

ROMANIA'S GREEN ENERGY MARKET

Current green energy context in Romania corresponds to a high renewable energy potential, mostly underutilized, which makes Romania an attractive location for green energy investors, developers and operators looking for alternative markets outside the conventional Western European countries. Although over 30% of Romania's electricity production comes from renewable sources, when excluding large hydro, Romania's RES (Renewable Energy Sources) potential has practically remained untapped over the last couple of years.

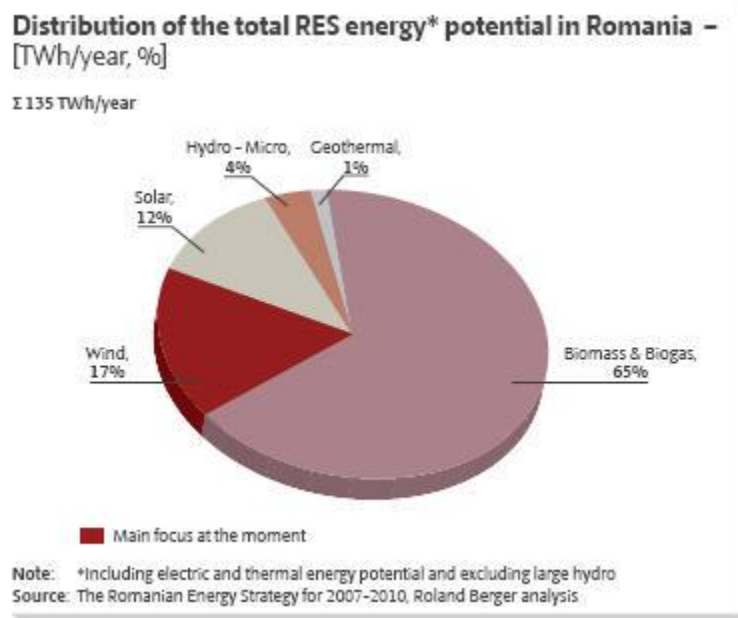
Recent developments, however, have determined Romania to emerge as one of the most fervent markets in the region from a renewables point of view, with wind practically representing the main focus. According to the Romanian Association for Wind Power, Romania's wind power capacity is expected to reach 545 MW in 2010, as compared to 14.1 MW installed capacity, as of 2009. 2011 and 2012 are projected to become even more promising, with an estimated installed capacity of up to 2,000 MW, by the end of 2012, in an optimistic scenario.

Despite soaring hopes for the future, the development of this sector poses nonetheless a great deal of challenges, including legislation shortcomings and restrictions, lack of land registries and bureaucracy in general, limitations of the national power grid system, as well as potential complexities in absorbing prospective imbalances in power production.

Romania's RES potential

Thanks to its marine climate, southern location and varied geography, Romania shows a remarkably extensive RES potential. Between the entire theoretical potential and the technically and economically feasible one, there is nonetheless a significant gap, creating great discrepancies between the theoretical hierarchy of the different renewable sources potential and the practical orientation of actual projects.

In terms of theoretical potential, biomass and biogas account for an overwhelming 65% of the total "new" RES potential (excluding large Hydro) of around 135 TWh/year (cumulating both electric and thermal energy), with wind and solar accounting for 17% and around 12%, respectively. Small hydro (under 10 MW) and geothermal energy register a relatively low share in the total, with 4% and 1%, respectively.



In terms of geographical spread, renewable energy resources are theoretically available on the entire Romanian territory, but there are major differences in their distribution by type and exploitation capacity.

Biomass carries the highest potential for green energy production in the country, amounting around 88.33 TWh per year. It is estimated that cca. 36% of this potential is currently used, but so far, biomass usage has mainly focused on household firewood: direct burning, space heating, cooking and water heating account for around 95% of the current biomass exploitation, while industrial biomass use equals only 5%. Carpathians and Sub-Carpathians provide around 66% of the firewood and wood waste, whilst the South Plain, West Plain and Moldova regions provide approximately 58% of the agricultural waste. About 27% of Romania's land is covered by forests, whose exploitable potential is estimated at 20,000 cm.

