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Study on performance of 80 watt floating photovoltaic panel

[Journal of Mechanical Engineering and Sciences](#) • Article • *Open Access* • 2014 •

DOI: 10.15282/jmes.7.2014.14.0112

[Majid Z.A.A.](#)^a ; [Ruslan M.H.](#)^b; [Sopian K.](#)^b; [Othman M.Y.](#)^b; [Azmi M.S.M.](#)^b

^a Kulliyyah of Allied Health Sciences, International Islamic University of Malaysia, Kuantan, Pahang, 25200, Malaysia

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Abstract

Photovoltaic panels are used to generate electric power. The surface temperature of the photovoltaic (PV) panels will affect their efficiency, where the increment of temperature will decrease their efficiency and total power gain. In this study, we will discuss the performance of an 80 W floating photovoltaic (PV) panel in a pond simulator, whereby in a two hour experiment it shows up to 15.5% increment of energy gain compared to a normal photovoltaic (PV) panel. The floating photovoltaic (FPV) panel was designed by replacing the photovoltaic panel frame with a material that has the ability to float on a water surface and is capable of transferring heat at the back of the photovoltaic surface. A heat sink is used to transfer heat at the bottom of the photovoltaic panel, which will decrease the surface temperature when placed on the water surface. The best performance of the photovoltaic panel is 1000 W/m² for a surface temperature of 25°C; however, the efficiency will drop by 0.485% per 1°C temperature increment. The system can be used on lakes, ponds or dams. © Universiti Malaysia Pahang, Malaysia.

Author keywords

Efficiency; Floating photovoltaic; Heat transfer; Performance

Funding details

Details about financial support for research, including funding sources and grant numbers as provided in academic publications.

Funding sponsor	Funding number	Acronym
Universiti Kebangsaan Malaysia		

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