

عنوان مقاله:

Enhancement of a linear concentrating photovoltaic system (LCPVS) through preheating water : A simulation study

محل انتشار:

دو فصلنامه تجهیزات و سیستم های انرژی، دوره 12، شماره 2 (سال: 1403)

تعداد صفحات اصل مقاله: 14

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خلاصه مقاله:

Growing worldwide energy demands, the drawbacks of fossil fuels, and global climate change have prompted the creation of sustainable, clean power. One of the viable alternatives to the consumption of fossil fuels is the use of solar energy. Solar photovoltaics (PV) and solar thermal are the most widely accessible solar technology. Hybrid solar systems that make use of Concentrated PV Thermal (CPV/T) technology give an alluring option for the generation of both electrical and thermal energy at the same time. CPV reduces the area of PV receivers while capturing the same amount of solar energy through the use of solar radiation that has been Concentrated on PV cells. However, a notable concern associated with CPV is the elevated temperature of the PV surface, often necessitating the implementation of cooling measures. This problem can be resolved by the implementation of a CPV/T system. Conditions for modeling a novel CPV/T hybrid system embedded Multi Junction Photovoltaic cells (MJPV) and based on Fresnel Lens (FL) have been presented in this research. The Python programming language was utilized to simulate the functioning of a linear concentrated Photovoltaic System (LCPVS). In addition, the influence of cooling fluid and its impact on the efficiency of MJ cells (MJC) were assessed. The findings indicate that the proposed system's average thermal and electrical energy were ۷.۲۵۹ and ۳.۷۳۷ (kWh) respectively. Moreover, the average efficiency of the new design was ۳۴.۷۱۳% and the amount of potable and hot water has more optimum outcomes

کلمات کلیدی:

Solar Energy, LCPVS, Solar radiation, Temperature, Thermal energy, Electrical

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