

## Multi-Input Boost Converter for Hybrid PV and Wind Generator Systems

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**Abstract.** A renewable energy source that works alone can't achieve customers' requirements for a stable power supply. Therefore, the paper proposes a multi-input converter for hybrid renewable energy system. This converter is designed for two input sources, PV and wind generator in order to design high efficiency and high performance converters for renewable energy applications. The proposed multi-input converter is composed by interleaved technique with two step-up converters and the two inputs are accommodated with some extra semiconductors, inductances and diodes. The modes of operation based on the status of the four switches, where  $S_1$  and  $S_2$  operate as main switches in order to deliver energy from both voltage sources. A constant output power to the load is provided by switching  $S_3$  switch, which guaranteed the appropriate output voltage by reduce the ripple and improve the reliability. Simulations of multi- input converter has been performed using MATLAB/SIMULINK. The simulation results confirm the validity of the proposed method, which can be seen as a promising new topology that ensure multi-input converter suitable for renewable energy applications.

### Introduction

Renewable sources are the requisite for the expansion of epidermal community and economical. These days, scorbutic resource, the basic part of the energy, is almost exhaustive, and the environment is becoming worst. Renewable energy sources like PV and wind have the characteristics like non-pollution and superabundant reservation. The evolution of the renewable energy sources have been became an important [1,6].

However, wind and PV are influenced by some factors like climatic conditions and seasons, and they are discontinuous. Thus, the renewable source that works individually can't achieve customers' demands for a steady energy supply. Multiple-input assortment of renewable energy sources work with each other for electrical serving to solve this problem is proposed [2].

Applications like wind and PV systems use converters susceptible to be accepted more than one input source [3]. Therefore, in order to develop the performance of the renewable energy system is choosing to have wind systems create a relatively low voltage and some to have a low voltage with the PV. The converters in these implementations are then normally of the boost mode.

The energy supplied from these systems is unstable and depended on the climatological conditions, this create that the power that can be provided to the load is also unstable [4,5]. Thus, the converters used in these implementations have to allow demanding power to both input sources simultaneously or individually, depending on the availability of the input sources.

In this paper is offered a new converter susceptible two input voltage sources, and the power can be requested from converters individually depending on the availability of the voltage sources.