UNIVERSITI TEKNIKAL MALAYSIA MELAKA

FACULTY OF ELECTRICAL ENGINEERING

FINAL YEAR PROJECT REPORT

DEVELOPMENT OF A POWER RECYCLING PROTOTYPE FOR RENEWABLE ENERGY USING DC MOTOR APPLICATION.

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DATE : 25 JUNE 2012

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Bachelor of Mechatronics Engineering

June 2012

I hereby declare that I have read through this report entitle "Development of a Power Recycling Prototype For Renewable Energy Using DC Motor Application" and found that it has comply the partial fulfilment for awarding the degree of Bachelor of Mechatronics Engineering with Honours

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DATE	:	25 JUNE 2012

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A report submitted in partial fulfilment of the requirements for the degree of Bachelor of Mechatronics Engineering with Honours

Faculty of Electrical Engineering

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2012

I declare that this report entitle “Development of a Power Recycling Prototype for Renewable Energy Using DC Motor Application” is the result of my own research except as cited in the references. The report has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

SIGNATURE	:	……..
NAME	:	SULHI BIN MOHAMMAD
DATE	:	25 JUNE 2012

Dedicated, in thankful appreciation for support, encouragement and understandings to my beloved mother and family.

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First of all, I thank Allah for giving me mental and physical strength and ability to run this final report of this project.

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ABSTRACT

In our daily life, the energy consumption is always happen but the energy will be used or change to other type of energy which may not be able to be used such as heat, sound and etc. The principle of conservation energy states that energy may neither be created nor destroyed. Energy sources used today cannot be renewed and most of these energy sources can adversely affect the natural environment by causing the phenomenon of global climate change from energy resource such as petroleum, natural gas and coal. Alternative ways to renewable energy must be considering the Green Technology in preserving the natural environment and saving natural resources. In this project, a normal table fan commonly used for domestic is used as a medium to drive 12V DC Motor to produce electricity energy. This 12V DC Motor acts as a generator that can generate electricity energy by using the drive rotation of the rear table fan shaft. Also, gearing up system is included in this project to increase the speed of 12V DC Motor. A Voltage Doubler circuit is equipped at the output 12V DC Motor that is function to step up voltage in order to charge and stored to the 12V SLA rechargeable battery. The output voltage from 12V rechargeable battery can be used for small application device which is using 5V DC such as USB LED lamp and hand phone charger. The analysis for this project is made to analyze the power consumption of table fan before and after modify. From the obtained result, the power consumption of table fan is same before and after modify that is for speed 1 and 2 the power consumption has use 20 Watt and for speed 3 use 30 Watt. The objective of this project has been successfully achieved that is to develop a prototype that aims to renewable energy using 12V DC Motor as a generator which is use rear shaft of table fan as medium to drive 12V DC Motor. In this ways, renewable energy can be produce while using the table fan at home and the option for a safe and environmentally compatible energy supply because it is not increasing the power consumption and also considering about the Green Technology.

ABSTRAK

Dalam kehidupan seharian, penggunaan tenaga sentiasa berlaku tetapi tenaga yang digunakan akan diguna semula atau ditukar kepada jenis tenaga lain yang mungkin tidak dapat digunakan seperti haba, bunyi dan lain-lain. Prinsip pengabadian tenaga menyatakan bahawa tenaga tidak boleh dicipta atau dimusnahkan. Sumber tenaga yang digunakan hari ini tidak boleh diperbaharui dan kebanyakan sumber tenaga ini boleh menjejaskan alam sekitar dengan menyebabkan fenomena perubahan iklim global iaitu daripada sumber tenaga seperti petroleum, gas asli dan arang batu. Cara alternatif menghasilkan tenaga baru mestilah mengambil kira Teknologi Hijau dalam memelihara alam sekitar dan juga menjimatkan sumber asli. Dalam projek ini, biasanya kipas meja hanya digunakan untuk kegunaan domestik, tetapi ianya boleh digunakan sebagai medium menggerakkan DC Motor 12V dalam menghasilkan tenaga elektrik. DC Motor 12V bertindak sebagai penjana yang boleh menghasilkan tenaga elektrik daripada putaran aci belakang kipas meja. Juga, sistem gear menaik digunakan untuk meningkatkan kelajuan 12V DC Motor. Litar Voltage Doubler dilengkapi pada keluaran 12V DC Motor yang berfungsi meningkatkan voltan bagi mengecas dan menyimpan pada bateri boleh dicas semula 12V SLA. Keluaran voltan dari bateri boleh dicas semula 12V SLA digunakan pada aplikasi peranti kecil yang menggunakan 5V DC seperti lampu LED USB dan pengecas telefon bimbit. Analisis untuk projek ini dibuat untuk menganalisis penggunaan kuasa kipas meja sebelum dan selepas ubahsuai. Daripada keputusan yang diperolehi, penggunaan kuasa kipas meja adalah sama semasa sebelum dan selepas ubahsuai iaitu penggunaan kuasa sebanyak 20 Watt pada kelajuan 1 dan 2, dan menggunakan 30 Watt pada kelajuan 3. Objektif projek ini telah berjaya dicapai iaitu membangunkan satu prototaip yang bertujuan untuk pembaharuan tenaga menggunakan 12V DC Motor sebagai satu penjana yang mana menggunakan aci belakang kipas meja sebagai medium untuk menggerakkan 12V DC Motor. Dengan cara ini, tenaga boleh diperbaharui boleh dihasilkan semasa menggunakan kipas meja dirumah dan sebagai pilihan untuk bekalan tenaga yang selamat dan sumber tenaga yang serasi dengan alam sekitar kerana ia tidak meningkatkan penggunaan kuasa dan juga mengambil kira tentang Teknologi Hijau.

