

**ANALYSIS OF THE RENEWABLE ENERGY SUBSIDIES
ADOPTED BY ROMANIA AND THEIR SOCIAL AND ECONOMIC IMPACT**

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ABSTRACT

This paper analyzes the support subsidies adopted by Romania and by the other members of the European Union in order to align the "20 20 by 2020" energy policy formulated in early 2008 by the European Commission, whose goal is, inter alia, to achieve a 20% share of renewable energy out of the total electricity consumption in Europe. The adoption and management of the support subsidies are the duties of each Member State, which have the right to change, along the way, the legislative coordinates. This document examines the legislative measures taken by Romania in order to achieve the quota proposed by the EU, the socio-economic implications, the proposed legislative changes and the legal framework prospects in which the renewable energy industry operates. This paper includes the comparative study of measures assumed by Romania and those adopted by other European Union members.

KEYWORDS: *energy consumption, renewable energy, Romania, subsidies, support scheme*

JEL CLASSIFICATION: *Q42, Q48*

1. INTRODUCTION

Mentioned for the first time at the beginning of 2007, the ambitious package of proposals for the development of a clean European energy sector, in concrete coordinates of sustainability, has found its final form a year later under the name of "20 20 by 2020". In April 2009, 2009/28/EC Directive regulated the promotion of the use of renewable energy.

The advantages in the development of systems in whose energy mix be included a considerable percentage of renewable energy are obvious, either we analyze the low environmental impact or we talk about social sustainability issues. But there are also limits to this type of producers. Wind farms can produce electricity only when weather conditions are right (wind speed must be within 4.5 m/s and 15 m/s), photovoltaic panels can only produce energy during peak hours (number of hours in which electricity can be produced daily depends on seasonality and weather). By exception, plants using biofuel can produce base-load electricity (constant power no matter the time of day or year).

Among other directions proposed to Member States, this package set the obligation of EU member states to reach a 20% level of electricity produced from renewable sources (wind, solar and biomass) in the total energy consumption within the Community. (European Parliament, 2009)

At that moment, only 8.7% of the energy consumed in the EU came from renewable sources, despite the fact that many European members had tremendous unexploited potential.

As a result of the measures imposed by the European Commission, each Member State regulated the development conditions of electricity production from renewable sources. They have adopted

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various subsidies schemes for supporting this type of production (some member states, including Romania, had already implemented some subsidies for producers of green energy) and national quotas for electricity from renewable sources in total energy consumption have been established with European Commission representatives.



Figure 1. Map of main support instruments by country (Europe)

Source: The European House – Ambrosetti re-elaboration on Ecofys and Enel Data (2015, p. 22)

2. DEVELOPMENT OF RENEWABLE ENERGY IN EUROPE. SUPPORT SCHEMES ADOPTED AT COMMUNITY LEVEL

Support schemes for producers of electricity from renewable sources were framed in a broad range of measures at European level (Foley & Thornton, 2015). A summary of the national strategic directions is presented below (it includes both the type of system support and financial opportunities of which the producers benefited from):

Table 1. Renewable energy subsidies by country (Europe)

Country	Regulatory policies							Fiscal incentives and public financing				
	Feed-in tariff/ Premium payment	Electric utility quota obligation / RPS	Net metering	Biofuels obligation /mandate	Heat obligation/ mandate	Tradable REC	Tendering	Capital subsidy, grant or rebate	Investment or production tax credits	Reduction in sales, energy, CO2, VAT or other taxes	Energy production payment	Public investment loans or grants
Austria	o			o		o		o	o			o
Belgium		x	x	o		o	o	x	o	o		
Bulgaria	r			o								o
Cyprus	o		o	o			o	o				
Czech Republic				o		o		o	o	o		r
Denmark	r		r	o		o	o	o	o	o		o
Estonia	o			o							o	o
Finland	o			o		o		o		o	o	
France	r			o	o	o	o	o	o	o		o
Germany	r			o	o			o	o	o		o
Greece	r		o	o	o			o	o	o		o
Hungary	o			o				o		o		o
Ireland	o			o	x	o	o					
Italy	r		o	*	o	o	o	o	r	o		o
Latvia	o		o	o			o			o		
Lithuania	o	o		o								o
Luxembourg	o			o				o				
Malta	r		o					o		o		
Netherlands	o		o	o		o		o	o	o	o	o
Poland	r	o		o		o	r			o		o
Portugal	o	o	o	o	o		o	o	o	o		o
Romania		o		o		o						r
Slovakia	o			o		o				o		
Slovenia	o					o	o	o	o	o		r
Spain			o	r	o	o		o	o		o	
Sweden	o	o		o		o		o	o	o		o
United Kingdom	o	o		o		o		o		o	o	o

