THE USE OF GREEN CERTIFICATES IN THE BANAT REGION

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Abstract: *The economy has developed and specialized itself in different fields of activity and great economists have had the possibility to observe the polluting effects of mankind's activity (which nowadays develops its activity within some local, state and world business enterprises heading at present towards a globalization of the economic activity). Even though the harmful influence of the economic agent's activity on the environment has been noticed for over a century now, only in the last decades new span concepts and actions appeared, such as: sustainable development and national and international policies regarding the environment.Sustainable development pursues and tries to find a stable theoretical framework for making decisions in any situation in which a man/environment type relationship is found (whether it is about the environment or the economic or social medium) and it constitutes the main objective of sustainable development. At present, the concept comprises both the solving of the ecological crisis ensuring the quality of the environment and that of life quality in its complexity, including social and economic aspects. One of these solutions is the introduction of the "green certificates" concept. Its emergence led to the appearance of a competition in the field of energy production from renewable resources. Each green certificate must contain the following information: the quantity of produced energy and its source, a unique registration number and other additional information, if it is required. The validity period of the green certificate is the date on which the energy was already produced and consumed.*

Keywords: *green certificates, sustainable development, renewable energies.*

JEL classification: *Q01, E01, F64,*

The problems related to the population have drawn the attention of scientists ever since ancient times. The main analyzed issues were those related to the depletion of food resources than those of the land and the environmental degradation. If the food resources depletion problems have been solved using scientific progress, the issues related to land resources depletion and those regarding the environmental degradation are currently awaiting resolution.
Man, in his double role as consumer and producer able to create his own resources outside the natural ones compared to the other living beings, does not just represent an environmental component but also a factor modifying it. In this sense, the main economic structures, which are described in Figure 1.2. can be determined, by analyzing the relationship between man and nature.

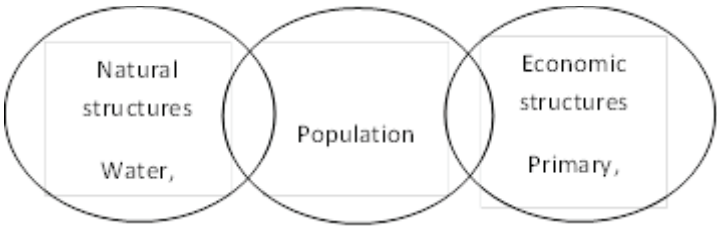

Figure 1: The interdependence of the population with the natural and economic structures
Source: Vert Constantin*, Geografia populaţiei, teorie şi metodologie*, Mirton Publishing House, Timişoara, 2001, p. 11

The population of the XXI century lives longer and has a higher level of education. Precisely, the increase of the level of education has determined the emergence and diversification of some new needs and desires of the people. Successful economic results recorded during history have bore and still borne a burden, which presses the environment and the quality of life, a burden that grows by the day. Despite the fact that population growth rate registers values that are increasingly smaller, global threats on the ecosystem are more numerous and pressing. Table 1.1. presents the global status of the environment since 1927 up to now as well as the forecasts until late 2050.

Table 1: Global status of the environment 1927 – 2050

Global status of the environment 1927 - 2050	**1927**	**1950**	**1972**	**1997**	**2009**	**2025***	**2050***
Population	2	2,5	3,8	5,8	6,8	*8*	*9,4*
Megacities	-	2	9	25	40	*60*	*90*
Food	-	1980	2450	2770	3100	*3400*	*4000*
Fishing	-	19	58	91	120	*150*	-
Used water	-	1300	2600	4200	6000	*7100*	*9000*
Coverage rate of tropical forests	-	100	85	70	60	*45*	-
Elephants	-	6,0	2,0	0,6	0,14	-	-
CO_2 emissions	-	1,6	4,9	7,0	10	-	-
Ozone layer	-	-	1,4	3,0	4,0	-	-

Legend	
1. Billions of people	6. Index of planet coverage with forests 1950 = 100
2. Cities with a population larger than 8 billion people	7. Billions of animals
3. Daily average food production expressed in calories/inhabitant	8. Annual CO_2 emission in billion tones of carbon
4. Annual fish catch in million tones	9. Ozone concentration in the atmosphere
5. Annual water consumption in cubic meters	* - forecasts

