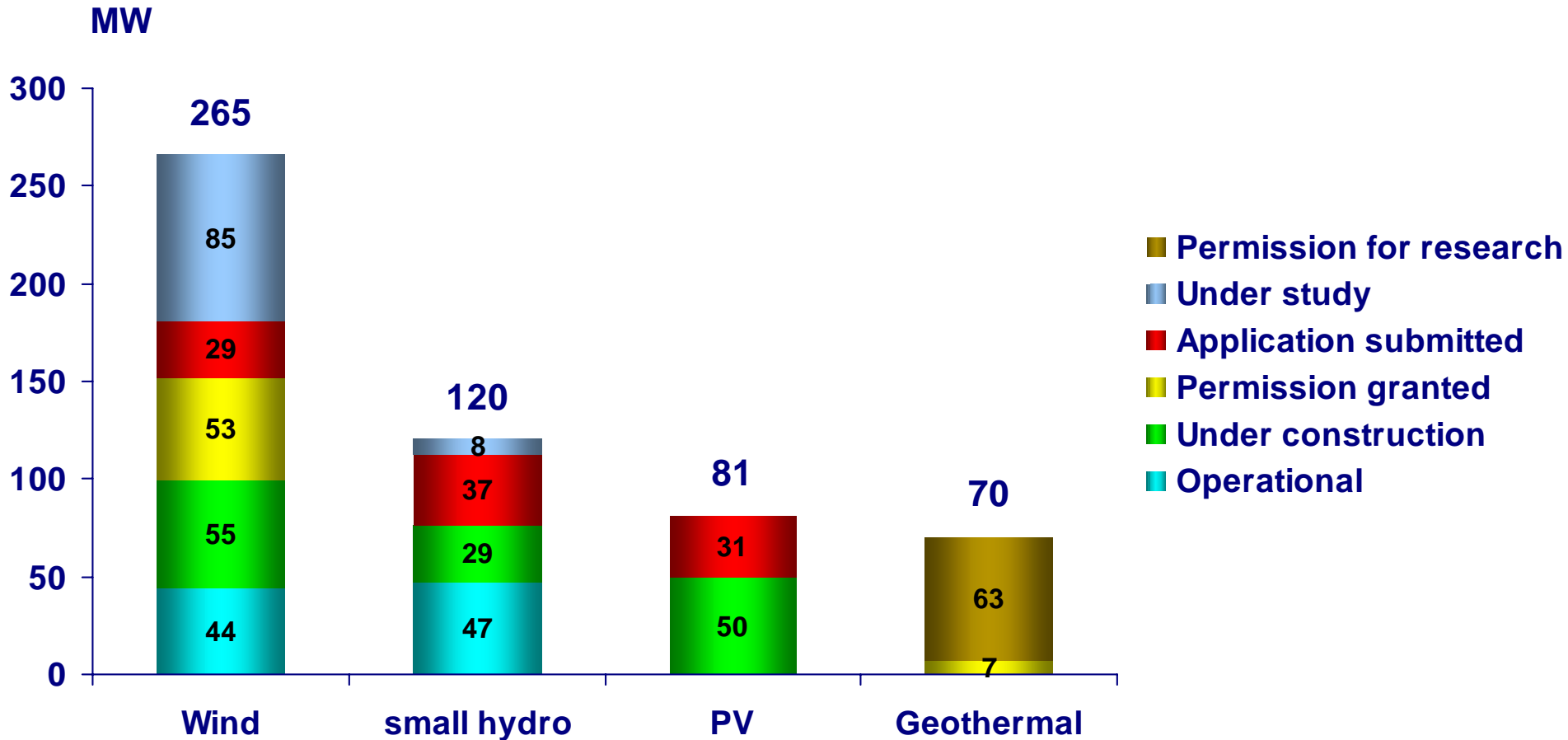
- Build plants embodying new technologies
- Decommission of aged and inefficient power plants
- Accelerate completion of hydro projects
- Decrease CO<sub>2</sub> emissions
- Improve procurement practices



# PPC Renewables on track



### Portfolio today [MW]







# PPC Renewables : 10% market share today



R09A

## Strengths:

- Market leader in small hydro capacity
- Fifth in wind installed capacity
- The only company that has a presence in all renewable fields

## Major Projects:

- 50 MW photovoltaic park in Megalopolis
- **MoUs / Joint Ventures with:**
  - ETVA-VI.PE. for the development of 35 MW of photovoltaic parks in industrial zones
  - EDF Energies Nouvelles for the construction of 122 MW of wind farms
  - S&B for the development of up to 120 MW of geothermal power on the island of Milos

