

THE CRETA EXPERIENCE: HOW WIND CAN HELP LOCAL DEVELOPMENT

*Menniti D. *, Burgio A. *, Pinnarelli A. *, Scordino N. *, Sorrentino N. * and Raffa M. #*

* CRETA @ Dept. of Electronics, Computer and System Science, University of Calabria - Italy

Fortore Energia S.p.a. – Italy

Abstract—This paper deals with a new model of local development that the consortium CRETA (Italy) and the company Fortore Energia (Italy) together propose. This new model is effected by some projects, said actions, based on the exploitation of the renewable energy sources of a territory; in order to contribute to a sustainable development, each action pours into the territory an equitable part of the proceeds obtained by the exploitation of its natural resources. This equitable part should be, for instance, the transformation of all the crumbling and unused houses of the historical downtown of a small village in rooms or apartments of a widespread hotel. In this paper several actions, that effected the proposed development model, and the achievable results are presented.

I. INTRODUCTION

The installation of systems for the wind energy exploitation in areas with good windiness is usually hindered by local communities that live in those areas. Indeed it is a well known fact that the decisional trial, which anticipates the realization of a wind farm, is long and complicated and that it worse when the national and international energy companies and the tall authorities are added to the local communities. As a result, applying a so promising technology for the wind energy exploitation such as the wind turbine becomes too difficult or impossible in practice. The reasons for which local communities valiantly oppose to wind turbines are mainly: a) a poor knowledge about the actual technology for the exploitation of the wind energy, b) their conflicting affairs respect those of the societies that realize such types of fittings, c) the environmental and landscape impact. In other terms a wind farm is not commonly accepted by the local communities because they do not judge comparable the costs (or the risks) and the benefits that came from. In order to have an idea of the cited local communities it is enough to consider the reality of the southern Italy where thousand of small villages, many with less than 5000 inhabitants, are situated in places so difficult to be reached that they might be considered stand-alone (landlocked area). Since 1950, after the second world war, these small villages have been subject to a slow but incessant depopulation with the consequent loss of their cultural and economic patrimony. Today it is tried to recover at least the economic patrimony converting the crumbling buildings in hotels according to an innovative conception of hospitality named widespread hotel; such conception do not needs the urbanization of new areas and it is addressed to a tourism alternative to that conventional. Unfortunately there are few investors interested to the widespread hotel since it is few profitable if appraised according to a classical cost-benefits

analysis, therefore such communities of small village are destined to survive with their poor patrimony. In such context the consortium CRETA and the company Fortore Energia (in the next they will be named CRETA-ES) together propose a new model of local development realized through a series of project ideas, said *actions*, finalized to stimulate the investments of the local actors to pour into the territory an equitable part of the proceeds obtained by the exploitation of its natural resources. In this way the risks and the benefits become comparable also from the point of view of local communities. The actions that effect the proposed development model are based in general on the exploitation of the renewable sources of energy (particularly on the wind energy) and they aim to sustain the development of that small villages that suffer of marginality, depopulation and abandonment but that, at the same time, have great potentialities in terms of renewable energy sources such as wind and sun. Adopting this model contributes to the pursuit of a sustainable development and it behaves benefits in the local and the global circle, allowing to glimpse the concretization of the following paradigm "Think globally, act locally"; it will be therefore fundamental to create a wide net of small municipalities that covers the whole country through memorandum of understanding and interventions. In the following this paper is so structured: in the Section II and III the consortium CRETA and the company Fortore Energia are briefly introduced then, in the Section IV, it is discussed the relapse in occupational terms that the renewable energy industry has. Finally, in the Sections V to IX, the actions that effect the proposed development model and the achievable results are presented.

II. CRETA

CRETA (www.consorziocreta.it) is a no profit consortium of several municipalities, two Universities and few private societies; born in 2005, CRETA has its strong point in a scientific technical committee composed by professor and university researchers.

The principal activities that CRETA develops are:

1. it predisposes all necessary documents for public auction for the electric energy supply of all members according to the Italian Legislative Decrees on the deregulated electricity market;

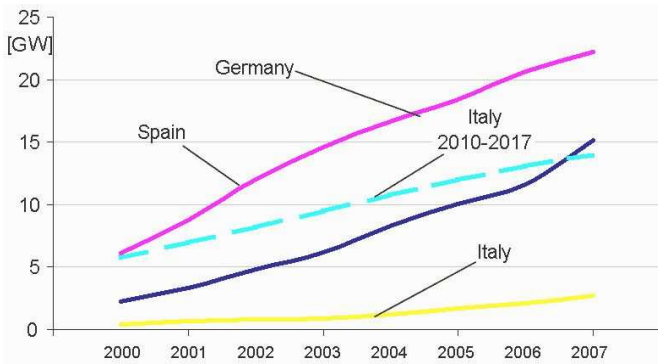


Fig. 1 Wind power in Italy

- it gives consultation and planning to consortium's members, it realizes and manages systems for the renewable energy exploitation, it sustains and develops new techniques and technologies for the energy saving and the environmental protection.

Thanks to these activities, CRETA finances besides the scientific research.

