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DESIGN AND UTILISATION OF MOBILE WIND MILL TO CHARGE ELECTRONICS EQUIPMENT

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ABSTRACT
At present, electric conservation is a main problem to whole world. The demand over the non-renewable energy resources is increasing day by day as a result of that there is a certain chance of scarcity of these all non-renewable sources. In modern and developed time, the use of electronics and communication systems is increased drastically which consume an enough amount of electricity in the charging processes. This consumption of electricity can be reduced by using some alternate renewable sources of electricity. The main renewable sources of energy i.e. Sun, Wind and Water can be produce huge amount of electricity that can be used till the universe will exist. Hence, in the present paper we have proposed a mobile wind mill for the production of electricity from wind stream that can be used for the charging purpose of small electronics equipment like mobile, computer, laptop etc. And design of mobile wind mill had been also done using Solid Works.

Keywords-. *Electricity conservation, Non-renewable energy source, Renewable energy source, Wind mill.*

Introduction
Wind mill is not the technology which is invented in the modern developed world but it was also existed in the ancient time as echo friendly character. Windmills were used in Persia (present-day Iran) as early as 200 B.C. Renewable Energy Sources are those sources of energy which can't be destroyed when their energy is utilised. Human use of nonconventional energy requires technologies that utilise natural methods, for example light of Sun, high speed air, water waves, flow of water, and natural bio processes such as anaerobic digestion, biological hydrogen production and geothermal energy which is freely available. In all of the above sources of energy there has been a lot of changes in the technology for utilising energy from the high speed air i.e. wind. Wind is the motion of air produced by the irregular heating the earth's surface from the sun light. These differences in temperature consequently create forces that allow to push the air masses in low energy region for balancing the global temperature or, on a much smaller scale, the temperature between ground and sea or between mountains and valleys. Wind energy is not a continue source of energy. It varies irregularly and gives energy in sudden bursts. About half of the whole energy is given out in just one seventh of the operating time. Wind strengths changes with time and thus cannot guarantee continuous power. It can only be used by the means of a system that has significant storing capacity such as hydro, or reserve load, such as a desalination plant, to reduce the economic effects of resource variability. Small wind turbines are those turbines which have lower energy output than large commercial wind turbines, such as used in wind farms. These turbines may be of fifty-watt generator for boat, caravan, or small refrigeration unit. Small units often have direct drive generators, direct current output, and lifetime bearings and use a vane to point into the wind. Bigger turbines generally run by geared power trains, A.C. output is actively pointed into the wind. Direct drive generators which is straight coupled with armature shaft are also used on some large wind turbines. The Micro Windmill Mobile Charger is an environment friendly charger that boosts up all your handhelds, trapping the wind power. The portable device is equipped with a small fan that charge up the generator and the connected mobile phone or other batteries via a connecting wire.

INDIA'S MARKET OVERVIEW OF WIND ENERGY
India has a vast supply of non-conventional energy resources. India is on the way to make world's largest programs for utilisation of renewable energy products and systems from renewable energy sources installed.

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State	Total capacity MW
Tamilnadu	7684.31
Maharasthra	4664.08
Gujrat	4227.31
Rajasthan	4123.35
Karnatka	3082.45
MadhyaPradesh	228.60
AndhraPradesh	1866.35

WORKING PRINCIPLE

In The Mobile charger as the name suggests uses Wind to generate power and in turn charge the mobile phone. The basic working principle of the micro-windmill is Faraday's law of converting mechanical energy into electrical energy. The wind energy is used to rotate the blade and the rotator is connected to a dynamo. This is a miniature (micro) version of windmill, without a gear wheel mechanism, with blades of different shapes and types, and a portable direct current generator (to be used to generate electricity while travelling). The gadget has to be fixed such that the blade opposes the wind. It is a compact portable gadget, containing blades of 10 cm diameter and a generator of 3.5x3 cm with a specific cable and a jack compatible with the charging socket of the instrument. Unlike wind mills which have an efficiency of 5 - 15 % wind mills on the other hand have 35% efficiency. The components are made of Polypropylene and thus are weatherproof and can be used in any weather conditions. Batteries of Laptops, Handhelds, MP3 players, Videogames can be powered using the mobile Windmill Charger. The mobile Windmill Mobile Charger is currently in development stage and sooner it will be available for sale. The Windmill extracts energy from moving air by slowing down the wind, and transferring this extracted energy into a rotating shaft, which usually rotates an alternator to produce electrical energy. The power available in the wind that can be converted depends on two factors one is speed of wind and second is area swept by the blades of the propeller.

Armature of Windmill

DESIGN AND CONSTRUCTION

Heat Design and construction of small wind mill charger is simple. Here, there are some work has been done using Solid-Work software for the design of different parts of mobile wind mill charger.

