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GENERATION OF ELECTRICITY THROUGH HELIX WIND TURBINE

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Abstract

Wind turbines generate electricity by using the natural perfor mance of wind to drive generators. Wind is a clean, sustainabl e fuel source, does not cause pollution and does not leave. Win dergie technology develops quickly. Turbines become cheaper and more powerful, paying for the cost of renewable power ge neration. A conventional method of producing electric combus tion fuel to ensure energy driving the generator, typically via h eat to supply steam to the turbine drive. These technologies ca n use fossil fuels, oil or gas, or nuclear fuels. The use of fossil fu els contributes to global climate change by causing pollution s uch as sulfur oxides and nitrogen, which contribute to acid rai n and carbon dioxide. The spiral turbine with a circular memb er attached to one end explains in this report that the wind tur bine can generate more power than it plays a television, as wel l as the working conditions of the wind turbine. The materials, manufacturing methods and costs used to manufacture this he lix wind turbine are also explained in this report. All paramete rs, i. H. Electricity generated with increased output voltage, ou tput current and wind speed. We also found that the maximum wind speed can be used in the summer season and in the winte r at a minimum.

***Key Words*: Wind energy, Vertical helix wind turbine, Power generation etc.**

1. INTRODUCTION

Wind energy has been use for thousands of years for milling grain, pumping water and other mechanical power applications. Wind power is not a new concept. The first accepted establishment of the use of wind mills was in the tenth century in Persia. Today, there are several hundred thousand windmills in operation around the world. Modern windmills tend to be called wind turbines partly because of their functional similarity to the steam and gas turbines and partly to distinguish them from their traditional forbears. Wind energy was the fastest growing energy technology in the 1990s, in terms of percentage of yearly growth of installed capacity per technology source. The growth of wind energy, however, is not evenly distributed around the world. By the end of 1999, around 69% of the worldwide wind energy capacity was installed in Europe, a further 19% in North America and 10% in Asia and the pacific. Wind energy is expected to play an increasingly important role in the future national energy scene. Wind turbines convert the kinetic energy of the wind to electrical energy by rotating the blades. Greenpeace states that about 10% of electricity can be supplied by the wind by the year 2020.

The Helix wind turbine which should give you trouble free service with minimal maintenance or intervention. The wind turbine is a means to harness the power in the natural wind. A wind turbine is a machine that is used to convert kinetic energy from wind into mechanical energy. The wind turbine is called a windmill if the mechanical energy is used by machinery. The wind turbine is called a wind generator, wind turbine, wind power unit, wind energy converter or aerogenerator if the mechanical energy is converted into electricity. The vanes have been carefully designed to capture the power in the wind and turn the turbine to generate useful electricity that can be stored in batteries for later use. Helix wind is a paradigm breaking distributed generation technology platform. Previous technologies designed to produce electric energy from the wind were focused exclusively on power efficiency and output, ignoring primary consumer concerns blocking widespread adoption, which include: visual impact, restrictive zoning and permitting and lack of access to wind information.

Helix Wind will revolutionize the small wind industry by overcoming these obstacles and providing cost effective residential and commercial wind energy systems Inexpensive, reliable, simple, the hallmarks of the Helix system make it the best choice for low wind speed residential and commercial applications. The helix turbine based design catches wind from all directions creating smooth powerful torque to spin the electric generator. Mounted up to 11 to 35 feet high, in winds as low as 15 km/h the helix system creates electricity to power your home or business.

1.1 Problem specification and results from helix wind turbine in the whole year in different wind velocity

A detailed analysis of the performance and results of a helix wind turbine throughout the year, measured under different wind velocity conditions.

Table -1: Helix wind turbine results throughout the year under different wind velocity

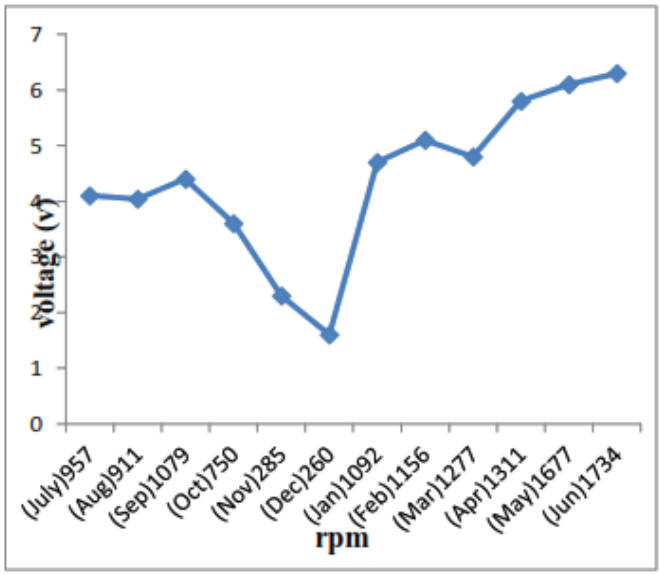
Sr. No.	Month	Average velocity (m/s)	Rpm	Voltage (V)	Current (mA)	Power (P) = V*I (watt)
1	Jul	10.80	957	4.10	789	3.23
2	Aug	10.40	911	4.04	715	2.88
3	Sep	11.80	1079	4.40	960	4.22
4	Oct	8.40	750	3.60	423	1.53
5	Nov	5.60	285	2.3	196	0.45
6	Dec	4.40	260	1.6	136	0.22
7	Jan	12.06	1092	4.7	1094	5.14
8	Feb	13.40	1156	5.10	1212	6.18
9	Mar	13.04	1277	4.8	1187	5.69
10	Apr	15.00	1311	5.8	1496	8.67
11	May	18.00	1677	6.1	2458	14.94
12	Jun	19.00	1734	6.3	2799	17.63

