Increasing Solar Panel Efficiency in a Sustainable Manner

Wim J.C. Melis [#1], Sajib K. Mallick [#2], Phillip Relf [#3]

[#] *School of Engineering, University of Greenwich*
Central Avenue; Chatham Maritime; Kent ME4 4TB; United Kingdom

[1] Wim.J.C.Melis@gre.ac.uk
[2] hellosajib@yahoo.com [3] rp905@gre.ac.uk

***Abstract*—Solar panel output is determined by a number of factors: obviously there is the type of panel that determines the conversion efficiency, but also the amount of light falling into the panel is of importance, among other conditions of operation. The output of a panel would e.g. drop when the amount of light falling onto it is reduced, or even when only a part of the panel is covered. Another reason for reduced output lies in the fact that the conversion efficiency drops by about 0.38 % per $^{\circ}$C increase in panel temperature. Considering that a panel would be able to produce most of its output on a sunny day, the reduction in efficiency due to heating up is of significant importance. To achieve an optimised output, it is therefore important for the panel to remain clean, but also keep it as cool as possible. Therefore, this paper looks at a method of running water on top of a solar panel in order to clean it and cool it down. To reduce the energy consumption of moving the water from the bottom of the panel back to the top, it exploits the kinetic energy of the water that runs down the panel to pump the water back to the top. Measurements indicate that this approach leads to an average increase in output of about 12 %.**