

THE MARKET DEVELOPMENTS OF WIND ENERGY - ACCESSIBILITY, AVAILABILITY AND ACCEPTABILITY

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Abstract:

This study is based on the reality to ensure the universal access to energy and to increase in the future, the global share of energy from renewable sources.

The wind energy sector is developing and it records amazing ascent rates, the resources to this sector are priceless. The researches and technological developments have spurred the manufacture and installation of wind generators in an increasing rate, they are registering an exponential growth, even so, it can be stated, without fail, that the potential of wind energy pathways is underexploited.

For the next years, we must grant importance for this environmentally-friendly energy, as well as, an efficient use together with the material resources, a circular economy, a water management, aiming at the minimal effects on the environment.

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At the same time as the appearance of the concept of sustainable development and the growing support of its requests, the countries of the world started searching for new methods of producing energy as fast as possible, also aiming at the continuous growth of the energy share, which is based upon renewable energies. *The Protocol from Kyoto* determined the subscriber countries to strongly and continuously reduce the emissions of gases which have a greenhouse effect, thus determining - as a prime necessity - the adopting and the endorsement of the national policies of developing wind energy and other sources of alternative energy.

The renewable sources of energy can certainly ensure the growth of the energetic safety and the limitation of the import of energetic resources under the circumstances of a sustainable economic development, their revaluation being made based upon three premises offered by these: accessibility, availability and acceptability.

At present, the field of wind energy is developing and it is recording amazing rates of ascension; the gradual giving up to using fossil fuels encourages the possibility of using wind energy as a viable solution in order to reduce the polluting emissions and the greenhouse effect gases.

Even under these circumstances, we can state that the potential available to different channels of wind energies is under-exploited, compared to the existing possibilities; the technological improvements enabled the production and the installing of wind generating sets in a permanent growing rhythm in the last decades, being even characterized by an exponential evolution.

In 2007, at an international level, the whole power installed in wind installations knew a raise from 74 GW – at the end of the previous year – to 93,9 GW.

Even under the pressure exercised by the financial crisis, in 2008, the field of wind energy knew a high raise of 30%, thus reaching the value of 121,1 GW. With all these important raises, the production of electric energy from wind sources represented

in the year previously mentioned above, only 1,5% of the electric energy consumption from the whole world.

In 2010, the wind power stations recorded at a global level, a raise with a fourth more compared to the previous year (2009 – 152 GW) and showed a level of 197 GW.

The year 2011 recorded 238,5 GW – an evolution maintained at levels which are similar to previous years, data certificated by EurObserv'ER 2012, too.

According to the figures offered by the Global Wind Energy Council, China has the largest market, adding an amazing capacity of 18 GW in 2011, surpassing the United States; it is confirmed to be the country with the highest capacity from the market of wind energy.

Table 1: The capacity of wind farms at an international level

Regions	The capacity of wind farms/2010 (MW)	The capacity of wind farms/2011 (MW)
EU	84958,6	94097,1
Rest of Europe	1997,0	2659,0
Total Europe	86955,6	96756,1
USA	40298,0	46919,0
Canada	4008,0	5265,0
North America	44306,0	52184,0
China	44733,0	62733,0
India	13065,0	16084,0
Japan/Other Asian Countries	2334,0/975,0	2501,0/1080,0
Asia	61107,0	82398,0
Africa	1065,0	1093,0
South America	1997,0	3203,0
Pacific Region	2516,0	2858,0
Total	197 946,6	238 492,1

Source: EurObserv'ER (UE) 2012, American Wind Energy Association (AWEA) 2012, Global Wind Energy Council (GWEC) 2012

At an international level, on the first three places there are: China (62,7 GW), the United States (46,9 GW) and Germany.

China is also the biggest consumer of electric energy; in order to cover the request which is bigger and bigger, the Asian state invests in renewable resources; until 2050, the wind turbines should be able to ensure 17% of China's daily necessary electricity.

Until 2020, Germany will be able to give away all the nuclear reactors in favour of installing wind turbines with a total power of 10.000 MW.

In the Iberic Peninsula, the wind domain has the biggest contribution in producing electricity.

For the year 2011, the GWEC 2012 Report shows a growing capacity of wind farms, having reached 238 493,1 MW, a raise which supports the estimations made by specialists.

Taking into account the developments that will characterize in the following years, countries such as China, the United States or Europe it is anticipated a raise of wind capacity of over 400-600 GW appropriate to the period 2010-2014, these being corresponding to the estimations made on five years, by the Global Wind Energy Council.