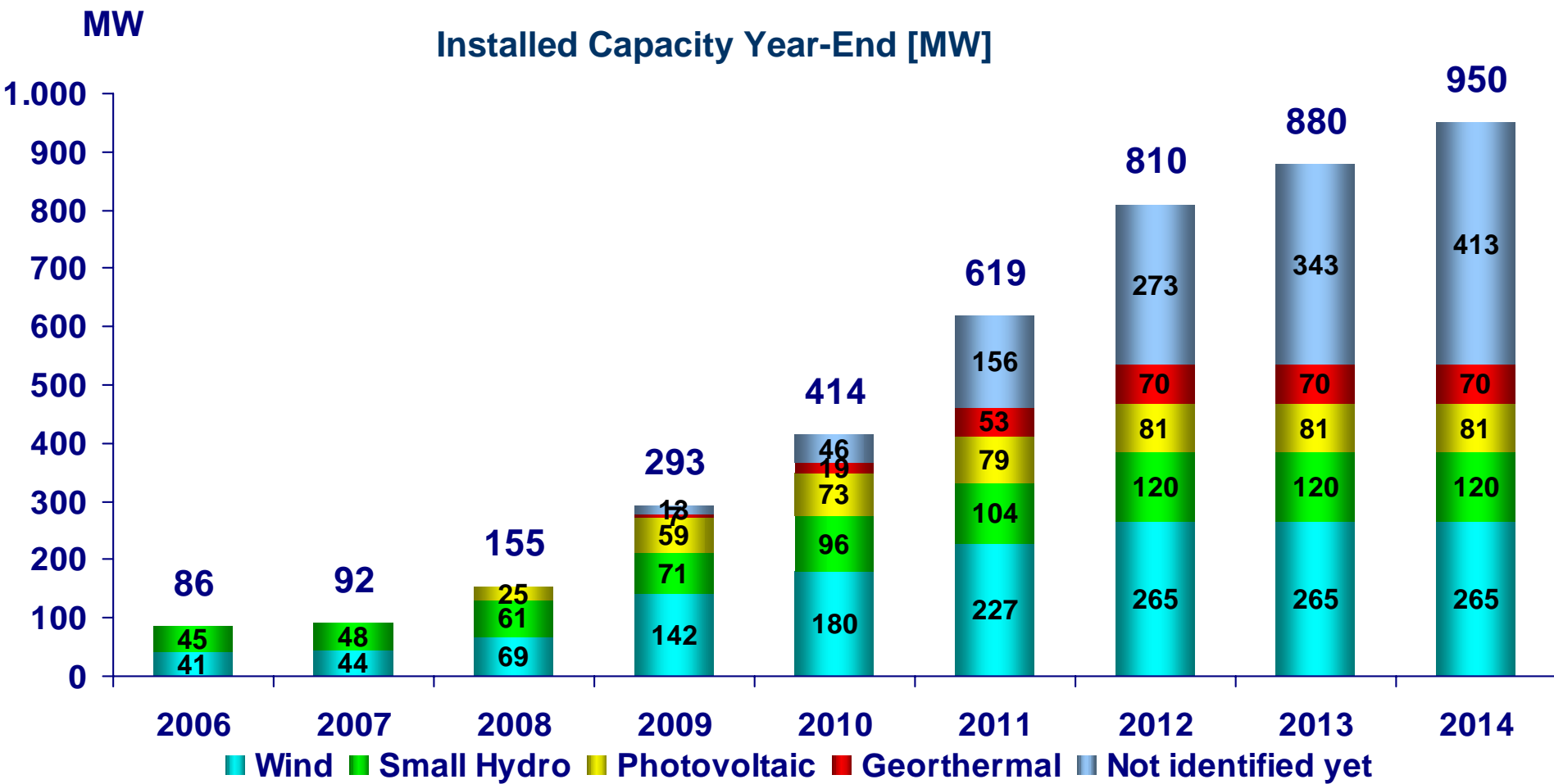


# PPC Renewables targeting 20% market share by 2014



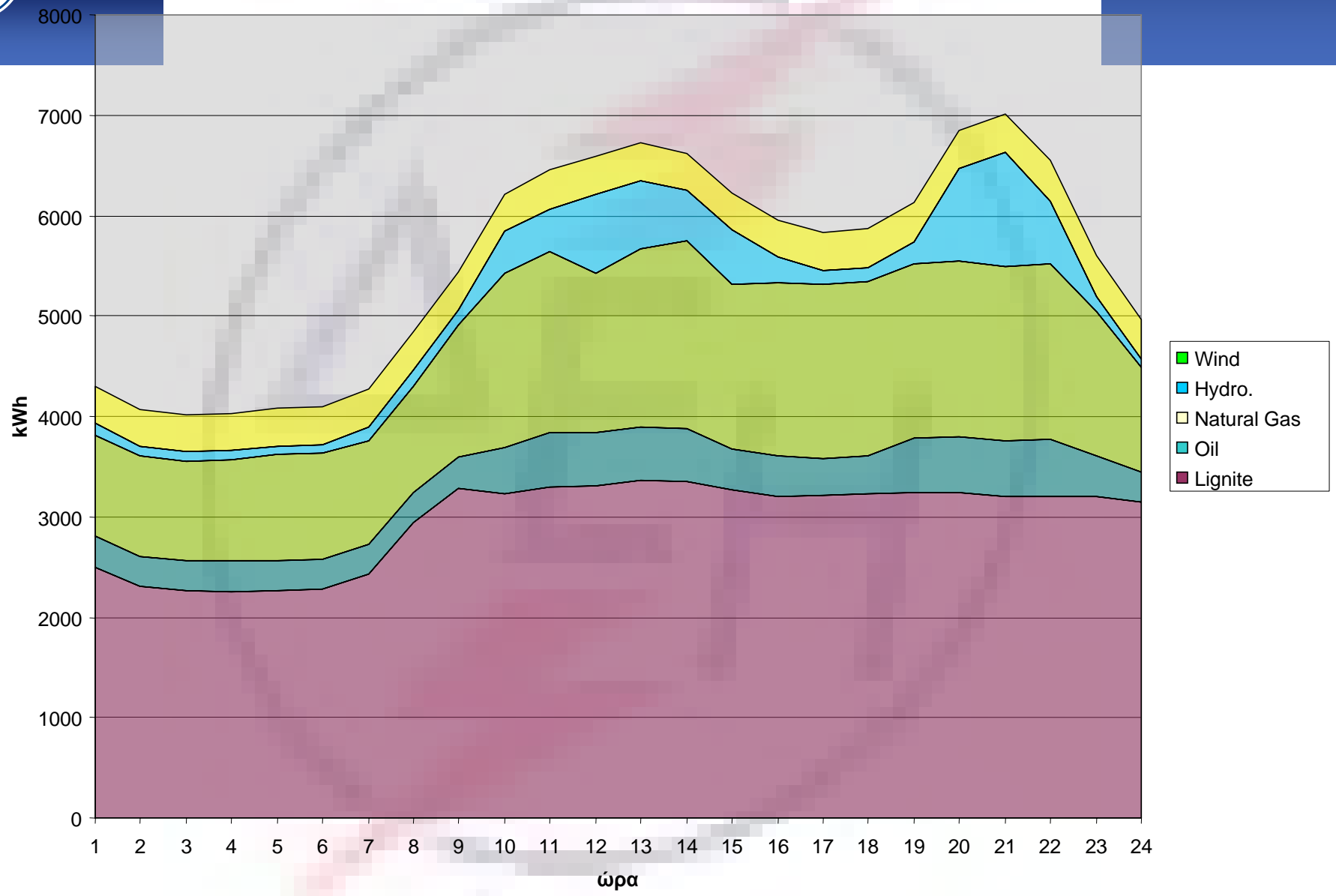
R09A

Required investment till 2014 : €1.9 bil. Average IRR for new projects : 18%



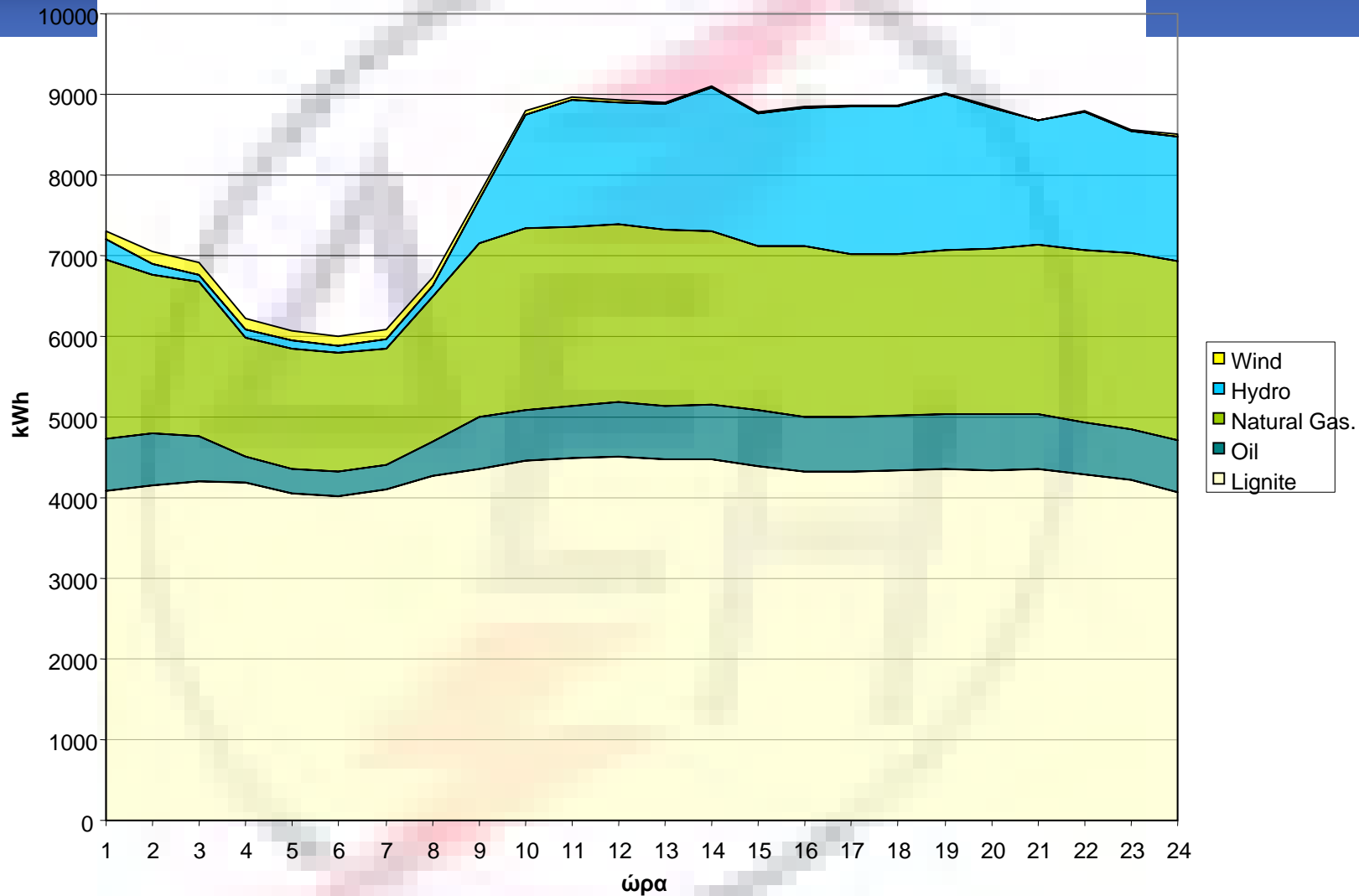


# Generation mix on 10/10/2006





### Generation mix on 26/6/07



# Primary Energy Sources

## *National Sources:*

Lignite in Megalopolis : 25 years.

Lignite in Western Macedonia: 35 years.

## *Imported Sources:*

Natural Gas : 50 years.

Coal : 200 years.



# Old and inefficient plants identified to be decommissioned (retired or in cold reserve)

## GROUPING

Power Station	Fuel	Capacity (MW)	Commissioning year
