

Techno-economic analysis of 1 MWp grid connected solar PV plant in Malaysia

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ABSTRACT

Most of the public and private technical universities in Malaysia have considerably abundant free areas, which could be a better place for equipping the renewable energy harvesters. The main objective of this paper is to analyse the feasibility of developing a solar PV plant at two different campuses of Universiti Malaysia Pahang (UMP). This paper proposes 1 MW solar PV power plant at the Pekan Campus (Rural Cam-pus), and Gambang (Suburban Campus) of UMP located in the east coast state of Pahang, which is biggest among other states in Peninsular Malaysia. The technical viability of the proposed crystalline technology based PV plant with open rack or free stand mounting position is analysed using PVGIS (Photovoltaic Geo-graphical Information Systems) and PV Watts's software. The economic and environmental aspects of the proposed plant are also analysed based on standard parameters. The proposed plant of 1 MWp Solar PV plant can generate around 1390 MWh, of electricity per annum with a GHG emission reduction of 818.71 tCO₂ per annum. The PV power plant can contribute in meeting 5% of total energy requirements of the campus. The technical performance obtained through PVGIS is quite comparable with the PV Watts results.

KEYWORDS

Solar PV plant; techno-economic; PVGIS; PV Watts; photovoltaic; UMP; sustainable campus