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Modelling and simulation of 1.2 MWp Tenaga suria brunei photovoltaic power plant (Article)

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Abstract

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The energy demand in Brunei Darussalam will increase in near future. The renewable energy is one of the alternative energy sources that could satisfy the increasing energy demands. Brunei Darussalam depends heavily on fossil fuel to generate its electricity needs. Fossil fuels are depleted and the main source of pollution. Photovoltaic (PV) systems generate electricity directly from the sunlight without any emission of global warming gases, and the fuel is free. In order to optimize the performance of PV systems their operation should be well understood. In this paper, we present the modelling of a real 1.2 MWp photovoltaic system. The PV power plant is tied to the grid. The PV array, the DC/DC converter and the DC/AC inverter are modelled and implemented in Matlab/Simulink. The controller of the grid-connected inverter is modelled to achieve constant voltage, constant frequency and to be synchronized with the grid. The system is simulated under Brunei weather conditions and the results are acceptable. © 2019 Mattingley Publishing. All rights reserved.

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