

# WAYS TO SUPPORT THE DEVELOPMENT OF REGIONAL RENEWABLE ENERGY PROJECTS IN THE EUROPEAN UNION

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## Abstract

The topic of the management of regional renewable energy projects and their implementation and development is highly debated nowadays. Therefore, the aim of this study is to reveal recent research focused on the means of supporting regional renewable energy projects in the European Union. Firstly, some success factors for the development of regional renewable energy projects are revealed, and secondly, the main instruments for supporting the implementation of regional renewable energy projects are analyzed. The findings of this study reveal that there is a need for cooperation between the private companies and public authorities, and moreover, policy goals can be achieved by using a large variety of instruments and supporting schemes. The results of this study may be helpful for upcoming research in the area of implementing renewable energy projects at regional level.

**Keywords:** Renewable energy, Regional projects, Success factors, Policy instruments.

## 1. INTRODUCTION

The issues of renewable energy and regional development have gained a global dimension, as well as the concerns about the economic growth. Nowadays all European regions are interdependent in terms of guaranteeing energy supplies and creating stable economic conditions. In this context, the debate regarding the means by which to support the development of regional renewable energy projects has involved more and more companies and public authorities. All actors are playing an essential role in managing this change, at local, regional, national and European level.

This study investigates the issues of supporting the regional renewable energy projects with an eye to reveal the need for cooperation between the private companies and the public authorities in this sensitive sector of the economy. Therefore, some success factors for the development of regional renewable energy projects, which involves both private companies and public authorities, are revealed firstly, and the main instruments for supporting regional renewable energy projects' implementation are disclosed secondly.

The research was conducted using a large variety of sources, such as strategies, regulations, as well as research reports and articles. The research question was answered by analyzing and evaluating published sources, and by interpreting and reorganizing concepts. Answering the research question was difficult, due to the variety of approaches, concepts and definitions found in the literature.

## 2. SUCCESS FACTORS FOR THE DEVELOPMENT OF REGIONAL RENEWABLE ENERGY PROJECTS

Urban management in more prosperous advanced countries is rapidly and seriously transiting from conventional to sustainable energy technologies (Ingwe et al., 2009). Nowadays, a wide variety of technologies provide energy from different renewable sources, such as biomass, wind, solar, hydro, and geothermal sources that have their unique technologies which convert the energy of the resource into a usable form. The elements that differentiate those sources from the conventional ones is their strong spread of the exploitable potential over quite extended areas and the immediate dependence of the season and weather conditions.

Currently, various problems and requirements of the society and of the development of cities and regions may be solved by using renewable energy. Therefore, one of the prioritized areas that may be taken into account in the urban development of cities is the management of the renewable and alternative energy (Hernandez Moreno, 2009: 126).

The development and implementation of regional renewable energy projects may be based on the natural advantage concept, which is a process that integrates innovation and sustainability policies and actions at a regional scale. The natural advantage manifests in three overlapping areas: (1) policies and initiatives for ecological modernization and cleaner production in industry, government, and civil society; (2) conservation and restoration of natural systems and maintenance of ecosystem services; and (3) innovation, knowledge transfer and partnerships between public, private and community based organisations (Potts, 2010: 714). Therefore, we can identify some success factors for the development of regional renewable energy projects, which involves both private companies and public authorities (figure 1).

Within the knowledge-based economy there is a strong correlation between human capital, knowledge, education, economic growth and regional development of renewable energy. The new economic growth models are connected to other more dynamic factors, as: human capital, knowledge, research and development, innovation and entrepreneurship. Innovation, knowledge and innovation capacity are essential elements in achieving the regional sustainable development (Ionescu and Moga, 2010). Geographic position and natural resources are not key concurrence advantages anymore, because knowledge and abilities of employees are becoming key factors for success (Mandic et al., 2010).

The persistent durability of regional successes and failures, as well as of the digital divides, suggest that only the knowledge regions may be good "hosts" to the (networked) knowledge-based economy (Alfirevic et al., 2009). Moreover, learning ability and innovations making are considered key factors of the regional development in institutional economics (Hajkova and Hajek, 2010). In this context, universities can have the

largest impact on regional economic growth by excelling in advanced research and by augmenting the region's stock of human capital (Popa et al., 2010). Under the regional development, the innovative process is more important than innovation production, because it potent the human capital.

