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ADVANCING RENEWABLE ENERGY

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In the new situation of 21st century, the renewables energies – solar, biomass, wind power – advance in Brazilian energy matrix, occupying more and more space between the conventional arrays of energy produced in the country: oil and hydroelectric power.

The energy from the hydroelectric plants, although renewable, has lost space due to two main factors: environmental impact and fall in the volume of water in the reservoirs, in virtue of climate instability. In addition to the water in multiple use, among which the most important is the cities supply for human use. Thus, the generation of energy becomes a by-product of the administration of water resources.

In this reality, mainly to the Northeast, the expansion of new renewable energy is relevant and wind power is the most significant growth in this region. In 2013 represented 3.13% of the energy generated in the Northeast, in 2016 reaches 39.9%. This advance comes from 310 wind farms installed in the region, with a nominal capacity of 8,000 MW.

This is the assessment of the electric system operator about what is happening in the energy supply in the Northeast, made in response to a questionnaire of Conjuntura Econômica, while noting that, in all of the National Interconnected System (NIS), the preponderance of water source of generation will remain still for long.

The estimate of the Energy Research Company (ERC) is that in 2030 the water sources still pay for 67% of the centralized generation (made in exclusive units, just over 90% of the total) consumed in the country.

However, the strong presence of wind generation in the electricity supply of the Northeast draws attention to the growth that the so-called alternative renewable sources have in the Brazilian electric matrix

According to data of the National Electric energy Agency (Aneel in Portuguese) compiled by the Brazilian Wind Power Energy Association (ABEEólica in Portuguese), at the end of the first half of this year renewable alternatives, represented by the wind power and biomass, had an installed capacity of 23.21 MW, which is equivalent to more than one and a half times the rated capacity of the Itaipu Binacional hydroelectric power plant (14,000 MW), the second largest hydroelectric plant in the world, or more than twice the nominal capacity of Belo Monte (11,23 MW) second largest in Brazil, accounting for 15.9 percent of the Brazilian installed capacity.

An important aspect for the expansion and use of these two forms of energy, wind and solar, in addition to the cost and the funding relates to the storage system. The need for investment in storage technologies that has been object of research in various parts of the world is essential factor to mitigate the problem of Intermittency of these energy sources.

One of the most promising solutions to minimize this issue of intermittency is energy storage by means of high-performance batteries. One of the companies has been investing in this technology is the American AES Corporation. This effort has arrived at the Group's subsidiaries in Brazil by means of Distributed Energy and Energy Storage of AES Tietê. According to Rodrigo D'elia, director of the Brazilian subsidiary of AES, this system is already in the fourth generation and AES already owns the world 394 MW in storage units.

According still this Director, the group won a bid to install a storage unit of 100 MW in California (USA) in order to meet the demand at peak times causing lower costs the same role of a thermal power plant. In Brazil, the Group presented a proposal to install a battery system in Santarém, Pará, to store 21 MW of energy instead of enlarging a 18.75 MW thermal installed by Eletrobras. The costs would also be smaller than those of thermal expansion.

In favor of this technology is that in the last six to seven years, storage batteries with lithium technology were about to 80% cheaper, largely benefited with the improvements obtained by the electronics industry, like cell phones.

Another application in order to solve this problem is the integration of wind farms and solar panels to reduce flashing inherent to these two sources of generation.

Also favorable to the expansion of wind power was the legislation which, from the second half of 2013, made mandatory the junction between the generators and transmission lines, this according to executives in the industry.

To the technological problems of renewable sources, what if question at this point is what the trajectory that wind and solar sources will have in the next few years in Brazil considering the economic climate of recession that the country lives causing falling demand. However, as the companies work with long-term horizon, that you stay away from a major downturn in investments.

The President of the Italian company Enel, for example, says that in 2030 the Brazil can reach between 20% to 25% of its energy matrix mounted on these renewable energy, and says he hasn't seen optimistic prospect of significant retraction of BNDE willing to finance the expansion of the sector, although the new direction of the Bank, headed by economist Maria Silva Bastos Marques, come by reducing the supply of resources for new projects in the energy sector and other areas, and the search for alternative sources in the private sector.

The Brazilian economy turmoil aside, the fact is that there are today in Brazil seven manufacturers of wind turbines, one being the catarinense WEG, national manufacturer of equipment that has been internationalizing in recent decades. According to João Paulo Gualberto da Silva, Director of the company's Wind Power, WEG started acting in 2012 and more strongly in 2013, having delivered since then until 2015 and equipment predicting 80 delivering a hundred this year. The wind turbine companies in Santa Catarina was developed with technology from the American Northern Power Systems adapted to Brazilian conditions.

Despite the market being with high degree of uncertainty at the moment, the Executive based on the company's experience in the sector, which has been very positive, and that this year the WEG hopes to reverse the return on investment that was negative in the early years, with the expectation to 2017 even better.

The company catarinense is not alone in this market. The development of domestic manufacturers did to arise other companies to manufacture steel wind towers. In 2014 was born in Jacobina, Bahia in the outback, the Northeast Wind Powers Towers (TEN), a partnership of the Andrade Gutierrez Group (51%) with GE (49%). According to Anderson Pinho, the company's managing director, the location chosen is related to the fact that the Brazilian State Bahia should lead the wind energy market in the coming years.

Another company already consolidated in the wind towers is Engebasa, located in Cubatão (SP), next to the port of Santos, having this place as an asset for a possible entry into foreign markets not yet achieved.

An asset of wind energy is that it has very competitive prices, and rapid deployment of power plants, allowing for a short period to meet the demand for energy.

An unquestionable proof of the relevance that won the following of wind energy in Brazil in recent years is the amount of resources funded by the BNDES. The R\$ 107.3 billion funding for 322 electric sector projects which the Bank approved in 2003 to 2015, R\$ 24.8 billion was for 76 projects of wind power. The value corresponds to 23.1% of the total approved and only gets behind the hydroelectric segment that got R\$ 66.3 billion, or 61.8% of the total funding.

Installed wind power parks in Brazil until 6/30/2016

States	Ability (MW)	Number of parks
Rio Grande do Norte	3,011.20	109
Bahia	1,897.80	73
Rio Grande do Sul	1,568.80	66
Ceará	1,561.40	59
Piauí	804.90	28
Pernambuco	693.40	27
Santa Catarina	238.50	14
Paraíba	69	13
Sergipe	34.50	1
Rio de Janeiro	28.10	1
Paraná	2.50	1

Source: ABEEólica.

Parks under construction in Brazil until 6/30/2016

States	Ability (MW)	Number of parks
Bahia	3, 647.80	159
Rio Grande do Norte	1,782.90	70
Ceará	1,096.20	47
Piauí	1,053.90	39
Rio Grande do Sul	487.80	25
Pernambuco	272	10
Maranhão	210	7
Paraíba	90	3

Source: ABEEólica.