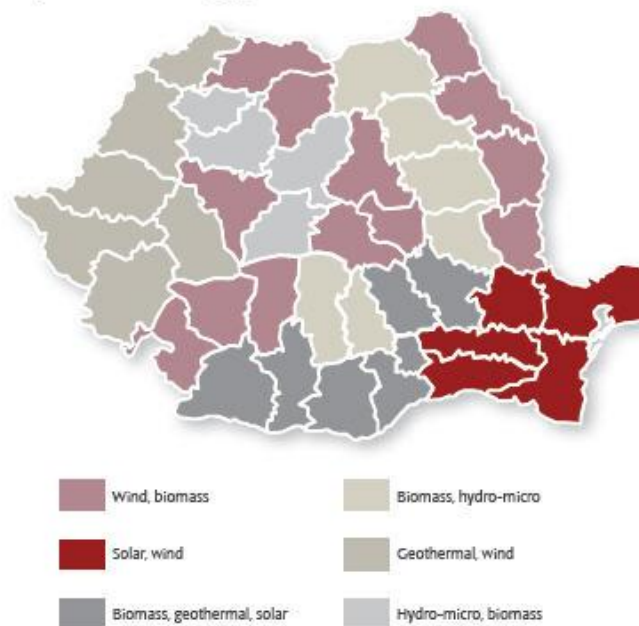
Wind potential in Romania is mainly concentrated in the Dobrogea, Moldova and Banat regions. It is estimated at around 14,000 MW installed capacity, generating around 23 TWh per year. Wind resources in Romania have been thoroughly analyzed over the last couple of years, revealing high potential in the practical set-up of both small independent units for rural areas and large off-shore projects. According to an Erste Bank report, Dobrogea – and most notably Constanta and Tulcea – establish Romania as the second best location for developing wind farms in Europe and the leading one in the region.

Solar energy shows a moderate potential throughout the entire territory of the country, but the most abundant solar resources are located in the southern part of the country and Dobrogea. Considering solely thermal energy, the country's solar potential reaches around 60 PJ per year (around 16.7 TWh/year), while solar electricity potential amounts to only approximately 1.2 TWh.

The analysis of the total **small hydro** potential in Romania reveals the possibility to install around 780 small hydroelectric plants (of below 10 MW/unit), with a total power of 2,150 MW, able to provide approximately 6 TWh per year. At the moment, small hydro plants in Romania account for a total capacity of 1,125 MW, but this capacity is not entirely functional, leaving the high potential of small-scale hydropower somewhat untapped.

Regarding **geothermal** energy, Romania shows the third highest potential in Europe, with major potential locations in the Western Plain, South Plains (Bucharest region) and Southern Carpathian regions. Total potential reaches around 1.94 TWh per year.

Map of the RES energy potential across Romania



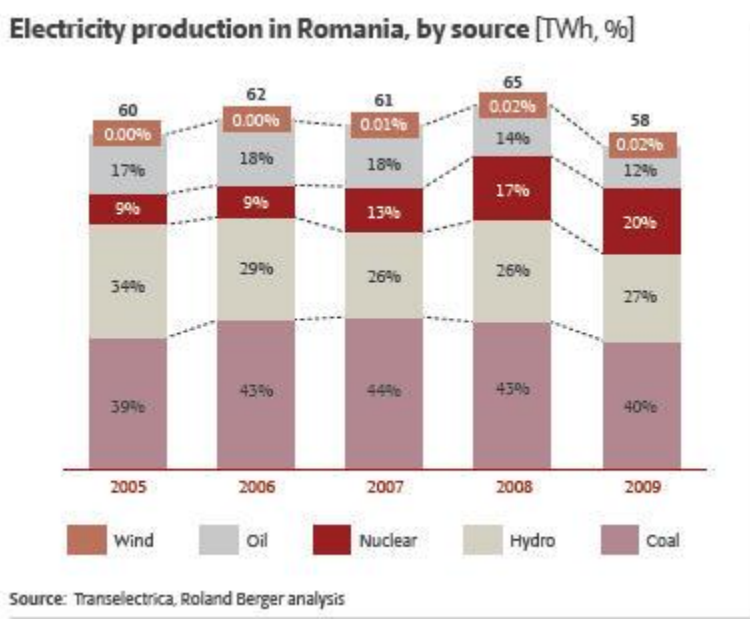
Source: The Romanian Energy Strategy for 2007-2010, Roland Berger analysis

Current situation and development perspectives

Current status

The share of renewable sources in primary energy supply, as well as in electricity generation in Romania, is significantly above the EU average. Renewable sources in Romania are estimated in 2009 to have accounted for almost 18% of the national primary energy production (and respectively over 13% of the national gross inland energy consumption), as well as above 27% of the national power generation.