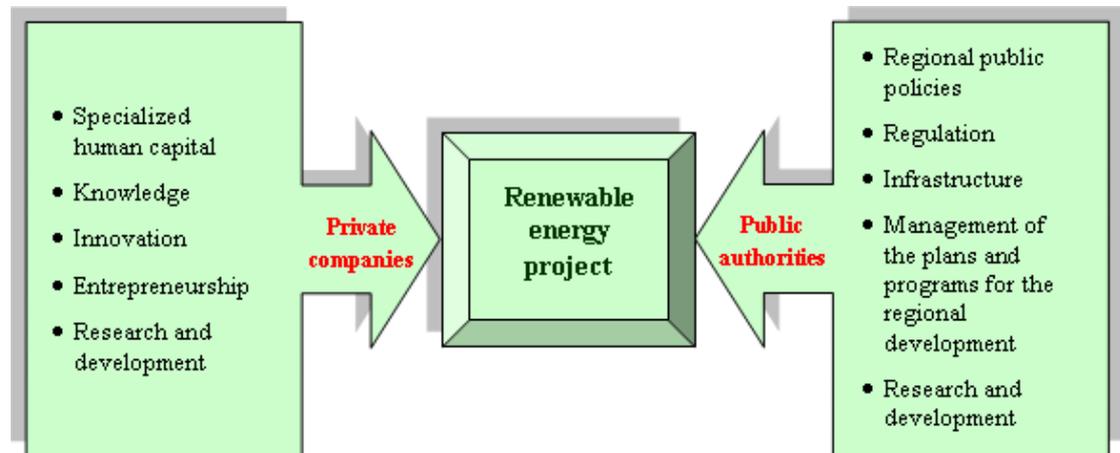


FIGURE 1 – SUCCESS FACTORS FOR THE DEVELOPMENT OF REGIONAL RENEWABLE ENERGY PROJECTS

Regional innovation relies on knowledge-based approaches that involve the willingness and ability of private companies and public institutions to interact and exchange knowledge and skills. Across the economy and across the region, processes of learning and exploring may lead to developing new products, services, and markets, entrepreneurial activity, and encouraging regional diversification and employment (Potts, 2010: 715).

On the other hand, the development of regional renewable energy projects depends on the regional public policies, the infrastructure, specialized human resources and management of the plans and programs of urban development, in addition to other tools, such as methodologies and procedures that help their application. Furthermore, regulation and rules play an important role in the use and advantageous exploitation of renewable energy, as well as the way to apply public policies in the region does (Hernandez Moreno, 2009: 138).

### 3. INSTRUMENTS FOR SUPPORTING REGIONAL RENEWABLE ENERGY PROJECTS' IMPLEMENTATION

Both emerging and developed economic theories have concerned, among other issues, the extent to which the state must interfere in the development of market mechanisms. All recognize the need for government intervention to achieve market balance (Hotaran, 2011: 62).

Policy frameworks and regulatory drivers play a significant role in stimulating the development of regional renewable energy projects. The opportunities for establishing economic growth through innovation and a sustainable competitive energy policy have been recognised. Therefore, the European Commission and the

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Member States should support national and regional development measures in the field of renewable energy, encourage the exchange of best practices in production of energy from renewable sources between local and regional development initiatives and promote the use of structural funding in this area (The European Parliament and the Council of the European Union, 2009: 16).

Policies to support renewable energy and energy efficiency need to be adapted to the features of different regions, the circumstances prevailing there and the potential for the development of new energy sources (Applica & Ismeri Europa, 2011: 10).

According to Gan et al. (2007), a general tendency in European Union is that policies shift emphasis from research and development stimulation towards dissemination and market application of renewable energy technologies. Furthermore, the European Union recognizes that demonstration and commercialisation phase of decentralised renewable energy technologies should be supported. The move towards decentralised energy production has many benefits, including the use of local energy sources, increased local security of energy supply, shorter transport distances and reduced energy transmission losses. Such decentralisation also fosters community development and cohesion by providing income sources and creating jobs locally (The European Parliament and the Council of the European Union, 2009: 16).

The instruments used to support regional renewable energy projects' implementation are usually grouped in more categories, the most widespread formula being direct instruments (figure 2) and indirect instruments (figure 3).

Direct instruments could be financial measures or regulations, while indirect measures are represented by actions taken in other sectors that could influence the use of renewable energies, such as: education, information, standards. Taxes, subventions, environmental product marking, and green certificates are only some examples of such environmental instruments. The decision on what kind of instruments should be used is a very important one, as the instrument to be used will influence the outcome and the public expenses. How the decision is taken depends on the criteria used for the evaluation of the policy instruments. Usually, several criteria are used, and the final decision depends on how much weight is given to each criterion.

