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## Exergy analysis of an inverted photovoltaic thermal compound parabolic concentrator (IPVT-CPC) water collector

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There is an acute shortage of fossil fuel supply in the present world. Solar energy utilization is one way by which this problem of energy shortage can be tackled. Therefore, a novel design of inverted photovoltaic thermal compound parabolic concentrator (IPVT-CPC) is proposed. The thermal modeling of IPVT-CPC system was performed. MATLAB 2010a software was used to investigate the exergy of the system. The exergy analysis was carried out to evaluate the system performance. This IPVT-CPC system was then compared with normal PVT-CPC system. Integration of the photovoltaic thermal system was done with a compound parabolic concentrator and an inverted absorber and the combined IPVT-CPC system formed have been found to have an increased overall exergy efficiency. Further, the analytical expression for the temperature dependent electrical efficiency has been developed and the results obtained were analyzed by MATLAB2010a. It was observed that IPVT-CPC system performance is better than the PVT-CPC system.

### Biography

Deepali Atheaya is a PhD research scholar since 2013 at Center for energy studies, Indian institute of Delhi, India. She has completed her BSc (Engineering) in Mechanical Engg. from Aligarh Muslim University, Aligarh, U.P, India. She did her MTech in Industrial & Production Engineering from the same university. She has about 10 years of teaching experience in thermodynamics, manufacturing processes, production engineering subjects and renewable energy resources etc.

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