Source: WBCSD Global Scenarios 2000-2050, Exploring Sustainable Development http://www.wbcsd.org/DocRoot/FFiAJwjBGGNjlawOAipD/exploringscenarios.pdf accessed on the 25.10.2010 and *Population Reference Bureau 2009* available on-line at http://www.prb.org/pdf09/09wpds_eng.pdf accessed on the 25.10.2010

More specifically, global threats on the ecosystems have begun to be more and more stronger, of these we will try to mention those we consider to be the most menacing, namely: soil erosion, desertification and infertility or low fertility of it, massive deforestation, where world statistical data shows that on average about 10 million

hectares per year disappear from the land surface, massive extinction of plant and animal species mainly due to natural habitat destruction, case in which biologists inform us that about 1,000 species of plants and animals disappear or are about to go extinct due to overfishing and water pollution, situation in which 25 of the main fishing areas not to be left without fish; climatic changes and acid rains occur mainly due to increased concentration of carbon dioxide in the atmosphere, which is a threat not only to plants and animals but also for human health (especially for those in highly industrialized areas) and, not least, the pressure on the natural resources beside the fact that their attainment is highly polluting, they are on the list of exhaustible (*WBCSD Global Scenarios 2000-2050, Exploring Sustainable Development*, available online at http://www.wbcsd.org/DocRoot/FFiAJwjBGGNjlawOAipD /exploringscenarios.pdf)

Energy is one of the most important physical concepts discovered by man. The correct understanding of the energy concept is a necessary condition for the completion of this paper as well as for the analysis and interpretation of the economic effects deriving from its making, both for ensuring electricity and thermal comfort of the people.

According to the explanatory dictionary of the Romanian language (*Dicţionarul Explicativ al Limbii Române*, available online at http://dexonline.ro/definitie/energie) by energy we understand "the capacity of a system to perform mechanical work, when changing from one state to another". Another definition still given by the Romanian dictionary is the one which states that energy means "force, power, strength, vigor, the ability to act". As the definition says, energy means power, which inevitably in our economic analysis makes us think growth, development and economic progress. Even more, if we compare the rate of energy consumption growth in comparison to the Gross Domestic Product, we will observe that between these there is a directly proportional connection. For example, in the United States of America, for each dollar of the GDP corresponds on average 95.000 BTU's (one BTU equals 1055 joules) of used energy, phenomenon that occurs not only in the USA but also in other countries of the world as can be observed from the below figure (Simon L. Andrew, *Energy Resources*, Pergamon Press Publishing House, London, 2011,)

Furthermore, we could say that energy is for some time now a basic need of humanity, without which under the current circumstances set by modern society the individual could barely survive.

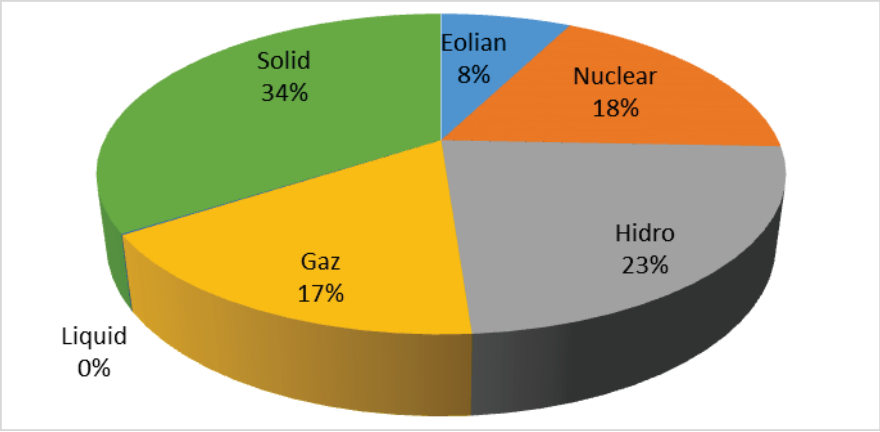

Figure 2: GDP versus used energy

Source: Simon L. Andrew, *Energy Resources*, Pergamon Press Publishing House, London, 2011, p. 6

