CHAPTER 1

INTRODUCTION

1.1 PROJECT BACKGROUND

“Wind energy” or “wind power” describes the process which is used wind to generate mechanical power. This mechanical power can be used for specific tasks or a generator can convert this mechanical power into electricity to power homes. Wind turbines turn in the moving air and power on electric generator that supplies an electric current.

Wind turbine work is like a fan but fan using electricity to make wind, however wind turbines turns the blade which spin a shaft, then connects to generator and lastly it will makes electricity. In energy-generating windmills, the shaft is connected to an induction generator inside the structure. The wind turns the fans, which provides the kinetic energy to spin the wires in the generator

Wind power means using the wind - harnessed by either a turbine, wind mill, wind pump or even sails (for ships) - to generate the desired amount of electricity to be used for home and commercial purposes. This provides an efficient power alternative that is clean, abundant and completely environmentally friendly. This means that a natural resource is used to produce clean, environmentally friendly power.

The most common ways of harnessing the power of the wind is using sails to propel ships and sail boats across the water. The most desirable way of using the wind to generate electricity is by erecting wind turbines.
There are two categories of wind turbines: the horizontal axis design (HAWT) and the vertical axis design (VAWT). Since it is the more practical and popular, the HAWT enjoys more attention than its sibling, the VAWT.

The HAWT has its main rotor shaft at the top of the column along with the electrical generator. The turbines must be pointed into the wind and is positioned favourably by either a small weathervane or a wind sensor. The rotor shaft and gearbox of the VAWT are positioned vertically and are also installed near the ground. This makes it more accessible for maintenance and other necessary adjustments. One of the reasons why this type of wind turbine is less popular is that it can produce what is known as pulsating torque.

As the wind turns the blades of the turbine they, in turn, turn the shafts running down the tower and are connected to a generator. The working of the shafts and the friction of the turning shafts link into the generator which then converts the energy created by the wind turbine into the useful electricity that is needed.

Windmills works in 3 parts:-

1) Blades (the parts that look like fan) - “catch” the wind. Sitting at a slight angle to the direction of the wind, the blades are pushed in a circle as the wind blows against them.

2) Hub of the windmill – like the hub of a wheel, with the fans sticking out likes spokes around it. Then the fans turn the hub as they move in a circle.

3) The part where hub is attached to the shaft, which spins as the hub spins. The shaft is connected to whatever mechanism the windmill is designed to turn such as generator part.
After finish the blade part, the next part is induction generators. Windmills that generate energy contain induction energy. It does not make energy, but rather converts kinetic (physical) energy into electrical by spinning a wire within a magnetic field, which causes an electrical current to flow through the wire.

1.2 PROBLEM STATEMENT

During the development of generator part for wind turbine, the analysis of each element need to be criticized so that the specific component used can be known. The details of type of material used also must consider in order determining the production of generator part of wind turbine experiment. Therefore, analysis must be done in order to know the strength and weakness of making the generator part in order to produce the output voltage.

1.3 OBJECTIVE

The objectives of this study are:

- To generate the DC permanent magnet motor as generator part in wind turbine.
- To gain the output power from the shaft rotation of DC permanent magnet motor.

1.4 SCOPE OF STUDY

- Literature review and study of wind turbine generator.
- Research and analysis component that use in generator part.