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Renewable energy sources in Romania: from a “paradise” of investors to a possible abandon or to another boom? The impact of a new paradigm in Romanian renewable sources policy

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Abstract

The objective of our working paper is to analyze the renewable energy development policy in Romania, in the larger European context, and to reveal its impact in recent years and in the prospects of policy changes. Renewable energy sources (RES) have a great potential in Romania, especially the wind and solar ones, so that investment projects can be developed to ensure a green energy production, for a sustainable development. Under the legislation enforced in 2005 and implemented in 2011, Romania was able to meet its target of covering 24% of its final energy consumption from renewable sources much in advance (2013) of the 2020 deadline. Romania became an investor's “paradise”, placed by the international consulting firm (Ernst & Young 2013) at No. 13 on a list of 40 nations ranked by their attractiveness for investment in renewables (*February 2013*)

The paper assesses the main determinants of the RES sector development in Romania and the outcomes of the generous policy implemented in the field as compared to other EU member states. Based on a comparative analysis, the study presents some scenarios regarding a possible change of paradigm in Renewable Energy Sources policy in Romania and in other EU member states and assesses its consequences on the medium and long term investment on domestic markets

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1. Introduction

Renewable sources of energy play an important part in the sustainable supply of energy and in the sustainable economic and social development, mostly by climate change mitigation. The explanation of this role of the renewable resides in two correlated elements: on the one hand, the production and use of renewable energy from sources such as wind, direct solar energy, or water do not have greenhouse gas (GHG) emissions effects; on the other hand, greenhouse gas emissions are inherently associated with conventional energy use and are acting as a major cause of climate change. *“Historically, economic development has been strongly correlated with increasing energy use and growth of GHG emissions, and RE can help decouple that correlation, contributing to sustainable development (SD). RE offers the opportunity to contribute to social and economic development, energy access, secure energy supply, climate change mitigation, and the reduction of negative environmental and health impacts”*. (IPCC, 2012).

After exactly 40 years of intense worldwide promotion of renewable energy sources as an alternative to scarce, climate changing conventional sources, 2013 is the year of inflection when strategies may change both at European and global level. This may happen either because more and more authorized voices question the connection between climate change and human activities using polluting energy, or because of the increasingly intense competition met by the renewable energy sources from a growing supply of exploitable conventional resources (cheap coal, liquefied natural gas, and shale gas). Current trends of the international energy market reveal that the global energy demand is growing. The structure of the demand/supply relation is quickly changing from one region to another, but it rests mostly on fossil fuels. The spectacular growth of the US oil and gas production - so that the idea has been advanced of this country coming to rank just second after Saudi Arabia in the great oil producers hierarchy and to export large quantities of these goods in international markets, the European one included - are elements of novelty and change for the energy demand/supply relation in the global market. In the European liberalized energy markets, the growing renewable energy production capacities contribute to ensuring the energy security, but they depend on private sector investments, which, in their turn, rely on the stability of the renewable energy policy.

In the context of these changes at European and world level, this paper aims at analyzing the impact of Romania’s policy on renewable energy sources (RES) and its medium and long term consequences.

1. Romania – a “paradise” for renewable energy investors

In 2009, Romania produced 12MW energy from renewable sources, but starting with 2010 its production capacity grew at an accelerated pace to 2880MW by the end of 2013, while an approximately equal capacity is still under construction. Such a development took place on a spectacular increase in the attractiveness to investors of the Romanian renewable sector (4 billion euro in 2012), which placed our country No. 13 on a list of 40 nations ranked by their attractiveness for investment in renewables, mainly due to big wind projects.

