

## Managing Renewable Energy: The Romanian Practice

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### *Abstract*

*There are several support systems used by the governments of the European Union's countries for the promotion of renewable energy. The aim of this study is to explore the Romanian managerial approach used to encourage the renewable energy generation and consumption. First part of the study is focused on revealing the variety of national support systems used within the European Union to encourage renewable energy, and furthermore, the second part of the study explains the Romanian approach. The paper provides a rational approach for finding solutions to the problems of renewable energy promotion in the European Union. The findings of this study may be the subject of managerial know-how international transfer and may be used as a starting point for further investigations on renewable energy endorsement.*

**Keywords:** *renewable energy, policy instruments, good practices, green certificates, Romania's economy*

### **Introduction**

This study examines how renewable energy could be supported by the governments of the countries within the European Union. In order to achieve this aim the study presents the Romanian managerial approach used to encourage the renewable energy. The main factors that may be considered when a support system like the Romanian one is being put into operation are revealed in this study and this may help policy makers to take the most convenient decision for their countries.

The study was carried out by combining a broad range of sources, such as regulations, energy policy documents, as well as reports and articles. In order to answer the research question the background from the point of view of national support systems was outlined and furthermore, the Romanian national system was presented. The research question was answered by analysing published sources and interpreting evidence.

## 1 Background

Renewable energy is a highly debated topic nowadays. The world energy scenario was deeply changed in the last few years and the attention has been moved on the environmental effects of the energy generation trying to establish a connection between energy, development and sustainability (Leva and Zaninelli, 2006). Contemporary society acknowledges both the value of renewable energy and the challenge of its use. There are at least four reasons for valuing renewable energies: first, society relies mainly on fossil fuels, which are limited and non-renewable; second, fossil fuels will be exhausted in a foreseeable future; third, the use of fossil fuels has generated environmental effects that negatively affect social well-being beyond acceptable limits; fourth, renewable energy could satisfy the needs of modern society in terms of consumption and environmental impact. Using renewable energy sources is challenging because it has some very serious drawbacks of which low economic competitiveness is the most important.

European Union is applying a range of policy instruments to encourage electricity from renewable energy sources. 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 (Gan et al., 2007).

Various environmental instruments to bring nature closer to an environment friendly consumption are being introduced by several governments (Pozeb and Kroppe, 2007). The instruments used to promote renewable energy sources are usually grouped in more categories, the most widespread formula being direct and indirect instruments (table 1). 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 etc. are only some examples of such environmental instruments. The green certificate system is a specific financial mechanism to encourage renewable energy sources.

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. Policy instruments used to support renewable energies do not make any difference among various types of renewable energy sources thus how the decision is taken depends on the criteria used for the evaluation of the policy instruments. Generally, several criteria are used, and the final decision depends on how much weight is given to each criterion. 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. Therefore, there are countries in the European Union where only one instrument is used to support wind onshore, biomass, biogas, small hydro and solar energy. Also, there are countries where a mix of instruments is

used. However, some instruments are more suitable than others for different renewable energy sources.

