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Generation By Fibonacci Spiralturbine

Tanmay Jadhav[1], Shubham Parnale[2], Neel Parab[3], Chitralekha Vangala[4]

[1]Department of EE, VIVA Institute of Technology
Email: Tanmayjadhav363@gmail.com
[2]Department of EE, VIVA Institute of Technology
Email: Shubhamparnale7@gmail.com
[3]Department of EE, VIVA Institute of Technology
Email: Neelparab2909@gmail.com
[4]Department of EE, VIVA Institute of Technology
Email: VangalaChitra6@gmail.com

Abstract— *This paper presents a conversion of WIND ENERGY to electrical energy. The generated electricity is used in the [electric vehicle. This generated electricity can be used as a backup and can be used to increase the run time of the electric vehicle. The Fibonacci turbine is used for generating electrical energy. Archimedes turbine is suitable for such an application because of its shape and speed at which it rotate.(Approx.12000 RPM).Fibonacci turbine is a type of Horizontal Axis wind turbine, which has a great wind flow velocity to its surface which leads to less stress on it even at high speed.*

Keywords— Greater efficiency, Fibonacci turbine, higher speed, loss stress, Secondary Generation, Increase runtime(EV), Low Cut-in Speed, Higher output

I. INTRODUCTION

The demand for electrical energy is rising rapidly. To date, the majority of power needs are met by using fossil fuels which are on the verge of extinction. Recent studies estimate that these fossil fuels will last only up to 2030. Hence to keep up with this ever-increasing power demand, we need to find alternative sources of energy. Also, the usage of these fossil fuels results in GHG emission which results in pollution and global warming. Thus finding a clean renewable source of energy is the need of the hour[1].The wind could be clean supply of renewable energy that produces no air or pollution. And since the wind is free, operational prize are nearly zero once a rotating turbine is erected. Besides, high amount of production and technology improvements are enhancing the turbines and making them cheaper. Among all renewable resources, wind energy has evidenced to be a comparatively matured technology and has higher potential in commercialization and the production of enormous quantities. The main application of wind generation is that the generation of electricity from a power system network that integrates transmission grids. Since big-scale wind turbines need giant grid-connected wind farms, the small-size wind turbine has been designed in fields such as mobile communication base stations, city road lighting, offshore cultivation and brine purification in several countries[1-2].

In general, small wind turbines are classified into two types of wind turbine HAWT (Horizontal axis wind turbine) and VAWT (Vertical axis wind turbine). Archimedes' spiral wind turbine is one of the HAWT, however, there is marked the contrast between new wind turbine design and traditional HAWT models. The spiral allowed higher measure of a circle's circumference and so its space. However, this spiral was shortly evidenced inadequate once the great mathematician Archimedes went to work out a lot of correct value of Pi that created an better way of measuring the area of a circle. Now we will be using such a small scale wind turbine to increase the run time of electric vehicles [3].From the following references we came up with an idea to use the Fibonacci spiral turbine with a bit modification and try to implement these ideas where charging stations are available in abundance.

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II. BLOCK DIAGRAM

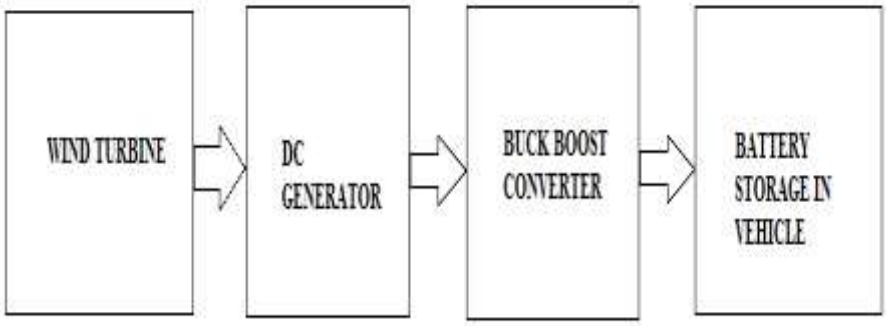

FIGURE 1: BLOCK DIAGRAM

The Wind turbine will rotate efficiently due to which the shaft connected to the generator will rotate. The dc Generator will start generating electrical energy quickly due to low cut-in speed. As there should be a constant generation a buck boost converter is used which will give constant output as per our need. The input to the Battery, which is stored in the Vehicle, will get charged with this constant output Voltage generated. The main Purpose of this battery is to act as a backup or Reserve power to the electric vehicle. The run time of the electric vehicle will increase this stored power can be used as a power source to other accessories in car which need power.

2.1 Wind turbine:-A turbine may be a device that converts mechanical energy from the wind into electricity. The blades of a turbine flip between thirteen and twenty revolutions per minute, reckoning on their technology, at a relentless or variable rate, wherever the speed of the rotor varies in respect to the speed of the wind to achieve a larger potency.

2.2 Dc Generator: - Permanent magnet DC (DC) machines are typically used either as commonplace motors or as DC rotary engine generators as constructional, there's no basic distinction between the dc motor or a dc generator. In fact, identical PMDC machine might even be driven electrically as a motor to maneuver a mechanical load, or it's about to be driven mechanically as a simple generator to urge associate output voltage. This then makes the permanent magnet DC generator (PMDC generator) ideal to be used as a simple rotary engine generator if we tend to tend to attach a DC machine to an immediate current supply, the coil will rotate at a collection speed determined by the connected supply voltage and its strength thereby acting as a "motor" producing torsion. If however, we tend to tend to mechanically rotate the coil at a speed over its designed motor speed by exploitation rotor blades, then we'll effectively convert this DC motor into a DC generator producing a generated voltage output that's proportional to its speed of rotation and strength.

