

Analysis of Maximum Possible Utilization of Solar Radiation on a Solar Photovoltaic Cell with A Proposed Model

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Abstract: *The paper proposes a possible solution to absorb and utilize all the solar radiation spectrum including ultraviolet and infrared along with the visible radiation. A typical solar PV cell usually absorbs only the visible solar radiation to convert to electricity which is 46% of the total solar radiation but it can't use the other non-visible spectrum like infrared (longer wavelength) and ultraviolet (shorter wavelength) which consists of the other 54% of solar energy. This non-visible solar radiation is either absorbed by the earth surface and atmosphere or reflected back to the space and it is wasted as far as the solar cell absorption is concerned. There are lots of researches going on in the semiconductor level to design a solar cell which can absorb the solar radiation in non-visible region using band-gap engineering but if we could somehow convert the non-visible solar radiation into visible range before it comes to the solar cell (semiconductor level) then the overall efficiency of a solar PV system would surely be increased to a satisfactory amount. After converting the non-visible spectrum into visible spectrum, we will then incident this radiation on a typical solar PV cell. In this paper the possible arrangement for such conversion is proposed which is still at a preliminary stage concept and yet to be implemented.*

Keywords: solar radiation, infrared radiation, ultraviolet radiation, virtual earth surface, solar PV cell

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