### Policy instruments for renewable energy sources promotion

Table 1

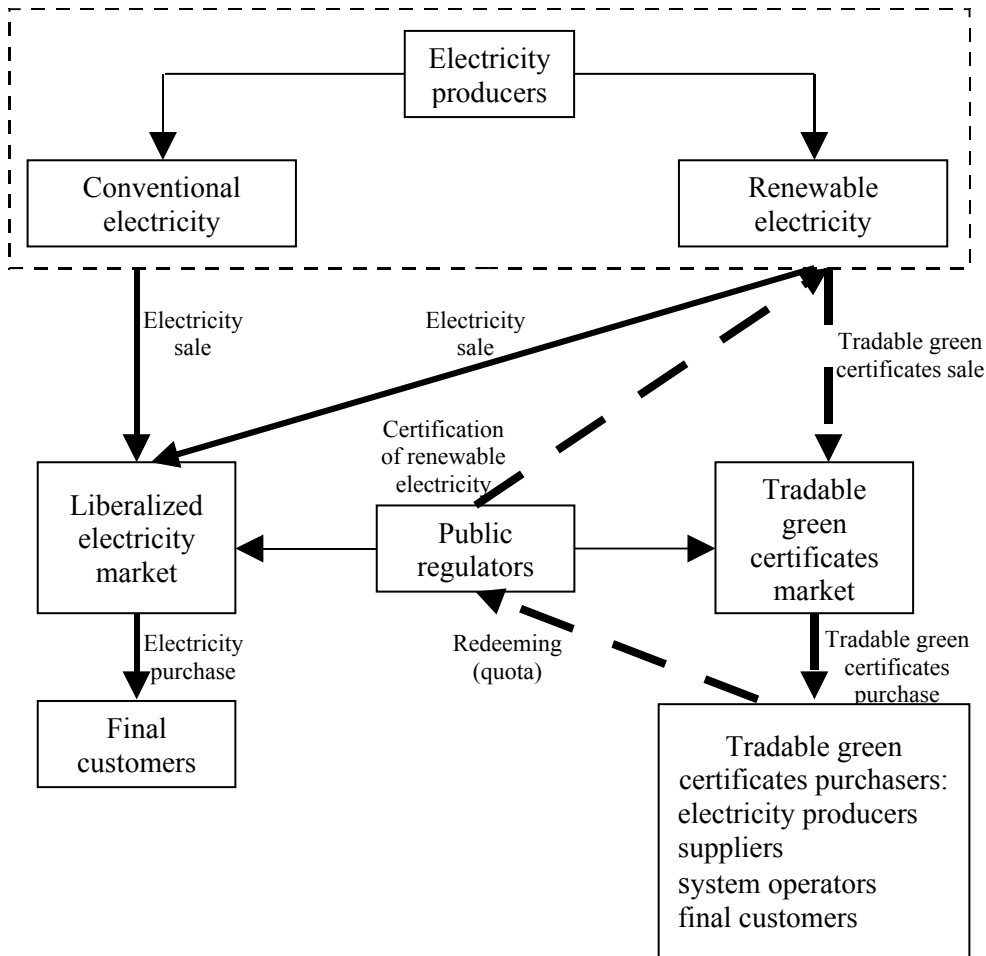
NO.	SUPPORT TYPE	INSTRUMENT	
1.	DIRECT INSTRUMENTS	Financial measures	Subsidies and loans
			Tax exemptions or advantage
			Feed-in tariffs
			Green certificates
			Bidding
			Funding research and development
			Interconnection regulations
			Independent power producer framework
		Non-financial measures	Negotiated agreements between producers and government
			Quota obligation on production
Quota obligation on consumption			
2.	INDIRECT INSTRUMENTS		Information campaigns
			Education and training
			Labelling
			Technology standards and certification

The dominant instruments for promoting the generation of electricity by renewable energy sources have been feed-in tariffs and quota with green certificates. These two instruments were also found as having high effectiveness (Dijk et al., 2003). Feed-in tariffs are used by a majority of European Union's member states for promoting electricity generation from renewable energy sources. For instance, Austria, Denmark, Estonia, Germany, Portugal, Spain, Hungary and Lithuania use feed-in tariff as the only instrument to support wind onshore, biomass, biogas, small hydro and solar energy (Ragwitz et al., 2004; Ragwitz et al., 2006; Swedish Energy Agency, 2008). Green certificates or electricity certificate systems or quota obligations are used in several countries within the European Union such as Belgium, Italy, Latvia, Netherlands, Poland, Romania, Sweden, and United Kingdom.

## 2 The Romanian practice in managing renewable energy

**In order to promote renewable energy, Romania introduced since 2004 a quota system with tradable green certificates.** The rationale of setting up a green certificates market is to bring in competition between green electricity producers. By this means, policy makers are ensuring that a given green quota is

met in the most cost-effective manner. A tradable green certificates system directs electricity generation from green sources to produce two distinct commodities (figure 1): one is electricity, which is sold on the normal electricity market, and the other is represented by green certificates, which are traded on a green certificates market (NERA Economic Consulting, 2005).



**Figure 1 General scheme of the tradable green certificates market**

Source: Adapted from Krook and Nouri, 2005: p. 2

A tradable green certificates system allows selling electricity generated from renewable sources at market prices, as conventional electricity. The additional cost for generating electricity from renewable sources is covered by the sale of green certificates. This means that a complete new market for green electricity is created. It is a market for green certificates that is separated from the electricity

market. Those certificates are bought by electricity suppliers at a price that depends on a quota – targeted quantity – of green electricity (Krook and Nouri, 2005).

A tradable green certificate is a market-oriented instrument to achieve targets for renewable electricity generation in deregulated electricity markets (Ford et al., 2007). The basic idea of green certificates is to create a support system where the market decides the level of support given to electricity from renewable energy sources. In a green certificate system producers of renewable electricity receive a certificate for each pre-defined unit of electricity produced (Nilsson and Sundqvist, 2007). Such a certificate represents in general terms the societal or environmental value of the electricity generated from renewable sources.

One of the goals of a tradable green certificates market is the promotion of a mix of renewable sources, some of which may be more attractive from a socio-economic and ecological perspective (Ford et al., 2007). The first rationale for implementing a green certificate system is to give incentives for further investments in electricity production from renewable sources, thus towards building a sustainable electricity production system (Nilsson and Sundqvist, 2007).

