

Solar Panels Cleaning and Cooling Techniques

Sujatha Thapa*

Department of Mechanical Engineering, Visakha Technical Campus, Jawaharlal Nehru Technological University of Kakinada, Visakhapatnam, India

DESCRIPTION

Solar photovoltaics (PV) are most widely used renewable energy source to avoid carbon emissions for electricity. As all we know that the efficiency of solar panel depends on amount of solar radiation captured by the panel. But, the surface of solar panel is scaling with fine dust particles and this dust stores solar radiation in it, this radiation causes high temperatures (Figure 1). High temperature around solar panel also reduces the efficiency of photovoltaic cells thus reducing the efficiency of photovoltaic effect.

The effect of dust-fall on photovoltaic module mainly effects the efficiency of the solar power has stated by many researchers around the world. To reduce the effect of dust on module surface basically they provide a 60 nm thickness of TiO₂ coating. TiO₂ coating on modules acts as self-cleaning element when the panel is fixed at certain angle [1].



Figure 1: Manual cleaning process.

compressor, compressed air tank with pressure regulator, pipe lines ended directly on surface of module with nozzles and condenser (Figure 2). Compared with first two methods of coatings this method is expensive and occupies more space to set up [3].

For self-cleaning solar panels, some of researchers developed a method of facial coating of transparent super hydrophobic as it contains agglomerated H-SiO₂ nanoparticles. For this two-step brush painting under ambient conditions is required [2].

As we discussed before high temperatures also reduces the efficiency of panel. To avoid this effect and to clean the surface of panel there is common solution to improve efficiency that is compressed cooling air method. This method includes air

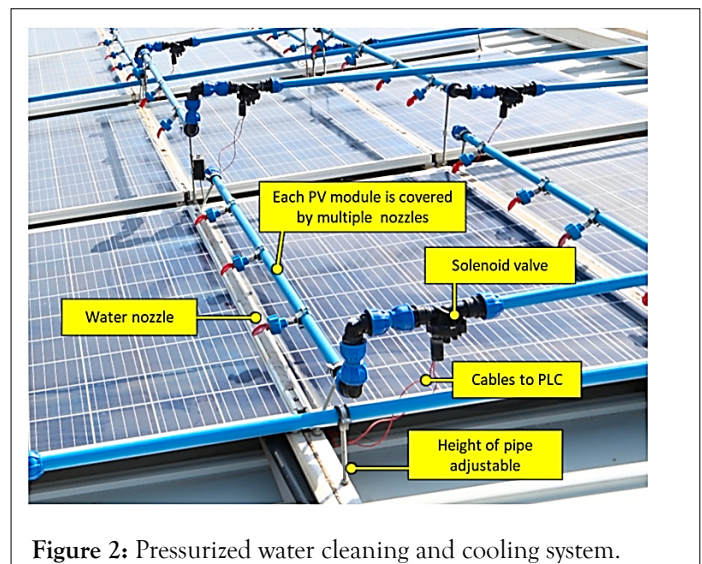


Figure 2: Pressurized water cleaning and cooling system.

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Correspondence to: Sujatha Thapa, Department of Mechanical Engineering, Visakha Technical Campus, Jawaharlal Nehru Technological University of Kakinada, Visakhapatnam, India, E-mail: sujathathapa@gmail.com

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