

Design And Fabrication of Vertical Axis Wind Turbine For Highway Purpose And EV Charging

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Abstract- Wind presents a vast source of renewable energy. We use arrangement of vertical axis blade for power generation called as turbine for power generation. When the car moves with an average speed the wind turbine attached to it also rotates the turbine should place in such a way that the wind strikes the blades. This gives the turbine a rotational movement. The turbine is placed along the path of wind flow path that is mounted on the car. Then the blade rotates and energy is generated the car moves, the turbine rotates and this rotational energy can be converted into electrical energy via alternator.

The conventional sources of energy are exhausting. Considering this fact, the Government is firmly set on making India a primarily electric car driven nation by 2030 to reduce the petroleum import bills and the running costs of vehicles. Thus, the automobile sector is going to be dependent on the power grids and on the power transmission firms. The sudden increase in electricity requirement would put extra load on the power supply chain which completely depend on the depleting natural resources such as coal and nuclear power plants. Thus, there is a need of an alternative electricity generation technique for the Electric Vehicle charging infrastructure in the country. Our approach of solving this problem is by installing an array of vertical axis wind turbines [VAWT] in the existing infrastructure of the cities such as bridges, flyovers, highways etc.

Keywords- EV is the future, Pollution reduction, Wind energy, VAWT.

I. INTRODUCTION

The electric vehicles were introduced in around 1832 since then with there has been more advancement and ultramodern technology the electric motor vehicle has taken a major stand in the automobile market. The main focus of manufacturers was to reduce the emission and overcome the drastic climate change due to global warming. The pollutants like carbon mono Oxide, nitrogen has changed the environment which affected the living beings. The task for the automobile manufacturers was to arrest the pollutants present

in the environment and produce clean and green energy. Then the manufacture solves the problem with electric motor vehicle. Since then, there has been major changes made in the electric motor vehicle. There has been many research and advancement going on to increase the driving range of electric motor vehicle. Various government policies and incentives have been given to promote the electric vehicles and create a large market of electric motor vehicle which will lead to less noise pollution and air pollution compared to IC engine. There are various types of electric vehicles like available in the market like (BEV), Hybrid vehicle (HEV). Several aspects are considered for the electric vehicle like: The wind energy is an environment friendly and efficient source of renewable energy. The kinetic energy of the wind can be used to do work. This energy is harnessed by windmill in the past to do mechanical work. This is used for generating electricity. To generate the electricity, the rotary motion of the windmill is used to turn the turbine of the electric generator. Now-a- days, renewable energy sources are gaining more attention in power sectors because of the efforts to reduce the usage of fossil fuels to generate the electrical power. Wind power in modern era has become the most established sources in generating the electricity amongst all the renewable sources because of its promising technical and economic prospects. With the latest wind annual report. It is stated that in 2015 around 392 GW is installed all over the world which can sufficiently supply 4% of world's electricity demand. And, it continues to grow approximately 24% per year globally. With the worldwide rise of generation of electricity through wind turbines, the impact on the electric utility grids has also increased. By the end of 2015, six countries including China (145362 MW), Spain (23,025 MW), Germany (44,947 MW), USA (74,471 MW), India (25,088 MW) and UK (13,603 MW) had over 10,000 MW of the installed capacity.

II. PROBLEM STATEMENT

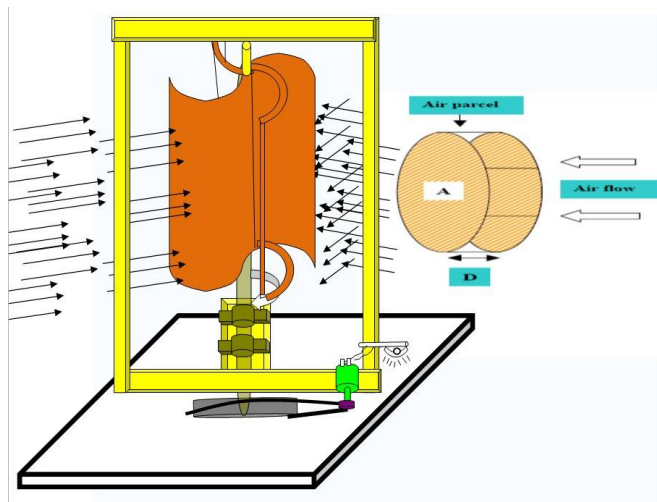
The demand of electric energy is rapidly increasing day by day and energy sources are also decreasing rapidly. The world has understood the importance of renewable energy resources and making developments in that aspect. In this project the main aspect is how the wind energy is utilized in

effective way for power development by running generator. For this a system is to be made which will convert the **wind force in rotational motion of generator.**

III. MOTIVATION

- To increase the efficiency of electric and hybrid vehicle.
- To avoid time loss in recharging of battery.
- To generate electricity using less expensive arrangement.
- To give the application of an ac generator and to describe the operating characteristics of that generator including methods of voltage production.
- To generate the DC permanent magnet motor as generator part in electric car.

IV. SYSTEM ARCHITECTURE



V. FUTURE SCOPE

Although predicting the future, based on the presently available data is not always fully accurate, we can get some idea where the Vertical Axis Wind Turbine technology goes. A major problem encountered during the operation of VAWTs is low air capture, as it very closes to the ground level. The deflector system that guides the wind towards the turbine blades will be solved that problem. It increases the power, speed and torque in these sorts of environments.

VI. CONCLUSION

The VAWT is designed and fabricated in such a way that it can able to capture wind from all the direction. power developed from the project is 28W for a speed of 6m/s, the efficiency of VAWT can be increase by changing the size and

shape of the blade. The theoretical and experimental result is varying because in theoretical calculation we consider the wind is hitting all the three turbine blades, practically it is not. Our work and the results obtained are encouraged that vertical axis Wind energy conversion are plausible and potentially very contribute to the production of the clean renewable electricity from the wind even under low deal sitting conditions.

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