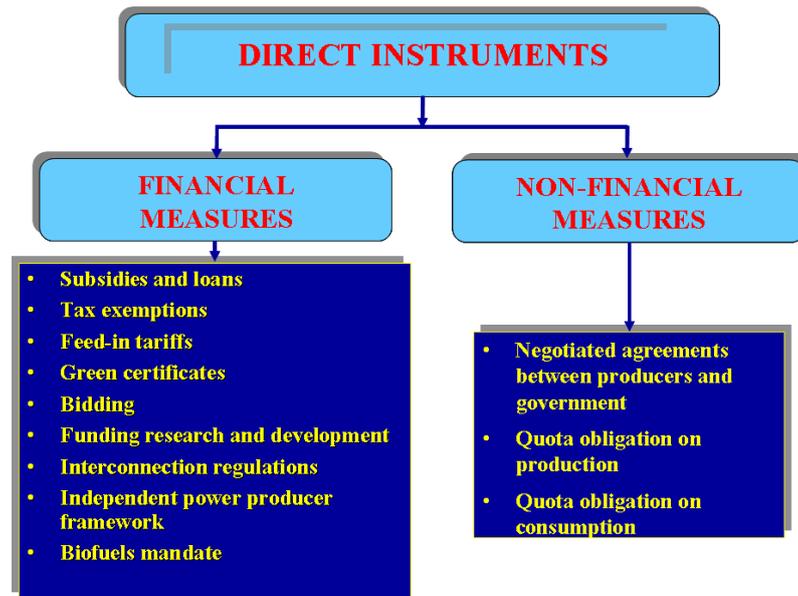


FIGURE 2 – DIRECT INSTRUMENTS FOR SUPPORTING REGIONAL RENEWABLE ENERGY PROJECTS' IMPLEMENTATION

Electricity generation from renewable energy sources is promoted within the European Union by using different groups of support systems: feed-in tariffs, quota often combined with tradable green certificates, tender, and tax incentives or investment grants (Ragwitz et al., 2004; Pfaffenberger et al., 2006; Ragwitz et al., 2006; Valle Costa et al., 2008). The dominant instruments for promoting the generation of electricity by renewable energy sources have been feed-in tariffs and quota with green certificates.

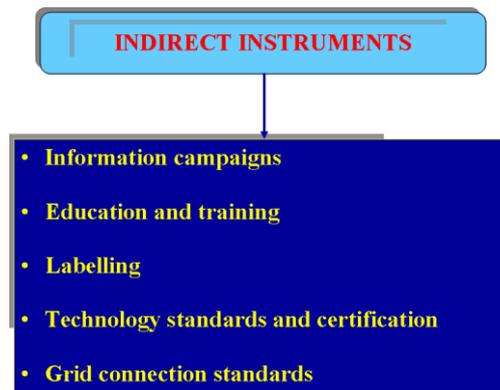


FIGURE 3 - INDIRECT INSTRUMENTS FOR SUPPORTING REGIONAL RENEWABLE ENERGY PROJECTS' IMPLEMENTATION

Feed-in tariffs are used by the majority of European Union's member states for promoting electricity generation from renewable energy sources. For instance, in Germany, Spain and Denmark they have been successful in supporting the expansion of wind, biogas and solar power production (Ragwitz et al., 2004; Ragwitz et al., 2006). According to Ragwitz et al. (2006), this system allows independent electricity generators to sell green electricity at a fixed tariff for a determined period of time. The main advantages of feed-in tariffs system are the long-term certainty about receiving support, which may significantly reduce investment risks, and the possibility of early market diffusion of less mature technologies, which may reduce

costs for society in the long term. However, the system of feed-in tariffs was frequently criticised for not stimulating competition among electricity generators to a sufficient degree to bring down the costs of renewable energy technology investments (Ragwitz et al., 2004).

Green certificates or electricity certificate systems or quota obligations are used in several countries within the European Union (such as Sweden, Romania, Belgium, etc.) and are based on the principle of imposing minimum shares of renewable electricity on consumers, suppliers or producers (Ragwitz et al., 2004; Ragwitz et al., 2006). Compared to feed-in tariffs, quota systems are strongly market-oriented policy systems (Ragwitz et al., 2006), based on the interaction between the supply and demand of certificates. The producers receive additional revenue from certificates, in addition to that from the sale of electricity. This support system encourages expansion of the most efficient types of renewable electricity generation, but there is a risk of supporting only lower-cost technologies, as forecasting the price of green certificates over a long period of time is difficult. A particular case in the European Union is Latvia which uses a quota system without certificates that includes elements of quota system and tenders. The Latvian system is based on quotas established yearly, determining the amount of installed capacity from renewable electricity that may be produced within the country.