Source: adapted from REN21 (2015), p. 99-100

Legend:

o - existing national (could also include state/provincial)

x - existing state/provincial (but no national)

r - revised (indicates state/provincial)

* - new (indicates state/provincial)

The multitude of support schemes, as well as the support offered by the state or by the programs developed by banking institutions, caused massive development projects for green power generation. This is why investments in this type of power was two times higher (\$ 426.6 billion) in 2009-2013 than the investments made before the "20 20" package, in 2004 -2008 (\$ 222 billion).

Even during the financial crisis (onset of the crisis coincided with the development of the 20-20 program), when the European Union's GDP was in a significant decrease, investments in the renewable energy recorded a strong ascendancy.

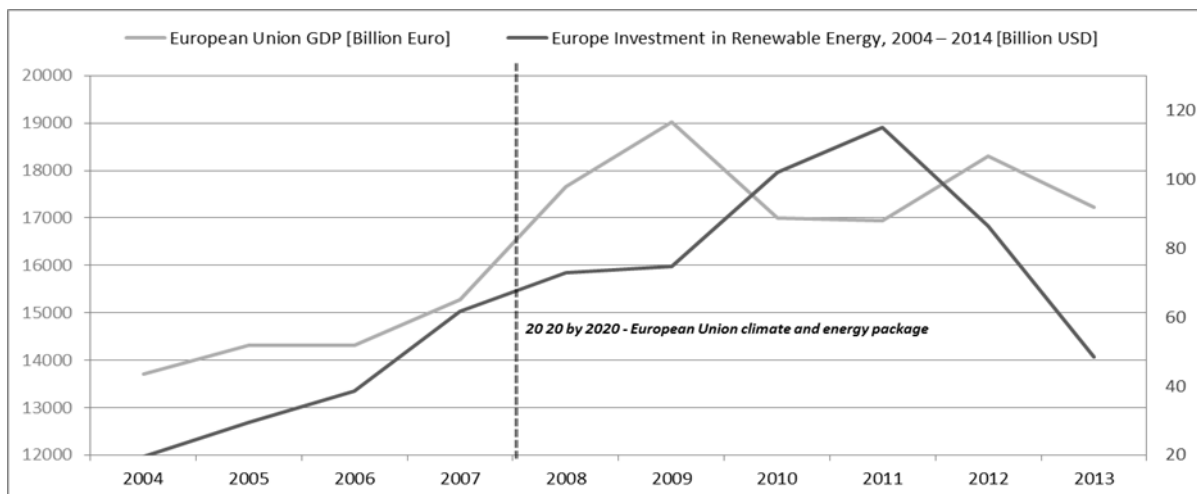


Figure 2. Evolution of investment in Renewable Energy/Evolution of the EU's GDP
 Source: adapted from www.statista.com, www.tradingeconomics.com, www.ren21.net

