

Power Generation by Wind Wave Energy

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Abstract— This paper is mainly studied the Electricity Generation by different method using a simple technology which will be very cost efficient and environment friendly. This whole system will give the different quality of model using some equipment like; curve fan blade, some gears, DC motor & Electric Board. It gives the renewable energy, considering comprehensive effect of energy utilization mode. This model is established with objectives of both maximized energy utilization & minimized system operation cost. On the basis of analysis of this model it can be said that this model is having many perks like; Max Power, Cost effective system, Environment friendly with 0 carbon emission. The result is compared with the various models & it secured very well performance.

Keywords—Wind Energy, Wave Energy, Power Generation, Wire Frame Blade

I. INTRODUCTION & WORKING

Wind wave energy is type of renewable energy and as we know that renewable energy is the energy which is produced with the various sources like sun and wind that are naturally replenished and do not run out. Its uses are very high in the field of space and water heating and cooling and power generation. As we know that in universe there are many types of renewable energy like; Bio energy, Geothermal Energy, Hydrogen, Hydropower, Marine Energy, Solar Energy, Wind Energy. When we look for the perks for the renewable energy we found that it is numerous and affect the economy, national security, and human health. We are using the wind energy to generate the electricity in different way. Actually, wind energy is a by-product of the sun. Wind is the result of the unequal heating of the atmosphere by the sun, the uneven surfaces of the earth (mountains and valleys), and the planet's rotation around the sun. Since there is always wind available, it is a resource that may be used indefinitely as long as the sun continues to heat the earth. As we can say that this whole system is the system which will produce the electricity with the help of wind wave or wind energy using shaft, wire frame blades, Dc motors, Gears, Bearings, Battery and Transformer.

When wind wave or wind energy will be there near system then the wire frame blades will give oscillatory motion and it will converted into the mechanical energy and through this we will be able to generate the electricity with the help of Dc motor and transformer.

II. DESIGN & FEATURE OF PARTS

In this system there will be various part in which some are important and they are:

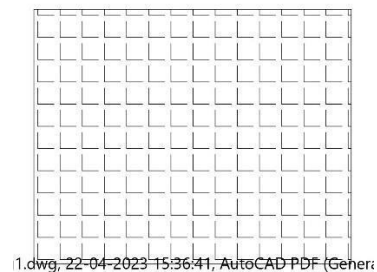
- Wire frame blade
- Shaft
- Bearing
- Gear
- Gearbox
- Generator
- Battery

h) Transformer

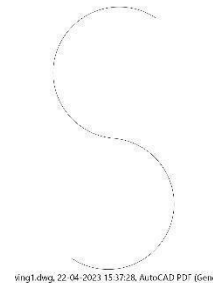
a) Wire frame Blade

It is type of blade which is made up of paper and wire. The blade paper is high quality of paper with the advantage of water resistance and very light in weight and the wire will be mounted in the whole design of paper. The hatch line is showing the wire frame. The weight of this wire fame blade will be very light because if it is heavy in weight then it will not give the efficient work which need to system.

Front view of wire frame blade



Side view of wire frame blade



b) Shaft

A wind turbine shaft is the most important component of this system, and it will be subjected to extremely dynamic loads and operating conditions. Wind energy is turned into mechanical energy by blades and rotors, which is then transported to a generator via the gear box and shaft. In general, wind turbines There are two sorts of shafts: main shaft and generator shaft. The turbine rotor is bolted through a robust disc on the main shaft, which is a low speed shaft. The generator shaft is a high-speed shaft connected to the gearbox output shaft.

Low speed shaft:

The low-speed shaft, which is leveled with the rotor and rotates by 8 and 20 times per minute, is a component of the turbine's power train.

High speed Shaft:

Part of the drive train for the turbine is the high-speed shaft, which is attached to the gearbox and powers the generator.





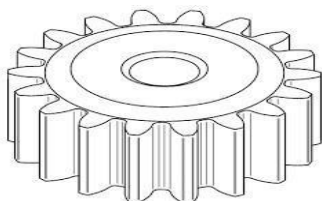
c) Bearing

An element of a machine called a bearing limits relative motion to the intended motion alone while lowering friction between moving parts. By managing the vectors of normal forces acting on the moving components, the bearing's design may, for instance, permit free linear movement of the moving part or free rotation about a fixed axis. Alternatively, it may prevent motion. The majority of bearings ease the intended motion by lowering friction. Based on the type of operation, the motions allowed, or the directions of the loads (forces) imparted to the components, bearings can be vastly classified. In this system, we are using roller bearings, which transfer loads between machine parts and support and steer spinning, oscillating machine parts like shafts, axles, or wheels. High rotating speeds are made possible by its high precision and low friction, which also helps to reduce noise, heat, energy use, and wear. Machine parts that can be replaced at little cost are roller bearings, which typically adhere to national or international dimensional standards. To find the roller bearings, accessories, and services that will best meet your unique performance requirements, browse our extensive assortment.



