UNIVERSITI TEKNIKAL MALAYSIA MELAKA

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Renewable Energy Technology: AIRco Wind Turbine

This report submitted in accordance with requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor Degree of Manufacturing Engineering Technology (Product Design) with Honours

by

MUHAMMAD BIN ABDUL LATIFF
B071310418
911115-07-5449

FACULTY OF ENGINEERING TECHNOLOGY
2016

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA MUDA

TAJUK: **Renewable Energy Technology: AIRco Wind Turbine**

SESI PENGAJIAN: **2016/17 Semester 1**

Saya **MUHAMMAD BIN ABDUL LATIFF**

mengaku membenarkan Laporan PSM ini disimpan di Perpustakaan Universiti Teknikal Malaysia Melaka (UTeM) dengan syarat-syarat kegunaan seperti berikut:

1. Laporan PSM adalah hak milik Universiti Teknikal Malaysia Melaka dan penulis.
2. Perpustakaan Universiti Teknikal Malaysia Melaka dibenarkan membuat salinan untuk tujuan pengajian sahaja dengan izin penulis.
3. Perpustakaan dibenarkan membuat salinan laporan PSM ini sebagai bahan pertukaran antara institusi pengajian tinggi.
4. **Sila tandakan (✓)

☐	SULIT	(Mengandungi maklumat TERHAD yang telah ditentukan oleh organisasi/badan di mana penyelidikan dijalankan)
☐	TERHAD	(Mengandungi maklumat yang berdarjah keselamatan atau kepentingan Malaysia sebagaimana yang termaktub dalam AKTA RAHSIA RASMI 1972)
☑	TIDAK TERHAD	

Disahkan oleh:

Alamat Tetap:

6512, SIMPANG TIGA

13300 TASEK GELUGOR

S.P.U, PULAU PINANG

Cop Rasmi:

Tarikh: _____

** Jika Laporan PSM ini SULIT atau TERHAD, sila lampirkan surat daripada pihak berkuasa/organisasi berkenaan dengan menyatakan sekali sebab dan tempoh laporan PSM ini perlu dikelaskan sebagai SULIT atau TERHAD.

DECLARATION

I hereby, declared this report entitled "Renewable Energy Technology: AIRco Wind Turbine" is the results of my own research except as cited in references.

Signature : .....

Name : MUHAMMAD BIN ABDUL LATIFF

Date : 14th December 2016

APPROVAL

This report is submitted to the Faculty of Engineering Technology of UTeM as a partial fulfillment of the requirements for the degree of Bachelor of Manufacturing Engineering Technology (Product Design) with Honours. The member of the supervisory is as follow:

ABSTRAK

Collecting energy from the wind when riding the motorcycle is the new way of generating the electrical energy. Beside that, it also can be as a green device that used the renewable energy of the wind to be used for charging the gadget when riding the motorcycles. The aerodynamic air flow that being produce when we riding the motorcycle is a free source that can be used to generate energy. The AIRCo Wind Turbine is a new kind of product that generate the electrical energy from aerodynamic air flow that can be used to charge the power bank and the phone.As a result, this device will be design to ease the rider to get the source for charging their gadget battery due to avoid them lack of battery power when riding the motorcycles in short period and long period in long distance.

ABSTRACT

Pengumpulan tenaga semasa daripada angin semasa menungang motorsikal adalah suatu cara pendekatan yang baru dalam penghasilan tenaga elektrik. Sehubungan itu, ia juga adalah sebagai sebuah alat berteknologi hijau yang menggunakan tenaga boleh diperbaharui daripada angin bagi digunakan untuk mengecas gajet semasa menunggang motorsikal. Aliran angin aerodinamik yang terhasil semasa kita menunggang motorsikal adalah suatu sumber percuma yang boleh digunakan untuk menghasilkan tenaga. Alat AIRCo Wind Turbine adalah suatu produk yang baru yang digunakan untuk mengecas tenaga elektrik hasil daripada aliran angin aerodinamik yang boleh digunakan untuk mengecas "Power Bank" dan juga telefon bimbit. Keputusannya, alat ini direka bagi memudahkan penunggang untuk medapat sumber bagi mengecas bateri gajet mereka adalah untuk menghindari daripada kehabisan bateri apabila menunggang motosikal dalam jangka masa yang pendek mahupun jangka masa yang panjang.

DEDICATION

ALHAMDULILLAH.

TO MY PARENTS,

PUAN JAROMA BINTI ABU BAKAR

TO MY SUPERVISOR

PUAN NURUL AIN BINTI MAIDIN

TO MY FRIENDS

FOR EVERYTHING.

AL-FATIHAH

ACKNOWLEDGEMENT

Firstly I would like to express my appreciation and thanks to my supervisor, Puan Nurul Ain binti Maidin, who has guided me along this whole semester. The supervision and supports from her is truly helping in the progress of my project. I had been exposed very much in product design and development which is very helpful information for this project.

The appreciation also goes to my families members. With their love and encouragement, I am strong enough to go through the obstacles come to me. Lastly, I would like to thanks all my best friends who have helped me in every possible and different way to finish this project.