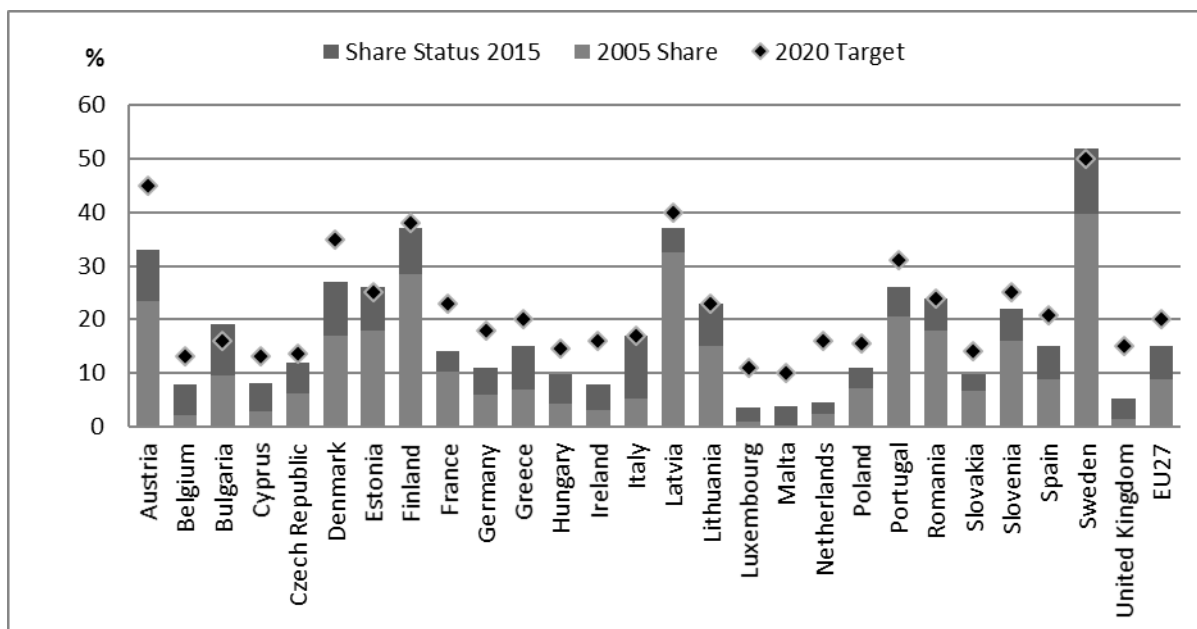


Figure 3. Share of energy from renewables by country (Europe)

Source: apated from REN21 (2015), p. 137-139, www.ec.europa.eu/eurostat/, www.cdcclimat.com

The effects of these subsidies schemes for investors in renewable energy, constantly monitored both nationally and at EU level, have been translated into good results. An evolution of the share of electricity from renewable sources in the total consumption of electricity in the EU is shown in the figure above.

Of the 27 European countries analyzed (late entry of Croatia into the European Union in 2013 and insufficient data about this state determines the research to continue without it), three exceeded the targets initially proposed, another three have achieved or are on track to meet targets imposed and the others are recording deficits contained in 1 and 12 percentage points of the national proposed share (see the chart below).

