# 1st INTERNATIONAL MEETING
# "Great Projects in the Mediterranean"
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## Introduction from the Moderator
## Prof. Ing Antonio Di Bartolomeo

**Energy and Technological Innovation - Renewable Energy Opportunities in the Mediterranean – Conference – Palacongressi - Montesilvano, 22-24 Sept. 2006.**

***Introduction from the Moderator, Prof. Ing. Antonio Di Bartolomeo***

## Solidarity and Humanitarian Development in a Burning World

The world is hungry for energy and burns petroleum and gas fossils: in the motors of vehicles on the road, in electrical power plants, in industrial processes, in heating systems for homes and businesses. There are areas developing at a strong pace such as China and India that, seen from space, are enveloped by a thick yellow curtain of pollution. In those areas, lax in environmental regulation, the air in some big cities has become unbreatheable. The world is in flames not only due to terrorism but from its failure to modify a perverse and inveterate process for creating the energy it needs, thereby perverting the climatic state and threatening the biosphere (global warming).

All of the Mediterranean countries, in particular those of the African band, have undergone a constant decline and isolation, placed as they are at the margins of Europe and between opposed geographic areas to the east and west that are in strong development. A sustainable local development fed by energy of a renewable kind represents a real opportunity to carry the Mediterranean forward to the center of the economic flow, with positive repercussions in solving various types of endemic enmities and conflicts. Such development in depressed areas must also be *"solid and humanitarian"* in the sense that it creates opportunity by initiating a master process that takes place in a local and autonomous manner and feeds itself in a continuous manner, seeking to learn from its mistakes in order to avoid repeating them.

## Centralized Generation (CG) and Distributed Generation (DG)

At the end of the 19th Century, amid the full fervor of plans for realizing some early generators and electric lines, a difficult double dualism presented itself:

-Centralized or distributed generation?
-Production of alternate or continuous current?

The decision was made for centralized generation (CG) and alternate current (AC).

The end of the last century, however, saw the exponential progress of technology in the field of information networks and computational capacity, together with progress driven by model simulation in physics, chemistry and nanotechnologies. That progress has fed hopes of a copernican revolution in energy generation. The traditional centralized generation concept has been shown to be able to evolve into distributed generation (in other words, the generation of energy right there where it is consumed). All the constellation of non-polluting gensets composed of diffused microgeneration of a type either stationary, mobile or vehicular, would be able, thanks to the new technologies, to be connected each to the other and to the centralized grid. Above all, they would be connected in a "spot" market network (see for example MODEnet – European Research Project EESD, 5$^{th}$ Framework).

The adoption of such technologies and their mass diffusion in a regime of market liberalization would reduce the cost of generators to a fraction of those we currently have -- according to the same market laws that have permitted cellulars to reduce costs and multiply functions. And it would do so with great advantages to the environment, to economics, to security and to energy quality.

However, complicated mechanisms of a regulatory character have favored the maintenance of the monopoly of traditional systems and have slowed the penetration of new technologies.

The development and economic competitiveness of a country's systems are tied to the cost of energy. And in Italy, energy costs too much. Huge efforts are being made in Italy to modernize the system of production and distribution (put to hard proof of reliability and efficiency by the black-outs of 2003), to limit atmospheric emissions, to build new power plants. Notwithstanding, applications of distributed generation have been growing, above all in industry, fueled by methane gas (and now from renewable sources, too). They have the advantage of a combined production of electricity and heat (microturbine, alternative engines), with an

overall (energy, environment, economic) balance more favorable than the adoption of separate systems for electric and heat use.

Grid connection is made possible in Italy, in fact, and disciplined by means of rules that do not always dictate, however, clear regulations and don't integrate often with European regulations, the lack of which will make it difficult to reach the 4000 MWe of green electricity necessary, according to a recent estimate by Cogena (on GRTN data), to satisfy the Kyoto protocols.

The final challenge, both for centralized (CG) and distributed generation (GD), would remain energy from sources that would be available everywhere in nature -- not tied, in other words, to the use of a fossil product, geographically localized and limited in quantity.
*Science and technology, that work toward further development represent, certainly, the key to the definitive resolution of the energy problem and, with it, many other problems.*

**Privileged Position of the Mediterranean**

The Mediterranean has at its disposal in a heightened sense the great resource of the sun. Some countries such as Spain have aimed for the intensive exploitation of such a resource. *Thermodynamic technology (concentrated solar power, or CSP) with storage of thermal energy***,** already now competitive, has obtained Spanish government backing and grants and has catalyzed important international technological developments in the USA and Germany. (Curiously, Italy doesn't yet recognize, by specific decree, the production of electrical energy from solar concentration as "green energy.") Moreover, the regions of the African coast have enormous extents of unused land (that render from one to two million barrels of oil in equivalent energy per year per 100 hectares). Such production could favor there the development of concentrated solar power plants, and of photovoltaic plants, too, when new technologies will allow for the reduction of prices. Energy can be utilized in loco to produce fresh water from sea water (desalinisation), for the development of agriculture in prohibitive areas, for air conditioning through absorption chillers, and for the creation of factories driven by available labor. Finally, it can be used to produce hydrogen for use in fuel cells or to export through pipelines.

**Conference Topics**

In this conference, spokespersons from the following fields will summarize their own study and research, and potential contributions to answering the challenges of energy and development in a changing world:

- advanced thermodynamic solar plants (academic)
- solar air conditioning in buildings (multinational, property)
- advanced photovoltaic in architecture (academic)
- study cases of cooperation in the Mediterranean (multinational, non-profit)
- open source and territorial web (arch software, property)
- project financing (banking, property)
- communications services (multinational, property)
- nanotechnology for fuel cells (academic)
- hydrogen generation from biomasses and carbon dioxide removal (study case, academic)
- energy planning (academic)

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