

Wind power is the energy field with the highest development trends in the last 15 years in Europe. According to the Energy Sector Development Strategy of Serbia, as well as the existing regulatory framework for subsidizing electricity produced from renewable source, significant investments are expected in the next 10 years in this energy field of our country. Since the region of South Banat has a huge wind potential, development of a wind farm with cumulative capacity of about 600 MW was envisaged for this geographically relatively small area. Installed capacity of the wind farm will many times exceed the load the loop to which it is connected, even under the maximum system load regime.

This paper analyzes the impact of wind farms on the quasi-stationary power flows and voltage conditions for different generation conditions of active and reactive power of wind turbines.

Based on the power flow analysis and dynamic simulations in terms of wind speed changes, this paper concluded that the proposed windfarm may have a positive impact on voltage conditions in the 110 kV network of the southern Banat, because this part of the system contains elements able to locally regulate voltage through their generation or active power generation.

The best effects may be achieved if wind turbines operate with variable power factor at the connection point, or with feedback by voltage. The simulation has demonstrated that operating regimes of wind farms under which they inject considerable reactive power values should be avoided, since some voltages of some busbars might exceed the permissible value prescribed by the Grid Code.

Bearing in mind the fact that the wind turbines are connected at different points inside the analyzed 110 kV loop, the authors believe that it is necessary to consider the conditions of their coordinated operation in terms of reactive power generation/absorption, in order to achieve optimal effects relating to voltage conditions and minimization of transmission network losses, transmits Serbia-energy.eu