Serbia: Treatment of wind power plants in the simulation model

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The electricity production part of Serbia power system is based on the use of its own primary energy sources, primarily coal and hydropower potential. Due to the negative impact of existing technologies for energy production from coal on the environment and the need to comply the energy sector development with the principles of the environment conservation, was enacted the Law on Energy and signed the Energy Community Treaty, which provide a more intensive use of renewable energy sources. So far a significant part of the project documentation was realized, especially those relating to the wind energy use.

The wind is used now significantly for electricity production in the world. Germany and Spain are leading in Europe. German energy system is dominant thermo system, while Spain also has significant hydro potentials.

The average time of exploitation engagement of maximum wind generators power in Europe, in 2012th, amounted to 1.800 hours per year, or about 21 percent. The greatest period of engagement has Ireland, following Denmark, Portugal and Spain. Despite the low efficiency values of maximum power, almost all European countries have joined to the activation of wind potential.

Fluctuation of primary energy source and a little time of power efficiency are the main characteristics of wind generators. Dedicative measurements of wind speed at several locations in Serbia indicate at significant number of days with no wind, namely with speeds below the minimum of 4 m / s. This leads to the balancing problem of wind generators power. Previous practice to balance wind power plants only by the energy significantly reduces their economic indicators. However, definitive stance on the issue of power balancing can be brought only after considering a longer period of time, for example 30 years, and such data do not exist. Measurements at three locations in Serbia, during three years (2010-2013) showed that there was a reduction in windiness during the summer and increase during the autumn and winter.

Wind energy cannot be accumulated and must be produced at all times with the available power. Accordingly, wind power plants should be engaged with the full available power at all times of the conditions existence for stable operation, and the other, more flexible sources provide balance force, reserves and so on. In this regard, in the EPS system, their involvement would be set between technical minimum of thermal power plants and constant hydropower production. All other production would be adopted, in the regular operation, to wind power plants.

The high costs production of wind power plants are conditioned by short time of work and significant investments. Obligations of taking energy from wind power plants and feed-in

tariffs are defined in order to stimulate use of renewable energy sources.

Source; Serbia Energy