1.2 PERFORMANCE GRAPHS OF OUR MODEL

The performance of model is discussed in the light of following headings:

1.2.1. Voltage versus RPM

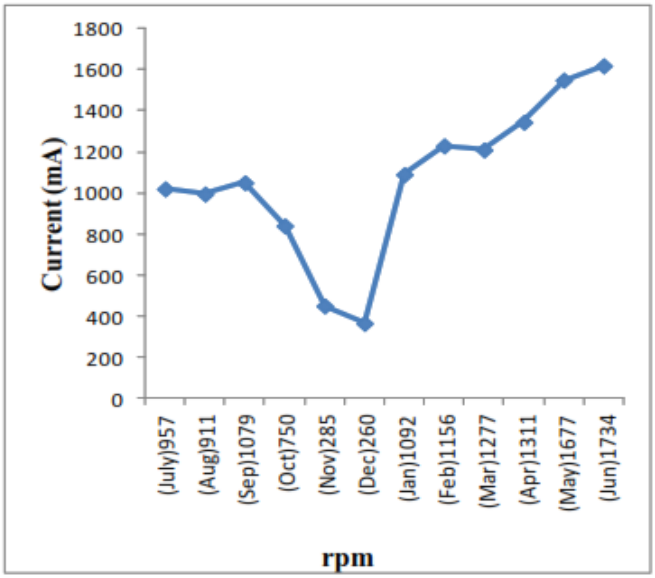
As the RPM increases the voltage developed increases as it is shown in the graph. So it can be said that voltage developed is directly proportional to RPM



Graph-1: Voltage and rpm

1.2.2. Current versus RPM

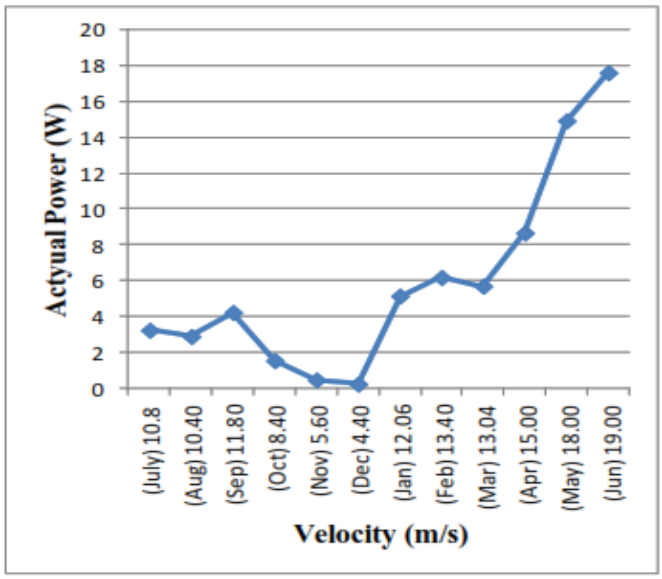
As the RPM increases the current generated increases as it is shown in the graph. So it can be said that current generated is directly proportional to RPM.



Graph-2: Current and rpm

1.2.3. Actual Power versus Wind Velocity

The graph between actual Power output versus Wind velocity shows that at zero velocity the power output is zero. From the graph between actual power and wind speed as the speed increases the power development by the helix wind turbine is increases.



Graph-3: Actual power and wind velocity

2. PROBLEM SPECIFICATIONAND RESULTS

The aerodynamic efficiency of blade element of our model varies from 98.30 to 96.45. The overall conversion efficiency of our model is 30.09 %. In our project we have used 12V DC generator and the maximum output comes out of the motor is 6.3 volt. Such that efficiency of the generator = 35 %. From the economical point of view our model stands in the financial feasible category as its cost is approximate 7025 Rupees. As we have produce maximum 6.3 volt output of the model thus we are capable to charge a 6 volt battery which is used in emergency light and used in bike and so on.

2.1 PERFORMANCE GRAPHS OF OUR MODEL

The graph between velocity versus season and power versus season shows that the generation of electricity is maximum in summer then spring and then after rainy and minimum in winter.