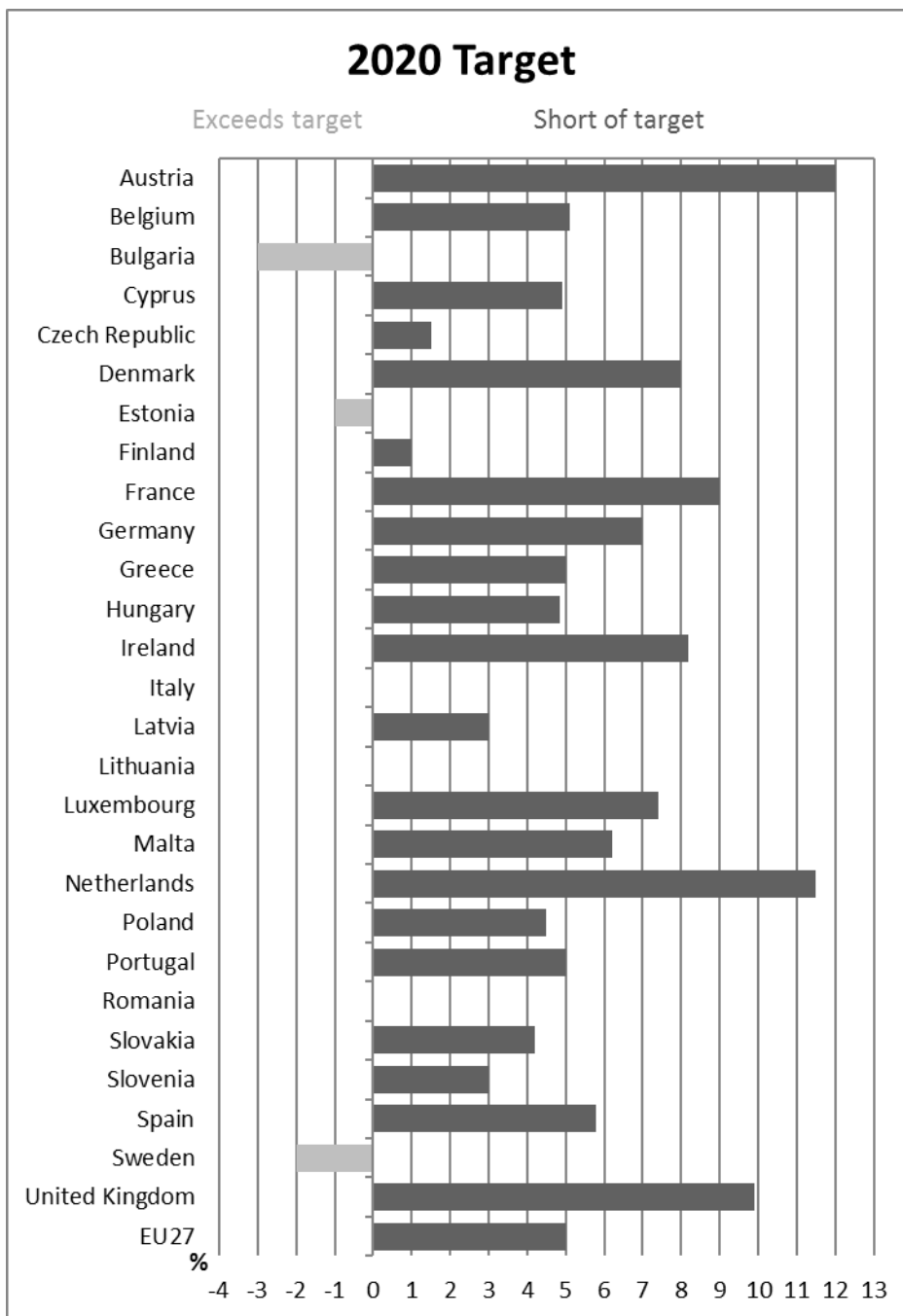


Figure 4. Renewable energy share status by country (Europe)

Source: apated from REN21 (2015), p. 137-139

3. RENEWABLE ENERGY IN ROMANIA. SUPPORT SCHEMES AND THEIR EFFECTS

In Romania, support for renewable energy producers has resulted in the so-called green certificates. A simple system for granting green certificates was ongoing in Romania starting the mid-2000s. The previously mentioned European Directive came as a boost for the Romanian regulator who prepared a more complex system of granting green certificates.

Thus, in October 2008, the 220 Law regulated "the promotion system of energy from renewable sources". According to this, the electricity suppliers were compelled to purchase and invoice (at the same price) to the end clients, be they individuals or legal entities, a number of green certificates, calculated as a percentage of the total energy sold (in 2015, the share reached 0.274 green

certificates/MWh supplied). The law also established the minimum and maximum price of a green certificate.(Romanian Parliament, 2008)

Table 2. Green Certificates support scheme as stated in 220/2008 Law

Type of renewable energy producer	Number of Green Certificates/MWh
Hydro power plants (installed capacity < 10 MW)	
• New	3
• Refurbished	2
• Old	0,5
Wind power plants	2 (until 2017) / 1 (starting 2018)
Solar power plants	6
Geothermal	2
Biomass	2
Biogas	2

Source: 220/2008 Law

The evolution of renewable energy producers is obvious, the industry recording an amazing breakthrough, mainly because of the advantageous support scheme. Either analyzing investments made by companies with tradition in Europe in major projects such as those from Fantanele-Cogealac, Constanta County (600 MW - the largest wind farm in continental Europe), or Salbatica Tulcea County (200 MW) or discussing only about many small producers with installed capacity between 0-3 MW, the legislative framework was an incentive for various financiers, be they classical or circumstantial.