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OLED	-	Organic light-emitted diodes
PV	-	Photovoltaic
DC	-	Direct current
AC	-	Alternating current
HHS	-	Hydro Home System
TEP	-	Technology Enhancement Programme
IC	-	Integrated circuit
PCB	-	Printed circuit board
CAD	-	Computer-aided design
USB	-	Universal Serial Bus

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CHAPTER 1

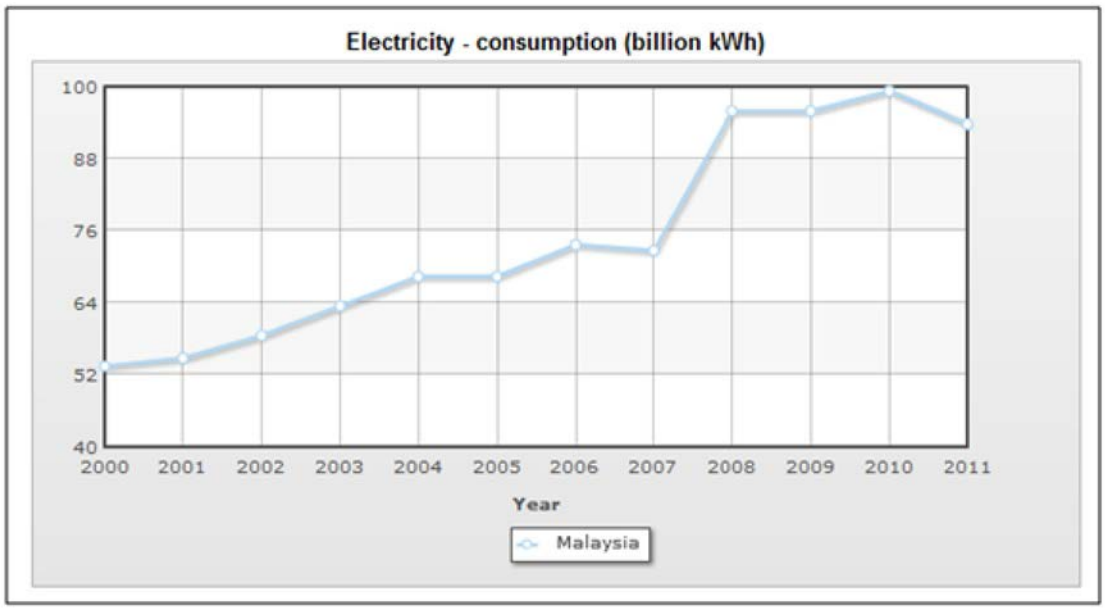
INTRODUCTION

1.1 Background

Energy consumption is an important part of life today because without the power a work cannot be done. The energy used today will be lost or waste without renewable energy or power recycle back. In reality, energy use has always had a noticeable impact on the environment. Overconsumption of energy is the main trigger for the global warming that is now threatening to cause devastation in many areas of the world. Each year, electricity consumption in Malaysia is always increasing. The effect of increasing the power consumption will contribute to the global warming.

Green Technology is the development and application some products or equipment to conserve the natural environment and resources, which is minimize and reduces the negative impact of human activities.

This project will be designed for renewable energy or recycle power to avoid waste of energy from lost. Also, this project consider regarding the Green Technology without polluting the environment.



Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Malaysia	53.42	54.87	58.59	63.48	68.4	68.4	73.63	72.71	95.98	95.98	99.25	93.8

Figure 1.1 : Electricity Consumption in Malaysia [1].

1.2 Problem Statement

1. In the future, energy resources will be depleted over time such as petroleum, natural gas and coal.
2. Energy often occurs in daily life, where the energy always used but it is not transformed to the other types of energy to renew it.
3. Normal energy resources could produce Carbon Dioxide emissions into the air which causes the phenomenon of global climate change.

1.3 Objective

1. To develop a prototype that aims to renewable energy using the 12V DC Motor as a generator which is use rear shaft of table fan as a medium to drive the 12V DC Motor.
2. To analyze the power consumption of table fan before and after install with hardware.

1.4 Project Scope and Limitation

1. The prototype uses the rear shaft of table fan as a medium to drive 12V DC Motor as a generator.
2. The prototype use the connector to connected with 12V DC Motor.
3. The prototype is attached with gearing up system to increase the speed for generating electricity.
4. The 12V DC Motor can produce electricity when table fan rotates.
5. The output from prototype will be charge the rechargeable battery and it output will be used for low power applications that using 5V to operating.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Traditionally, many people are not aware of the importance of renewable energy and some of them still don nott care about the renewable energy. The government is encouraging to maximize the use of renewable energy in power generation. This is because the government are desire to expand the development of the renewable energy.

Renewable energy is intended to replace the raw materials used in the present. The supplies of fossil energies, such as oil, natural gas and coal, are limited. They will be depleted within a few decades and then cease to exist. Renewable energies are also referred to as 'regenerative' or 'alternative' energies. Other renewable energies include wind power, biomass, the natural heat or the earth and solar energy [2].

The development of renewable energy sources is important for the future of the country and health of the environment. The existence of the renewable energy is caused by energy resources use today will be reduced or deplete. Several of the traditional sources of energy, such as fossil fuels, are being depleted at faster rates. Technologies required to harness other, less traditional sources, such as renewable energy, have not kept pace with the rising demands of developed and more significantly developing countries [3].

Global climate change is one of cause the existing of renewable energy. Conversely, global climate change, believed to correlate to the accumulation of greenhouse gases in the atmosphere, poses an even more urgent and demanding set of questions. These are related to