Table -2: Power and velocity in different seasons

Sr. No.	Season	Month	Avg. velocity(m/s)	Max. velocity(m/s)	Mini. Velocity(m/s)	Power (w)
1	Rainy	July	11	11.8	10.4	Avg.=3.42
2		Aug				Max.=4.22
3		Sep				Mini.=2.89
4	Winter	Oct	6.13	8.4	4.4	Avg.=0.59
5		Nov				Max.=1.52
6		Dec				Mini.=0.22
7	Spring	Jan	12.83	13.4	12.06	Avg.=5.42
8		Feb				Max.=6.18
9		March				Mini.=4.50
10	Summer	April	17.33	19	15	Avg.=13.38
11		May				Max.=17.63
12		June				Mini.=8.67

2.1.1 Velocity versus season

The graph between velocity versus season shows that the generation of electricity is maximum in summer then spring and then after rainy and minimum in winter.

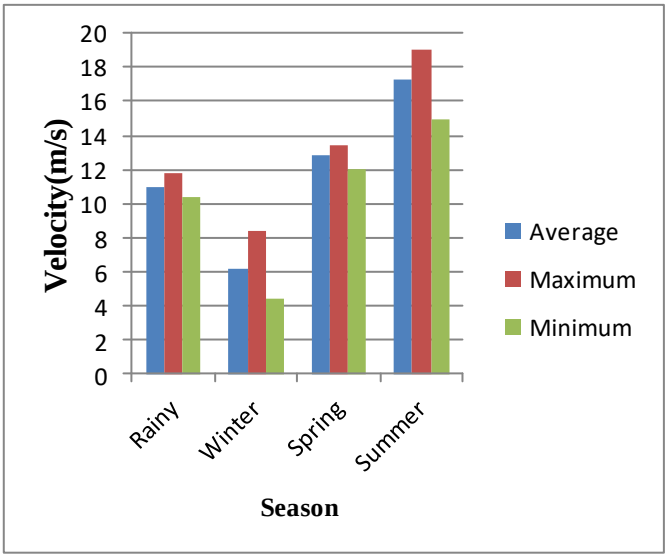


Figure 1:- Graph between velocity and season

2.1.2 Power versus season

The graph between power versus season shows that the generation of electricity is maximum in summer then spring and then after rainy and minimum in winter.

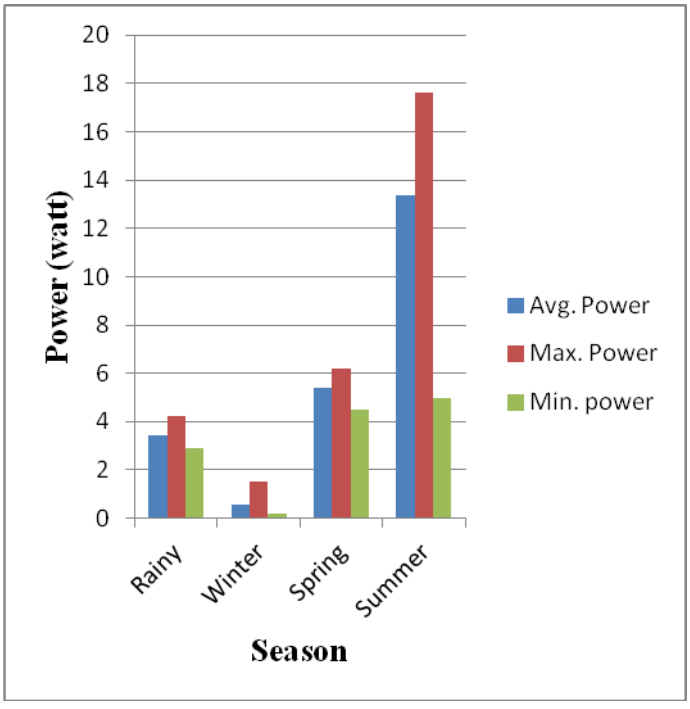


Figure-2: Graph between power and season

3. CONCLUSIONS

The man has been served by the power from winds for many centuries but the total amount of energy generated in is manner is very small. The expense of the installation and

durability of operation have tended to limit the use of wind mill to intermittent services where its variable output has no serious disadvantages. The principle services of this turbine are the pumping of water into storage tanks and charging of storage batteries. After fabricating the wind turbine model we measured the output of model at different wind velocities. Our model "Vertical helix wind turbine" works efficiently at different wind velocities.

The following conclusions were drawn from our model:

1. Vertical helix wind turbine was able to capture more wind as compared to other conventional wind turbines.
2. It is capable of generating electric energy at low wind velocity.
3. It is able to capture the wind coming from any direction so it is more effective as compared to other conventional wind mills.
4. If we make this model at the industry level than it will be more compact, more efficient and also more effective. The cost of this model will also be very low and it may be a revolution in generation of small electric energy.
5. If the height of the turbine increases the effectiveness of the helix wind turbine also increases due to increased velocity.
6. Robust of the structure of good quality is necessary otherwise it will fall down or vibrate.
7. In our model we found out that the current, voltage and power increase with the velocity of wind
8. Also in summer season the current, voltage and power are maximum as in this season the maximum wind flows in this region.
9. A support is needed for the shaft to reduce the deflection of the shaft due to wind.

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