

# Production of Electricity Using Wind Energy in Residential Tower

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## Abstract:

*In this paper a Production of electricity using wind energy in residential tower, is a future concept project, to save the nature and earth, this kind of concept is essential or need of new generation. This project shows the future planning and better utilization of non-conventional energy source with the help of engineering science and technology. In today's life the demand of electricity is much higher than that of its production .the main objective of our project is to generate electricity without any pollution and also make the effective use of land.*

**Key words:** Wind turbine; wind energy; electricity; residential tower; pollution.

## I. INTRODUCTION

The concept of Production of Electricity Using Wind Energy in Residential Tower is a latest and applicable concept. By using this concept we can make an arrangement of wind turbine on residential tower. It is the effective way of generation of electricity. This concept will defiantly apply, plus very help full for civil and city designing. For development of well-planned civil city with effective use of natural source, this "production of electricity using wind energy in residential tower" concept is useful.

Today, the maximum amount of electricity is the need of developing civil society .for fulfils their requirement, coal and petroleum material burn by human. Hence the air pollution is the major problem .hence to avoid it, wind energy is also a good option.

Also day by day population all nations get raise, hence there is problem of land .to solve it, huge residential tower is good option. For full fill of demand of electricity, hence residential tower is good option.

## II. WHAT IS MEAN BY WIND ENERGY

An energy created by using the wind to generate power. It is usually form of kinetic energy of air in motion that can be transformed into mechanical energy into electrical energy.

Also wind energy is the form of kinetic energy. By using perfect mechanical design (means turbine) we can easily convert the kinetic energy of wind into mechanical energy.

When turbine convert this kinetic energy into mechanical energy ,rotation of turbine blades occurs , when turbine blade get rotates , shaft of turbine also rotates. And this rotating shaft also rotates with generator shaft, where the generator shaft rotates and it produces the electricity.

## GENERALISED CONSTRUCTION OF WIND TURBINE



Fig no:1 wind turbine mounted on ground.



### Inside a Wind Turbine

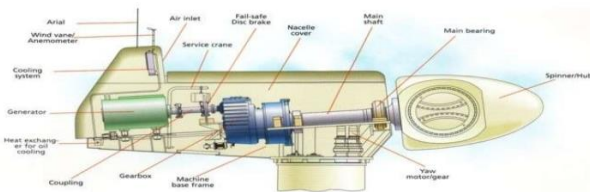


Fig no:2 internal construction of turbine.

### III. HOW PRODUCTION OF ELECTRICITY USING WIND ENERGY IN RESIDENTIAL TOWER IS POSSIBLE.

The production of electricity using wind energy in residential tower is the future project for human kind. Generally wind turbines are installed on the huge ground plane. Where the wind is continuous. For a rotation of wind turbine blades or propellers there is a need of high velocity wind + continuous wind.

But if we put this wind turbines on any huge residential tower, then we can easily minimize the demand of the electricity generated from coal, petroleum material, etc. If we able to minimize the demand of this material then there is a maximum chance to minimize the various kinds of pollution.

In European countries like Germany, England, Netherlands, Scotland, Denmark and in many countries, their government applies this kind of concept on multi floor buildings. If the multi floor building is more heightened than 50 to 60 m, then there should make the installation of wind turbines. Because near about 50 to 60m from ground level, the rate of wind flow is maximized. Again, if we go the higher the speed of wind get increases.

But where this concept is used, the wind turbines are very small. Each turbine can produce only 100kw to 150 KW. For maximum production of electricity, there is need of high capacity turbine. But this kind of turbines is vast and huge in shape. Hence also need a huge base for installation, men need a huge multi floor building with well civil constructional design.

This type of project implemented in BAHRAIN in Arab countries. They successfully installed the wind turbines on multi floor building. Due to this project, this BAHRAIN world trade centre work as a self

generator. Because 30 to 40% need of electricity full fill by this wind turbines.

For better rotation of blades need strong laminar flow of wind. Need low turbulent flow of wind. It possible above than 50m from ground. In India there is many places where the speed of wind is greater and continues. And also shows many places where the maximum laminar flow of air is present with a low turbulence air.

### IV. CALCULATION

1. Generally 70M heighted wind turbine can easily generate minimum 3mw electricity. 3mw electricity is sufficient for 1500 people.

2. Windmill association and research center, America. Is the organization which makes research on wind turbine to increase the efficiency of wind turbine. Also, they developed the wind turbines, which can generate 9mw electricity.

3. SUZLONE is the India's most ranked wind Mill Company, which generates 6500mw electricity per day.

4. Power in the wind calculated by =  $\frac{1}{2} * (\text{density}) * (\text{area}) * (\text{velocity})$

### 5. BAHRAIN WORLD TRADE CENTRE:

In Arab countries, Bahrain successfully implements this project, and able to do a better utilization of wind energy. These two towers are built as per the flow of wind. The design of the tower is totally aerodynamic.

This two residential tower is connected to each other by using the aero dynamic bridge. 3 Bridges are connected to this two tower. 3 bridges are installed at particular required distance. On this bridges engineers makes the installation of high rate wind turbines. Each turbine able to generate 3 MW electricity per day.

3 turbines, each generate 3 mw.  $= 3 * 3 = 9mw$ . Means that this 3 turbines combine to generate a 9 MW electricity per day. 3MW electricity is sufficient for 1500 people.

The BAHRAIN WORLD TRADE CENTRE is one type of self-generating center. Which easily generate 30 to 40% of electricity as need of people.

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Photograph no: 1 Bahrain world trade center.

**ADVANTAGES:** 1. Ability to minimize the air pollution

2. This tower work as self electricity generator. 30% need of electricity fulfills.
3. This project is applicable where the flow of wind is continuous.
4. Having low maintenance.
5. It's one time investment.
6. Can be able to solve the problem of pollution, waste material and land utilization.

**DISADVANTAGES:**

1. The initial cost is high.
2. Difficult installation.
3. Need minimum turbulence in the wind. & need a strong laminar flow of wind.
4. Need well planning and civil design which is costly.

**FUTURESCOPE:**



Photograph:2 Future scope structures [civil design.]

The Pearl River Tower will include four vertical-axis turbines located in penetrations through the face of the building. If you try to put a turbine on a tower on top of a building—to get away from the turbulent flow and into the most productive wind—the stresses on the building are magnified. Randy Swisher, the past executive director of AWEA, notes that wind turbines are subjected to a great deal of stress, and if installed on a building, “that stress can be transmitted to the building structure, creating substantial problems.”

In future there will be maximum demand for such kind of future building structure. This kind of civil structure is very effective and it will be need of the next generation. There will be lots of scope in future, and defiantly it plays an important role in minimizing the various kinds of pollution. This future project will defiantly able to full fill the demand of electricity for vast smart city.

**CONCLUSION:**

Wind energy gaining the importance in all over the world. And it is important to study the technology behind it. So one can be able to harness more power from wind energy.

Countries like India should involve in research and development of the windmill, and better civil infrastructure. Because it is the future of the world. May be demanded of future. Because wind energy is unconventional energy source.

The countries like India, there will a lot of scope to this kind of projects. Also we can give a touch of solar energy, and make it multi-purpose project. The”PRODUCTION OF ELECTRICITY USING WIND ENERGY IN RESIDENTIAL TOWER” is a future concept project and may be future of the world.

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