Generation Of Electricity By Traffic Using Renewable Energy Resources

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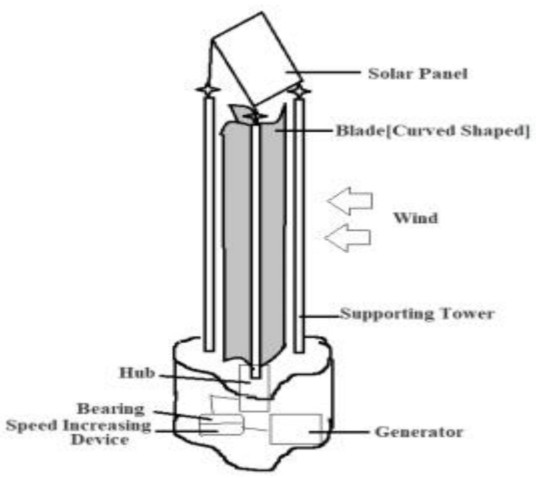
Abstract
Basically, Electricity Generation using Renewable Energy Resources is inDemand, since it is made with the effect of movement of vehicle on roads will play a significant role in the future smart city. This technology can be implemented using wind and solar energy, realized via Wind Mill Mechanism, provide many benefits; consumption of natural energy resource with good efficiency and utility operates at reduced peak demand. In this paper, it shows that the proposed model optimally provides the evolution.
***Keywords*– Electricity Generation, Smart City and evolutionary.**

I. Introduction
Wind is a form of solar energy. Winds are caused by the uneven heating of the atmosphere by the sun, the irregularities of the earth's surface, and rotation of the earth. Wind energy capacity is increasing day by day rapidly in comparison to the steady growth of energy generation. Since we are planning to work on the large part of unutilized wind/air. Such as the wind created by the movements of vehicle.



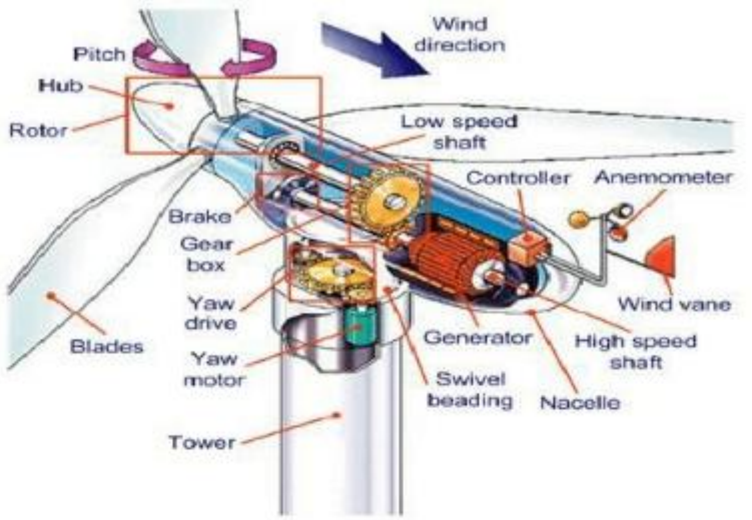
II. Traffic Wind Energy Tower
CONCEPTUAL MODEL

The tower as shown beside is the model, which converts the wind into electrical energy.

- Hub – it is a small device which is used to inlet the wind to the controller
- Bearing & speed increasing device – it is a basically a gear box which rotates faster to increase the speed
- Blade – vertical axis blades are used as shown,
  as it rotates due to the wind created by the vehicle Movement .this blade makes easier to receive the wind clearly.

III. Wind Energy Turbine

The model works exactly based on the Wind Turbine



Below is a diagram of the inside of a wind turbine, along with descriptions of each part.

Anemometer: Measures the wind speed and transmits wind speed data to the controller. *Blades*: Most turbines have either two or three blades. Wind blowing over the blades causes the blades to "lift" and rotate.

