A NEW MULTI-INPUT CONVERTER CONFIGURATION FOR RENEWABLE ENERGY SYSTEMS

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ABSTRACT

In renewable sources, such as wind and solar energy, the generated voltages often vary because of environmental changes. When the input voltage drops to the value lower than the battery, it will fail to charge. The cascaded buck-boost converters are conventionally used to step-up or step-down the input voltage, however it is relatively complex and costly. In this paper, a new battery charging system is proposed based on the non-inverting buck-boost converters. Circuit connected to wind turbine, for the low wind speed range, the control strategy is aimed to follow the wind turbines maximal power coefficient by adjusting the generator's rotational speed. For high wind speeds, the system power regulation is also made by controlling the generator speed. This control is made by the DC/DC power electronic converter, which modifies its input voltage, changing the machine voltage and consequently varying the generator's rotor speed. The model is validated through the simulation results of one and multiple sources with constant and variable input voltages .Test results show stable operating performances on both steady-state and transit conditions.

KEYWORDS: Buck-boost cascaded, fuel/stack energy system, Solar system, wind energy system**.**