Renewable and Sustainable Energy Reviews 54 (2016) 341–349

Contents lists available at ScienceDirect

Renewable and Sustainable Energy Reviews

journal homepage: www.elsevier.com/locate/rser

The exploitation of electricity production projects from Renewable Energy Sources for the social and economic development of remote communities. The case of Greece: An example to avoid

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ARTICLE INFO

Article history:
Received 27 January 2015
Received in revised form
11 May 2015
Accepted 19 October 2015
Available online 11 November 2015

Keywords:
Rational R.E.S. development
Environmental impact protection
Local rural communities development
Wind energy
Wind parks
Photovoltaic

ABSTRACT

Since 2009, an anarchic policy has been followed by the investors regarding the submission of a large number of applications in Greece for the construction of electricity production projects from Renewable Energy Sources (R.E.S.). Applications and licenses without any strategic design, usually of extremely large size in relatively small insular territories, often violating several environmental or cultural constraints defined in the relevant legislation. Applications and licenses that have been submitted without informing the local communities, neglecting the existing industrial, agricultural or domestic activities, the land properties and, consequently, provoking the common sense and reverting the generally positive common attribute about R.E.S., recorded in Greece before 2008.

These applications and licenses exhibit low maturity, characterized by violation of environmental constraints, disapproval of local communities, inadequacy to procure the required land properties and lack of R.E.S. potential measurements. Ultimately, they exhibit very low probabilities to be implemented. Furthermore, all these premature applications cover large geographical territories, preventing thus other mature and more realistic R.E.S. projects from applying for licensing. Consequently, the existing applications and licenses, instead of promoting the R.E.S. development in Greece, continue to keep it steady.

This article aims at the investigation of the causes that resulted in the above described negative reality. Potential deficiencies of the existing legislative framework are analyzed. Some characteristic examples of the submitted applications or issued licenses are presented and their technical and economic feasibility is evaluated.

Finally, the article proposes measures for the rational development of R.E.S. electricity production projects in Greece. These measures aim to combine the maximization of the R.E.S. development with the protection of the local communities. Furthermore, they aim to support the participation of local investors and public organizations in the R.E.S. projects. This perspective will maximize the social and economic benefits to the local communities.

Contents

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http://dx.doi.org/10.1016/j.rser.2015.10.029
1364-0321/

1. Introduction

1.1. Renewable Energy Sources: a means for development

The Renewable Energy Sources' (R.E.S.) potential in Greece – mainly the wind potential and the solar radiation – has been evaluated during the last 30 years with hundreds of measuring stations. The results of these stations indicate that Greece should be placed among the richest countries in the world, regarding the available primary energy sources [1–10]. Annual averaged wind velocities higher than 10 m/s are often measured mainly in the insular country, while the annual global irradiation is recorded higher than 1900 kW h/m^2 [1–10]. The annually available R.E.S. potential in the Greek territory (especially in the islands) on the one hand outgrow the annual electric [11–15], thermal and mechanical energy demand and, on the other hand, can be a fundamental exportable product, capable of becoming the locomotive lever for the recovery of the Greek national economy. Consequently, the available R.E.S. in Greece constitute a potential source of wealth that can boost the development of the country.

The approach to the two above targets (national energy autonomy and economic development based on the exploitation of the available R.E.S. potential) is a multi-parametric procedure, with parallel prerequisites that should be satisfied, such as:

- the optimum exploitation of the R.E.S. potential per geographical territory, based on the optimization of the overall siting of R.E.S. projects;
- the minimization of the impacts on the existing land uses and human activities;
- the environmental protection;
- the maximization of the contribution to the economic and social growth of the local communities, leading to a consequent contribution to the development of the national development.

Focusing on the electricity production projects from R.E.S., the successful approach to the above directions can be achieved following the steps presented below:

1. The design of a national plan for the siting and the development of R.E.S. projects, setting the targets and defining the restrictions for R.E.S. projects construction, taking into account, except from the availability of R.E.S. potential, environmental issues, as well as the existing human activities in a geographical territory [16–20]. This first step aims, on the one hand, to guarantee that first of all the locations with the maximum available R.E.S. potential will be exploited, minimizing, on the other hand, any potential impacts on the natural environment and the existing human activities.
2. For special cases (e.g. autonomous geographical territories, such as islands or territories with environmental, historical or cultural peculiarities), the design of specific siting plans for the construction of R.E.S. projects [21,22]. This second step actually constitutes a region-specific adaptation of the previously proposed national plan, in cases of areas with considerable historical, environmental and cultural interest.
3. For the offshore wind parks, for obvious reasons arising from the occupation of a common good like the sea with several professional and recreational uses, the definition of specific areas for the projects' construction [23,24]. This third step also constitutes another specificity of the national siting plant, in cases of offshore wind parks.
4. The enacting of a clear, complete and objective legislative framework, regarding the licensing procedure of the R.E.S. projects, free from obscurities and ambiguous meanings [25–27]. This step aims to introduce certain regulatory measures to accelerate the licensing of the most mature R.E.S. projects applications. Such regulatory measures will be described in Section 3.
5. The introduction of specific measures in the relevant legislation for the maximization of the economic benefits for the local communities from a R.E.S. electricity production power plant [28–30]. The development of the local communities' economies will set the basis for the development of the national economy, as well. Such regulatory measures will be described in Section 3 too.
6. The introduction of specific regulatory measures to protect the small, autonomous, geographical territories, such as islands, from the construction of large size R.E.S. projects, which, by outgrowing the local energy demand, reinforce the development of energy monopolies and exclude the local investors and organizations from the participation in local R.E.S. investments [31–34]. Without these protective measures, no investing opportunities on R.E.S. power plants will be available for local Municipalities and investors of small size for their own geographical territory.
7. The introduction of specific regulatory measures and motives in the relevant legislation for the participation of the local Municipalities in the required investments. Given the positive conditions created by the above proposed actions, this final step aims to introduce specific supporting regulatory and funding measures towards the participation of local Municipalities in R.E.S. projects investments. Such participations will maximize the economic and social developmental benefits for the local communities [35–38].

1.2. The existing reality

By comparing what has been achieved in Greece to the above proposed steps, it is realized that:

1. Only the design of a national siting and development plan about R.E.S. electricity production projects has been introduced [39]. This plan constitutes a complete tool for the siting of the required works, providing a definite frame for their co-