

Power generation from Wind Turbine on Train

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Abstract-

Energy is needed to improve the finances of our country. Energy exists in nature in various structures, but the most important structure is electrical energy. Modern society is so dependent on the use of electrical energy that electrical energy has become a part of our lives. Energy is needed in the form of heat, light, and propulsion. Moreover, modern advances in science and innovation have made it possible to convert electrical energy into desired forms.

Additionally, all parts of the train are powered by wind energy. Its main purpose is to generate electricity from a wind turbine, store it in a battery, and then discharge that energy to an electric vehicle. Fossil fuels, coal, etc. are also disadvantages of this mechanical component, so it is a very useful whole system to generate electricity with a train wind turbine. The entire system provides only wind energy to the trains, and the remaining energy is used to charge the electric vehicles..

Keywords-Energy, wind, train, Battery, Electric

I.INTRODUCTION

An important factor in development of human
An important factor in human resource development is energy. The development of inexhaustible and renewable energy sources such as wind and solar energy is essential to human life as traditional energy sources are depleted. Wind energy has been used by humans for a long time, and the technologies associated with it are more advanced than other forms of clean energy. Today, wind energy is attracting benefits to the

power industry, and its applications are developing more and more rapidly.

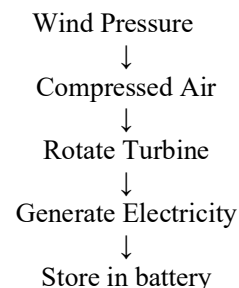
Fast-moving train traveling at high speed on a long journey, traveling at high speed and producing wind power as a source of wind turbines and generators. The kinetic energy of the wind thus created can be used to generate electricity. So, running on high-speed trains, they generate electricity very easily using a wind turbine source.

Using sustainable energy sources for moving trains is a very creative methodology. In particular, you must use the top of the car to install the windmill.

There may be some complications, for example the additional air resistance created by the turbines installed on top of the train roof. The speed of the airflow on the leading edge of a wind turbine is equal to the speed of the train used to generate electricity. A rebuild of a van with a wind turbine installed on the roof will be sent. These devices include vertical windmills that can be adjusted in plane, gearboxes, generators and accumulators located inside cars. The force of wind can be very strong.

At the beginning of the 20th century, the concept of electricity found its way and the windmill was converted into a wind turbine with a rotor connected to an electrical generator.

Project according to the invention - vehicles.



Once, this was a failure project because of improper design and position of the turbine which

made it hit on the over bridges and electric lines. The other main reason which made it unrealistic is the drag force which affected the performance of the train. By taking these problems into consideration, we have designed our model to overcome these drawbacks.

II. METHODOLOGY

A. Materials-

- 1.AutoCAD- It is used to design the model before making the prototype so that while making the prototype or the product no confusion is there.
- 2.DC Generator Motor- It is used to generate electricity from rotational motion of the rotary device attached to it.it converts rotational kinetic energy into electrical energy.
- 3.Battery- It is used to store the electrical energy produced by the generator.
- 4.Wires- It used to connect the various devices used to complete the circuit.
- 5.Fan (Rotary Structure)- It is attached to the generator and is used to create a rotational mechanical motion from the wind.
- 6.Stainless Steel Frame- It is creating a sturdy structure to protect the internal circuit and make the product aesthetically more appealing.
- 7.Air Tight Structure- It is used protect the circuit from water and other substances that can damage the circuit
- 8.Water Insulation
- 9.BMS- It is used to regulate the voltage input and output into the Battery.

B. Design-

A drag is created due to impulse force created at the sharp edges of the duct. So, to remove this impulse force, the duct is designed with a smooth surface by neglecting the sharp edges all over the path at which the air pass through. Wind Turbine

A wind turbine is a device that converts kinetic energy from the wind into electrical power. A wind turbine used for charging batteries is widely known as wind charger. Generator A generator is a device that converts mechanical energy into electrical energy. Here the generator is coupled with the wind turbine through belt. So, as the turbine rotates, generator also rotates. As the generator rotates, gradually electric current is produced. Belt A belt is a loop of flexible material used to mechanically link two or more rotating shafts. Belts may be used as a source of motion to transmit power efficiently or to track relative movement.

