



protergia

MEMBER OF **MYTILINEOS** GROUP

6th South East Europe Energy Dialogue
Redefining SE Europe's Energy Map

Session V

Strategies for Promoting RES, Energy Efficiency and Cogeneration

DEVELOPMENTS IN THE
GREEK ENERGY LANDSCAPE

THE INVESTOR'S POINT OF VIEW

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Company Information



- Protergia is 100% subsidiary of MYTILINEOS Holdings, which holds the management of the energy assets and activities of the Group.
- The strategic positioning of the Group focuses on developing new business activities in the Greek energy sector and on putting in place the largest installed independent power production capacity in the country, through a balanced portfolio of investments in thermal and renewable sources.
- The company's activities include holding or/and managing of thermal power plants and renewable energy sources (wind, hydropower and photovoltaic parks), development of renewable energy sources projects as well as energy and emissions trading.
- The dynamic entrance in the wholesale and retail electricity markets is also within our goals once the conditions in the Greek market will permit so, as well as the future expansion in neighbouring countries with increased needs for energy capacity.

Energy Portfolio



Energy Portfolio 1/3

1.2 GW from Thermal Plants in operation

- **444.48 MW** - Gas-fired Combined Cycle Thermal Power Plant (CCGT) owned by Protergia SA, located at the Energy Complex of Ag. Nikolaos (Viotia).
- **334 MW** - Combined Heat and Power plant (CHP) owned by ALUMINIUM SA, located at the Energy Complex of Ag. Nikolaos (Viotia).
- **436.6 MW** - Gas-fired Combined Cycle Thermal Power Plant (CCGT) owned by KORINTHOS POWER SA, located at Ag. Theodoroi (Corinth).

Energy Portfolio 2/3

54 MW from RES plants in operation

Wind Farms

- 1 Wind Farm in Sidirokastro of 17 MW
- 4 Wind Farms in Marmari Evia of 19 MW

Small Hydropower Plants

- 4 Small Hydropower Plants of 6 MW in the regions of Aitoloakarnania and Fthiotida

Photovoltaic Parks

- 3 Photovoltaic Parks of 11.5 MW in the regions of Artta, Viotia and Aitoloakarnania

RES projects with capacity of 1.4 GW in various licensing stages

- 140 MW in construction stage by 2012 (subject to financing)
- 1.040 MW under licensing procedure (with generation licenses)
- 200 MW with application to RAE for generation license

Energy Portfolio 3/3

Trading license for 310 MW of electricity

CO₂ Emissions Trading Platform

Natural Gas Management



Our Goals

- **2011** → to own and/or manage directly or on behalf of other companies of the Group a total production capacity of 1.2 GW from gas-fired thermal power plants in operation.

GOAL ACCOMPLISHED

- **2015** → to have in operation a total production capacity of 400 MW from RES plants (mainly wind farms)



thus covering 10-15% of the total power generation in Greece

Climate and Energy Targets: A technology and social approach

European Policy:

The development of RES consists National as well as European priority in the frame of the adopted policies towards environmental protection, promotion of sustainable development of natural resources, as well as the drastic reduction of gaseous emissions resulting from the power production sector.

Such environmental policy is targeted towards the following by 2020:

- 20% reduction of greenhouse gas emissions,
- 20% penetration of RES in the final electricity consumption,
- 20% energy efficiency

European forecasts:

- 36,4 % share of RES electricity to total electricity consumption by 2020
- 51.6% share of RES electricity to total electricity consumption by 2030

All the above are highly questionable under the current financial circumstances.

The RES sector in Greece: National Targets

The adoption by the Parliament of Law L3851/2010 which came into effect on 4th June 2010 and in which ambitious national targets for RES (namely 20% on final energy consumption, 2% above the mandatory level of 18% set by Directive 2009/28/EC) are specified.

In order for the 20% target to be accomplished, the following technology mix for RES is enforced by the Greek Government.

