

Hybrid Cooling System for Solar Photovoltaic Panel

Abstract

Solar photovoltaic (PV) panel is one of the renewable sources of energy and produced daily nowadays. Solar panel systems have efficiency influenced by different factors, such as ambient temperature, solar panel temperature, sunlight, weather, and irradiation. The increasing of the temperature of the solar PV panel decreases its efficiency and lifetime. Thus, to maintain and decrease the temperature of the PV cell, cooling system is required. This paper presents the hybrid (water and air) cooling system method for solar PV panel. The method has been designed and developed to lower and stable the operating temperature of the system considering different weather conditions. The results revealed that the hybrid cooling system has shown improvement of output power solar PV panel as compared with water cooling system only. Furthermore, the proposed method managed to improve efficiency approximately to 4.5%.

Keywords

Cooling; Solar concentrators; Solar panels; Solar power generation; Temperature; Thermoelectric equipment