Overview of the wind energy market and renewable energy policy in Romania

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Abstract. The modern, developed society becomes aware of the necessity to conserve and protect the environment, increasing the gained benefits from a rational use of the natural resources. The pollution and the limitation of the fossil fuels, associated with the political situation worldwide that affects direct the energy strategies, have opened opportunities in the area of operation renewable energy sources. The development of the exploitation of renewable energy sources is directly linked to the energy politic, which, in terms of Romania, has the focus to integrate into the European Union energy strategy. The year 2014 brought in Romania many legislative changes to the renewable support scheme, that proves, once again, the legislative unpredictability and limitations introduced by the legislator “during the game” that overthrew all economic profitability calculation of the existent and planned investments in this sector. The actual stage of the wind energy across Europe and the particular situation in Romania are highlighted; also a 2020 forecast for Romania tries to evaluate the perspective for the wind, and general, renewable energy market. The actual Romanian renewable energy support scheme, mainly regulated by “Law 220/2008” ends December 2016. The so-called “ready to build” projects especially wind- or hydropower, can’t be finalized until this deadline, being unable to qualify to the existing, mainly to inoperable, support scheme. Another legislation that has to clarify how investments in renewable energy will be supported is still not in place, blocking any project development, implementation and economical benefit of the producer. The paper presents in this respect an updated overview of the Romanian renewable energy sector and its perspective.

1. Introduction

The total installed wind power decreased at the global level in 2013, compared with previous years, being for the first time in more than 20 years that this sector has experienced a downtrend. Despite this, the total worldwide installed wind power capacity raised to 318.105 MW at the end of 2012, establishing itself as one of the main sources of electricity generation [1].

In this context, we can indicate countries and cities that have proposed to achieve, or already are, a 100% renewable energy in their energy production: Iceland, Cook Islands, Scotland, Denmark, a.o [2].

With more than 1.000 MW installed wind capacity, Romania is among the twenty-four countries worldwide beyond this limit. Closest to the milestone of 100.000 MW installed wind capacity is China [3], which will attain it at the end of 2014 [1], [2].
An overview of the growth of the global cumulative installed wind capacity is shown by the chart reflecting this evolution for the period 1996 – 2015, Figure 1 [2]. The global capacity installed in wind farms at the end of 2013, placed China in the first position with 91.412 MW, followed by USA, with 61.091 MW and in third position, the first European country, Germany, with 34.250 MW.

In other classification, those of installed wind power capacity during 2013, places Romania in „top 10‖ worldwide, at the 10’s position, with 695 MW. According to the Romanian wind energy association (RWEA), Romania has now a total number of 75 wind farms with 1200 installed wind turbines, totaling 3.008 MW, state 1 April 2016, of the nearly 5.000 MW renewable energies on the Romanian market [4].

Figure 1. Global installed wind power in the period 1996 – 2015 [12]

2. Wind energy in context of economic downturn
The regulatory and political uncertainty across Europe since 2011 began to influence direct existing wind power installations as well as planned and „ready to build‖ wind power plants starting with 2013. So, the boom of build and installed wind turbines in Romania, 2013, have been authorized and financed based on the prior legislation changes that affect today the wind energy sector, especially in Eastern Europe.

The pressure on the renewable energy sector, especial on the wind farms with their higher installed capacity, will act across Europe and especially in Romania, to a falling and almost stagnant installation of new capacities. Many projects, as well as operational capacities in the renewable energy sector, are put up for sale by smaller companies in the hope of escape from bankruptcy. Other companies take into account the losses made with the project development (grid connection, wind measurements and monitoring [5], [6] building permits, environmental studies, zoning classification and land designation, securing land through land purchase and / or rental, legal advice, payment of various fees, a.o.), amounts that can easily reach the order of several million euro / project, knowing that, in the today legal framework, building and operating a wind farm in Romania would have meant even higher losses, which could have caused instability in the mother companies, specifically in small and medium sized companies. The companies that have built on the Romanian market, in specially wind power plants and big photovoltaic plants, are big players, as ENEL Green Power, CEZ, EON
owning also parts of the electric energy distribution networks (ENEL Distributie, EON or CEZ), which are able to overcome easier the market blockade of green certificates trading and maintaining a low level of the renewable energy quota.