Despite the fact that these levels are considerably higher than the EU average (reaching 8.4% of gross inland energy consumption and 15.6% of electricity generation), they are mainly conveyed through conventional renewable sources – large hydro and household use of biomass – and less through "new" renewable sources. With regards to primary energy production, around two-thirds of the renewable energy generation comes from biomass and most of the remainder from hydroelectricity, while virtually the entire quantity of electricity generated from renewable sources can be attributed to hydro plants.



Country targets

In 2007, in an attempt to ease the effects of climate change and launch a common energy policy, the EU Commission proposed a series of goals aimed at fighting climate change and improving EU's energy competitiveness and security. Based on this proposal, the Council agreed in March 2007 on certain binding objectives to be attained by the EU by 2020, better known as the 20-20-20 targets:

- Reducing greenhouse gas emissions by at least 20% (compared to 1990)
- Improving energy efficiency by 20%
- Increasing the share of renewable energy in the total EU's final energy consumption to 20%
- Raising the share of biofuels in transport fuels to 10%

In order to ensure the fulfillment of these objectives, the EU set specific renewables targets to be reached by each member state. These are calculated as the share of renewables in gross final energy consumption and gross electricity consumption respectively. Thus, Romania is required to achieve a renewable level of 24% of the gross energy consumption by 2020 and 38% of the same year's electricity consumption. Intermediary targets amount 11% of gross energy (RES target) and 33% of gross electricity consumption (RES-E target) by 2010.

In terms of both RES and RES-E, Romania is more or less on target. However, the majority of renewable is generated through large-scale hydro power and household biomass, leaving the high potential of “new” RES mainly untouched.

National legislation and main supporting policies

In order to convene these goals and establish its own standards for renewable energy, Romania introduced a series of supporting policies:

- A quota system with tradable green certificates (GC) issued to electricity generation from wind, solar, biomass or small hydro (the mandatory quota increased from 0.7% in 2005 to 8.3% in 2010)
- Compulsory dispatching and priority trade of RES generated power

Furthermore, Romania passed the Electric Power Law in 2007 and created a renewable energy law, Law no. 220/2008 which introduces certain additional measures to promote RES:

- Incentives for "new" renewable sources like small hydro, solar, wind, geothermal, biomass, biogas, as well as waste water and gas projects, assigning: 4 GC for 1 MWh from photovoltaic energy, 3 GC for biomass, 2 GC for wind energy and 1 GC for 1 MWh from hydro energy up to 10MW
- An outline for a green certificate trading market
- Higher GC price limits on the competitive market (minimum value EUR 27, maximum value EUR 55)
- Priority access for RES generated power, as long as such priority does not negatively impact the safety of the National Energy System and equal distribution of grid connection costs between investors, TSO and/or discos • Loan guarantees and tax exemptions for renewable energy investments

Limitations and challenges

Despite a relatively positive legal background, at the moment many of these supporting policies are inapplicable, mainly because of two factors. The first one refers to certain regulative restrictions, since the system must first be approved by the EU Commission, while the second deals with certain methodological restrictions, since certain components depend on secondary legislation – norms which have not yet been adopted by the government, ANRE (The Romanian Energy Regulatory Authority) or the competent ministry. Under these conditions, although it was supposed to be functional starting with 2009, Law no. 220/2008 is expected to become applicable only as of this year.

Another challenge is represented by the highly bureaucratic administrative procedures. The administrative bodies at national, regional and local level in charge with the authorization, licensing and certifications procedures prove in many cases to be decidedly uncoordinated. Moreover, they often fail in establishing transparent schedules in order to allow proper planning of applications. A particularly problematic area is that of the spatial planning, since many land plots lack proper registration and cadastration. Finally, one of the key challenges that the development of the renewable sector in Romania needs to overcome is represented by the national power grid limitations. It is estimated that the current national energy system cannot possibly sustain more than 4,000 MW of operational installed capacities from alternative sources. Therefore, in order to expand its renewable electricity sector, Romania will be forced to take suitable measures towards improving the transmission and distribution grid infrastructure, as well as its storage facilities, towards designing intelligent networks and properly connecting the national electricity system to international routes.

Latest developments

Latest and most spectacular development plans in the sector of renewable energy sources in Romania mainly deal with the segment of wind power generation.

Romania's very high potential, doubled by the attractive incentive schemes (2 GC for each MWh of wind energy until 2015), have raised a particularly high theoretical interest from investors, in this segment. Romanian authorities have until now received approval requests for the installation of a wind capacity that exceeds the country's potential.