Ptolemais I,II,III	Lignite	320	1959-65
LIPTOL I,II	Lignite	43	1959-65
Aghios Georgios VIII	Natural gas	160	1968
Lavrio III	Natural gas	180	1980
Megalopolis I,II	Lignite	250	1970
Ptolemais IV	Lignite	300	1973
Aghios Georgios IX	Natural gas	200	1971
Lavrio I,II	HFO	450	1972-73
Cyclades Islands	Diesel and HFO	200	
Aliveri III, IV	HFO	300	1978-79



# 660 MW new Hydro Capacity to be commissioned by 2016

R13A

Power Station	Unit	Installed Capacity (MW)	Commissioning Year
Smokovo	I	10	2008
Mesohora	I, II	161,6	2009
Ilarionas	I, II	157	2010
Metsovitiko	II	29	2010
Sykia *	I	125	2013
Pefkofito *	I	160	2013
Temenos	I	16,5	2016

\* Subject to completion of dams by the State



## PPC's accelerated new-build plan : 3.300- 3.700 MW by 2014

<b>Power Station</b>	<b>Fuel</b>	<b>Installed Capacity (MW)</b>	<b>Commissioning Year</b>
<b>Aliveri V</b>	<b>Natural Gas</b>	<b>400</b>	<b>2010</b>
<b>Megalopolis V</b>	<b>Natural Gas</b>	<b>800</b>	<b>2011</b>
<b>Florina II</b>	<b>Lignite</b>	<b>450</b>	<b>2012</b>
<b>Ptolemaida V</b>	<b>Lignite</b>	<b>450</b>	<b>2012</b>
<b>Aliveri VI <sup>1</sup></b>	<b>Hard Coal</b>	<b>700-800</b>	<b>2013</b>
<b>Larimna I <sup>1</sup></b>	<b>Hard Coal</b>	<b>700-800</b>	<b>2014</b>

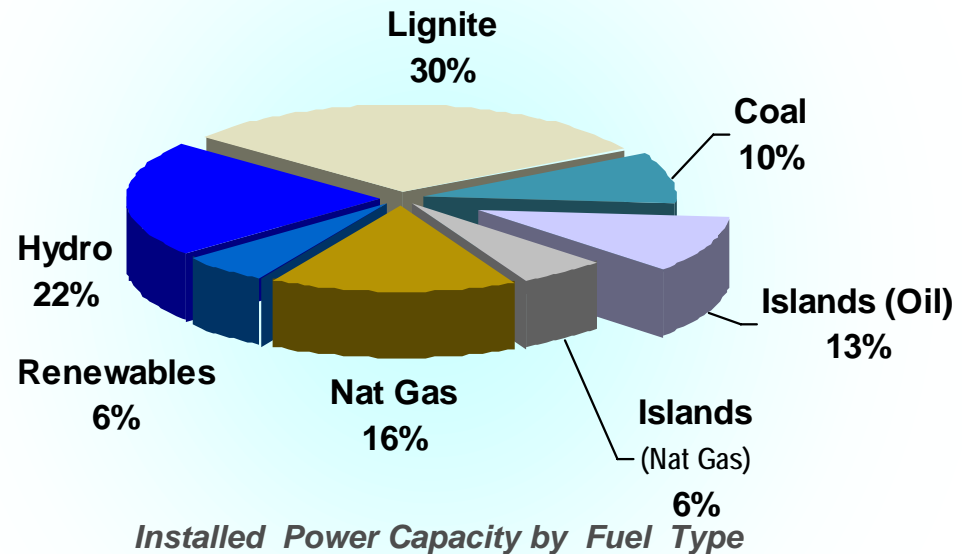
<sup>1</sup> In negotiations to be constructed with partners; 200MW each





