

# Electricity Generation By Using Roof Ventilator

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## ABSTRACT

The demand for electricity is increasing at alarming rate and the demand for power is running ahead of supply. The present day methods are not sufficient to keep pace with ever increasing demand. The recent severe energy crisis has forced to think and develop the power generation by renewable sources (mainly wind power). This project dwells on the implementation of an alternate configuration of a wind turbine for power generation purposes. Regenedyne (magnetic levitation) has apparently moved to prototype stage. The floating blade spin with little resistance and the power output is increased. They also can spin in light breezes. This provides efficient frictionless power generation with less maintenance, compare to Horizontal Axis Wind Turbine (HAWT). The aim of this major qualifying project is to design and implement a magnetically levitated vertical axis wind turbine system that has the ability to operate in both low and high 1.5m/s to 40m/s ) wind speed condition. This new model of wind turbine uses magnetic levitation to reduce the internal friction of the rotor which is considered as a revolution in the field of wind technology, producing 20% more energy than a conventional turbine, at the same time decreasing of operational cost by 50% over the traditional wind turbine.

**Keywords:** Renewable energy, power generator, ventilator, HAWT, VAWT, AFPM.

## ARTICLE INFO

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## I. INTRODUCTION

In this concept we invent the exhaust fan as a wind mill. The goal of this paper was to design a wind turbine specifically for a low wind speed sites. As energy demand around the world is increasing day by day, Wind energy is the one option for fulfill the needs as compare to other renewable energy resources. Since most of the country has low speed wind available, this turbine would be applicable in many places. It is more efficient in rural areas.

We know that day by day the demand of electricity in India is increasing. To meet that demand the various renewable and non-renewable energy sources are used to generate electricity and meet the demand. Other Hand by using conventional energy sources the pollution is increasing and this effect the global warming .The conventional energy sources are destroyable energy sources. All countries have becomes interested in the renewable energy sources. The solar, wind, water, ocean, waves can play important role in production of electricity. But the

some problems arises in the development of energy power generation like, high construction cost, difficulties in maintenance, space for plant installation and power distribution. Therefore in India begin to develop a micro power station to improve such problems.

Therefore the rooftop ventilators are used for ventilation purpose because this ventilator is work on without using electric energy. This technology is popularly installed on the roof in workshop's, industrial buildings, and ware houses and also in residences. The main function of this ventilator is that when the air flow on the top of roof or the hot air that lifting under the roof that called ventilator. The ventilator suck the hot air from building and through outside the building and maintain the building temperature .The another function of roof top ventilator is to convert wind's kinetic energy to electrical energy.

## II. SYSTEM ARCHITECTURE

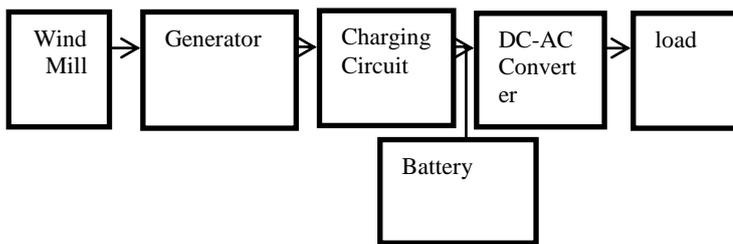


Fig. 1 Block Diagram of Regenedyne Wind Power Generation

### A. Wind Mill Mechanism

It is a fabrication of blades. The material used for these blades is Aluminum. After iron, aluminum is now the second most widely used metal in the world. The properties of aluminum include: low density and therefore low weight, high strength, superior malleability, easy machining, excellent corrosion resistance and good thermal and electrical conductivity are amongst aluminum's most important properties. Aluminum is also very easy to recycle.

### B. Generator

It works on the principle of electromagnetic induction. This method of excitation consists of a smaller direct-current (DC) generator fixed on the same shaft with the alternator. The DC generator generates a small amount of electricity just enough to excite the field coils of the connected alternator to generate electricity. A variation of this system is a type of alternator which uses direct current from the battery for excitation, after which the alternator is self-excited.

### C. DC-DC Converter

It is a device that converts Dc to Dc signal by using full wave bridge rectifier, full wave output is obtained. Capacitor is used for filtering purpose. Dc-dc power converters are employed in a variety of applications, including power supplies for personal computers, office equipment, spacecraft power systems, laptop computers, and telecommunications equipment, as well as dc motor drives.