Table 1 Attractiveness of the Romanian Renewable Energy Sources (RES), between 2011-2012

Romania global ranking	The field Renewable energy sources
10	Attractiveness of the wind energy sector
13	Attractiveness of the renewable energy sector as a whole
13	Attractiveness of renewable energy investments
24	Attractiveness of the solar energy sector

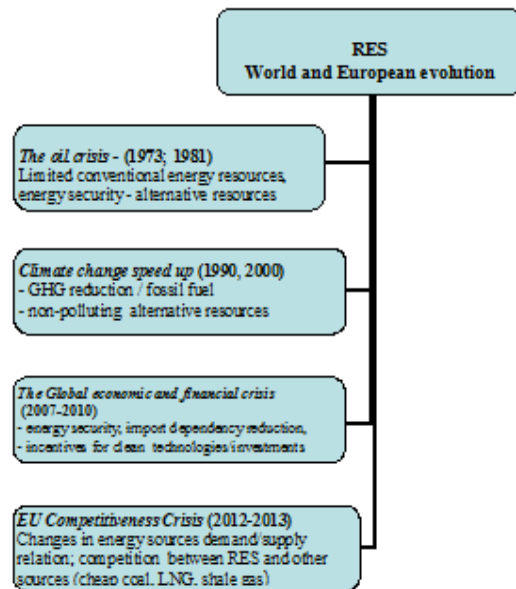
Source: authors, IWE, 2013, based on Renewable Energy Country Attractiveness Indices, Ernst & Young, Report, December, 2012

2. Determinants of Romania's renewable energy spectacular evolution

Analyzing the evolution of RES production capacities in Romania and the endogenous and exogenous determinants, we came to the conclusion that there have existed mainly four categories of factors: the global and European favourable background; the European and national encouraging legal framework; the natural potential of Romania; European and national stimulus policies for RES development.

2.1. Global and European favourable background for RES development

Four big crises were the milestones of the RES strategic direction and evolution at global, European and national levels:



Source: Câmpeanu, V., IWE, 2013

Fig.1 Determinants of RES sector at global, European and national level

The oil crisis (the first and the second oil shocks of 1973 and 1981, respectively); the 1990-2000 climate change speeding up; the 2007-2010 global economic and financial crisis, and the European Union competitiveness crisis (2012-2013).

Out of these four, only the first three crises led to RES development, while the fourth has generated disputes and a potential change of paradigm in EU policy on the matter (Figure 1).

Greenhouse gas emissions which make the root cause of the global climate changes are generated mainly by energy production and use. Therefore, we maintain that in the 21st century, energy policy at global and European level is crucial for reaching the goal of halting or slowing down the climate change.

2.2 Encouraging European and national legal framework

An important milestone in the history of the global energy strategic measures related to climate change mitigation is the Kyoto multilateral Protocol, concluded in 1997. The European Union acted as a global leader in this matter. Considering the risks posed by global climate change, especially the global warming, the political debates were dominated by EU's first goal to reduce greenhouse gas emissions.

To reach, by the year 2020, the goal of reducing the greenhouse gas emissions by at least 20% below the 1990, the EU member states were committed for certain binding GHG national levels not covered by the Emissions Trading System (EU-ETS), which vary by country and are individually applicable for each member state. According to the most recent projections (European Commission, 2012) performed for the member states within the framework of the existent policies, EU-27 will meet and even beat this goal for the year 2020 (by 0.9%).

On the other hand, according to the *carbon dioxide intensity index* (IEA, 2013) of the International Energy Agency (IEA, 2013), in spite of the technological developments and the international efforts made, the intensity of the carbon dioxide emissions by the energy sector did not recede during the last 20 years, but worse, it reached a record level in 2012. The IEA Report underlines that the energy industry itself is not immune to the physical impact of climate change, calling for readjustments and improvement of flexibility.

In its current form, Directive 2009/28/CE has established the European framework for RES facilitation, “*with binding national targets allowing for increase to 20% of renewables share in the EU aggregate final energy consumption and 10% in transport, by 2020.*”

At the national level, the EU member states have various energy potentials in terms of their energy mix. Therefore, the EU target was bound to generate specific targets for each member state. An adequate and fair allocation was considered, related to the starting point of each country and its different potential (National Renewable Energy Action Plan).