Goals		
	2014	2020
Hydro Plants	3700	4650
Small (0-15MW)	300	350
Large (>15MW)	3400	4300
Photovoltaics	1500	2200
Solar-Thermal	120	250
Wind Farms	4000	7500
Biomass	200	350

Progress to date (source: ADMIE – LAGIE)	
	April 2012
Hydro Plants	3231,9
Small (0-15MW)	211,9
Large (>15MW)	3020
Photovoltaics	535,1
Solar-Thermal	-
Wind Farms	1390,7
Biomass	-
Biogas	44,5

Positive Effects of the RES Sector in Greece

- Use of abundant local natural renewable energy resources (wind, sun, water), reduction of imported fossil fuels, security of energy supply.
- Reduction of greenhouse gas emissions as a result of the replacement of conventional electricity production units with RES units.
- No environmental impacts, minimum interference with the natural ecosystem as well as contribution to the preservation of the biodiversity (fauna and flora).
- Investments in RES projects consist a major form of development in Greece during the current economic situation.
- Guaranteed revenue (by Law 3851/2010) towards the local communities as a result of the operation of RES projects.
- Promotion of employment in local communities during the construction and operation phases.

Developments and Considerations in the RES sector - Current Situation

- Liquidity of the market operator (LAGIE).
- The future of FITs in Greece during the period of economic crisis is uncertain (recent example of Spain).
- Present PV tariffs non-sustainable despite recent reduction.
- The national goal for 7500 MW of wind farms by 2020 at risk due to insufficient network infrastructure to accommodate such capacity. Estimated necessary investment in network infrastructure: €4 billion by 2014 and €8 billion by 2020 mainly for interconnection of the islands.
- HELIOS: Question on international transmission capacity and energy purchase price.

Developments and Considerations in the RES sector - Current Situation

- FIT development - Achievement of grid parity.
- Good prospects for offshore wind farms.
- Scarcity of financing resources.
- The constantly changing legislative environment as well as administrative barriers are affecting the sound development of RES projects.
- Increasing number of cases brought to the State Court with the aim of cancelling the installation of RES projects.
- Resistance by the local communities towards installation of RES projects.

Are there thermal technologies that can contribute in reaching the 20-20-20 targets?

- Combined Heat and Power (CHP) production technology offers energy savings ranging between 15-40% when compared to the supply of electricity and heat from conventional power stations and boilers

CHP electricity in the EU

 **Share (%) of CHP in total generation 2008**



Figure 1 Map showing the percentage of CHP electricity in the delivered electricity by EU Member State

Source: Code project – COGEN Europe

CHP Development in Greece

- Cogeneration of heat and power in Greece has not been significant.
- CHP Law in force (Law 3734/2009) transposing EC Directive 2004/8/EC into National Law.
- Specific incentives for CHP installations in the form of FITs and guaranteed access to the Grid (Law 3468/2006, Law 3851/2010 & Law 4001/2011).
- Existing operating small CHP installations in the sugar and paper industry, oil refineries, fabrics industry etc.
- PPC is utilizing useful heat from conventional power plants for district heating purposes.

The largest SEE CHP plant is in Greece: 334 MWe CHP Plant at St. Nicholas, Viotia



334 MW CHP Plant, St. Nicholas

- Largest high-efficiency CHP plant in South Eastern Europe.
- Investment of more than 200 million Euros by Aluminium S.A. under Mytilineos Holdings management.
- EPC Contractor METKA S.A., high quality construction completed on time.
- Operation by Protergia S.A.
- To supply all necessary steam for the alumina plant of Aluminium S.A. and replace fuel oil used for that purpose.
- Under operation since May 2008.



334 MW CHP Plant: Fact sheet 1

- Reduction of the annual consumption of fuel oil by **160,000 tons** for the steam production process.
- Reduction of CO_2 emissions by at least **1.25 million tons/year** at national level to the benefit of the country.
- The combined heat and power production (CHP) offers a significant potential for increased energy efficiency, significant savings in primary energy as well as reduced environmental impacts and represents a priority for the EU Member States in accordance with the objectives and relevant provisions of Directive 2004/8/EC.

Major Barriers experienced

- Administrative Barriers (e.g. licensing, operational).
- Uniqueness of the project (no prior experience on large-scale CHP).
- Delayed adoption of legal and regulatory framework to fully support large-scale CHP (still under progress).

Thank you for your attention!