### D. Battery

It is a storing device. Batteries convert chemical energy directly to electrical energy. A battery consists of some number of voltaic cells. Each cell consists of two half-cells connected in series by a conductive electrolyte containing anions and cations. Cations are reduced (electrons are added) at the cathode during charging, while anions are oxidized (electrons are removed) at the anode during charging. During discharge, the process is reversed. The electrodes do not touch each other, but are electrically connected by the electrolyte.

### E. Charging Circuit

In the charging circuit we use full wave bridge rectifier. The main function of full wave bridge rectifier is to remove

pulsating DC and give the pure DC output .The IN 4007 diode is used in the circuit diagram.

### F. Inverter 12V to 220V

This circuit is 100 watt power inverter using power transistor 2N3055. It is designed for you that need to use appliances at outdoor or no electrical places. Someone use it in car or the high mountain etc. The maximum output power of this circuit about 100 watts, it is suitable for a normal lighting (all home lamps), also used for radio, mini TV.

### G. Load

The load used is CFL bulb. the wattage of bulb is 60W. We connect here 2 CFL for maximum 6 hours .We can connect more CFL bulb as a load it depends upon the revolution of wind turbine.

## III. WORKING

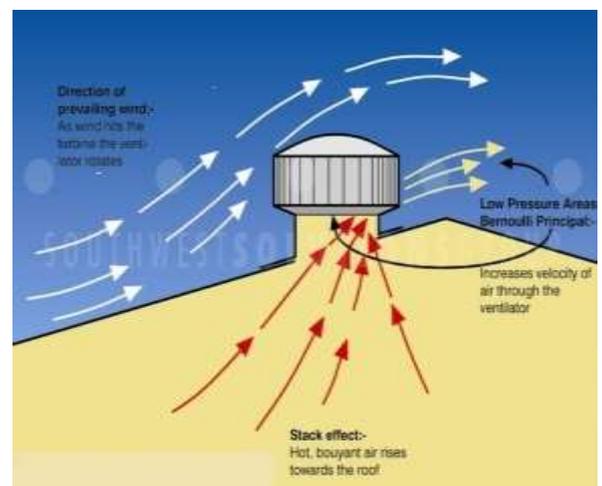


Fig. 2 Working Of Regenedyne Windmill

The roof ventilation fan applies the theory of convection between natural wind and air to accelerate and transform any parallel airflow into vertical so as to improve the indoor ventilation. The hot air rises and cold air falls, which make the fan rotate. So the indoor heat, stink and dust are exhausted effectively. It also can effectively remove indoor soot, smoke, odor, moisture, heat, decorative harmful gas, dust, human metabolism and other dirty volatile mixed-doped odor as well as viruses and bacteria invasion. As a result, it improves the working environment, protects workers' health and enhances the working efficiency. It is widely used in warehouse, toilet, factory, workshop, stadium, tennis hall, assembly hall, garage, paper mill, and galvanization factory and coating factor.

The below table shows the internal details of the windmill that is total height, diameter of the sphere, neck diameter, blade quantity also from the diagram we introduce all the parts of windmill such as top cover, wind blade, bearing, neck, bearing seal coat, stand bar, vertical shaft etc.



	Total Height	Sphere Dia.	Neck Dia.	Blade Qty.
Model 300	350mm	420mm	300mm	24
Model 400	420mm	530mm	400mm	24
Model 500	480mm	620mm	500mm	32
Model 600	650mm	750mm	600mm	32
Model 680	700mm	750mm	680mm	32
Model 800	750mm	920mm	800mm	42
Model 880	760mm	1000mm	880mm	42

Fig.3 Internal Detail Of Windmill

#### IV. CONCLUSION

It represents a very promising future for wind power generation. A single large turbine can output More than conventional horizontal wind turbines. The major components are placed at ground Level. We can say the turbine can power more output with high efficiency conversion compared to traditional wind turbine. The system will provide electricity at a rate lower than coal and nuclear. Thus we believe technology has the capacity to completely displace current technology in use for wind farm.

#### REFERENCES

- [1] Mr.vishal D.Dhareppagol and Mrs. Maheshwari M.Konagutti research on “Regenedyne Maglev Wind Power Generation” in International Journal of Electrical, Electronic and Data Communication, ISSN 2084-2320, volume1, Issue 6.
- [2] Mr.W.T. Chong and A. Fazlizan research on “The Design, Simulation and Testing of an Urban Vertical Axis Wind Turbine with the Omni- Direction-Guide-Vane” Elsevier Paper, Applied Energy, 2006.
- [3] Mr. Archit Patnaik, "Industrial Exhaust Fans as Source of Power", International Journal of Electrical, Electronics