

Title: Effect of Dust Accumulation on Solar Panels and Mechanism for Alleviation: Design for Street Lighting Purpose

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As the conventional energy sources dry up, future of world lies with renewable energy sources. Solar energy is known as cleanest sustainable energy source and solar photovoltaics is the most sought after renewable source of energy these days. The output power of the solar PV panels depend on various factors such as solar cell build up, solar panel tilt, solar insolation, cell temperature, sun exposure hours and other meteorological factors. The aim of this research is to deal with the decrease in the power output due to the particle deposition in solar panels and provide detailed design of the modular cleaning device. After a number of design modifications, alterations and testing, a modular cleaning device for the street solar panels is proposed which is energy efficient, effective in cleaning and inexpensive. The cleaning module consists of rollers, sliders, pulley, brushes and a DC motor. Main focus of the design is to make it light-weight so the existing panels can easily hold device's weight. This research is based on the specifications of solar panels installed for street lighting purpose in Kathmandu by Nepal Electricity Authority. Cost-effectiveness is another advantage of this device as the device costs under 10% of the total cost of street solar panel system. The power output decrement due to dust deposition was found to be 3.16% in one day and reaching 10.41% in ten days and 15.74% in a month.

Biography

Tejan Adhikari has completed his Bachelor's in Mechanical Engineering from Institute of Engineering, Pulchowk Campus. He is currently working as a research assistant in his home country, Nepal in the field of Sustainability of Renewable Resources.

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