

Simulation and optimization of a stand-alone sustainable renewable energy system

Abstract

This paper presents a state of the art design of a stand-alone photovoltaic (PV) system to provide the required electrical power for a single refrigeration system at Kuala Terengganu, Malaysia. The simulation result shows a total of 1849.7 kW/m²/year horizontal global irradiation available at Kuala Terengganu. After considering losses such as IAM factor, model array miss match etc, the final energy available to the consumer is 5,256 (kWh/year). The energy requirement of the refrigerator system is 83.3% of the energy available.

Keywords; Off-Grid Renewable Energy System, Optimization, Photovoltaic System, Solar Energy