III. FORTORE ENERGIA

Fortore Energia (www.fortoreenergia.it) is a private company which operates in the renewable energy industry and it plans, build and manages systems and services. During its own activities Fortore Energia becomes aware that the wind energy industry has always left little wealth and development to the local communities so it decided to promote the renewable sources exploitation in general as driving force for an auto-sustainable local development. In such sense Fortore Energia forms local professional figures and financial sources, it facilitates the local enterprises and stimulates the birth of new ones.

IV. RENEWABLE ENERGIES AND OCCUPATION

The renewable energy sources (i.e wind, sun, water, ...) are particularly attractive due to their for their inexhaustible, diffusion, potential exploitable and reduced environmental impact. The wind farms in Italy has been built in a "legal" condition of oligopoly therefore local communities have been emarginated by the investments and by the consequential economic benefits.

By considering the development of the Italian wind energy industry, it emerges that this kind of investment has not found yet a way to become a concrete chance for employment and income for those land where the wind energy is meaningfully present so that overcoming the opposition of the local communities.

The wind power installed in Italy, in comparison with respect to that of other Countries as Spain and Germany, is reported in Fig. 1; if we take a look to the perspectives of such power in Italy in the period 2010-2017 (the outlined line of Fig. 1), it is easy to understand that the energy industry, and the wind energy industry in particular, is one of the most interesting and driving sectors of the national economy.

The energy industry is a really driving sector; all the sub-sectors will need investments in order to satisfy an increasing

demand but also to promote the environmental protection and to improve the quality of the products and energetic services.

In general, renewable energy sources have a great deal in terms of occupation potential, a potential greater than the conventional energy sources like fossil fuels or nuclear energy. The Worldwatch Institute, a worldwide independent research centre, estimates that every million of kWh of electric energy produced by wind creates a direct occupation of 542 employees whereas the same quantity of energy, if produced by nuclear or coal (including its extraction), creates a direct occupation of as soon as 100 and 116 employees respectively. Thanks to the wind energy industry, in the last five years in Europe, 33 new job opportunities a day have been created; this is a result of a recent study of the European Wind Energy Association (EWEA) on the actual and future job opportunities due to the wind sector.

In the report edited by EWEA and titled "Wind at work", the development of the wind energy industry will increase, more than double, the job opportunities in few years, passing from 154.000 employees in 2007 to 325.000 employees in 2020.

In the wind energy job market, the construction of turbines is the strongest activity; the EWEA esteems that the 37% of the direct employees have to be imputed to this activity and that, obviously, the greatest concentration of such employees (about the 75% of the total) is concentrated in those Countries which were pioneers of the wind industry such as Denmark, Germany and Spain. Nowadays this sector is driving encouraging job perspective also in Italy, France and Great Britain.

It have not be neglected that the increase of technology export's level let economies in the production of technologies themselves with a consequent reduction of prices and occupational advantages for the local productive systems.

The benefits in terms of occupation due to the wind energy industry must be not attributed exclusively to the construction of wind turbines; beside this activity there are others such as:

- installation (planning, technical consultations, foundations, electric cables for the grid connection, transformers, systems for the supervision and the remote control, roads, expansion of the electric grid);
- management and maintenance.

Referring this two last activities, management and maintenance, it has been estimated that the occupational relapse is about 141,5 employees every 10 MW wind power installed; this number of employees is 4 times smaller than that due to the wind turbine construction.

Permanent occupational benefits derive essentially by the constitution of local companies for the exploitation of local renewable energy sources; these companies live at least as much as the system (i.e. wind farm) they built.

It should be considered also that a careful development of the wind sector can drive to the local communities a plenty of job opportunities regarding structural works (about the 20% of the overall cost of the investments) and assemblage work of the turbines themselves (about 30% of the overall cost of the investments).

Besides the activities above mentioned, many other service activities will be necessary: monitoring the wind farms and verifying other renewable energy sources, planning the use of

those energy promising areas, promoting the acceptance of the local communities in these kind of plants, promoting the interest of the local communities to the profit-sharing in the investments, verifying the impact of these system on the territory, developing competences for the overseeing and the ordinary maintenance of the plants.

The *actions* that CRETA promotes with the partnership of local communities, citizen and entrepreneurs (in order to built these plants for the renewable energy exploitation) are presented in the following sections and all these *actions* accord to the principle of the "distributed generation" that allows the pluralistic access to the resources of a territory.

V. THE ACTION "EOLO'S VILLAGE"

The action named "Eolo's village" is an accord where CRETA-ES, if authorized to realize a wind farm, transforms all the crumbling and unused houses of the historical downtown in rooms or apartments of a widespread hotel; the costs for the transformation are obviously commensurate with the power of the wind farm. CRETA-ES provides the know-how for the planning, it realizes and manages the project for the local development and for the exploitation of all renewable energy resources.

The citizens can also participate financially to the project with the aim of a pension fund or a supplementary income.

Of course it will be necessary the constitution of a management company for both of the widespread hotel and the wind farm.

Each Megawatt of wind power installed and realized allows to assign about 250.000 Euro (that is a part of the amount the banks generally finances to realize a 1 MW wind power plant) to renovate old houses or buildings, i.e 5 immovable properties of 50 square meters each.