It exists three scenarios which have the purpose of following the progress of wind energy at a global level.

In the three scenarios mentioned and presented by GWEC, we notice that the estimation of the referential scenario stipulates a growth of the capacity until 572,7 GW in 2030, as the advanced estimation, the most optimistic prevision, suggests a future capacity of 2.341,9 GW for the same period.

Under these conditions which are so benefic, more and more companies will invest funds into this attractive domain, which will stimulate, at the same time, a spectacular evolution of labor market in this field of wind energy. The wind pathway allowed the creating of places of employment in different fields – producing wind systems and their components, installing wind systems, exploiting and maintaining them, as well as in the field of research and development (2005 - 235 thousands; 2006 - 300 thousands; 2007 - 350 thousands; 2008 - 440 thousands; 2009 - 540 thousands; 2010 - 660 thousands of places of employment and indenting continue in the coming years).

Wind energy is considered to be one of the most sustainable options from the choices of the future. According to the estimations, the recoverable wind energy at an international level is situated between 52000 - 53000 TWh, which represents four times more than the current global consumption of electricity.

Focusing on the importance which the European Union gives to this field, it is checked the fact that the EU took at an international level the part of a leader in the fight against the climatic changes, assigning itself the task of promoting an economy based on low emissions of carbon dioxide, on knowledge and efficiency from the point of view of using resources; thus, the efforts of all member-states are supported.

Europe has the first position in the top of renewable energies, especially in the domain of wind energy (Europe - 40,6%; North America - 21,9%; Asia - 34,5% and The Rest of the World -3 %).

Table 2: The production of electric energy generated by wind in Europe

Country	The production of electric energy generated by wind/2010 (TWh)	The production of electric energy generated by wind/2011 (TWh)
Germany	37,793	46,500
Spain	44,165	42,060
Great Britain	10,182	14,100
France	10,028	12,200
Denmark	7,856	9,752
Italy	9,126	9,560
Portugal	9,182	9,264
Sweden	3,502	6,100
Netherlands	3,993	4,825
Ireland	3,473	3,671
Poland	1,664	2,584
Austria	2,019	2,300
Greece	2,136	2,130
Belgium	1,293	2,090
Romania	0,180	1,444
Bulgaria	0,600	0,962
Hungary	0,527	0,640
Finland	0,294	0,483
Czech	0,336	0,397

Estonia	2,276	0,365
Lithuania	0,262	0,350
Cyprus	0,081	0,216
Latvia	0,053	0,062
Luxembourg	0,055	0,058
Slovakia	0,006	0,006
Total EU	149,1	172,1

Source: EurObserv'ER 2012

On the European continent, the total capacity of the installed wind energy reached 84.958,6 MW at the end of the year 2010. European Wind Energy Association estimated the value of the investments in wind farms in 2010 at 12,7 billions euro, confirming the growth of the capacity with 10 % compared to the previous year.

The year 2010 individualized itself as being the first year after 2007 in which wind energy did not represent the top field in what regards the value of the capacity of the new installations which are based on alternative sources of electric energy. Wind energy represented 16,7% from the energetic capacity new installed. The total capacity of the sources of renewable energy from Europe grew at the end of 2010 with 61.855 MW reaching 885.023 MW, with a contribution of wind energy of 84.958 MW (9,52%).

At present, EWEA considers, according to the data obtained, that during a year with a medium intensity of wind energy, the wind farms from the European space are capable of ensuring 5,2% of the electricity request of Europe. In one of its studies, the European Wind Energy Association demonstrated that until 2020, the wind industry from the European Union ensures a doubling of the quantity of energy produced based upon this source.

The European Commission estimates in the scenario "Energy trends to 2030", that in the period from 2011 to 2020, installations with a capacity of 333 GW will begin to function, capacity out of which 136 GW (41%) is associated with wind energy. Moreover, another estimation of the European Commission shows the fact that 64% from the new capacity is the result of the field of wind energy (17% sources of gas, 12% coal, 4% nuclear energy and 3% oil).

The European Commission chose as a reference year – the 2005.