2.3 Natural potential of Romania for RES development

Romania's natural potential is favoured by its geographic location and weather conditions. Hence, Romania has: a) large surfaces of land for building wind and solar (PV) power plants with comparatively lower cost, especially for land purchase; b) the largest theoretical wind potential in SE Europe and the second largest on the entire continent (14 000 MW) (Ministerul Industriei, 2007); c) a considerable, completely unexploited, potential to develop offshore wind farms, in the Black Sea waters; d) a relatively important solar energy potential, as Romania enjoys 210 sunny days per year (300 sunny days/year in Spain, Italy, Greece) (GISCO, 2012); e) available biomass resources—the RES with the highest potential in Romania (Strategia Energetică a României pentru perioada 2011-2020, 2011).

Romania has developed RES projects only in the recent few years, especially wind farms, but this delay has “*the advantage of the latecomer*” as the newest and best performing technologies were installed and a high technology industry was set up. For 2050, Romania is estimated to theoretically have the potential to cover from renewable sources 73% of its total energy demand (European Renewable Electricity Data).

Table 2 Romania – Regional distribution of the national RES Potential

Région/Romania	RES development potential
Danube Delta	Solar
Dobrogea	Solar Wind
Moldavia	Micro hydro power stations Wind, Biomass
Carpathian	Biomass
Mountains	Micro hydro power stations

Transylvania	Micro hydro power stations
Western Plain	Geothermal
Low-Carpathians and hills	Biomass, Micro hydro power stations
Southern Plain	Biomass, Geothermal Solar

Source: authors, 2013, IWE, based on Romanian documents

2.4 European and national stimulus policies for investment in RES

According to the Lisbon Treaty, EU and the member states share competences in energy policy. Therefore, with a view to achieving, by 2020, the 20% renewable energy target in the EU, the Renewable Energy Directive establishes legally binding individual targets for the share of renewable energy in final energy consumption for each Member State. It also establishes a legally binding target of for each Member State to achieve a share of 10 % renewable energy in the transport sector. But, the renewable energy support schemes are not harmonized, so that each country has established its own stimulation levers according to its internal potentialities and to the targets it has to meet by 2020. The EU level measures for reaching the national targets by 2020 include: a) support schemes, with levels established by each member country; b) measures for cooperation between different member countries and between them and third countries.

The main instruments of the RES support schemes used by EU member countries are:

- Feed-in tariffs set by auctions;
- Mandatory production quotas and green certificates with prices which can vary between minimum and maximum limits;

The feed-in tariffs for energy from RES are used by 21 member states not including Romania, Belgium, Denmark, Estonia, Poland and Sweden. The green certificate system is used by Romania and other six member countries: Belgium, Italy, Portugal, Sweden and the United Kingdom. No correlation can be established between the use of this stimulation system and the 2020 targets of these countries regarding the weight of the energy from RES in their final energy consumption, as these levels vary in the 7 states between 13% (Belgium) and 49% (Sweden).

2.4.1. Advantages of the support scheme in Romania, 2011-2013, which made a contribution to its attractiveness to investors

- The electricity from RES enjoys preferential connecting to the national energy system. For each MW of electricity produced from RES and delivered into the network, producers receive a certain number of green certificates depending on the technology they use;
 - The electricity distribution companies have to meet mandatory buying quotas for the electricity produced from RES (14% in 2013), by the instrumentality of green certificates (GC), at prices per certificate which vary between certain minimum and maximum limits;
 - The electricity distribution companies have the obligation to buy green certificates from the RES electricity producers. When selling the electricity to their final customers, either industrial consumers or households, they transfer to them the GC acquisition cost;
 - The number of GC the producers may receive varies by technology, exerting a real attraction for investors:
 - 2GC for each MW of electricity from wind farms;
 - 6 GC for each MW of electricity from solar power plants;
 - 2-3 GC for each MW of electricity from new biomass, biogas, bio-fuel plants;
 - A comparative analysis of the maximum prices offered per 1 GC reveals that in Romania they ranked among the highest in Europe. Hence, in 2012 the maximum trading value per 1 GC was Euro 56.44 and in 2013 it was Euro 58.823 (Ordin 10 ANRE, martie 2013);

- Under the commissioning decision issued by ANRE and provided that the operations start before 2016, the RES electricity producers get 1GC/1MW during the testing period.