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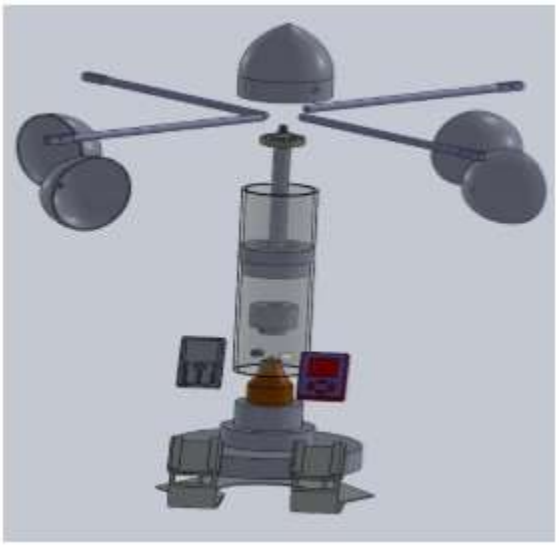

THE VARIOUS PARTS OF MOBILE WIND MILL ARE

1. Base sheet
2. Housing base
3. Bottom end
4. Cap internal
5. Dynamo as
6. Dynamo housing
7. Dynamo inside housing
8. Dynamo magnet
9. Flat round head drives rivets
10. Housing
11. Indicator
12. Magnet detector
13. Magnet holder
14. Magnet
15. Mental rotor magnet
16. Phone
17. Phone holder
18. Rod
19. Shaft
20. Top end
21. Wing arm
22. Wind blade

POWER PRODUCED BY WINDMILL

$\mathbf{P_w}$=0.5ρπR3Vw3Cp(λ,β)
Pw = extracted power from the wind,
ρ= density of the air, (almost 1.2 kg/m3 at 20° C at ocean level)
R = radius of the blade (in m), (its value lie in between 40-60 m)
Vw = wind velocity (m/s) (velocity can be controlled between 3 to 30 m/s)
Cp = the power coefficient which depends on two factors tip Speed ratio (**λ**), and Blade pitch angle, (**β**) (deg.)
Power coefficient (**Cp**) is the ratio of the output power produced by turbine to the max power available in the wind.

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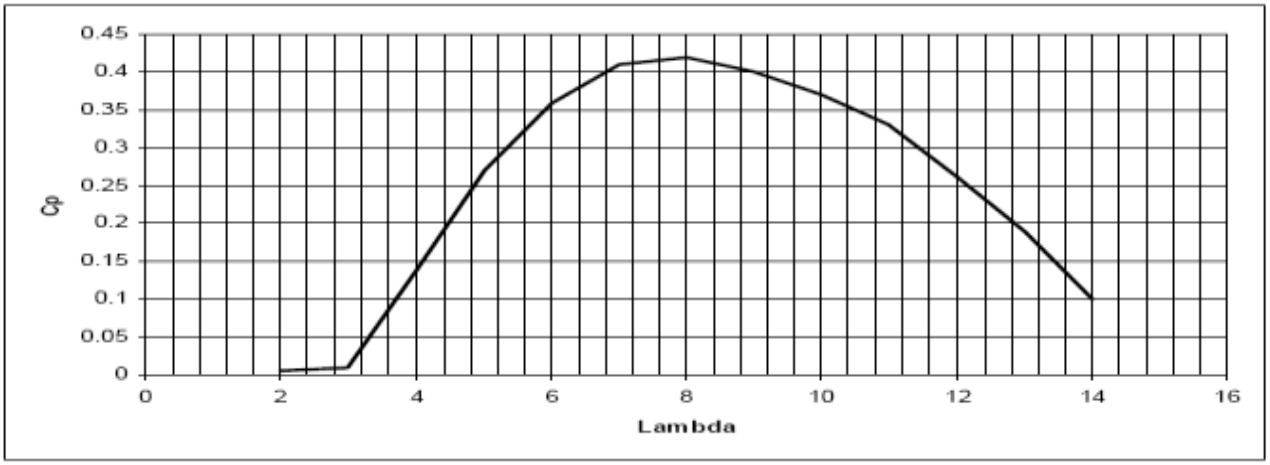

Cp vs λ curve

ADVANTAGES

There are various advantages of wind mill. The main are the following:

1. The wind is free and with modern technology it can be captured efficiently.
2. Once the wind turbine is built the energy it does not cause harmful pollutants.
3. Although wind turbines are very tall structures each takes up only a small plot of land. That means the land below can still be used. This is especially happening in agricultural areas as farming can still continue.
4. Many people find wind farms an interesting feature of the landscape.
5. Remote areas which are not connected to the electrical power supply grid can use wind turbines to produce their own neat and clean energy supply.
6. Wind turbines have a role to play in both the developed and third world.
7. Wind turbines are available in various range of sizes that means a vast range of people and businessmen can utilise them. Personal home to small towns and villages can utilises range of wind turbines.

DISADVANTAGES

Besides the advantages, there is some disadvantages are also. The main disadvantages are:

1. The strength of the wind always changes and varies from low to high storm force. That means that purposed wind turbine does not develop the constant amount of electricity at all time. There will be times when it does not produce any electricity at all.
2. People feel that the urban areas should be left untouched, without these mega structures being developed. The area of earth should left in its natural form so that everyone can enjoy.
3. Wind turbines produce unpleasant noise. Each one generate the equal amount of noise as a personal car running at 70 mph.
4. Most of people thinks that wind turbines are unsightly structures and not pleasant or interesting at look. They reduces the beauty of the countryside and looks generally ugly.
5. When wind turbines are being manufactured in company some pollution is exerted in atmosphere. Therefore wind turbine does develop some pollution.

CONCLUSIONS

In conclusion, a wind turbine is a machine that converts the wind kinetic energy into electricity. The chief components of a wind turbine are: the rotor which rotates, the gearbox which give the speed ratio, the generator which generates electricity, the control and protection system which ensure the safety of all parts, the tower and the foundation which gave the base and height to turbine. Today, wind power is economically competitive as compared to conventional source of energy because the running cost of wind turbines is much cheaper because of the new technology advancement and government policies. It also helps in creating the jobs and generates extra personal and tax income. Today wind energy is also a nonconventional and pollution-free energy which can help us to lower the emissions of

greenhouse gases. I am sure that wind energy will become an important asset to solve climate change and global warming issues in the future.

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