# PPC's Power Plant Portfolio by 2014

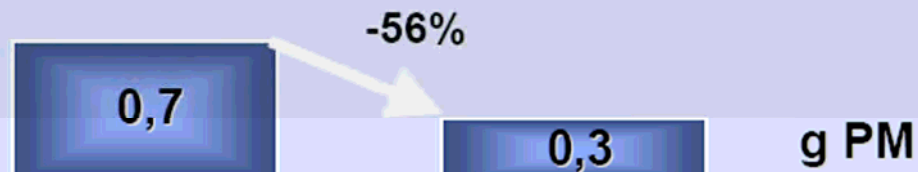
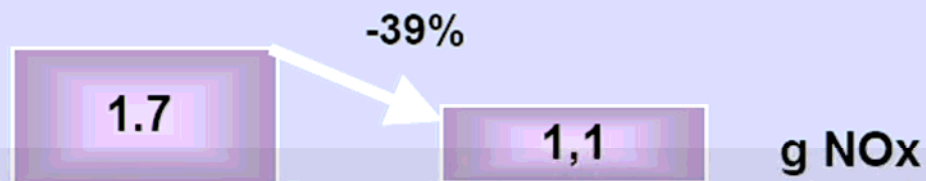
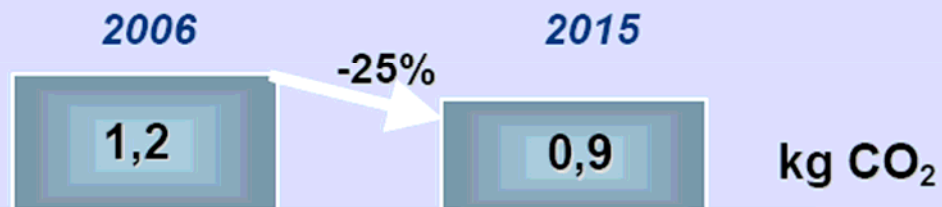
	Installed Capacity (in MW)	Vintage (Weighted Age in Years) (2007)
<b>Interconnected System</b>		
Hydro	3.702	25
Lignite	5.232	18
Fuel Oil	0	
Nat Gas	2.650	3
Coal	1.600	
<b>Total</b>	<b>13.184</b>	
<b>Islands</b>		
Crete (oil)	302	8
Rhodes (oil)	354	9
Small Islands (c)	1.103	
<b>Total</b>	<b>1.759</b>	
<b>Natural Gas in Islands</b>		
Crete	929	4
<b>Renewables</b>		
<b>Total</b>	<b>950</b>	
<b>Grand Total</b>	<b>16.822 MW</b>	





# Reduction of Environmental Effects

Για την παραγωγή μιας kWh





# 2008-2014 Investments

**Generation**

**Transmission System**

**Distribution Networks**



# Drivers and targets for investments in Transmission

## Drivers

- **Significant increase in peak-load nationwide (6,5% this year)**
- **Need for upgrading national transmission infrastructure**
- **Significant increase in renewable energy projects**
- **Increase of transnational trading**

## Targets

- 1 Transmission System expansion**
- 2 Reliability increase**
- 3 Interconnection of Cyclades islands**
- 4 Upgrade of interconnection to Turkey**
- 5 Interconnection of renewable energy sources**



## €1.410 m investments in Transmission network

- **€1.350 m for agreed /planned projects for 2008-2012**
  - **€600m new extra-high voltage (EHV) 400/150 kV substations**
  - **€700m new 400 kV lines**
    - **€250m interconnection of Cyclades**
    - **€60m interconnections with Turkey**
  - **€50m Various projects**
- **€20 m for expansion of 400 kV lines**
- **€40 m for expansion of 150 kV lines**



