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WIND ENERGY DEVELOPMENT AND POLICY IN INDIA

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ABSTRACT

India is glorified with great renewable energy resources in general in that particularly wind energy. India stands at 4th position in the world for use of wind energy. Up to 2018, about 34605MW capacity wind power plants are installed .From last 10-20 years wind energy shows tremendous potential in capacity addition and generous production throughout the world. In case of India, wind energy is not only for production of power but also to fulfill the energy in a profitable way. This paper discusses the development opportunities and challenges associated with wind energy in the country. Also the present picture of wind power potential of India was compared with other leading countries in world.

I.INTRODUCTION:

Main factor of the Economy o0f country is demand of energy. The population of India increases very rapidly up to average rate of 6.4%. Due to significant economic growth we can fulfill the demand of power. But in this tremendous use of non-renewable sources takes place. This causes the pollution of environment. Pollution harmed environmental and human health. Due to the pollution global, warming, skin cancer etc. hazardous effect takes place. Also the use of coal, mineral oils. Natural gaseous cause's greenhouse effect. It was the reason of decaying ozone layer. That's why all community associated with science and research forced to work on renewable source of energies.

Production of wind takes place due to the different temperature distribution due to solar radiation and earth rotation. Wind energy is big source of the power. It is renewable, non-conventional, non-polluting energy source. At the end of 2017, collective it gives 10.7% of cumulative business growth. Cost installation is high for wind power plants but the running cost is low.

The imperious and useful features of the wind power plant are 1) It is nonpolluting, 2) prevent global warming, 3) we can utilize the land in which the wind turbines are raised as they are tall and occupy less land. We can use that land for agriculture. 3) Greenhouses gaseous also can reduced. 4) Use of fossile fule can be control.

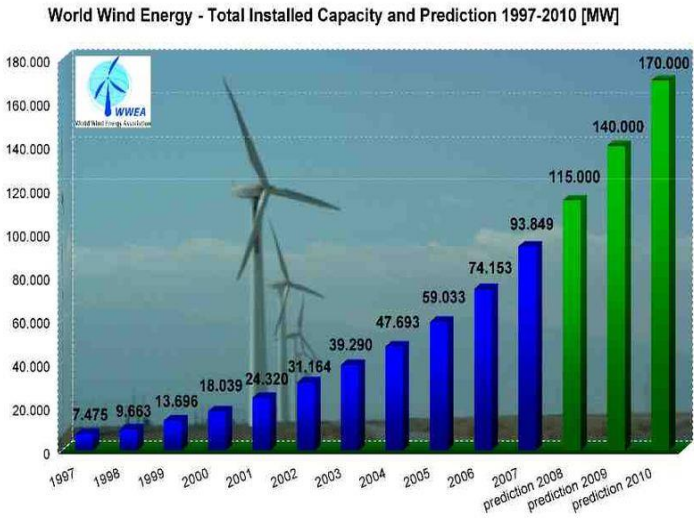
Up to 84% of world's total wind power plant installation takes place in top ten wind power magisterial countries i.e. USA, Germany ,UK, China , Italy , Canada , India etc. All this countries including India gives 73% of total wind power plant. Significant reduction in the cost of harnessing wind energy increases the numbers of wind power plant. From total amount of carbon dioxide half amount is emitted due to use of conventional power sources. Because of this India is at fourth position in carbon dioxide emission in all over world. The Indian Gov. launched "National Action Plan on Climate Change (NAPCC)" as Gov. concerned the adverse effect of conventional power resources.

II LITERATURE REVIEW:

The wind energy converted kinetic energy of wind in to electrical energy which is use for further industrial and household works. Wind power plant consist of wind turbines, generator, PLC controls, and engine. The mean velocity required for wind power generation is 3.5 to 25 m/s. The first power plant in world is installed at USSR in 1929-30 it was 8 kW capacity, and in 1931 in Sevastopol a wind power plant installed which had 100kw capacity. It was for parallel work with thermal power generation.

The global production of power using wind energy is as follows:

1. China= 158000MW
2. USA=74696MW
3. Germany=47420MW
4. India=27157MW
5. Spain=22987MW



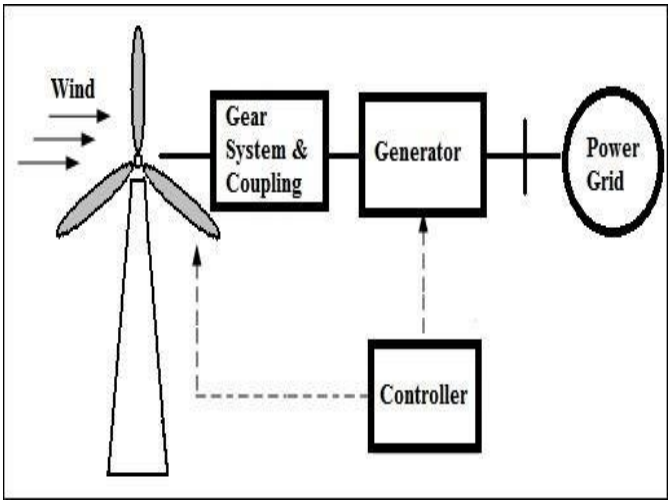
Forest area plays significant role for change in atmospheric conditions as it provide all natural energy resources. Also they effect on flow of wind, hence the installation of wind mills had carefully done. The factor which are affect the working of wind turbines are as follows:

- Variation in designs of blade of wind mill.
- Material used to construct the wind mill i.e material intensity.
- Availability of wind in that particular area.
- Time of service.
- Age of wind mill.
- Maintenance of wind power plant.

The important benchmark for the determination of places for wind power plants are:

- When the wind mills connected or disconnected the voltage differentiation must be 15% at coupling point.
- Sometimes voltage get increase at wind turbines it always should be less than 13% of decided rated voltage.
- Up to 15% asymmetry is allowed.
- Common coupling point have certain short circuit level which should be above 5 to 10 times the maximum power produced in that wind power plant.
- Current limiting machines should be provided to wind turbines.

III BLOCK DIAGRAM



As observed in block diagram the production of wind power takes place. Firstly because of wind flow blades of wind mill start rotating. As they start rotating the kinetic energy of the wind is further transferred to the generator to convert in to electrical energy. Universal law of energy conversion is observed in this mechanism.

Also there is two types of wind power plants that are onshore wind power plant and offshore power plant. The difference between both types is given in table below.

Onshore wind power plant	Offshore wind power plant
✓ Medium velocity wind turbines ✓ It was harmful to human beings ✓ Visual reverberation is not good ✓ Soil erosion is low ✓ Capital cost is low ✓ Maintenance cost is also low ✓ Easy to accesses	✓ High velocity wind turbines ✓ It was not harmful to the human beings ✓ Zero reverberation ✓ Soil erosion is high ✓ Capital cost is high ✓ Maintenance cost is also high ✓ Hard to accesses
	✓

IV. WIND TURBINES:

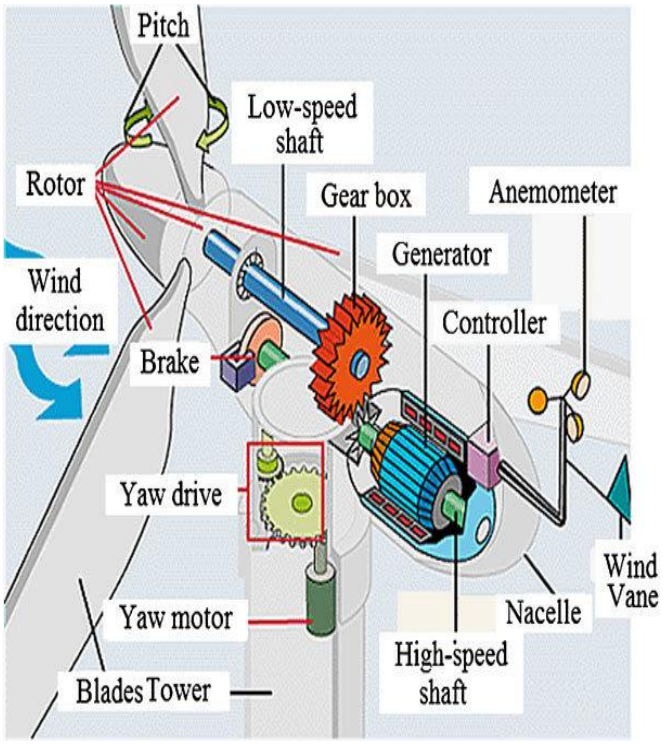


Fig. wind turbines

Blades of wind turbines are always faced to high stress of various environmental factors like uv rays, heavy rain, moisture, humidity. Wind turbines are ultimately used as the energy converter. There are two types of wind turbines that are horizontal axis wind turbines and vertical axis wind turbines. Material used to construct wind turbines are mostly of rain forced steel or aluminium etc.

Fig. wind mills at Jaisalmer India

V. CONCLUSION

In this paper author studies the various types of wind mill present in India. Performance of India in wind power generation also observed by using various review and research paper. Global wind power scenario also studied. Author compared the production of wind energy with other leading countries. India stands at 4th position in all over world in production of wind energy. This is very proud thing for all of us

VI. REFERENCES:

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