Taking into consideration the practical side and even removing speculators, the outlook remains, nevertheless, promising. By October 2009, planned installed capacity of wind farms already with a contract had reached 1493 MW, while other 2361 MW of planned capacity belonged to wind farms with granted technical access. Thus, a wind power capacity of over 3,800 MW could be installed in Romania over the next 3-5 years.

In the meantime, as already stated in the beginning, wind power capacity is expected to increase in 2010 to 545 MW, up from 14.1 MW in 2009. This spectacular development is mainly due to the wind farms developed by CEZ in Fantanele and Cogealac. The first stage of the project (acquired in 2008 from Continental Wind Partners for about EUR 300 mn), located in Fantanele and comprising 139 turbines of 2.5 MW each, is estimated to finalize by the end of 2010, with the first wind turbines already operational as of June 1st, 2010. The entire project, with an installed capacity of 600 MW, is projected to become fully operational by the end of 2011, under total investments of EUR 1.1 bn. The wind farms will thus be able to supply electricity to around 400,000 homes.

EDP Renovaveis (Energias de Portugal) is also close to starting operating wind power generation facilities in the Dobrogea region. After having acquired several projects in 2008 from Renovatio Power and Cernavoda Power, with a total potential capacity of 736 MW, EDP became an active player and, according to the company's representatives' latest statements, a project with a capacity of 90 MW, located in Pestera (near Medgidia, Dobrogea), is expected to become operational by the end of 2010. The company is also setting up a 138 MW wind farm in Cernavoda. Estimated investments for the two projects exceed EUR 300 mn, which could be partially financed by the European Bank for Reconstruction and Development (EBRD) and the IFC (the World Bank's investment division).

Enel is another important international group having started the construction of a wind park in Dobrogea. The project, acquired from Blue Line, consists of a 200 MW capacity and amounts investments worth around EUR 350 mn. As the construction of the project commenced in February 2010, the first turbines could become operational by the end of 2010 also.

The Spanish group Iberdrola has recently received a license from Transelectrica to connect 1,500 MW of wind energy to the national electricity grid. The Dobruja project (Dobrogea) will consist of 50 wind parks, scheduled to be developed between 2011-2017. In addition, Iberdrola is currently developing an 80 MW wind park, located in Mihai Viteazu. The project is not included in the Dobruja venture, and is scheduled to become operational as of 2011. Total investments implied by the Iberdrola wind projects in Romania are estimated at around EUR 2 bn. The company is mainly working in partnership with Eolica Dobrogea.

Several other important players have initiated plans to develop wind power plants in Romania. RWE for example is in an advanced stage for obtaining the approval for two wind farms that will be built in Dobrogea, near Constanta, one of 200 MW and the other one of 150 MW. Electrica is so far the only Romanian state owned company heading towards the completion of a wind park in Chirnigeni area, near Constanta. The 50 MW wind farm is expected to become operational by the end of 2011. In addition, the company is also planning the development of some other two parks in Frumusita (Galati) and Sacele (Constanta) by 2012. Petrom will also start producing wind energy in 2011, after acquiring a 45 MW project from Wind Power Park in Dobrogea. With investments amounting EUR 100 mn, the project is scheduled to become operational by the end of 2011.

Excluding wind farms, other renewable projects which were recently announced include certain smaller projects in biomass (e.g. a 8.5 MW condensing generator group on Somes-Dej platform developed by A6 Impex), a series of small photovoltaic parks (e.g. the ones in Gura Ialomitei, partly developed by the Ialomita county authorities), as well as certain smaller geothermal energy production fields (e.g. the one in Beius developed by Transgex).

The Romanian renewable sector – great expectations

2010 and 2011 are widely regarded as milestone years for the development of green energy in Romania. By June 30th, 2010, Romania is required to submit the National Action Plan to Promote Renewable Energies to the EU Commission. Moreover, the first large wind projects are expected to become operational by the end of this year. Challenges lay, nevertheless, ahead. Appropriate legislation is expected to become more functional in order to provide real incentives to investors and also ease and harmonize bureaucratic procedures. Lack of land cadasters and the shortcomings of the national power grid are also key issues to be dealt with. Finally, despite the economic downturn, companies are required to find financing solutions to carry on their projects. In order to address all these challenges, appropriate and practical solutions must be found. It is only then, that 2010 and 2011 could make the transition from "great expectations" to "great accomplishments" in the Romanian green energy sector.

