

Vertical Wind Turbine Axis

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Abstract -

In today's world, the demand for electricity is increasing continuously due to population growth and industrial development. Most of the electricity is generated using fossil fuels such as coal and petroleum, which are limited in nature and also cause environmental pollution. Therefore, it is very important to find alternative sources of energy that are renewable and eco-friendly.

This project presents a simple method of generating electricity using wind energy produced by moving vehicles on highways. When vehicles like cars, buses, and trucks move at high speed, they create airflow around them. This airflow is normally wasted and not used for any purpose.

In this project, a Vertical Axis Wind Turbine (VAWT) is used to capture this airflow. The turbine rotates when wind hits its blades. This rotation is transferred to a DC motor which works as a generator. The generator converts mechanical energy into electrical energy. The generated electricity is used to light an LED and can also be stored in a battery.

This system is simple, low cost, and useful for smart city and highway applications. It also promotes the use of renewable energy.

1. INTRODUCTION

Electricity is one of the most important needs of modern life. It is used in homes, industries, transportation, and many other fields. At present, most of the electricity is generated using non-renewable energy sources. These sources are limited and harmful to the environment.

Renewable energy sources like solar, wind, and hydro energy are clean and safe. Among these, wind energy is widely available and easy to use. Wind turbines are used to convert wind energy into electrical energy.

There are two main types of wind turbines:

1. Horizontal Axis Wind Turbine (HAWT)
2. Vertical Axis Wind Turbine (VAWT)

In this project, a Vertical Axis Wind Turbine is used because it can rotate in any wind direction and does not require any special alignment. It is also suitable for low wind speed conditions.

Highways are places where vehicles move continuously and create airflow. This project uses that airflow to generate electricity, which is a new and useful idea.

1.1 Sub Heading 1

The proposed system is based on installing small vertical axis wind turbines on the road divider or roadside. When vehicles move on the road, they create wind due to their speed.

This wind hits the turbine blades and makes them rotate. The rotating blades are connected to a shaft, which is further connected to a DC motor. The DC motor works as a generator and produces electricity.

The electricity generated can be used to light LED street lights or can be stored in a battery for future use.

This system is simple, cost-effective, and suitable for smart city applications. It can also help in reducing electricity consumption from traditional sources.

1.2 Sub Heading 2

The project uses simple components like turbine blades, shaft, DC motor, LED, base and wires.

The blades catch the wind. The shaft transfers rotation. The DC motor generates electricity. The LED shows the output.

2. HEADING 2

The system includes turbine blades, vertical shaft, DC generator, LED load, and connecting wires.

The turbine blades capture wind energy. The shaft transfers mechanical energy to the generator. The generator produces electrical energy, which is used to power loads like LEDs

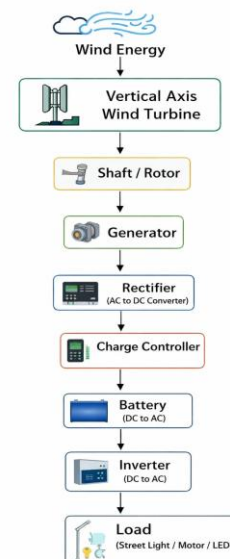


Fig –1: Simple Block Diagram Of Vertical Wind Turbine Axis



Fig -2: Vertical Wind Turbine Axis

When vehicles move on the road, they create airflow. This airflow hits the turbine blades and makes them rotate.

The blades are connected to a vertical shaft. This shaft is connected to a DC motor. When the shaft rotates, the motor produces electricity.

This happens because of electromagnetic induction. The generated electricity is used to light an LED.

If wind speed increases, the rotation becomes faster and more electricity is generated..

3. CONCLUSIONS

This project shows a simple way to generate electricity using wind from moving vehicles. It helps to use wasted energy in a useful way.

The system is environment friendly and easy to build. In future, it can be used on real highways for power generation

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System Components & Their Functions

Sr. No.	Component	Function
1	Turbine Blades	Capture wind energy
2	Shaft	Transfer mechanical energy
3	DC Generator	Convert mechanical to electrical energy
4	LED	Indicate output
5	Base Platform	Support structure
6	Bearings	Reduce friction
7	Wires	Electrical connection

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