# 2008-2014 Investments

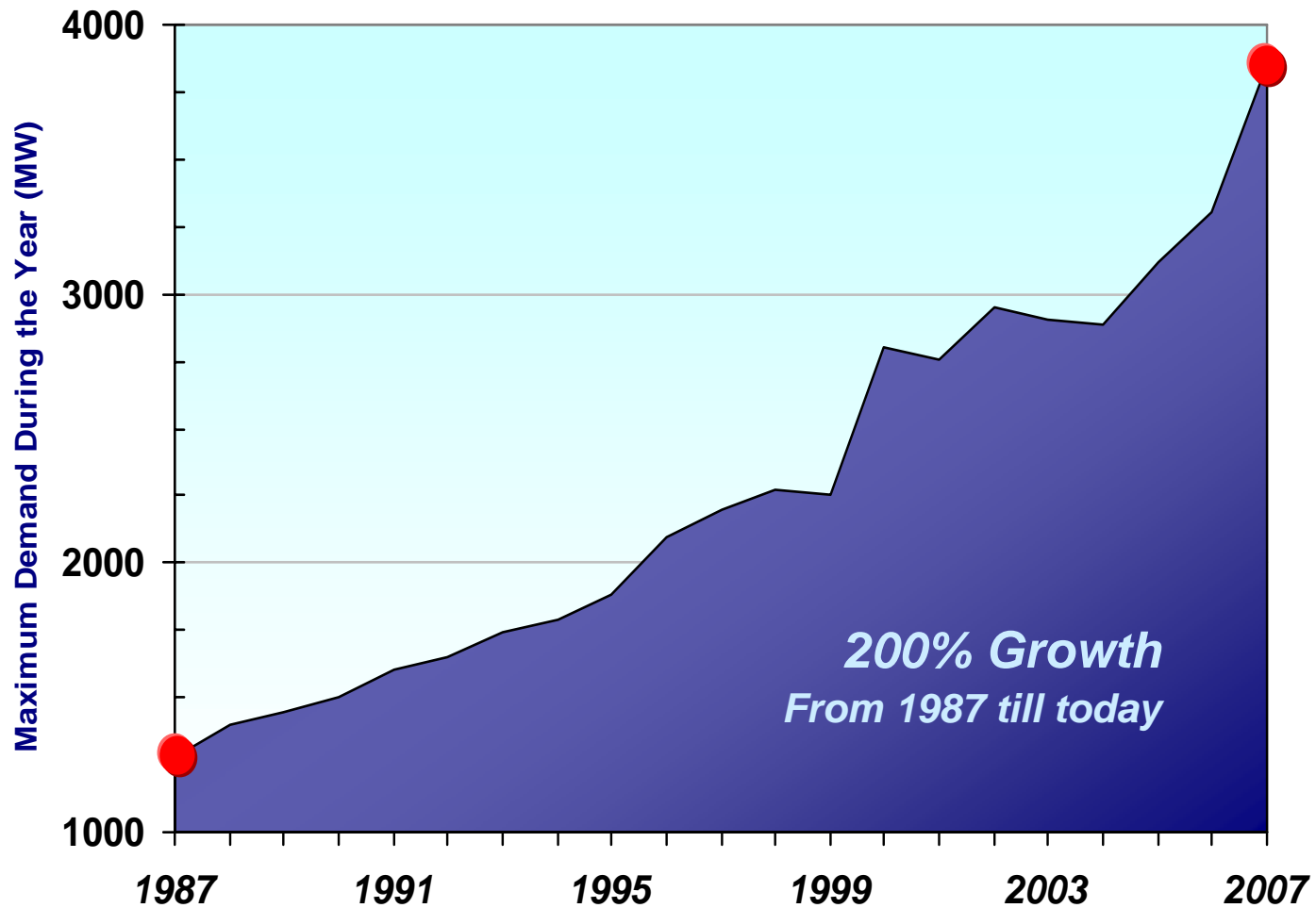
**Generation**

**Transmission System**

**Distribution Networks**

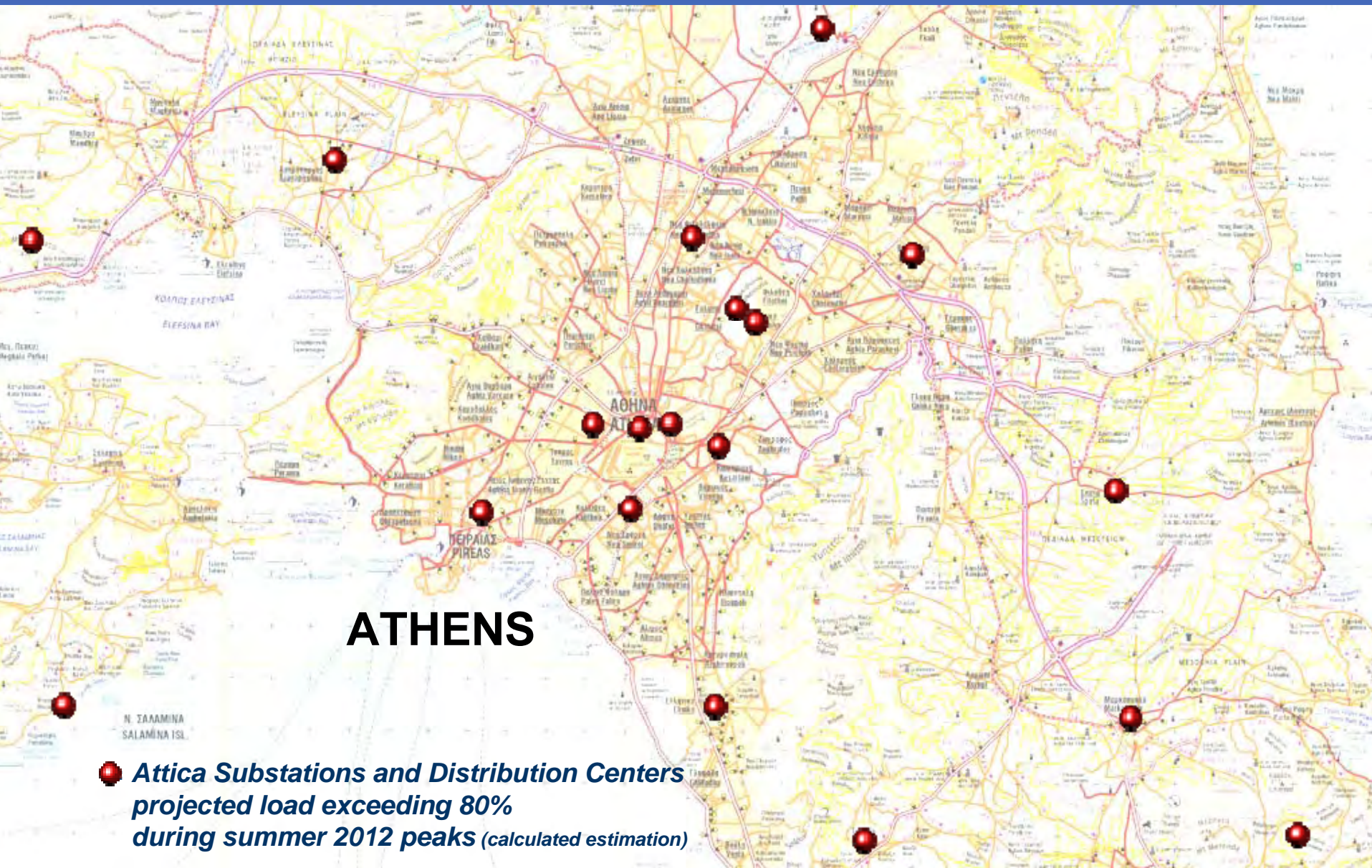


# Steep demand growth in Athens region, challenging the power network : 14% increase only this year





# ... Problems in 2012 if regular investments only



## ATHENS

 **Attica Substations and Distribution Centers**  
*projected load exceeding 80%  
during summer 2012 peaks (calculated estimation)*





# Drivers and targets for infrastructure investments in Distribution

## Drivers

- Significant increase in peak-load during the summer months everywhere (e.g. 14% in Athens region, 10% in Thessaloniki this year)
- Upgrading and reinforcing existing urban networks
- Improve PPC's services to the customer
- Reduce costs

## Targets

- Improve Power quality
- Reduction of network outages
- Automate network management and metering
- Minimization of time-to-repair
- Power loss reduction
- Better demand management



# Investments of €2.8 billion Euros <sup>(1)</sup> for Distribution Network Infrastructure in 2008-2014 (included in RAB)

## Distribution Infrastructure

1

Attica &  
Thessaloniki

900 MVA new HV/MV substations

700 MVA capacity increase of existing HV/MV substations

100 km of new HV cables

400 km HV and MV cables upgrades / replacement

2

Nationwide

1,500 km per year of new MV and LV lines and several MV/LV substations

3

Routine network extensions with customer sharing costs

- 180,000 new customer connections per year
- 4,000 km network per year

€615 million for reinforcement of the Distribution Network

€2,200 million for routine distribution network extensions

(1):subject to regulatory approval



# Investments of €1 billion <sup>(1)</sup> for automation (included in RAB)

## €100 million for automatic network management

- 1 Installation of automatic network switches to increase remote control and fault detection
- 2 Incorporation of all substations to Distribution Management System (DMS)
- 3 Power quality monitoring system

## €950 million for telemetering

- 1 Automatic Meter Reading in all customers, if co-funded



Telecontrol

(1): subject to regulatory approval



# SENCAP: The investment Vehicle of PPC and ContourGlobal



## Geographic scope of investment

SENCAP is the exclusive investment vehicle of PPC and ContourGlobal aiming to acquire and develop power assets in the wider South East European market, mainly targeting generation investments of a variety of fuels (lignite, coal, natural gas, hydros)

