

Performance of Partially Covered N Number of Photovoltaic Thermal (PVT) - Compound Parabolic Concentrator (CPC) Series Connected Water Heating System

Authors : Rohit Tripathi, Sumit Tiwari, G. N. Tiwari

Abstract : In present study, an approach is adopted where photovoltaic thermal flat plate collector is integrated with compound parabolic concentrator. Analytical expression of temperature dependent electrical efficiency of N number of partially covered Photovoltaic Thermal (PVT) - Compound Parabolic Concentrator (CPC) water collector connected in series has been derived with the help of basic thermal energy balance equations. Analysis has been carried for winter weather condition at Delhi location, India. Energy and exergy performance of N - partially covered Photovoltaic Thermal (PVT) - Compound Parabolic Concentrator (CPC) Water collector system has been compared for two cases: (i) 25% area of water collector covered by PV module, (ii) 75% area of water collector covered by PV module. It is observed that case (i) has been best suited for thermal performance and case (ii) for electrical energy as well as overall exergy.

Keywords : compound parabolic concentrator, energy, photovoltaic thermal, temperature dependent electrical efficiency

Conference Title : ICEESD 2016 : International Conference on Energy, Environment and Sustainable Development

Conference Location : Paris, France

Conference Dates : January 21-22, 2016