The tender scheme, that has been used in the United Kingdom and Ireland and is still used only in France, is a quantity-driven mechanism (Ragwitz et al., 2006), meaning that the state calls for offers from companies wanting to supply renewable electricity on a contract basis at a particular price. The company submitting the most competitive tender receives the contract, and the consumers who purchase the electricity have to pay a fee element covering the additional costs arising in connection with production of the renewable electricity. The main advantage of the tender system is related to the awareness of renewable energy investment opportunities (Ragwitz et al., 2004). Nevertheless, the market uncertainty and the risk of not covering the cost of electricity production through tenders lead to a much lower penetration of renewable energy sources than expected.

Tax incentives form a group of policy measures that include tax relief, exemptions from energy tax, grants and investment support (Ragwitz et al., 2006). Frequently, these mechanisms are used in order to complement other types of policy measures for promoting renewable energy sources. For that reason it is difficult to evaluate the results of the tax incentives as instruments for promoting renewable energy sources.

Policy instruments used to support renewable energies do not make any difference among various types of renewable energy sources. There are countries in the European Union where only one instrument is used to support wind onshore, biomass, biogas, small hydro and solar energy (Ragwitz et al., 2006; Federal Ministry for the Environment, Nature Conservation and Nuclear Safety – BMU, 2008; Valle Costa et al., 2008). For instance, Austria, Denmark, Estonia, Portugal, Spain, Hungary and Lithuania use feed-in tariff as the only

instrument to support all five renewable energy sources. For these renewable energy sources different instruments are used in different countries and all instruments could support each one of the renewable energy sources. Each country could choose any instrument or mix of instruments to promote renewable energy sources, taking into consideration the local conditions of renewable energy sources, the costs and the target for market penetration.

The use of renewable energy sources is stimulated in most countries by more than one instrument. This statement is based on surveying the support schemes applied by the different European Union countries to stimulate renewable energy development. National support is essential in order to ensure the development of renewable energy sources. A wide range of policy instruments are mixed support schemes, which vary among member states. Generally, a mix of instruments is essential and a key to success.

Information on support measures should be available to all relevant actors, such as consumers, builders, installers, architects, and suppliers of heating, cooling and electricity equipment and systems and of vehicles compatible with the use of energy from renewable sources. Member States, with the participation of local and regional authorities, shall develop suitable information, awareness-raising, guidance or training programmes in order to inform citizens of the benefits and practicalities of developing and using energy from renewable sources (The European Parliament and the Council of the European Union, 2009: 34).

These instruments may manifest at the local, regional or national scale and can take the form of new regulations or policies such as energy efficiency measures, market based instruments (such as subsidies or emissions trading schemes), and educational tools, strategies or networks that increase knowledge transfer. It is critical to encourage the development of sustainable products and services using a “whole of society approach” with contributions from civil society, business, government, and educational institutions (Potts, 2010: 716).

Nevertheless, the competition on the energy market may be hindered by the vertically integrated companies which operate on this market and have access to the distribution network. A company that controls the distribution network, and is also a player on the electricity market could be interested and could have the ability to impose terms and conditions relating to the access to that network in order to reduce the competition on the competitive energy market (Corbos, 2011: 72).

Public support is needed to reach the Community’s objectives with regard to the expansion of electricity produced from renewable energy sources, in particular for as long as electricity prices in the internal market do not reflect the full environmental and social costs and benefits of energy sources used. To obtain an energy model that supports renewable energy there is a need to encourage strategic cooperation between Member States, involving, as appropriate, regions and local authorities (The European Parliament and the Council of the European Union, 2009: 19-20).

#### 4. CONCLUSIONS

This study has revealed that there are some success factors for the development of regional renewable energy projects, which involves both private companies and public authorities. On one hand, there is a strong correlation between human capital, knowledge, education, economic growth and regional development of renewable energy. On the other hand, the development of regional renewable energy projects depends on the regional public policies, the infrastructure, specialized human resources and management of the plans and programs of urban development, in addition to other tools, such as methodologies and procedures that help their application.

Another conclusion of this study is that policy goals in the renewable energy field could be achieved by using a large variety of instruments and supporting schemes. This conclusion is based on the premises that (1) the local conditions of renewable energy sources, the costs and the target for market penetration influence one country's option for one instrument or a mix of instruments; (2) various instruments are used in different countries and all instruments could support each one of the renewable energy sources; (3) countries with more experience in this field use a variety of supporting schemes; and (4) policy instruments complement each other in achieving renewable energy policy objectives.

Information on support measures should be available to all relevant actors, and thus some awareness-raising campaigns may be developed, as well as guidance or training programmes in order to inform citizens of the benefits and practicalities of developing and using renewable energy.

The results of this study may be helpful for upcoming research in the area of implementing renewable energy projects at regional level.

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