**Table 3: The structure of renewable energy sources
- energy generated -**

Type of energy	Energy generated / 2005 (TWh)	Energy generated / 2010 (TWh)	Energy generate / 2015 estimates (TWh)	Energy generate / 2020 estimates (TWh)	Energy generated / 2025 estimates (TWh)	Energy generated / 2030 estimates (TWh)
Hydro	307	323	332	339	349	335
Wind/land	68	147	197	253	316	368
Wind/sea	2	14	72	146	204	276
Biomass	84	127	164	191	218	241
Solar	1	17	32	46	60	75
Water /geothermal	5	6	6	7	11	19
Water/ marea	0	0	1	3	6	9

Source: European Commission

The European Union wants that *until 2020* to cover 20% of the energy consumption from renewable sources of energy and it *imposes* itself the following in order to achieve the objective settled for 2020:

- a) promoting E-SRE – it imposes to take into account some conditions with a great severity, as well as the functioning of an open market, regulated by laws and norms, a market which attracts investments in this field of renewable energies;
- b) the existence of a system of subventions and monitoring (CV);
- c) the connection to the network to be made without any discrimination;
- d) the transparency of markets.

At the level of the EU it was also elaborated a plan for the development of the renewable sources of energy after 2020 so it is considered that the european market of energy coming from these sources will stagnate if the EU does not take any measures in order to reduce the costs and to stimulate investments. As solutions, within the strategy of the fight against climatic changes, the EU proposed itself that 20% of the energy that it needs, to be produced from renewable sources until 2020; it seems that this objective will be achieved.

However, the industry manifests a slightly reticence towards the additional investments in renewable sources; on the one hand, it is manifested the inability of definition regarding the long-term policy of the EU, on the other hand the costs from this domain do not drop fast enough.

If hereinafter it is manifested a price of the energy produced from renewable sources, as well as a price of the wind energy which is much higher than that of the energy produced with the help of fossil fuels, the growing evolution of the market of renewable resources, of wind energy may, stop after 2020.

There are imposed the knowledge and the analysis as attentive as possible of the methods which would ensure the lowering of the costs at the desired level: (The Commission Report regarding the energy from renewable sources launched the process of making the EU Policy after 2020):

- a first solution – activating competition on this segment; the subventions for fossil fuels to be gradually excluded, the taxes on energy should be transposed to stimulate the investments in technologies with low emission of carbon dioxide, the support for renewable sources should be gradually diminished/supressed, in order to give a higher enthusiasm to long-term competition in this domain in relation to the other sources of energy;
- the national support programmes should be more homogenous and coherent at an european level – the administrative costs of these should be reduced, they need to be reformed;
- the production of wind energy should be much more sustained in the regions in which costs are lower; thus there will be countries with requests of wind energy from outside the countries, the costs being lower than those which would be imposed by the development of their own renewable sources.

The need of stimulating and sustaining the economic growth determined more and more companies to wish for more substantial investments in this domain; the use of wind energy, solar energy, hidroelectric, geothermal, tide and biomass energy, will ensure us the opportunity to be in the future less dependent on imported energy and it will also stimulate innovation and employment; at an european level, it will keep recording a growth of the number of places of employment in the industry of wind energy, not only for those employed in installing and maintaining turbines, but also for the employees who will have jobs in producing wind installations.

The special interest for the energetic efficiency has known a major extending and to answer the requests of reducing the impact of the activities of the energetic field on the environment, for a better protection of the environment.

The permanent or periodical analysis of the energy consumption and the intensification of using energy from renewable sources, together with the saving of energy and growth of energetic efficiency, represent the essential components of the set of measures which were established to reduce the emissions of greenhouse effect gases.

The programme of using renewable sources of energy adheres at the environmental desideratum. Wind energy acquired a higher importance and the investments in the wind domain can surely ensure:

- sustainable development and environmental protection;
- long-term energetic security, in theory they are inexhaustible energies;
- a clear answer to the necessity of reducing emissions.

At the same time as the raise of population number at a global level, we are faced with a lot other vicissitudes – a high pollution with more devastating effects, the beginning of more visible climatic changes, as well as a more intensive deficiency of natural resources; these ensuring the development engine at a global level. Taking into account the situation created, sustainable energy constitutes itself as a branch which lacks superficiality, its involvement regarding ecology and the existence of the environment is reflected in the importance that they have today and which renewable energies will have in the future, the number of the existing companies on the market and the number of those who work in this domain which is in a continuous evolution.

As wind energy market, including the whole market of renewable resources grows, many other improvements are required. As I have stated before, in theory they are inexhaustible energies and the investments in this domain answer to the urgent necessity of reducing the polluting emissions and the greenhouse effect gases, but they can certainly ensure: not only a durable development but also an adequate protection of the environment.

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