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Performance Efficiency of Solar Wind Hybrid Power Generation Using Hybrid Grid Based Grey Wolf Optimization

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Abstract

Clean energy is generated with some resources like wind, solar, biomass, ocean, hydropower and geothermal resources. The development in the socio-economic status of any world nation is to provide more reliable system which supplies electricity. This work focuses on developing the hybrid solar–wind power system that unites the renewable energy of wind and sun to produce electrical energy. PV array and utility grid are connected through electronic converter which has several requirements related to power quality, energy efficiency and grid stability. By using maximum power point tracking (MPPT), PV generator is optimally utilized. Implementation of MPPT and solar charging controller can increase power handling and energy efficiency can be maintained throughout the day as well as course of the year. The major objective of this proposed model is to focus on load demand, handle power flow from different resources, provide extra power to grid and charge the battery using grid when necessary. Thereby, the system reliability and efficiency are effectively improved. This developed hybrid system

using MPPT controlled bidirectional DC–DC converters and voltage regulated inverter which well suits for stand-alone application is implemented in MATLAB simulator.

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