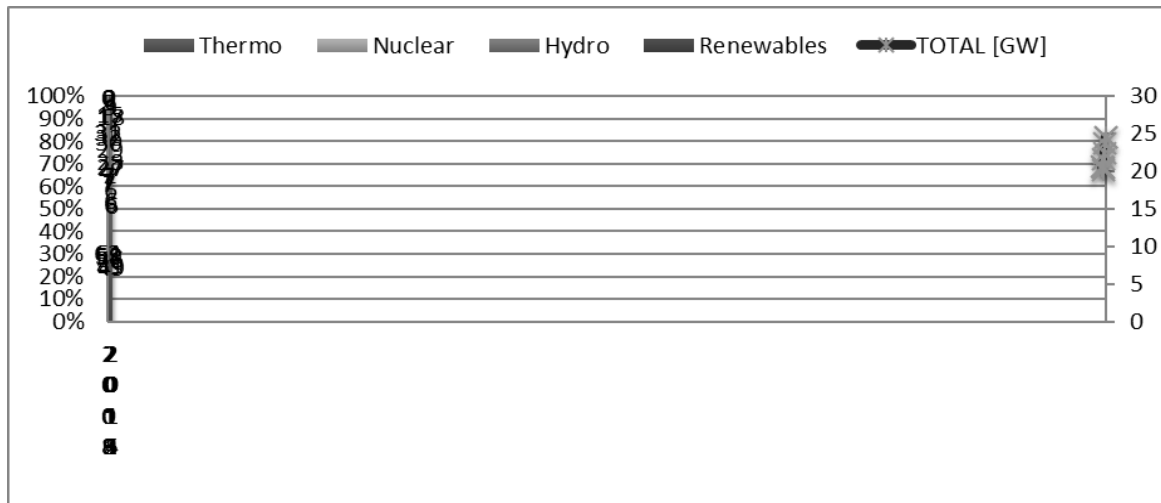


Figure 5. Share of energy producers in Romania's national energy grid

Source: adapted from Energy Dept. (2015), p. 43, www.transelectrica.ro, www.hidroelectrica.ro

The graph below illustrates the evolution of installed power of renewable energy in the national energy system in Romania, in 2008-2015.

Whereas the authorities were not expecting such an explosion of investments in renewable sources, there have not been established, at that time, installed capacity limits for different technologies. Therefore, unbalances occurred between the certificates issued and the purchase obligation of energy suppliers. As a result, the offer exceeded the demand, the certificates' price naturally reaching the low trading price which remained ever since.

This highly favorable climate of investment was about to change in 2013, also as a result of imbalances seen in the market. Government Decision no. 994, issued in December 2013, imposed a

change in the support scheme for renewable energy, by reducing the number of green certificates granted. Thus, new hydro power plants with an installed capacity below 10 MW, would now receive only 0.7 green certificates/MWh, the producers of electricity from solar sources would receive 3 green certificates/MWh and wind farms would only be granted 0.5 green certificates/MWh, until 2017, respectively 0.25 green certificates/MWh, starting 2018. (994/2013 Government Decision, 2013)

In addition, the 23/2014 Law, approving the 57/2013 Emergency Ordinance, legislated the postponement of a number of green certificates for the July 1st 2013-March 31st 2017 period, for producers who have received accreditation until 31 December 2013. The new hydro power plants with an installed capacity below 10 MW faced postponement of a green certificate/MWh. Two green certificates were delayed for producers of electricity from solar sources and wind farm operators also received one less green certificate for each MWh produced and delivered to the grid. According to the law, the recovery of these delayed green certificates would be done in stages by 2020, from 1st of April 2017 for hydroelectric and solar power plants, respectively from 1st of January 2018 to wind power producers. (Romanian Parliament, 2014)

Over the years, to these highly unpredictable regulations were added others, which are in fact taxes which would appease the momentum of these investments. Among them are:

- Any producer of electricity and, thus, any producer from renewable sources, has to pay a special construction tax (applied to the constructions' value from the contributors' patrimony at 31st of December the previous year) (Romanian Government, 2013a). If this initial charge was 1.5% of the existing buildings' value, at the beginning of 2015 it has decreased to 1% (Romanian Parliament, 2014a). Although discussed, the complete elimination of this tax in the new Fiscal Code, which comes into force from 1st of January 2016, it will be maintained in the following year.
- The hydroelectric power plants producers (small hydro power plants or hydro power plants) pay a fee of 1.1 lei/1000 m³ of used water (industry tax). The same kind of producers are forced to pay a fee that represents the rent for streambeds. Of these, however, only those with installed capacity below 10 MW benefit from green certificates subsidies. (Romanian Wind Energy Association, 2015)
- Another difficulty faced by producers of electricity from renewable sources is the green certificates taxing mechanism. These are taxed upon receipt from Transelectrica (energy transporter) and not upon sale. In a market situation in which supply exceeds demand, this practice constitutes a serious cash-flow problem. (Romanian Wind Energy Association, 2015)
- The DAM (day-ahead market) coupling with similar markets in Hungary, the Czech Republic and Slovakia imposed participants in this platform to notify hourly power-values for trading with two decimal places, which is why some producers with low installed capacity could not fully exploit the energy produced in their units.

An important step in improving the climate for producers of electricity from renewable sources was adopting the 122/2015 Law, through which certain producers (with installed capacity below 3 MW) could sign bilateral contracts directly negotiated with suppliers to final consumers. (Romanian Parliament, 2015)

Also in the text of this law is mentioned a time frame in which will be regulated the establishment of a feed-in tariff system (support scheme involving price regulation for renewable energy producers through long-term contracts, whose price will include both the equivalent charge for energy and green certificates, which will not be granted, and the provider's obligation to purchase electricity from these producers) for producers with installed capacity of less than 0.5 MW (Romanian Parliament, 2015). This measure may be a solution to relieve pressure on the green certificates market and provide a viable alternative for producers. But this measure should be better

regulated, establishing precise thresholds to avoid an excess of such new producers, by splitting large parks of current renewable producers.

At the moment, the Ministry of Energy is seeking for a consultant for the development of the third report of Romania's progress in promoting the use of renewable energy.(www.investenergy.ro, 2015)

4. ECONOMIC AND SOCIAL EFFECTS OF THE SUBSIDIES SCHEMES FOR RENEWABLE ENERGY

Currently, considering the forecasted electricity consumption and the number of green certificates issued, the impact of green certificates in the final consumer's bill represents about 33-35 lei/MWh consumed.

In time, the state issued the decision for exemption of a quantity of green certificates (between 40% and 85%) for energy-intensive consumers (Romanian Government, 2014). Since the cost of purchasing green certificates represent a huge burden, these large consumers have found support from authorities to exempt a significant amount of the total consumption. In compensation, they have been imposed certain conditions such as keeping jobs, investment in new technologies, measures for youth employment and taking measures to increase energy efficiency and reduce pollution. Although the beneficial social effects of these measures are obvious, another social impact on a larger scale, this time a negative one, highlights the reverse of these decisions. Since these exemptions of green certificates did not come bundled with a lower mandatory quota for the acquisition of energy suppliers and, thus, dispensing the population from paying, this surplus was divided to a smaller number of clients who have had to pay a higher price. An alternative would have been diminishing the support scheme and the suppliers' purchase quota, in accordance with the exemptions of major manufacturers.