Simon Andrew defined energy as "a key element in economic development", which he considered it will register an upward almost without stopping tendency, as long as we will want the achievement of a growth, of a development or of an economic progress, the only difference will be the way to accomplish it (Simon L. Andrew, *Energy Resources*, Pergamon Press Publishing House, London, 2011)

In respect to the cataloguing of the resources necessary for the production of energy, we believe that the most important criterion besides their classification is their degree of renewability and according to it we will group the resources in two categories: renewable and nonrenewable. Renewable resources are those that can be cyclically exploited and are practically inexhaustible, while nonrenewable resources can only be used in a single production cycle and they are limited as quantity, so their use leads to exhaustion. Fossil fuels are part of this category.

First of all when we refer to the classification of the non-polluting resources we take into account the source of these. In the following, we will list the main types of unconventional resources, which we will detail in the next pages: solar energy, fossil fuels energy, hydropower, wind power, geothermal and nuclear energy.

World Council of Energy (*Comitetul Național Român al Consiliului Mondial al Energiei*,) presented numerous scenarios, which meet future energy requirements and that put the emphasis on economic development, technological progress, environmental protection and international ethics. Between 1990 and 2050, the consumption of primary energy is projected to increase by 50% in line with the other real solutions of environmental protection and by 275% in line with the highest rate of economic growth. In scenarios that take into account environmental protection, carbon emissions are expected to slightly decrease below the 1990 level, compared to the high rate of economic growth scenarios that lead to the doubling of the carbon emissions.

Aware of how important is the development of a clean energy sector, overall investments in renewable energy have increased in recent years from 39 billion dollars in 2005 to 55 billion dollars in 2006, in 2007 100 billion dollars and it is expected to continue its upward trend. According to an EU directive Member States must gradually hybridize traditional fuel used in biofuels transport, so that by 2020, biodiesel will represent 20% of the diesel market (Antal Cornel, coord., *Utilizarea durabilă a resurselor regenerabile de energie. Energia geotermală*, Risoprint Publishing House, Cluj Napoca, 2010)

Unlike conventional forms, unconventional energy starts from the extremely simple idea that in the directly accessible to human knowledge space there is insufficient energy that manifests itself in one form or another. It just needs to be identified, captured and possibly transformed in the desired form. Simplifying things eventually all comes down to cost issues and conversion efficiency.

The green certificate is, according to the OPCOM-Romanian Gas and Electricity Market Operator definition, a “document which attests that a quantity of 1MWH electricity was produced using renewable energy sources”.

Green certificates have been defined for the first time in the Electricity Act made in 1998 in order to support energy production by using hydropower, wind, solar and biomass resources but without using fossil fuels. At the beginning these resources were meant only for internal usage, but due to the fact that for 6 months only in Germany these certificates were used, situation in which the European target regarding the reduction of greenhouse gas emissions could not be reached, the training of these extended internationally but in accordance with the following principles (Lovinfosse de Isabelle, Varone Frederic, *Renewable Electricity Policies in Europe. Tradable Green Certificates in Competitive Markets*, Press Universitaires de Louvain Publishing House, Belgium, 2004): reciprocity, double subvention is not accepted, the careful checking of the data

and of the manner in which the energy is produced, the attestation of the country's ability to import green certificates, etc.
As regards the price of these green certificates this ranges between a minimum and maximum variant established by Government Decision. Setting a minimum price has as purpose the protection of the producers while the minimum one the protection of the consumers. More precisely, for the 2008-2014 period the trading value of green certificates in Romania registers a minimum value of 27 Euros/certificate and a maximum of 55 Euros/certificate. As for the value of the exchange rate at which the transaction is made, it was taken into account the exchange rate in the last month of the previous year set by the National Bank of Romania.
Another important aspect of these certificates is the features that they must have, features that were identified and detailed by the economist Halfdan Wilk and namely (Wilk Halfdan, *Green Certificate Systems and a Greenhouse Gas Emission Permit Trading Systems*, Nordic Council of Ministers Publishing House, Copenhagen, 2003):

1. to have a unique registration number, by means of which the used energy source to be identified,
2. the certificate must be issued by a competent authority,
3. each certificate has a maximum validity period of one calendar year (Lovinfosse de Isabelle, Varone Frederic, *Renewable Electricity Policies in Europe. Tradabile Green Certificates in Competitive Markets*, Press Universitaires de Louvain Publishing House, Belgium, 2004),
4. the certificates must be issued electronically.

