

One-axis tracking parabolic trough collector with rotation about horizontal EW and NS axes, and photovoltaic systems are modeled; their performances and heat and optical losses from both systems are quantified for each location. The findings demonstrate that energy output from the selected solar technologies is maximum and relatively stable in Sharura, whereas ...

Experimental investigation of a V-trough PV concentrator integrated with a buried water heat exchanger cooling system ... 20.5 °C and 22.4 °C compared to the conventional Fig. 6. Soil temperature at horizontal locations near the BWHE. 710 Solar Energy 193 (2019) 706-714 N.A.S. Elminshawy, et al. Fig. 7. ... Acknowledgement Authors would ...

Figure 4 shows the power generation efficiency of the trough solar photovoltaic cell. The maximum power generation efficiency of the trough solar photovoltaic cell is 40% when the light intensity is 1.2 kW/m<sup>2</sup>. It can be seen that, with the gradual increase of the light intensity, the power generation efficiency of the photovoltaic cell under ...

In [63], the power output of a V-trough photovoltaic system was predicted with support vector machine (SVM), ANN, kernel and nearest-neighbor and deep learning (DL) methods. Through a statistical ...

4. Conclusions A V-trough (2-sun) PV concentrator system using commercial PV modules was fabricated and tested to achieve electricity cost reductions generated using PV. Geometric concentration of 2 for V-trough concentrator PV system can be obtained for different combination of trough angles, as obtained from different design models.

cooled V-Trough concentrators with c-Si PV technology. Recently, Hadavinia and Singh [14] through an experimental study reported that a CPC with geometric concentration ratio of 2.7 generating 2.4% higher power than a geometrically equivalent V-Trough. These studies have shown CPC and V-Trough based LCPV systems in conjunction with c-Si

The photovoltaic (PV) panel performances are dependent upon many factors. A study was executed to ascertain the effect of a V-Trough Concentrator (VTC) to be engaged on a PV Panel in this research ...

This paper presents a methodology for the optical design of a novel solar concentrating photovoltaic trough collector, consisting of several flat reflecting segments, joined together in an open polygonal shape. The concentrator reflects the incident solar radiation to a flat receiver, thus forming a photovoltaic module. The system of analytical design equations ...

Recent work of the authors showed that, as compared to fixed PV panels, the increase of AEG from inclined

north-south axis multi-position sun-tracking VPV is even larger than the  $C_g$  [20].

trough photovoltaic/thermal collector with a geometric concen- ... (60) enters the aperture of the concentrator reflector (10) at an incident angle  $90^\circ$  to the horizontal plane. For seven plane ...

Bifacial photovoltaic modules combined with horizontal single-axis tracker are widely used to achieve the lowest levelized cost of energy (LCOE). In this study, to further increase the power production of photovoltaic ...

The electricity and heat produced simultaneously in a photovoltaic thermal (PVT) system from solar energy is about 60-70% efficient. The traditional photovoltaic (PV) system conversion of electricity from solar energy is only about 6-15% efficient, whereas 85% of the incoming solar energy is either reflected or absorbed as heat energy, which are cooled by ...

PV panels mounted on roof Workers install residential rooftop solar panels. The solar array of a PV system can be mounted on rooftops, generally with a few inches gap and parallel to the surface of the roof. If the rooftop is horizontal, the array is mounted with each panel aligned at an angle. If the panels are planned to be mounted before the construction of the roof, the roof can ...

This paper is a summary of the last ten years of work on the study of parabolic trough collectors (PTCs) and compound parabolic collectors (CPCs) coupled to photovoltaic and thermal solar receiver collectors (SCR ...

The difference between the geometrical and the real concentration is due to the optical losses such as reflectivity of the mirrors ( $\rho \sim 85\%$  for commercial V-trough concentrator on a PV system 2.0- ... i.8 529 1400 1200 [  $\sim x \sim m \sim 1000$  1.6 800 0 &quot;  $\sim 600$  I..) 1.4 400 1.2 200 I 10 I 15 I I 20 25 Angle ( $^\circ$ ) I 30 I A Nor o Concentrated horizontal J 35 8 I 10 I 12 I 14 I I 16 18 I 20 Time (h) Fig. 2.

The low concentrating photovoltaic (PV) system such as a  $2^\circ$  V-trough system can be a promising choice for enhancing the power output from conventional PV panels with the inclusion of thermal ...

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