International ConferenceTechnologies and Materials for Renewable Energy, Environment and Sustainability (TMREES14) / Elsevier- Sience Direct (Technologies and Materials for Renewable Energy, Environment and Sustainability)

Volume 50, 2014, Pages 97-104

Dynamic Response of a Stand Alone DC Side Wind Energy Conversion System with Battery Energy Storage to a Wind Gust.

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Abstract: The study concerns particularly the DC side of the wind system, the continuity of the AC one being already studied in. Then,this work elaborates an analysis of the DC components, particularly the system conversion and storage of the wind system conversion. Indeed, the battery is a storage buffer essential in our case for isolated network. We emphasize its importance by evaluating its various features. The AC study concerned the analysis and simulation of a low speed Permanent Magnet Synchronous Generator (PMSG) driven by a vertical wind turbine through a Pulse-Width Modulation (PWM) voltage inverter. Renewable resources are in constant fluctuation. Therefore, in order to maximize the efficiency of the renewable energy system it is necessary to track the maximum power point of the input source. In this system, the maximizing is assured while considering the optimal power curve as load characteristic, with the knowledge of the turbine characteristic Cp (?). The study was accomplished on MATLAB/Simulink and Script platforms.

Keywords : Permanent Magnet Synchronous generator, mdel, DC side, Storage, Small Wind Turbine