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Titolo	Photovoltaic Thermal Collectors with Nanofluids and Nano-PCM [[electronic resource] /] / by Ali H. A. Al-Waeli, Kamaruzzaman Sopian, Hussein A. Kazem, Miqdam T. Chaichan
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Soggetti	Solar energy Energy storage Production engineering Nanotechnology Energy harvesting Solar Thermal Energy Mechanical and Thermal Energy Storage Thermal Process Engineering Impact of Nanotechnology Nanoscale Design, Synthesis and Processing Energy Harvesting
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Nota di contenuto	Photovoltaic Thermal (PV/T) -- Traditional PV/T Collectors -- State-of-the-Art of PV/T Systems -- PV/T with Nanofluids and Nano-PCM -- Performance of PV/T with Nanofluids and Nano-PCM -- Life Cycle Cost Analysis.
Sommario/riassunto	This book gives you theory and design of PV/T systems. Are you interested in solar energy? If you are, you must have read about solar panels, or photovoltaics (PV). If you have installed a photovoltaic system, you must have noticed it not to generate the amount of power mentioned in its datasheet. A major issue that PV suffers from is its

temperature, which causes a drop in its power. Among the solutions to this issue is to use active cooling methods, such as the hybrid photovoltaic thermal (PV/T) system. These systems can produce electrical and thermal energy simultaneously and within same area. The thermal collector serves to cool down the PV surface temperature, which negatively affects the PV efficiency, to reclaim the efficiency or bring it back close to standard testing conditions value. Moreover, the thermal collector will convey this heat using a working fluid and extract it as thermal energy. On the other hand, the electrical power generated from the PV can be utilized in standalone or grid-connected configuration. Moreover, the book presents a novel PV/T collector which can utilize nanofluids and nano-Phase Change Material (PCM) to enhance its performance in tropical climate conditions. The methods used to develop the heat transfer and energy balance equations are presented as well. PV/T collector numerical simulation using MATLAB and computational fluid dynamic (CFD) was also presented. Finally, the approach of life cycle cost analysis (LCCA) is presented to evaluate PV/T with nanofluid and nano-PCM, economically.

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