A green certificate system may be set up as a voluntary system where demand is more or less directly linked to consumer preferences (like the disbanded Dutch system) or as a mandatory system with quota obligations and penalties (Nilsson and Sundqvist, 2007). **The quota obligation system is a mechanism used to promote the production of electricity from renewable energy sources by means of the acquisition by the suppliers of a specified quota of electricity produced from renewable energy sources in order to sell it to their consumers (OPCOM, 2007a).** The quota obligation can be implemented on the supply side (as has been done in Italy) or on the demand (user) side as has been done in the United Kingdom (quota obligation on retailers) and Sweden (quota obligation on end-users) (Nilsson and Sundqvist, 2007).

**This system could reduce the prices that will be supported by the consumers (Vasilevschi et al., 2008), protecting in the same time the producers of green electricity. The renewable energy sources eligible to participate in the Romanian Green Certificates Trading System are wind, solar, biomass, hydro (hydropower plants with a capacity equal or less than 10 MW), geothermal, waves, and hydrogen produced from renewable energy sources (ANRE, 2007).**

**Green Certificates Market Operator (OPCOM)** is the legal person which assures green certificates trading and determines the prices on the Romanian Centralized Green Certificates Market. On the other hand, the market is regulated by another institution, namely the Romanian Regulatory Agency (ANRE). Romanian Power Grid Company Transelectrica S.A. (TSO – Transport System Operator) is another entity that assures the proper functioning of the green certificates market.

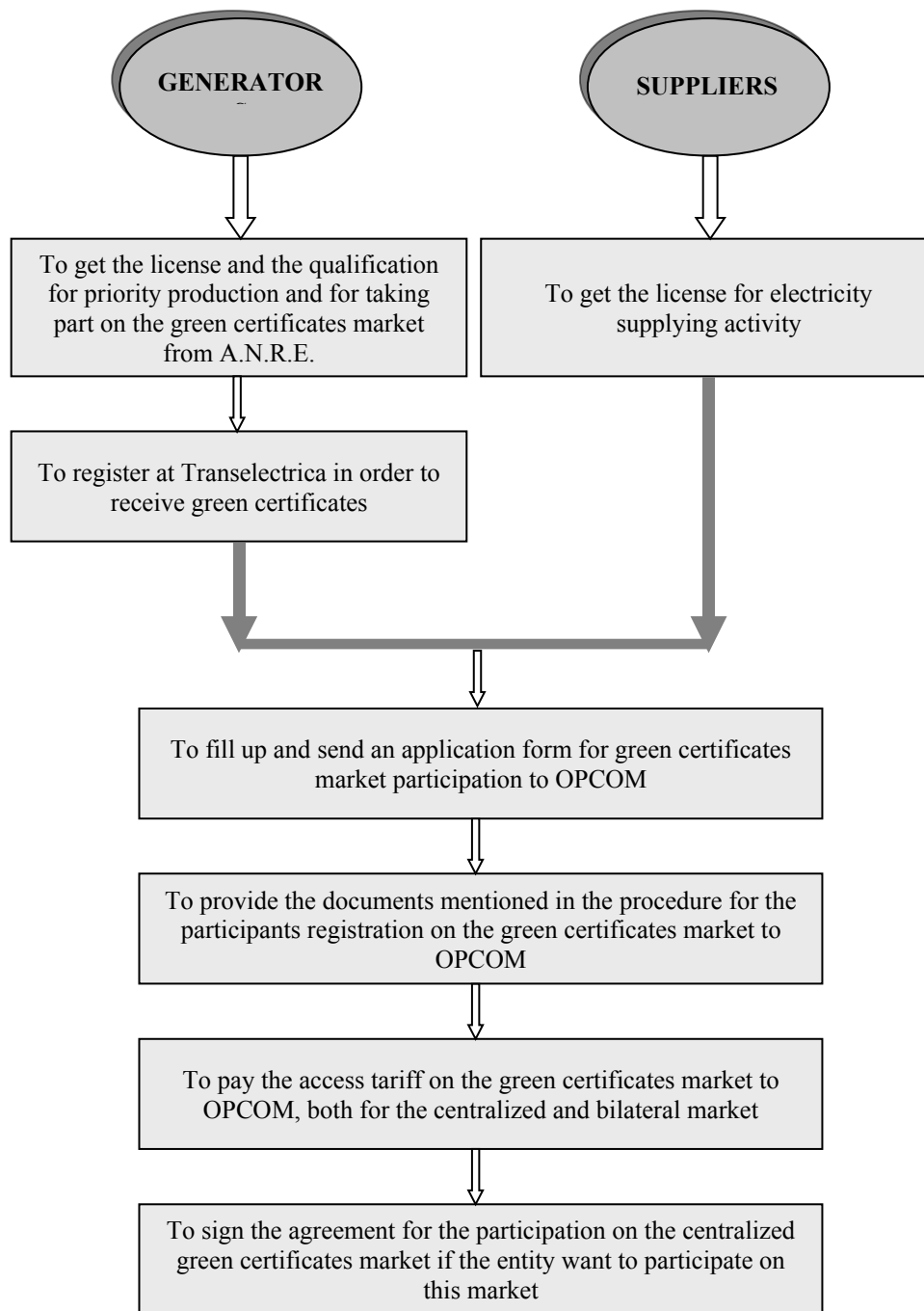
The functioning of the quota obligation system to promote the electricity generated from renewable energy sources supposes the following *phases* (OPCOM, 2007a):

