DESIGN AND INSTALLATION OF STAND-ALONE SOLAR POWER STREET LIGHTING FOR POLYCRYSTALLINE

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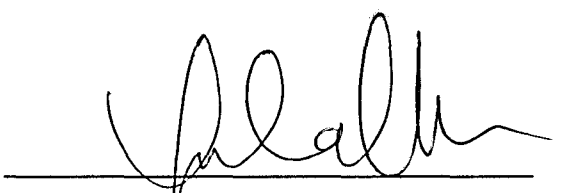
This Final Year Project Report entitled **"Design and Installation of Stand-Alone Solar Power Street Lighting for Polycrystalline"** was submitted by Hatifi Bin Zainal Abidin, in partial fulfillment of the requirements for the Degree of Bachelor of Science (Hons.) Industrial Physics, in the Faculty of Applied Sciences, and was approved by



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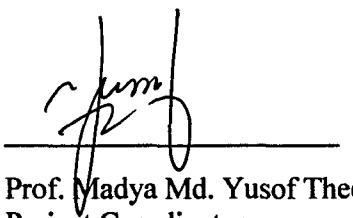

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ABSTRACT

DESIGN AND INSTALL A STAND-ALONE SOLAR POWER STREET LIGHTING FOR POLYCRYSTALLINE

Global environment concerns and the escalating demand of energy, coupled with steady progress in renewable energy technologies, are opening up new opportunities for utilization of renewable energy resources. Solar energy is the most abundant, inexhaustible, and clean of all the renewable energy recourses till date. Photovoltaic systems utilize solar energy to generate electrical energy to meet load demands. Accurate sizing is one of the most important aspects to take into consideration when designing a stand-alone photovoltaic system. In this study, stand-alone system was designed based on systems configuration without shedding loads and installed using polycrystalline module to powering a 15 Watt bulb. For the system to work as required, it need to be designed precisely and installed correctly. A series of rational consideration are presented in this study with the aim of shedding light upon the basic principles. The investigation is based on a detailed study of the performance of the polycrystalline module in a stand-alone system. Based on the calculations that were made during designing process, the system were installed and been tested. From the result, the performance of the stand-alone system was evaluated. Throughout the calculation, it been estimated that the total time of the battery to fully discharge is 8.11 hours. Based on the result, the battery is fully discharged at 6 hours and 15 minutes for first cycle and 6 hours and 30 minutes for second cycle. The difference between the calculated value and the experimental value are analyzed. The time of discharged battery differ due to the DODmax of the battery. The common value of DOD for a battery is from 70% to 80%. The calculated DOD of the battery for first cycle and second cycle are 77% and 80 % respectively. Since the value of the DOD calculated is between the values of the theoretical DOD, thus the system that designed is correct and well-functioning. Based on the performance that been evaluated, the output current produced by the module depend on the irradiance. The higher the irradiance, the output current will increase.

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