The implementation, starting from 2011, of the mentioned above legal provisions in support of the RES electricity producers (Law 220/2008, re-examined) is considered (Ernst & Young, 2012) “*one of the most attractive legal projects for renewable energy*” (E&Y, 2012).

3. Outcomes of the generous policy for RES development

3.1 Accelerated growth of the renewable energy new installed capacity

In Romania the RES electricity sector developed at a fast rate starting from 2011, after the enforcing of Law 220/2008, re-examined.

In 2012, the whole new, high technology, installed capacities for renewable energy was 923 MW in wind farms (78% of the overall RES) and 23 MW in photovoltaic parks, Romania being a newcomer to the solar energy market. In 2013 the number of wind projects increased by 9% while the number of photovoltaic projects grew by 121%, so that in September 2013, the new solar projects cumulated a 600 MW installed power. Optimistic projections for 2014 regarding the overall RES capacities expect them reach 3500MW in wind farms, (1 905 MW, in December 2012) and 950 MW in solar parks (48 MW, in December 2012). Further development of solar (PV) energy is expected to be the most dynamic.

3.2 Comparative outcomes regarding the economy and job creation in the EU and Romania

Andris Piebalgs, the European commissioner for energy, considers (Union, European Commission, 2009) that “*the benefits of alternative energy in terms of the security of supply and fight against climate change go hand in hand with economic advantages.*”

In the European Union green economy kept creating jobs even during the economic crisis and, for the year 2020, forecasts correlate the fulfillment of the goal that 20% of the energy consumed be from RES, with the creation of 400 000 new jobs in the renewable energy sector. In relative terms, the highest employment rates will be registered in Romania, Portugal and Denmark, while in absolute terms in Romania, Germany, Spain, France and Italy [CE, 2009]. Investments in RES created jobs in other economic sectors too, (for instance in constructions, a sector badly hit by the crisis). The growth of energy production from renewable sources and the contraction of energy import dependency and costs had a positive impact on the EU current account, given the fact that the EU net fuel imports cumulated Euro 388 billion in 2011, accounting for 3% of EU GDP.

Romania has already reached its assumed target for 2020, that 24% of its overall energy consumption be produced from RES, and this contributed to:

- the reduction of the greenhouse gas emissions, an important outcome given the fact that some of the most polluting energy industries in the EU are located here (coal power plants);
- energy security, at the same time with natural gas import reductions by 45% in the first semester of 2013 compared to the same period of the previous year [INS, 2013];
- FDI increases – in 2012, wind industry alone attracted one third of the total FDI inflow to Romania;
- Investments in infrastructure, logistics and production attracted other connected investments in testing equipment, cable production, other plants, etc.

3.3 Costs or adverse effects generated by RES support

In the EU, the economic and financial crisis put pressure on the business environment, population and the finances of the member countries. The subsidized boom of the renewable energy new capacities led to the increase of the aggregate costs paid by electricity consumers. EU statistics show a more rapid increase of the energy costs in Europe, as compared to its competitors in the international markets: in 2013 the index of energy costs reached 137.7 in Europe, 116.2 in Japan and 95.5 in the US compared with index 100 in 2005.