The uncertainty of legislation and measures taken to curb the producers of electricity from renewable sources' momentum caused the closure in 2015 of several wind farms (Targusor wind farm in Constanta county, with an installed capacity of 27 MW) or of small hydroelectric power plants. The immediate effects of such measures are renewable energy power plants layoffs and loss of an important source of tax for the state.(www.energyreport.ro, 2015)(www.capital.ro, 2015)

In November 2015, the Romanian Academy and ANRE will launch a study that aims to centralize the main measures for reducing energy poverty and increasing the safety and quality of life of the consumer. In the summary's study, among other recommendations offered by specialists, it is risen the question whether the use of green certificates scheme is still justified since Romania has met its targets for 2020 (Romanian Academy, 2015). Although legitimate, the question does not have a favorable response in accordance to current economic realities. Investors in projects that aim to produce electricity from renewable sources borrowed for a maturity still unreached, which is why the abrupt end of the subsidies scheme, without offering a viable solution (feed-in tariff), is a measure that will cause most of them to declare insolvency. However, a first step in preventing it and in finding a more advantageous solution for further support of renewable energy producers might be eliminating or even reducing the benefits for those who want to invest from now on in this sort of energy production. For each type of renewable energy producer, it should be identified the advantages and disadvantages it brings to the national energy system and create a supportive strategy based on these results.

A rough calculation reveals that through the 57/2013 Emergency Ordinance, approved by the 23/2014 Law, between July the 1st, 2013 - July the 1st, 2015, have been delayed approximately 13 million green certificates only for producers of electricity from wind and photovoltaic sources (of the beneficiaries of the subsidies scheme, only these two types of producers are included in the package "20 20 by 2020"). A forecast made for the remainder of the green certificates which have been postponed, for July 1st, 2015 and March 31st, 2017, taking into account the historical

production, anticipates that other 13.5 million green certificates will be postponed for wind and solar producers, bringing it to a total of 26.5 million green certificates. According to regulations, these certificates will be granted in stages by 2020. Therefore, a surplus of about 800,000 green certificates will appear on the market monthly for the specified period (683,000 for producers from wind sources and 121,000 for producers from solar sources). Although this surplus will be diminished by the adjusted subsidies scheme, which reduces the number of green certificates granted for each type of producer, it will not reach parity, as regulated today. The existence of such a surplus will determine the national regulator to increase the compulsory energy suppliers' acquisition quota, thus, implying the final consumer to purchase a greater number of green certificates, which will have direct and immediate effects on the increase of the energy bill' cost.

5. CONCLUSIONS

- The present study shows the subsidies scheme adopted by Romania to promote renewable energy sources, in the context of compliance with targets set at EU level by the European Commission through the "20 20 by 2020" program.
- Measures adopted by the European Commission had a direct effect on the energy industry in Europe. The evolution of installed capacity, in order to meet the targets imposed, is obvious, many EU countries already having met or being on track to meeting the targets set.
- Romania managed to reach the share of electricity produced from renewable sources in final consumption 5 years before the deadline. This achievement gives Romania the status of a solid partner and turns it into a pillar of energy security in the region.
- The measures adopted by Romania in order to promote renewable energy production were achieved through a complex system of granting green certificates, depending on the producing technology. However, inexistence of a limit level for installed capacity has resulted, in a short time, to an explosion of investment in this area, which translated into a surplus of green certificates on the market (also caused by the lack of alteration of the compulsory acquisition of green certificates' quota by the population, via electricity suppliers). The immediate result was lowering the level of these green certificates trading price on the statutory minimum price.
- Delaying a number of green certificates until 2017, and then reducing the support scheme for renewable producers represented a difficult moment which they were confronted with.
- To those highly unpredictable legislative changes were added, over time, other taxes that burdened the economic agents' activity which operated renewable power plants. Together, these measures have led to the closure of some parks, halting investments for others, layoffs of personnel and, for the Romanian state, to losing the contributors to the national budget.
- In 2015, measures were adopted to decongest the green certificates market, in terms of granting permission to the producers with installed capacity below 3 MW to sign contracts negotiated directly with the suppliers of electricity. Also, a time horizon has been set for issuing an official document designed to regulate the feed-in tariff scheme for producers with installed capacity below 0.5 MW.
- A calculation made by the authors of this document reveals a total of approximately 26.5 million of postponed green certificates (between July 1st, 2013 - March 31st, 2017), which will appear on the market in 2017. This will translate most likely in compulsory acquisition for suppliers of a growing number of green certificates, which will almost certainly increase the invoices of final consumers.

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