TABLE OF CONTENT

CHAPTER 3: METHODOLOGY

LIST OF TABLE

LIST OF FIGURE

LIST OF ABBREVIATIONS, SYMBOLS AND NOMENCLATURE

HAWT	-	Horizontal Axis Wind Turbine
VAWT	-	Vertical Axis Wind Turbine
CAD	-	Computer Aided Design
CFD	-	Computational Fluid Dynamics
3D	-	3 Dimension
RP	-	Rapid Prototyping
UV	-	Ultra Violet
FDM	-	Fused Deposition Modelling
ABS	-	Acrylonitrile Butadiene Styrene
PLA	-	Poly Lactic Acid
DC	-	Direct Current
A	-	Ampere

CHAPTER 1

INTRODUCTION

This chapter will cover the introduction, background of project and problem statement. From that, the conclusion will be determined based on the problem. The objectives and scope of the project are also will be explained briefly through this chapter. Besides, the objectives and scope are very important towards this project because it will give guidance through the whole process. On the other hand, with objectives and scope, it can give an overview on how to handle and conduct this project clearly.

1.1 Background of the Project

The aerodynamic air flow that being produce when we riding the motorcycle is a free source that can be used to generate energy. The AIRCo Wind Turbine is a new kind of product that generate the electrical energy from aerodynamic air flow that can be used to charge the phone. It is a green technology that used the wind as a source of energy to rotate the wind turbine and then rotate the small electrical motor to generate the electrical power. This product is assemble and attached to the side of motorcycles basket in order to collect the wind energy to generate the electric power and also come with a gadget storage to place the phone when charging the battery.

1.2 Problem Statement

When travelling by riding the motorcycle, the energy that we waste is the aerodynamic air flow that occurs when we accelerate the motorcycle. This energy can be used to generate electrical energy to charge our gadgets. In travelling in a long distance period of time, the problem occurs for the motorcycles is to be prepare by charging their phone and the power bank before start their journey. So, this Wind Turbine is a Go-green tech use to ease and help the rider to charge their gadgets such as phone when they travel by riding the motorcycle. It is an alternative way to generate the electrical power using the aerodynamic air flow as a free green energy.

1.3 Objectives of the Project

1. To analyze and purpose the best blade design for wind flow.
2. To design and develop funtional prototype of AirCo Wind Turbine.
3. To generate electrical power for charging phone.

1.4 Scope of the Project

The scope of these project are :

1. To focus and study on the AirCo Wind Turbine.
2. Used Solidworks for design AirCo Wind Turbine.
3. Analyze wind flow by using CFD Simulation Sofware.
4. To fabricate prototype using Rapid Prototyping Machine, electrical circuit and another manufacturing process.

1.5 Organization of the Project

The report will be conducted in few chapters and each of it has been stated respectively:

(a) Chapter 1: Introduction

This chapter will simply introduce about the project. This chapter contains introduction, background of project, problem statement, objectives and scope of project.

(b) Chapter 2: Literature Reviews

This chapter shows about the studies and research that relevant to the project.

(c) Chapter 3: Methodology

This section will shows about the flow about the project methodology that have been used in this project.

(d) Chapter 4: Result & Discussion

This part will state out the result that have been obtained and describe the discussion of the project respectively.

(e) Chapter 6: Conclusion & Recommendation

This chapter will discuss about the summarization of the project and the major conclusion of the project. Hence the recommendation for a future use.

1.6 Result Expectation

The expectations for this project are:

(a) The prototype can be functional.

(b) The wind turbine can rotate and collect the wind energy.

(c) It can be assemble and attach to the motorcycle basket.

(d) The prototype can generate 5V electrical power to charge phone and the power bank

CHAPTER 2
LITERATURE REVIEW

The literature review for this Airco Wind Turbine is huge. These several book, journal and article are available on describing the methods used to design, analyze and developed this wind turbine to generate electrical power for charging the gadgets. All the information, points, data that are related and link to this project will be discussed and attach on this chapter. Hence, it will elaborate and explain more on what is the renewable energy, wind turbine, the aerodynamic air flow for motocycles, CFD, Electrical component, the element of Product Design and Development and software that have been used to develop this project.

2.1 The renewable energy

In conventional energy source according to Antonia V. Herzog, et. al (2001) are based on oil, coal, and natural gas have proven to be highly effective drivers of economic progress, but at the same time damaging to the environment and to human health. In order to save the environment and to human health the renewable energy is the best way to solve this problem. According to the Australian Renewable Energy Agency or know as ARENA (arena.gov.au, 2012-2016), the renewable energy is the energy which can be obtained from natural resources that can be constantly recharged. These renewable energy technologies include the technologies that use or enable the use of one or more renewable energy sources. There are several types of renewable energy technologies that include bioenergy, geothermal energy, hydropower, ocean energy, solar energy and the wind energy. So for this project, most suitable renewable energy than can be used is the wind energy because most energies produce occurs when the rider accelerates the motorcycles is the wind energy.Wind energy is generated by converting the wind as the kinetic energy into other forms of energy using wind turbines. Winds are generated by complex mechanisms involving the rotation of the