2.3 Buck boost Converter: - The output voltage of the DC to DC converter could be a smaller quantity than or larger than the input voltage. The magnitude of the output voltage depends on the duty cycle. These converters noted because the accelerate and step down electrical devices and these names are coming from the analogous accelerate and step down electrical device. The input voltages unit of measurement step up/down to some level of over or however the input voltage. By exploitation the low conversion energy, the input power is capable the output power. The next formula shows the low of a conversion. DC generator producing a generated voltage output that's proportional to its speed of rotation and strength.

2.4 Batteries: - Batteries unit a bunch of one or extra cells whose chemical reactions manufacture a flow of electrons in an exceedingly} very circuit. All batteries unit created from three basic components: degree anode (the '-' side), a cathode (the '+' side), and some fairly answer (a substance that chemically reacts with the anode and cathode).

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III. METHODOLOGY

In this project, we will be using the concept of a horizontal axis wind turbine to charge the battery storage system present in the electrical vehicles. This system would be effective when the vehicles are running on a constant speed which is very much possible on the highway. Now the main obstacle, which comes in forward to reduce the use of electric vehicles in India, is the number of charging station and the distance between them. So when these vehicles are running on highways and no nearby charging station this would be a bigger problem for the costumers.

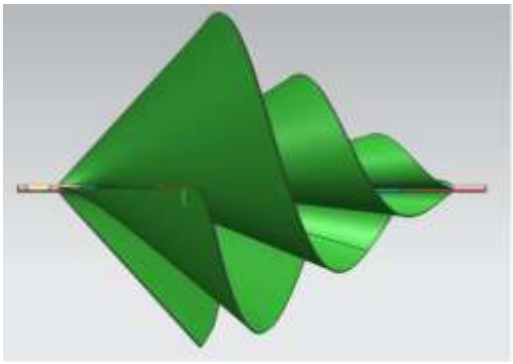

FIGURE 2: Design of Fibonacci spiral turbine

Thus exploitation this method we tend to area unit able to increase the run time of the vehicles. The generated energy is utilized to charge the battery system of the electrical vehicles already mounted on the vehicle. The presently designed rotary engine can bear moving its energy by reversing wind direction. inside the gift analysis, degree experimental study is attended to induce the evolution of the tip vortex structures inside the on the brink of wake of the scientist rotary engine model and thus the mechanics characteristics in degree open kind construction by using a PIV live system. The Lattice physicist technique has been applied to research the behavior of mechanic's characteristics shut the scientist rotary engine and take a glance at the power as a mode implement for the rotary engine. The most focus of this analysis is on quantifying the evolution of the tip vortex properties and rate distributions, furthermore as mean velocities and instant velocities.

A spiral blade rotary engine works on the principle of conservation of momentum like completely different wind turbines, but the excellence in their blades that is capable to extract most electricity from the wind by ever-changing energy into electricity. The Fibonacci spiral degree approximation of the golden spiral created by drawing circular arcs connecting the choice corners of squares at intervals the Fibonacci tiling; this one uses squares of sizes one, 1, 2, 3, 5, 8, 13 and 21.

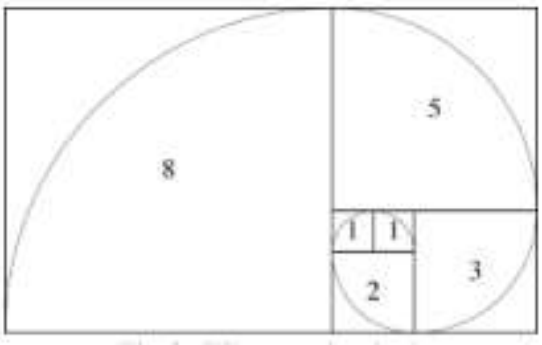

FIGURE 3: Fibonacci sequence

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Some analysis were on these variety of rotary engine by the analysis and development team of a company and therefore the the} following results were obtained: and that we would also expect approximate same results from our style that is that the Fibonacci spiral rotary engine.

TABLE 1
VELOCITY EFFICIENT TABLE

Sr. No	Velocity of air before impact , V1 (m/s)	Velocity of air during impact, V (m/s)	Velocity of air after impact V2 (m/s)	Efficiency of the turbine (η) %
1	19	12	2	71.38
2	17	11	3	68.95
3	15	8	3	45.45
4	11	6	3.5	35.16

Table 2
AIR VELOCITY V\S VOLTAGE TABLE

Sr. No.	Air velocity (m/s)	Voltage (V)
1	5	0.8
2	11	1.8
3	15	4.5
4	19	11.6

FIGURE 4 Front View

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TABLE 3
LIST OF TURBINES WITH EFFICIENCY

Type of turbine	Efficiency(%)
Wind turbines(HAWT,VAWT)	35-45%
Water turbines (Kaplan, Francis)	60-65%
Thermal turbines	40-45%
Archimedes screw turbine	55-60%
Fibonacci spiral turbine	65-70%

IV. CONCLUSION

The wind has huge potential and can be used as a clean alternative energy source. As the pressure of wind increases, the output voltage also increases. By efficient conversion, the output voltage values obtained can be further enhanced. This technology is not used practically until now due to efficiency concerns, but present work in this field makes it future quite promising and using this method would successfully encourage people to choose electric vehicles rather than the petrol/diesel consuming cars which produce GHG, carbon emissions.

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