In Romania, a significant increase in the energy costs of both industrial and household consumers was registered,

as a result of the GC paid to RES electricity producers. As the Romanian minister for energy declared in a statement, “*the cost of certificates, passed on to customers, would account for almost half of a 10 percent increase in electricity tariffs this year*” (2013).. Industries, mainly the energy-intensive ones, suffered losses of competitiveness as, on the one hand, Romania paid the highest price, of Euro 10.7/MW, for GC and co-generation and, on the other hand, other EU member countries introduced measures such as order of merit and exemptions for the great industrial consumers [CEPS]. Some examples are highlighted by the Association of the Large Industrial Energy Consumers in Romania [ABIEC]: in 2013 AlroSlatina paid for GCs about 20 million Euro (as compared to 2 mil. Euro in 2012); Arcelor Mittal paid 15.4 mil. Euro, Lafarge 10.9 mil. Euro and Tenaris 3.3 mil. Euro (ABIEC, 2013).

4. A change of paradigm in the RES Development Policy in Romania and other UE member states

4.1 A change of paradigm in Romania

Aiming at reducing the electricity bills of industrial and household energy consumers, the Government decided to give up some of the incentives granted to RES investors, both for the already existing and for the new projects, by the Urgent Ordinance/OUG 57/2013, which came into force on July the 1st, 2013. New measures applicable to the RES sector (OUG/ June, 2013) refer to:

- a suspension in issuance, until 2017, of as many as half of the certificates due under current incentive arrangements, effective starting July 1 and applicable retroactively to existing projects as well as new ones; the measure is valid for small hydro power stations and solar parks until March 2017, and for wind farms until January 2018;
- a reduction in issuance of a certain number of GCs for:
 - new hydro-power plants (max at 10 MW): 1 GC deferred
 - wind farms: 1 GC deferred
 - solar: 2 GCs deferred
- some exclusions from the support scheme were operated:
 - on the one hand, photovoltaic (PV) plants erected on land that has the status of "agricultural" land as of 1 July 2013 will not benefit from the GC support scheme.
 - on the other hand, RES plants with installed capacity above 10 MW and PV plants above 5 MW will not be granted GCs for the electricity that generated positive imbalances in the system.

The maximum accepted value for GC trading in their specific market could be reduced from 55 to 30 Euro/ MW, while the minimum level will be kept unchanged, at 27 Euro/MW. Also, the national RES electricity production could be limited to 3500MW annually (2880 MW, in 2012).

4.2 RES subvention cuts in other EU member states

Along the economic austerity period (2010-2013), cost increases and the risk of overcompensating RES electricity producers have augmented. Many EU member states reduced the incentives and readjusted the support schemes for RES electricity producers:

- **Spain**, once a renewables champion before the crisis, cut the subsidies for alternative technologies, disappointing foreign investors who, in return, threatened the government with Court for breaking the terms of their investments;
- **Bulgaria** cut its support scheme for new RES projects, since July the 1st, 2012 and introduced a high fee for the access to the grid (up to 39% of the feed-in tariffs earned from renewable energy projects);
- **Poland** is switching from the GC system – still valid until 2017 for the capacities installed before December 2012– to feed-in tariffs/RES, considering that the latter is a cheaper and much easier to handle than a quotation system. Feed-in tariffs/RES will be different for wind and solar parks as compared to biomass, biogas and

hydro, and will be distributed via an auction system. A tender program will be introduced, with bidders competing primarily on price, in order to avoid unreasonable profits.

- **Italy** has already given up the GC system, in favour of feed-in tariffs/RES Italy needed two years to implement an auction system. The auction system started in January 1, 2013.
- **United Kingdom** promised a revision of subsidies/RES in order to limit electricity price increases (before the 2015 elections).
- **Germany** also faces electricity price increases due to high subsidies for RES. Still, in spite of the pressures exerted by voters, in 2014 the tariffs paid by customers in support of the renewable energy development will be increased by 18%, because the authorities decided to completely give up nuclear power by 2022. German consumers will contribute with 6.240 euro cents/KWh, as compared to 5.277 euro cents/KWh in 2013, to the development of renewable energy. This induced turbulence among consumers.