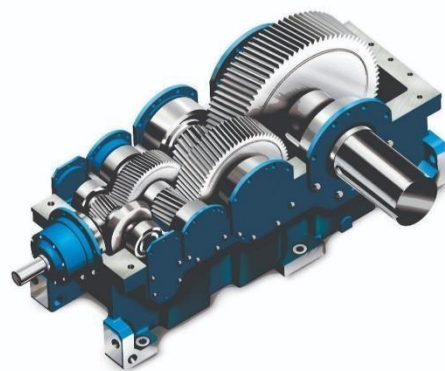
d) Gears

Gear is the mechanical element which transfers the power from one to another element. It is a rotating circular machine part having cut teeth which mesh with another toothed part to transmit torque and speed. We are using the spur gear for power transmission.



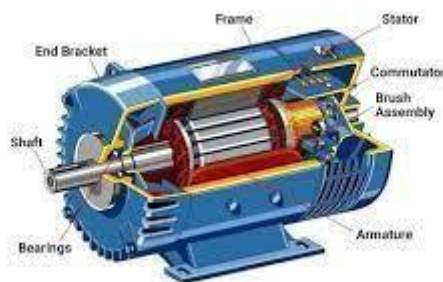
e) Gearbox

Gearbox is also a mechanical element which is made using many gears and mounted in box and it is used for various work like; achieve the need speed, conversion of motion using mechanical linkage, etc. In this system we are using a mechanical linkage called gearbox for motion conversion; To and fro motion to rotary motion and achieve the desired speed to generate the power.



f) Generator

An apparatus that converts motive power into electricity is known as a generator which is mechanical energy, fuel-based power, or chemical energy, into electric power for use in an external circuit. It is also called as dynamo, and we are using this generator to generate the electricity using mechanical power that is working on the principle of electro magnetic induction.



g) Battery

During chemical reactions in batteries, electrons flow from one substance (electrode) to another through an external circuit. We are employing lithium ion batteries to store the energy for later use. An electric current can be formed by the flow of electrons and utilised to execute tasks.

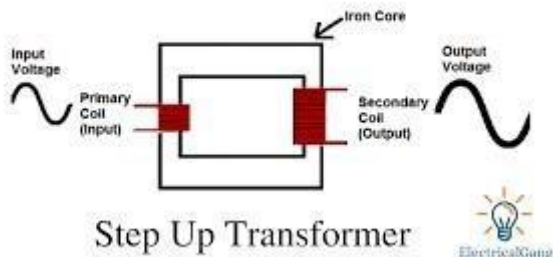


h) Transformer

Transformers are inductive electrical devices used to modify alternating current voltage. It works on the principle of mutual



induction (faraday law's). Two coils that are magnetically linked together make constitute a transformer. Alternating current in one coil (referred to as the "primary") causes a current in the second coil by changing the magnetic field. We are using the Step-up transformer; Step-up transformers enhance voltage from primary to secondary by having more secondary winding turns than primary winding turns.



III. CALCULATION

We are taking the values on the basis of experiment:

$$\begin{aligned} \text{Blade area (A)} &= L \times B \\ \text{(Rectangular in shape before made of blade)} \\ \text{Blade area (A)} &= 1 \times 0.8 \text{ m}^2 \\ A &= 0.8 \text{ m}^2 \end{aligned}$$

Take Air Velocity striking on blade = 15 m/s

Air Density of air(C) = 9.81

$$\text{Power (P)} = \frac{1}{2} \rho AV^3$$

$$P = \frac{1}{2} \times 1.225 \times 0.8 \times (15)^3$$

$$(\rho = 1.225 \text{ kg/m}^3)$$

$$P = 1653.75 \text{ Watt}$$

$$P = 1.65 \text{ KW}$$

IV. CONCLUSION

One of the fastest-growing sources of electricity today, as well as one of the fastest-growing sectors, is wind energy. Several advantages of using wind energy. Green Energy: Since no pollutants or greenhouse gases are produced during the production of wind energy, it is referred to as "clean" electricity.

Sustainable: The wind is an unending source of renewable energy that needs no other "fuel" than the wind itself to operate.

Affordable: In large part as a result of technology developments, wind power is a cost competitive source of electricity.

This system enables us to produce work and power in the most effective manner.

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