A current and future study on non-isolated DC`DCconverters for photovoltaic applications.

ABSTRACT

Photovoltaic (PV) is a fast growing segment among renewable energy (RE) systems, whose development is owed to depleting fossil fuel and climate-changing environmental pollution. PV power output capacity, however, is still low and the associated costs still high, so efforts continue to develop PV converter and its controller, aiming for higher power-extracting efficiency and cost effectiveness. Different algorithms have been proposed for Maximum Power Point Tracking (MPPT). Since the choice of right converter for different application has an important influence in the optimum performance of the photovoltaic system, this paper reviews the state-of-the-art in research works on non-isolated DC–DC buck, boost, buck–boost, Cúk and SEPIC converters and their characteristics, to find a solution best suiting an application with Maximum Power Point Tracking. Review shows that there is a limitation in the system's performance according to the type of converter used. In can be concluded that the best selection of DC–DC converter which is really suitable and applicable in the PV system is the buck–boost DC–DC converter since it is capable of achieving optimal operation regardless of the load value with negotiable performance efficiency and price issue.