Brake: A disc brake, which can be applied mechanically, electrically, or hydraulically to stop the rotor in emergencies.

Controller: The controller starts up the machine at wind speeds of about 8 to 16 miles per hour (mph) and shuts off the machine at about 55 mph. Turbines do not operate at wind speeds above about 55 mph because they might be damaged by the high winds.

Gear box: Gears connect the low-speed shaft to the high-speed shaft and increase the rotational speeds from about 30 to 60 rotations per minute (rpm) to about 1000 to 1800 rpm, the rotational speed required by most generators to produce electricity. The gear box is a costly (and heavy) part of the wind turbine and engineers are exploring "direct-drive" generators that operate at lower rotational speeds and don't need gear boxes.

Generator: Usually an off-the-shelf induction generator that produces 60-cycle AC electricity. High-speed shaft: Drives the generator.

Low-speed shaft: The rotor turns the low-speed shaft at about 30 to 60 rotations per minute.

Nacelle: The nacelle sits atop the tower and contains the gear box, low- and high-speed shafts, generator, controller, and brake. Some nacelles are large enough for a helicopter to land on.

Pitch: Blades are turned, or pitched, out of the wind to control the rotor speed and keep the rotor from turning in winds that are too high or too low to produce electricity.

Rotor: The blades and the hub together are called the rotor.

Tower: Towers are made from tubular steel (shown here), concrete, or steel lattice. Because wind speed increases with height, taller towers enable turbines to capture more energy and generate more electricity.

Wind direction: This is an "upwind" turbine, so-called because it operates facing into the wind. Other turbines are designed to run "downwind," facing away from the wind.

Wind vane: Measures wind direction and communicates with the yaw drive to orient the turbine properly with respect to the wind.
Yaw drive: Upwind turbines face into the wind; the yaw drive is used to keep the rotor facing into the wind as the wind direction changes. Downwind turbines don't require a yaw drive; the wind blows the rotor downwind.
Yaw motor: Powers the yaw drive.

IV. Proposed Method

A. Working Principle

As we know it is made successful only by the kinetic energy of the wind

Therefore,

E=1/2 ⍰V^2 J/m^2

Power is given as

P= E V

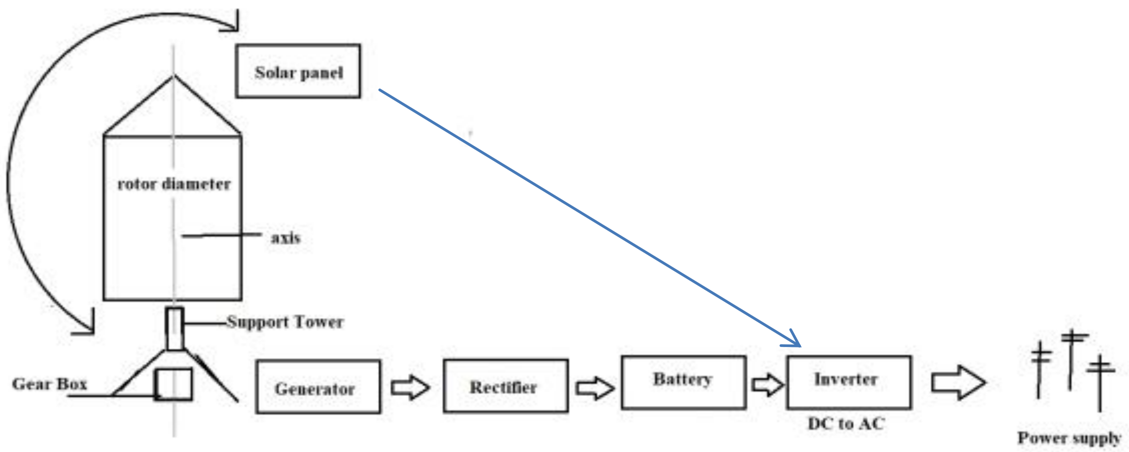
= 1/2 ⍰V^3 W/m^2

There we can conclude it directly depends on the velocity

As velocity of the vehicle increases, the generation of electricity increases

Note : Solar panel is secondary power generator in this Tower and can aslo be use the same energy to boost the gear box

