UNIVERSITI TEKNIKAL MALAYSIA MELAKA

ENHANCE POWER ENERGY CONVERSION OF SOLAR PV WITH FINS HEAT SINK

This report is submitted in accordance with the requirement of the University Technical Malaysia Melaka (UTeM) for the Bachelor of Electrical Engineering Technology (Automation And Robotic) with Honours.

by

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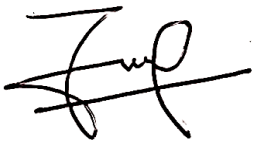

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DECLARATION

I hereby, declared this report entitled ENHANCE POWER ENERGY CONVERSION OF SOLAR PV with FINS HEAT SINK is the results of my own research except as cited in references.

Signature:

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Date: 8/1/2021

APPROVAL

This report is submitted to the Faculty of Mechanical and Manufacturing Engineering Technology of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Electrical Engineering Technology (Automation And Robotic) with Honours. The member of the supervisory is as follow:

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ABSTRAK

Hari ini, penggunaan tenaga suria sangat penting untuk menjimatkan kos. Sebilangan besar kilang dan syarikat di Malaysia atau di luar negara bersaing untuk menghasilkan arus output dan voltan yang lebih berkualiti dari panel solar. Projek ini lebih fokus untuk membuat reka bentuk sirip heatsink baru untuk panel solar. Tujuan utama projek ini adalah untuk mengkaji kesan rawatan serat terhadap sifat mekanik seperti sifat tegangan, lenturan dan hentaman dan penyerapan air komposit penguli / poliester. Kita juga perlu menyelesaikan masalah dari eksperimen sebelumnya untuk membuat produk yang berkualiti untuk industri. Panel solar kriteria yang telah digunakan adalah sel suria Monokristalin kerana ia mempunyai kecekapan yang lebih tinggi. Heatsink dibuat dari tin aluminium untuk menjimatkan kos.

ABSTRACT

Today, the use of solar energy is very important to save costs. Most factories and companies either in Malaysia or abroad are competing to produce a better quality output current and voltage from the solar panel. This project more focus to made a new design of heatsink fin for a solar panel. The main purpose for this project is to investigate the effect of fibre treatment on the mechanical properties such as tensile, flexural and impact properties and water absorption of knead/polyester composite. We also need to solve the problem from the previous experiment to make a quality product for the industries. The criteria solar panel that have been use is Monocrystalline solar cells it is because it has a higher efficiency. The heatsink is made from aluminium can for saving the cost. This project is aim to reduce 20% of the heat produce by solar panel.

DEDICATION

I dedicate my dissertation work to my family. A special feeling of gratitude to my loving parents, Bakri Bin Aziz and Hariati Binti Jantan that always support me to finish this project, no exception also to my friend Haziq Bin Razali who always helps give ideas and develop me in hardware skill from beginning of this project until end. I will always appreciate all they have done.

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Firstly, thank you so much to all my friend and my supervisor, Madam Nurul Kausar Binti Abd Majid that have guide me to finish the final year project. I also grateful to University Technical Melaka (UTEM) because give a preparation with complete equipment during made this experiment. Without the guidance offered, I would surely be lost and gone off track.

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V	-	Volts
A	-	Ampere
W	-	Watts
G	-	Irridiance

LIST OF ABBREVIATIONS

DC	Direct Current

CHAPTER 1

INTRODUCTION

1.1 Background

Solar energy is the energy that have been produced by capturing heat and light from the Sun. Solar energy is depends on the sun. Nowadays, variety of ways of using this abundant resource have been provided by several technologies such as green technology. It is because it does not emit greenhouse gases. Solar energy is readily available and has long been used both as electricity and as a heat source. There are two types solar that have been use. For example, active solar and passive solar. Active solar use of photovoltaic systems. Active solar is used directly in operations such as drying clothes and air conditioning. Passive solar approaches include the orientation of a building to the sun, the selection of materials with desirable thermal mass or light-dispersing properties, and the construction of spaces that disperse air naturally. Photovoltaics are arrays of cells containing a solar photovoltaic material that transforms solar radiation into direct current electricity. Solar energy is used to produce electricity. Solar cells generate sun-light direct current (DC) electricity, which can be used to recharge a battery.