- The Regulator Authority establishes a fixed quota of electricity produced from renewable energy sources which the suppliers are obliged to buy it;
- The Regulator Authority yearly qualifies the producers of electricity from renewable energy sources in order to receive green certificates;
- The producers receive for each unit of electricity delivered into the network (1 MWh), a green certificate, which can be sold separately from the electricity which produced them, on the green certificates market;
- In order to fulfil their obligation, the suppliers have to own a number of green certificates corresponding with the quota of electricity produced from renewable energy sources imposed;
- The green certificates value represents an additional income received by the producers for the “clean” energy that they deliver into the network;
- The price of electricity sold is determined on the electricity market;
- The additional price received for the green certificates sold is determined on a parallel market, separated from the electricity market, where are traded the environmental benefits of the “clean” electricity production.

The producers of electricity from renewable energy sources, who benefit of this supporting instrument, distinctly participate both in the electricity market, through the sale of produced electricity at the market’s price and in the green certificates market, through the sale of the allocated green certificates. It is to point out that electricity is traded separately from green certificates.

Regarding the registration on the green certificates market, the entities wishing to become participants in the Green Certificates Market have to accomplish the steps illustrated in figure 2.

The green certificates value is determined by means of the market mechanisms: through bilateral contracts negotiated between producers and suppliers and on a centralized market organized and administrated by OPCOM. The price of green certificates varies in a range (minimum and maximum price) established by Government Decision. The minimum price is imposed in order to protect the producers and the maximum price is imposed in order to protect the consumers. For the period 2005-2012 the annual minimum and maximum values for green certificates trading are 24 EUR/certificate, respective 42 EUR/certificate, calculated at the exchange course established by the Romanian National Bank, for the last working day of the December of the previous year (OPCOM, 2007a). As a consequence, little investment has moved into renewable energy generation in Romania so far.



**Figure 2 Steps for the registration on the green certificates market**

Source: Adapted from OPCOM, 2007b

As mentioned before, the system of mandatory quotas of green certificates is applied combined with the system of green certificates trading in order to promote renewable energy generation. Annual mandatory quotas of green certificates are of 6.28% for 2009, of 8.3% for 2010-2012, of 9% for 2013, of 10% for 2014, to rise to 16.8% for 2020. Electricity weight produced from renewable sources must account for 33 percent of the gross internal consumption of power in 2010, 35 percent in 2015 and 38 percent in 2020. To attain these targets, the contribution of electricity produced by hydro power stations with installed power higher than 10 MW is also taken into account (AGERPRES, 2008).

In case the suppliers do not comply with the annual mandatory quota, they will have to pay to the Romanian Power Grid Company Transelectrica S.A. (TSO) the value of the green certificates they were unable to buy.

The green certificates system is based on competition market mechanisms, and this could lead to electricity market distortion avoidance. This instrument could help governments to protect both the producers and consumers of electricity generated from renewable energy sources because it is based on the market forces. The result is the limitation of the price rising, avoiding the doubling of the support granted. Also, the green certificates system could be harmonized at the European Union level through common regulations.

### **Conclusions**

This study reveals that several support systems may be used by the governments of the European Union's countries for the promotion of renewable energy. The decision on what kind of instruments should be used is a very important one, as the instrument (s) to be used will influence the outcome and the public expenses. Therefore, the Romanian managerial approach used to encourage the renewable energy generation and consumption, and that is the quota system with tradable green certificates, may be helpful for policy makers. The separate flows of electricity and green certificates traded, the different phases of this system's functioning, and the steps for the registration on the green certificates market are only some factors that should be taken into consideration when this kind of support system is being put into operation.

Another conclusion of this study is that the green certificates system could contribute to a better promotion of renewable energy sources as it is based on competition market mechanisms and thus it could help governments to protect both the producers and consumers. Moreover, the encouragement of using a mix of renewable energy sources through a tradable green certificates market such as the Romanian one may be attractive from a socio-economic and ecological perspective.

The findings of this study may be the subject of managerial know-how international transfer and may be used as a starting point for further investigations on renewable energy endorsement. This could be helpful in order to better address the problems encountered in supporting renewable energy, and may be to harmonize the support systems at the European Union's level.



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