



Lessons to be learned from our Greek experience for the effective development of RES investments to national and local level.



History

- Our Company **TERNA Energy S.A.** was incorporated in 1997 by our parent TERNA S.A. to undertake the TERNA Group's development of RES generation activities, in light of the opportunities arising from the Kyoto Protocol and the subsequent EU and national legislation prioritizing increased reliance on RES-generated electricity.

- We focused our attention first on developing wind power, and began the process of locating and measuring wind conditions for suitable sites throughout Greece.

- Our first wind park (located in Evia) entered into operation in 2000, with an installed capacity of 11.22 MW. In the following years, the installed capacity of our wind parks increased rapidly as we continued to expand our wind park portfolio.

- We began diversifying into different RES segments by starting the construction of the first two small hydroelectric plants in 2006.
- Currently, we are also expanding our business in Solar and Biomass projects.

- We have already begun exploring opportunities for entering the RES generation markets in several developing countries in the S.E. and N.Europe, Asia and S. America, with a view to supporting the long-term growth of our generation business as our home market approaches its RES targets and expansions of the Greek power grid will become necessary to take on additional capacity.

Types of RES:

- **Wind energy**
- **Hydraulic Energy**
- **Biomass**
- **Biogas**
- **Solar Energy**
- **Geothermal Energy**
- **Wave Energy**

Advantages of RES:

1) Their exploitation/utilization is widely accepted by the general public, due to their environment- and human-friendly nature. They are practically inexhaustible sources of energy.

2) RES constitute (together with energy conservation) the most ecologically sound solution for the effective reduction of carbon dioxide emissions and the combating of the greenhouse effect. In addition, by replacing energy generation plants which use conventional fuel resources, they lead to a reduction in the emissions of other pollutants as well, such as sulphur oxides which cause acid rain, nitrogen oxides which cause photochemical smog, airborne particulates, etc.

3) RES are domestic sources of energy and contribute to strengthening the energy independence and security of supply at the national level.

- 4) RES are geographically dispersed, leading to the decentralization of the energy system, making it possible for energy needs to be met at the regional and local level, thus relieving the pressure on infrastructure systems (electricity grids, roads, etc.) and reducing the losses from energy transmission.

- 5) RES provide opportunities for the rational use of energy sources, because they cover a wide range of users' energy needs (i.e. solar energy for low temperature heat, wind energy for electricity production, etc.).

- 6) RES usually have low operating costs, which are not influenced by fluctuations in the international markets and especially in the prices of conventional fuels (crude oil, natural gas, coal).

- 7) RES installations are usually designed to meet the specific energy needs of users/consumers, both at the large or at the small scale, and they have relatively short materialization times, thus allowing quick response of energy supply to energy demand.

8) RES investments create a significant number of new jobs, especially at the local level.

- 9) In many cases, RES can become a catalyst for the regeneration of economically and socially depressed areas and an important point for local development, through the promotion of relevant investments (for example, greenhouses using geothermal energy, district heating of local communities and towns via hot water/steam produced by the energy exploitation of agricultural and forestry biomass, etc.).

Projects' framework:

- 1) Legislative framework;
- 2) Administrative & financial framework;
- 3) Complete, steady incentives with an horizon for minimum ten years;

- RES electricity is absurd and therefore few times faces difficulties in remuneration.
- Priority to dispatch and feed in system or other as green certificate or quotas required.
- Basic licensing steps and requirements in order to give a total licensing period upon installation, for not more than a year.

- Relevant licensing authorities and institution to incorporate closely.
- Licensing procedure to be clear, rational and transparent and encompassing as few steps as possible.
- One stop shop.

- For the first few years of financial development, some kind of public support is necessary in order to compete with the conventional energies, such as tax holidays, capital subsidies, KWh support.
- In emerging markets, capital subsidy is preferable

- As the market matures, it would be preferable if the support were shifted towards better operation
- Space planning - National plan.
- Licensees required for use of land.
- Development of the electrical system, parallel way infrastructure for strengthening, extending, upgrading the national grid system.

- The Grid needs many more years to be designed till it can be compared or even considered as an alternative to the wind farm, whose construction lasts more or less for a year.
- Road infrastructure, telephone line (assist the control system).

- Transmission System Operator's role in the development will be critical.
- Regulatory Energy Authority provides equal opportunities to all interested bodies. Providing the development of RES, the priority it needs.

TERNA Energy S.A. RES Activities

- **Wind Energy**

Terna already owns and operates eight wind farms in different regions of the country (Evia, Thrace, Crete), with a total operating capacity of 118 MW. Two more wind parks with a total capacity of 44 MW are under construction. The company has set for the development of new wind farms through the securing of electricity production licenses for additional wind farm capacity of 523 MW. Moreover, having identified suitable sites Terna has filed applications and secured these sites, where more than 2000 MW could be built.

- **Hydroelectric Projects**

Within 2006 the construction of the first two small hydroelectric projects began, which have a total installed capacity of 15 MW.

The company is developing a number of small and large hydroelectric projects, for which production licenses have already been awarded in various regions of the country, with a total capacity of more than 120 MW. Moreover, another 93 MW are in the pipeline, for which the company has already applied for production licenses.

- **Management & energy utilization of wastes and biomass**

TERNA has been actively involved in the waste management sector in Greece for the last two years. The company has already acquired substantial and specialized expertise and technological know-how in the field, which enables it to undertake integrated waste management projects in the private and public sectors in Greece and abroad.

- **Solar Energy**

Terna has applied for production licenses for three photovoltaic plants, representing a total of 21.7 MW of capacity, and subject to our obtaining the necessary regulatory approvals, these facilities are expected to become operational by 2010. Greece has one of the highest solar power potentials in the EU and the government has incentivized investment by providing for high tariffs and capital subsidies for photovoltaic energy.

- **Entering the RES market abroad**

Terna is in the process of conducting wind tests in Balkan Countries and Turkey, S.E. Europe and N. Europe to locate suitable sites for wind parks, and are in discussions with potential joint venture partners in Middle East, China and in Brazil to explore future wind project developments in those areas.