A photovoltaic module is called a set of solar cells electrically attached to each other and mounted in a support structure or frame. To form an array, several modules can be wired together. For the electricity The greater the area of a module or array, the more power generated. When combined the n-type and p-type semiconductors together, and irradiated with sunlight, the hole will have produced. It is because the electrons in the n-

type material flow to the -type, and the holes thereby. Vacated through this hole and electron flow during this process to the n-type, the two semiconductors behave as a cell, producing an electric field on the surface where they cross (known as p-n junction). It is this field that allows the electrons to leap out of the semiconductor to the surface and make them accessible to the electrical circuit.

The part used for this project is the solar panel and aluminium can. The basic solar panel will be upgrade with heatsink fins that have design from aluminium can. The function is to reduce the temperature at the PV module solar panel. There are two types technique that have been used. Passive cooling and active cooling. In this project totally we use passive cooling. The reading will been record in a room temperature.

1.2 Statement of the Purpose

The purpose of the research is to investigate the effect of fiber treatment on the mechanical properties such as tensile, flexural and impact properties and water absorption of kenaf/polyester composite.

1.3 Problem Statement

PV cells absorb 80% of the solar radiation that exists, but do not completely transform it into electricity. The efficiency of conversion depends on the technology of the PV cell used. The remaining portion of solar radiation raises the temperature of solar cells up to 40 ° C above the temperature of the atmosphere. This is due to the fact that PV cells convert a range of definite wavelength of the solar spectrum of light into electricity

and the rest of the incident solar spectrum is converted into heat. The degradation of the open-circuit voltage leads to an evident decrease in the available maximum electrical power which can be better observed in the characteristic curves of PV modules at different operating temperatures as shown in Figure 1.

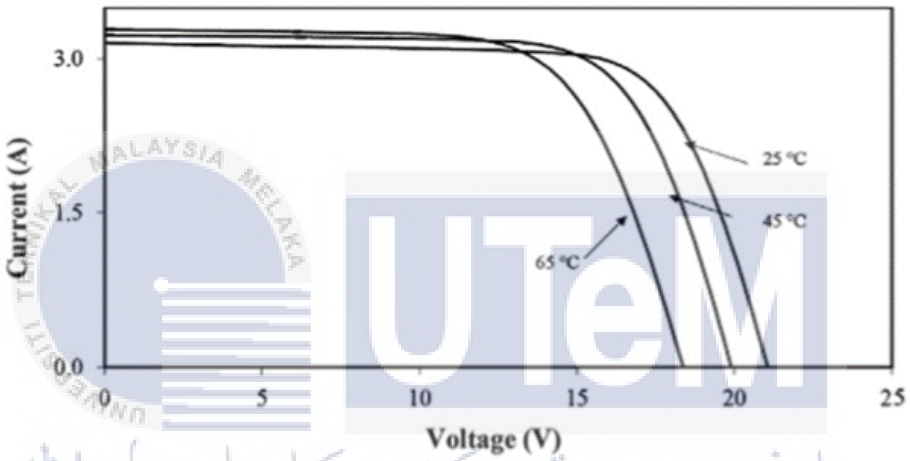

Figure 1. 1: The PV Absorb

Research Motivation

My research is motivated by the following factors:

a) **GHGs mitigation and the depletion of fossil fuels**

The present study focuses on Malaysia, which is the third largest energy consumer in the ASEAN region, as reported in the South East Asia Energy Outlook in 2013. Malaysian primary energy demand is expected to increase by as much as 71% between 2011 and 2035, with an annual average growth of 2.3% (IEA, 2013). The status of fossil fuels, as the primary energy source in Malaysia, is predicted to stay well-above 90% through 2011-2035.

b) **Abundant Solar Radiation**

Malaysia receives an abundance of solar energy, ranging from 0.61 kWh/m² per day in December to the maximum of 6.8 kWh/m² per day in August and November. Following this, solar energy's application is seen as one of the most promising renewable energy resources in this country.