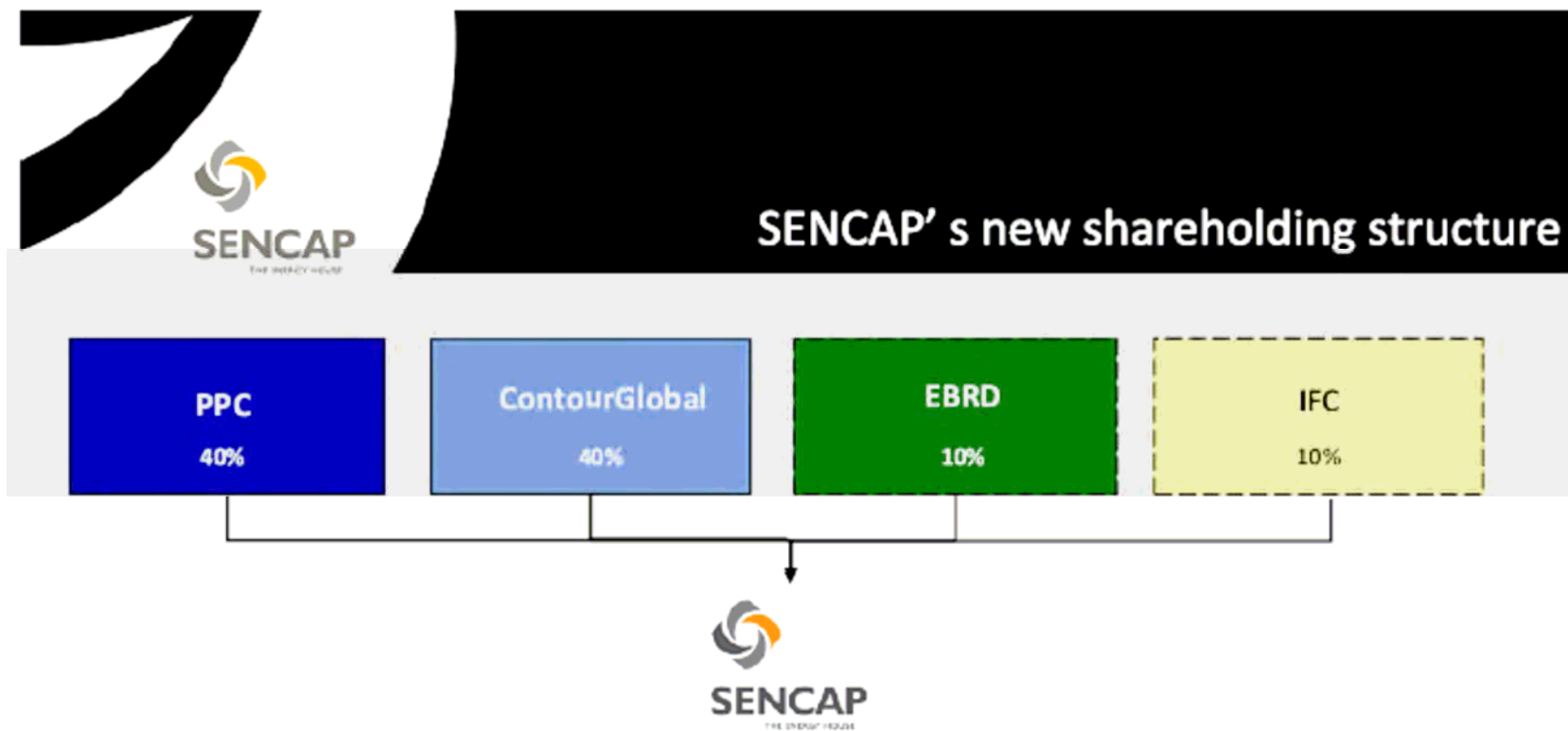
- SENCAP's focus is initially on the generation business including mines and associated trading of energy
- SENCAP also monitors distribution business opportunities
- SENCAP seeks economically viable opportunities in renewable energy in the region
- SENCAP is currently engaged in a full scale process of establishing local liaison offices in various key locations, such as Bosnia Herzegovina and Turkey



Map: SENCAP's geographic scope includes all major South East European countries excluding Greece



# SENCAP: Acquisition and Development of Assets in S.E. Europe



SENCAP combines a set of qualities:

- Long-term technical & operational experience of PPC
- ContourGlobal's financial expertise (M&A, asset optimization/turnaround management)
- EBRD's ability to mobilize significant foreign direct investment (as the largest single investor in the region)
- Being a global financier, IFC offers its unique local experience in restructuring and facilitating the privatization of local enterprises



# SENCAP: Business Development



## Pillars of SENCAP's business development activity

### Projects



Kosovo

SENCAP is following up the privatization process in various assets of generation (lignite, coal, hydros, etc.), mining and distribution in the wider South East European area, such as tenders of Kolubara B & Nikola Tesla B in Serbia (pending to be announced) and others

Indicative project: SENCAP is participating in the Kosovo tender where it is pre-qualified in a consortium with the Italian Enel, to submit a bid in compliance with the tender rules (pending to be announced)

### Partnerships /local presence

SENCAP aims for strategic partnerships with international and local well reputed players in order to jointly participate in public tenders and mainly in direct acquisitions by negotiating with project owners and ultimately create synergies and maximize the value for both partners.

SENCAP has already established a local liaison office in Bosnia-Herzegovina and is in the process of setting up a representation office in Turkey.

### Hydros

SENCAP is currently developing a business structure that will incorporate all hydro opportunities (small and medium sized hydros) being targeted, mainly in Bosnia Herzegovina, FYROM and Montenegro along with local partners and a network of local experts



**Thank you for your attention**