In Romania, based on the Decree no. 15-2005 of the Regulatory Authority for Energy, OPCOM-Romanian Gas and Electricity Market Operator operates and whose role is to trade, coordinate and making efficient these certificates as well as to determine their price. It was set up on the 15th of August 2000 as a joint stock company.
A "system of mandatory shares" was set in order to promote the attainment of clean energy, which works like this:

- a certain share of energy from unconventional resources is set by the competent authority, which subsequently is sold by the energy producers,
- producers receive for each 1MWh of produced and delivered energy a green certificate, which can be marketed on the Green Certificates Market,
- the need to have green certificates arises from the obligation of each manufacturer to achieve an amount of energy equal to the number of held certificates,
- as for the price of the obtained energy, this is determined on the energy market.

For the 2008-2020 period the mandatory shares of green certificates are presented in the table no. 2.

Table 2: The evolution of the mandatory shares of green certificates during 2008-2020

Year	Share	Year	Share
2008	5,26%	2016	12,0%
2009	6,28%	2017	13,2%
2010-2012	8,3%	2018	14,4%
2013	9,0%	2019	15,6%
2014	10,0%	2020	16,8%
2015	10,8%		

Source: *Operatorul Pieţei de Certificate Verzi*, available online at http://www.opcom.ro/opcom/uploads/doc/PCCV/PCV_Descriere.pdf, accessed on the 24.08.2012

The necessity to set mandatory shares for a longer period of time represents a way to attract foreign investors, because based on these shares the necessary forecasts regarding their price can be made(Kyritsis S., *1st Word Conferences on Biomas for Energy and Industry*, James&James Publishing House, Germany, Munich, 2000).

Case study

Banat region is a territorial-administrative unit, which covers the territories of the following counties: Timiş, Caraş-Severin and part of Arad County. As regards the resources of fossil fuels existent in this region, coal and methane gases are the most abundant, especially in the sub- region of Reşiţa.

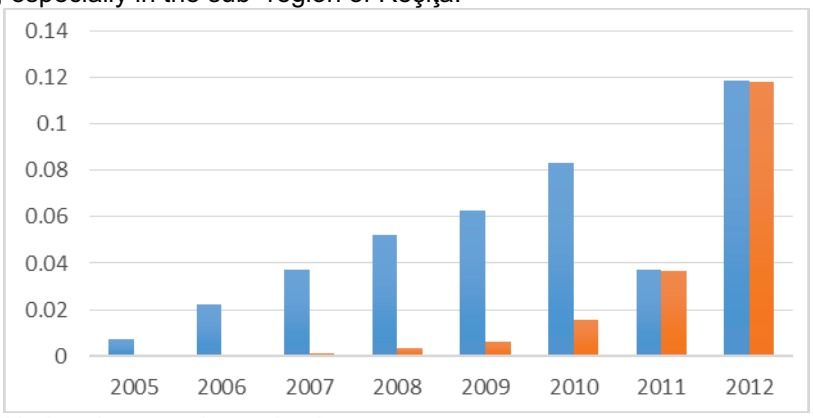

Figure 3: National energetic production structure on resources
Source: S.C. Enel Distributie S.A.

As expected, the greatest amount of energy from this region is produced by burning coal and gas or by the use of fossil fuels. What we believe is worth appreciating is the great quantity of energy from renewable resources produced within this region such as: wind power and hydro energy, which added up represent over 30% of the produced and consumed energy in the entire region. More specifically, the total installed electric capacity at the end of 2012 in the accredited units for the production of energy from renewable resources was of 2327.76 MW.