Setup The whole setup which includes a duct, turbine, generator and belt are placed on the hollow place at the roof top. A small portion is made open on the roof for the air to enter into duct. The setup is placed in such a way that it is fitted within the maximum height of the train, so that it does not hit on the over bridges and electric lines on the pathway of the train.

Mechanical and electrical features of the model were designed in order to optimize the existing engineering decisions and maximize the efficiency of the wind power generation system. It is realized that amid the train development the air vacuum will be created along the edges and the back of the wagon. In this way an air with the speed equivalent to moving vehicle's speed will race to these vacuums so as to fill that vacuum. The rooftop of the train was picked for establishment indicates due higher wind speed and less obstructions.

Every coach consists of a single turbine generator setup at its middle portion on the roof. The blade of the turbine is designed by considering the direction of rotation. Here, the duct and blades are designed symmetrically, so that in whatever direction the wind flows, the blades can rotate and generate electricity.

C. Characterization-

Capturing and routing wind induced by moving train: Wind energy is also be generated the kinetic energy by turbine in high route train in India. It

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and generator convert the electrical form of energy.

1. Main bearing & shaft: It is not containing any problem but they do not usually experience many problems besides normal wear & tear over time. It is also be the help of location of a turbine & help ensure that the rotation of blades smoothly & shaft is a rotational part.

2. Gear box & brake: Rotor locks are used in the wind turbine luxury trains and are also be mounted to the turbine main is the rotor shaft, between gear box & generator. A rotor brake is also intended by for use as safety brake using emergency stop under high wind conditions.

3. Generator: The wind generator is also be the used in wind power generation of the wind turbine to operate the energy in wind turns in three blades around a rotor, its convert mechanical energy into the form of electrical energy. The rotor is also be connected the main shaft rotate a generator to create useful energy. The generator is utilized to change over mechanical energy into electrical energy. The turbine blades exchange the kinetic energy from the wind into rotational energy and the wind turbine is utilized to exaction of generator. With the assistance of turbine exaction generator produce the electrical power. The wind turbine combined with generator. This power is create utilizing generator. Furthermore, this power is put away in DC battery. What's more, this created power is utilized to run electrical hardware inside the train.

III.RESULTS AND DISCUSSIONS

Mechanical and electrical features of the model were designed in order to optimize the existing engineering decisions and maximize the efficiency of the wind power generation system. It is realized that amid the train development the air vacuum will be created along the edges and the back of the

also be captured the wind by rotor part and then rotate the turbine then generate the kinetic energy

wagon. In this way an air with the speed equivalent to moving vehicle's speed will race to these vacuums so as to fill that vacuum. The rooftop of the train was picked for establishment indicates due higher wind speed and less obstructions. Additionally, the territory of the top is adequate to find all segments of the system, including wind turbines, gearboxes and generators, along these lines diminishes the need of long wiring. It is proposed to introduce five lines of turbine-pair on the train, each having tallness of 30 cm and length of 1 meter. Wagon length is 26 meters and the separation between each unit is adequate to keep up the favoured air speed at every unit.

CONCLUSION

This system helps in effectively utilizing the wind energy and generating electrical energy at low cost with less maintenance. With the Indian railways network of thousands of kilometers running across the length and breadth of our nation, by implementing this system of power generation, we can generate power to supplement the requirements of rail passengers such as audio facilities, Wi-Fi facilities, lighting facilities, etc.

The technology is expected to contribute to the cause of the environment as it helps to reduce carbon emissions and also assists the government in saving on fuel too. It can be concluded that an effective system can be installed in rail coach to generate power which is purely environment friendly and cost effective.

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