Based on the GWEC estimation [2], a positive trend in the wind energy market is expected, especially in the regions of Asia, Europe, and North America, Figure 2 [7].

3. Wind energy in Europe

Considering that the value of 100 GW of total installed wind power was reached in 2012, in 2013 a shift could be finding in the interest of the investor in wind power in Europe. At the end of 2013, begin of 2014, Germany has strengthened their position in Europe achieving the highest installed capacity in wind farms across Europe, total 34.3 GW.

Across Europe, in 2015, a total amount of 12.800 MW has been installed in wind power, accounting 15.6% from the total installed power, overtaken hydro as the third largest source of power generation in the EU [8], [9].

The importance of the wind energy compared with other energy sources is highlighted in the next figure, Figure 3 [8], [9].

The installed wind power in Europe at the end of 2015, is highlighted in Figure 4.

At European level, the annual installed wind power since 2000, is revealed in Figure 5 [8], [9]. As shown, the best year with new installed wind power capacities was the last year, 2015, with 12.800 MW.

A significant growth of the offshore wind power installation can be noticed: towards 2014, in 2015 those capacities have more than doubled, reaching now 24% of the annual EU wind energy market, from 13% in 2014, Figure 6 [8].
**Figure 3.** Europe: importance gain of wind energy with other energy sources

**Figure 4.** Europe: installed wind power by end of 2015
4. Wind energy in Romania
Even with the major legislative unpredictability, generated by changes of the law 22 from 2008 through repeated government decisions, culminating with the violation of the green energy quota in the last years – being much lower to the prescribed value in law 220 / 2008, as well as the more restrictive secondary legislation, 3.008 MW installed wind power were registered in Romania, compared to the 2.599 MW at end of 2013. The increase with almost 13.6% - 354 MW compared to 2013, is due to the projects that made the financing closing, ordered the wind turbines and start construction work before the occurred legislation changes. Besides the classic developers risk in the wind power plant development [6], [10], the Romanian market raises with legislative instability.
This rapid growth of the Romanian wind energy market has exceeded the expectations of the Energy Regulatory Authority (ANRE) [11] and those predicted in the National Renewable Energy Action Plan (NREAP), as highlighted in Figure 7 [7], [4].

According to Transelectrica, the Romania wind power plant’s injected 2014 in the grid 4.7235 TWh, compared to 4.70TWh in 2013, considering that the total energy consumption fell by 6%. The electricity produced by the wind farms in 2015 covered 11.03% of gross Romania electricity consumption [12].

Based on the last statistic dates, Romania has a number of 75 wind farms, with installed capacities between 0.008 MW and 600 MW, with a total number of about 1.200 wind turbines. A Romanian wind park has in average 40 MW, which is much above the European average. This value could be achieved due to a low population density in Dobrogea, the main windy region of Romania, with over 85% of the installed wind power capacity.

The Romanian wind market is dominated by „big players‖, which own also, in the different region, the distribution network, as ENEL or CEZ. Other multinational companies are EDPR, Verbund or Monsson Group, that registers around 80% of the total installed wind capacity. The figure of investments made in the Romania wind energy totals EUR 5 billion.

The biggest problem that investors that already installed their wind parks or those that are now remaining in expectation have, is the unstable and thereby unpredictable legislation, with numerous inefficient – as the normal functioning of the market for green certificates, which brought mistrust of the investors, abolishes the initial financial calculations and makes it impossible to finance other investments in this area.

Despite the increase in efficiency of the wind power plants, through control techniques [13-18] or the possibility of increasing their gauge – nacelle height, diameter of the rotor blades and the installed power of a generator, a good and courageous environmental [19] policy and economic policy [1], [7], [20] is needed at European Union level, followed by their takeover through the member states.

5. Conclusion
In this condition, shortly, Romania has a negative premier: the first investor that announced the disassembly of his wind park, with a capacity of 27 MW in the Dobrogea region.

In the absence of new legislation [8], the existing support scheme is applicable just to the projects commissioned by 31 December 2016, a serious and constructive approach from the decision makers to this industry will make Romania impossible to achieve 2020 the quota of 20% of the total gross
energy consumption for renewable energy, foreseen by the European Union, and on the other hand would undermine investor confidence.

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