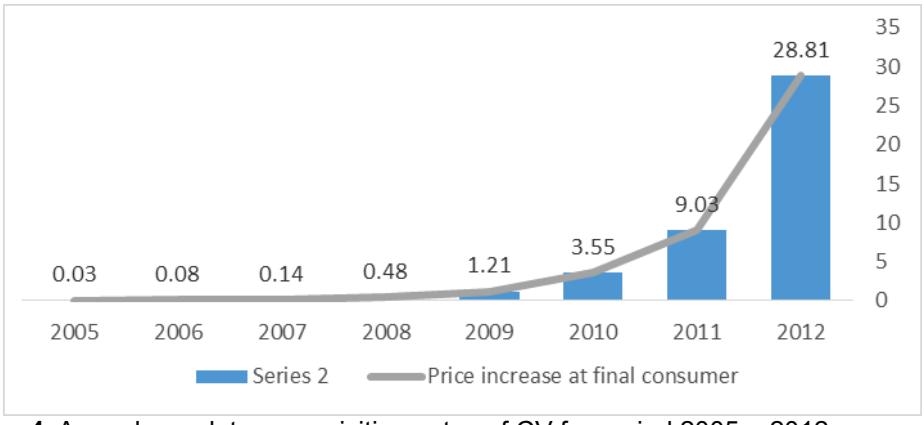

Figure 4: Annual mandatory acquisition cotes of CV for period 2005 – 2012
Source: S.C. Enel Distributie S.A.

Even if the annual mandatory shares of green certificates showed a strong upward trend, according to the plan developed by the Green Certificates Market Operator in Romania, the emergence of the economic crisis, the lack of some funding sources maybe even the slight decline of the energy demand have determined some annual shares of green certificates significantly lower than initially established. For example, in 2010 annual mandatory shares set by OPCOM were over 0.0800 CV/MWh, while annual shares were under the value 0.02000. The only year in which the two shares were equal was 2010 being made 0.01200 CV/MWh.

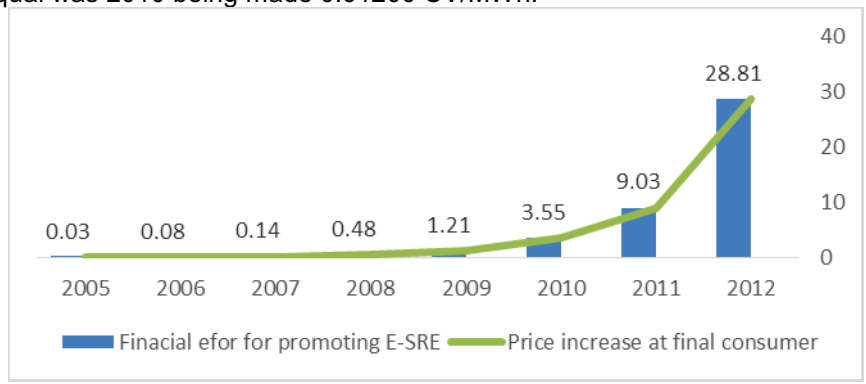

Figure 5: CV impact evolution in final price
Source: S.C. Enel Distributie S.A.

All efforts to promote and achieve energy from renewable resources in absolute terms mean money. This money is either obtained from the state budget or from the final consumer. In our case, as can be seen from the above figure, the financial effort made to promote energy from renewable resources and increase of the price at the final consumer were directly proportional, situation that we consider it to be a heavy burden placed solely on the final consumer. Specifically, if we look at the 2005-2012 period, we can see that energy prices increased, 2012 being considered the peak due to an increase of 28.81 lei per MWh consumed was registered.
In conclusion, we can say that the implementation of an energy strategy for the valorization of the renewable energy resources is included in the coordinates of the medium and long term energy development of Romania, by providing the appropriate framework for making decisions regarding energy alternatives and the entry in the acquis the European law in the field.
The strategic objective for 2010 is that the contribution of the renewable energy sources in EU Member States to be of 12% from the total consumption of primary resources. All these objectives represent an ideal hard to fulfill goal, however the when the entire effort to achieve it is made only by the final consumer this target is even more difficult to reach.

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Refereces

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