4.3 2020 and post 2020 Prospects of RES development in the EU

Energy security

At the beginning of 2010, the president of the European Commission, J.M. Barroso, declared: “*Today we import around 50% of our energy. By 2030 that will be nearer 70%, if we continue with current policies. ...We need The Third Industrial Revolution, with its emphasis on renewable energy and a transformation to a low carbon economy. At the same time, it will improve Europe’s energy security, and decrease geopolitical tensions*”.

Later, in the EU official documents the necessity of further growth of the EU renewable energy production by 2020 and post- 2020, is maintained. One of the most adamant countries are Germany – which envisions an increase of the renewable energy weight in its overall energy consumption to 50% by 2030, 60% by 2040 and 80% by 2050 – as well as Denmark, which intends to cover 100% of its energy consumption from RES, by 2050.

The perception of the Europeans on the relationship between energy and climate change

According to the 2011 Euro barometer, 80% of the Europeans consider that the fight against climate change in the field of energy may give an impulse to the economy and create new jobs. The European citizens consider that climate change is the second most critical issue the humankind faces, after poverty, hunger and water shortages taken together, and that, under the circumstances, the development of alternative technologies for energy production is a necessity.

Recent technological developments in the global solar market provide a reason for optimism from this point of view, as starting from 2014 they will allow for the transition from a subsidized, to a sustainable market. The substantial cost reduction of the solar systems on the one hand, and the increase of the feed-in tariffs on the other hand, will stimulate households and industrial users to install solar systems in order to reduce bills without any subsidies.

Conclusions

1. Will the RES investments be abandoned in Romania?

The changes implemented in 2013 by the Romanian government on the support scheme for RES have alarmed and strained investors who did not expect such mutations. Some investors announced that they were ready to give up further investment plans, others declared their disappointment and complained for having their businesses badly affected by the unpredictable changes, while small companies maintained that they even faced bankruptcy. Large multinational companies declared they will sell their businesses in Romania and leave for other locations. CEZ, for example, the most important foreign investor in wind farms declared that it will redirect its future investments towards Poland.

2. Romania still attractive

- The changes operated by the Romanian government on the support scheme for RES are not singular in Europe. With the notable exception of Germany, many other EU member states took similar measures to

diminish the overcompensation of RES investors, given the competitiveness loss and the slow economic recovery of the European economies after the economic and financial crisis.

- From our point of view, investors might find Romania still attractive as compared to other EU member states, on the strength of the following arguments:
 - While in Europe the phenomenon of incentive reductions amplifies, in Romania incentives were not reduced, but only postponed, and for a number of GC transactions were just spaced out until April 2017 (solar and hydro) and January 2018 (wind);
 - After 2017 Romania might consider switching to a feed-in tariff support scheme, similarly to the majority of the other member states, as this system is cheaper and easier to implement. From the experience of other countries which changed the RES support system from GC, to feed-in tariffs (Poland, Italy) we must keep in mind that only the preparations of the auction system needed to establish prices usually takes about two years.

3. Is a new RES investment boom still possible in Romania?

- Currently, many investors in Romania do not hurry to leave the sector in spite of their immediate reactions, but they hurry up to finalize as many RES projects as possible to take advantage of the current regulations: for instance, the support scheme for solar projects providing for 6GC/1MW is still valid by the end of 2014; also, according to law, only the projects finalized before the end of 2016 qualify for the support scheme.
 - The development of new technologies is prone to stimulate both demand and investments made by households and by commercial users in increasingly diverse and high-performing solar systems, with the purpose of reducing energy bills. Therefore, a new increase of the new installed capacities, especially in photovoltaic plants is possible in Romania, even if it will not be a real “boom”. We would rather expect slower growth rates, which in fact might be preferable, allowing for the new, innovative technologies become more accessible in the medium run.

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