B. Block Diagram



a. **Model block diagram mechanisms**

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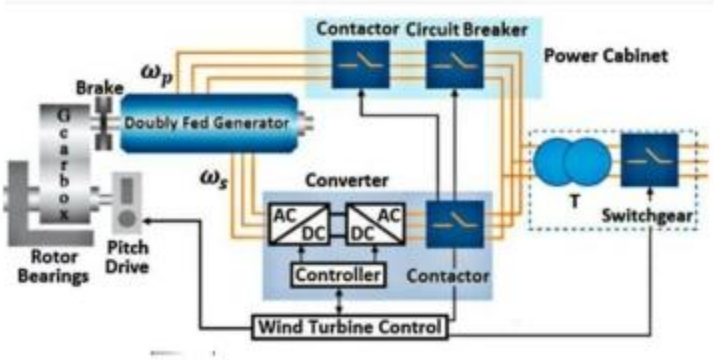

b. Turbine block diagram mechanism

C. Advantages

- Utilization of Renewable Energy
- Low installation cost comparatively to Wind Mill
- Good efficiency

D. Limitations

- Frequent vehicle movement is necessary
- Distance between the model tower and vehicle must be less, so that tower can able to receive the wind.
- Moderate traffic

V. Result and conclusion

A unique and easy way of generating electricity in cities and also can be beneficial in various way of electric usage Primary Electricity Usage can be reduced by implementing this method, since the number vehicles usage is more in cities.

References

1. infoteknoterupdateinstagram page
2. B.B Mandelbrot, “The Fractal Geometry of Nature, New York,” W.H. Freema, 1983].
3. Ahmed Azeez Khudhair Al-Zabee1,2, Saba Qasim Jabbar1, Desheng Wang1. “ Fractal antennas (study and review)” . International journal of computers and technology, volume 15 Number 13 , ISSN 2277-3061.
4. Werner, Douglas H., and Suman Ganguly. "An overview of fractal antenna engineering research." IEEE Antennas and propagation Magazine 45, no. 1 (2003): 38-57.

5. Patil, Sarang, and Vandana Rohokale. "Multiband smart fractal antenna design for converged 5G wireless networks." In Pervasive Computing (ICPC), 2015 International Conference on, pp. 1-5. IEEE, 2015
6. Takebe, Kozaburo, Hidetoshi Miyashita, Keisuke Takano, Masanori Hangyo, and Sang-Seok Lee. "Electromagnetic wave absorption characteristics of H-shaped fractal antenna for multi-band microbolometer."
7. G. A. Losa, Switzerland. " Fractals and their contribution to biology and medicine".
8. Amanpreet Kaur 1, Gursimranjitsingh 2. " A Review Paper on Fractal Antenna Engineering". International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering ,(An ISO 3297: 2007 Certified Organization) Vol. 3, Issue 6, June 2014.
9. Mircea V. Rusu and Roman Baican. "Fractal Antenna Applications".
10. M. Levy, S. Bose, A. Dinh, and D. S. Kumar , A Novelistic Fractal Antenna For Ultra wideband (UWB) Applications, Progress In Electromagnetics Research B, Vol. 45, 369–393, 2012.
11. M. Levy, D. Sriram Kumar, and A. V. Dinh Analysis of Nonlinear Fractal Optical Antenna Arrays - A Conceptual Approach, Progress In Electromagnetics Research B, Vol. 56, 289–308, 2013.
12. M. Levy, D. Sriram Kumar, and Anh Dinh, Analysis of Novel Fractal Optical Antenna Arrays — A Conceptual Approach, Progress In Electromagnetics Research M, Vol. 32, 83–93, 2013.

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