# A Review on Thermophotovoltaic energy conversions and its space power applications

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# Abstract

Thermophotovoltaic is the direct conversion of radiant heat into electricity. A TPV system changes the radiant heat energy from a source into electrical energy using TPV cells. The TPV model consists of multiple array of TPV cells, an emitter, a radiator and a filter.[1] one of the important advantages of TPVs are the high efficiencies and direct conversion of DC power.[4] This paper present the research being conducted till date in the field of photovoltaic cell and space application of TPV cells. We have Thermophotovoltaic has been regarded as an energy substitute in radioisotope deep space power system for thermoelectric. TPV provides outstanding potential improvement in mass specific power as well as in efficiency. TPV system also proposed for inner planetary solar system. This idea leads TPV capability to store energy in the form of heat energy rather than electrical energies which is common in photovoltaic system. The current effort to derive the demonstration of efficiency conversion up to 19% and it enhances the specific power W/kg at the system level. [ 2,3] Next generation TPV concepts are also reviewed in order to explore the future space power application. The application of TPV(RTPV) that includes radioisotope TPV and solar TPV(STPV) plays a vital role in deep space powered systems. [3,4]

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**Key words**- Thermophotovoltaic, conversion, space, system, efficiency.

**Reference**

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