The fundamental elements of this kind of accord are:

- A windy land and the wish to realize a wind farm field commensurate to the project of renovation;
- The availability, for at least 30 years, of the immovable properties (included ownership, dense etc) and of the necessary authorizations for the renovation.

Whereas there are not immovable properties to be renovated, this action, "Eolo's village", is replaced by a further action named "Eolo's park" which offers (with the same economic and financial mechanism) the construction of scientific, teaching, and demonstrative centres for the renewable energy sources and the rational use of the energy in rural areas.

VI. THE ACTION "THE SOCIAL ENERGY CELLAR"

The development of the exploitation of renewable energy sources is strongly limited by the ability of the electric infrastructures in the rural areas.

The Italian electric power system, in fact, developed as a centralized system of production and a capillary distribution system. This fact has determined the capillary presence of electric grids with a great transmission capability in the proximity of the urban areas and also their scarce presence in the rural areas where, for a long time, scarce and marginal energy consumers are found.

But the thick production of energy from the renewable sources (big power wind farm, wide photovoltaic plants, hydro plants, biomass) is possible really in these rural areas whereas, in the urban areas, this production is exclusively sized for a self-consumption and the energy saving.

To widespread the production of energy from renewable sources in the rural areas and to "convert" the farmers into investors and direct operators it is therefore necessary that the Local Corporate and the big electric operators become promoters of a new local net.

The project of such new local net is entitled "Social energy cellar" and it is articulated as follow:

- realization of new electric infrastructures to harvest and delivery the energy;
- use of the existing electric infrastructures to harvest and delivery the energy produced by existing or new wind farm;

VII. THE ACTION "THE FARMS OF THE WIND"

The "Farms of the Wind" instead of the Wind Farm is a new formula that merges the agricultural vocation of the country areas and the increasing interest in the production of energy from renewable sources.

The objective is to improve the quality of agriculture products using the economical benefits of the renewable energies reaching a comprehensive one "territorial competitiveness" such to determine a strength rural development. A land becomes competitive if it produce cheap agricultural products and if then it is able to face the competition of the market guaranteeing, at the same time, a based environmental, economic, social and cultural sustainability of the organization.

The strength of the rural world in the renewable sources field lies on the great availability of wide surfaces for the production of energy, on the low energetic demands and on the fact that the same agricultural productions deliver biomass for energy production.

The action "Farms of the Wind" will allow therefore not only the reduction of the energetic expense in bill but also the increase of the positive voices of budget thanks to the sale of the produced electric energy.

The spirit of this action "farms of the Wind" after all it is ain line with how much brought in the White Book of the European union on the Renewable Energetic Sources: "Within the future politics of rural development, the Committee will encourage States members and the regions to confer an elevated priority to the projects of renewable energy in their programs for the rural zones."

VIII. THE ACTION "THE SUN BANK"

The aim of the action name "the sun bank" is the creation of the technical and financial conditions for the spread of those small systems that exploit renewable sources and that are sized for the self-consumption and the local market.

This action requires the following elements:

- a structure which operates as intermediary between the consumers, companies, local corporate and citizens;
- a net of energy producers from renewable sources;
- a net of energy self-producers from renewable sources;
- one or more financiers; i.e banks;
- a financial guarantee fund.

The main activities of this action are:

- it guarantees a virtuous circuit able to capsize on the energy producers (particularly on the small producers) the availabilities picked up by the consumers, providing contemporarily a series of useful services for the installation of new systems;
- it exploits the potentialities given by the titles for the energy production from renewable sources energy" and for the energy efficiency";
- it conducts the activities of brokering and trading of the energy provided by small producers which are constituted in the form of a society or a corporation. Both societies and corporations belong to the *sun bank* which promote all the activities of investment and innovation.

CRETA: The offices of the consortium CRETA are situated at the Department of Electronics, Computer and System Science of the University of Calabria - Cubo 42 C - 87036 - Arcavacata di Rende (CS) Italy.

Web site: www.consorziocreta.it

Tel. (+39) (0984) 494699

Fortore Energia S.p.a.: Fortore Energia S.p.A. business center is situated in Piazza della Repubblica, 5 - 71036 - Lucera (FG), Italy

Web site: www.fortoreenergia.it

Tel. (+39) (0881) 520401

IX. THE ACTION "WIND ROAD"

In the last years in Italy it is becoming very popular the so-called "wine-food" tourism that consists in suggesting and/or offering itineraries of relevant naturalistic, cultural and environmental interest.

These roads runs through agricultural firms open to public so that they divulge and commercialize the local production; as a consequence it born an activity of hospitality which foresees the promotion of local foods and recreational, cultural, didactic activities.

In this philosophy of alternative tourism policy we propose to include a "wind road" that, besides the promotion of local foods, shows the energetic potentialities of a territory and foresees, for instance, the visit to wind farms with the intent to eliminate the distrust that many people felt towards this type of systems and regarding their environmental impact. The small agricultural firms would become therefore self-sufficient structures from the energetic point of view, to be taken as model for a policy of sustainable development.