"HYBRID ENERGY GENERATION"

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ABSTRACT

Now a day's electricity become a most essential need of human beings, from household to industrial work. All the non-renewable energy resources are depleting day by day. So, the purpose of these project is to generate electricity without using non-renewable resources and pollution. So we have to shift from conventional to non-conventional energy sources. This paper deals with the generation of electricity by using two sources such as (solar and wind) combine which leads to generate electricity with affordable cost without damaging the nature balance. This project is generate of an electricity from the technology hybrid Solar -Wind Power system that harnesses the renewable energies in Sun and Wind to generate electricity. Here, energy is produced in the DC from photovoltaic and wind turbine systems.

Keyword : - *solar system, wind energy, hybrid energy*

1. INTRODUCTION

Hybrid Renewable Energy Systems are becoming popular as stand-alone power systems for providing electricity in remote areas such as in rural areas due to advances in renewable energy and subsequent rise in prices of petroleum products. Now a day's electrical energy is generated by the conventional energy resources like diesel, coal, and nuclear etc. The main drawback of these sources is that it produces waste like ash in thermal power plant, nuclear waste in nuclear power plant and taking care of this wastage is very costly. It also damage to the nature. The wastage produced from nuclear is very harmful to human being. The non-renewable energy resources are depleting day by day. Soon it will be completely finished from the earth so we have to find another way to generate electricity. The new sources should be reliable, pollution free and economical. The renewable energy resources should be good alternative energy resources for the conventional energy resources.

A hybrid energy system, or hybrid power, usually consists of two or more renewable energy sources used together to provide increased system efficiency as well as greater balance in energy supply. Most of us already known how a solar/wind power generating system works, all these generating systems have some or the other drawbacks like Solar panels are costly and the production cost of power by using them is generally higher than the conventional process, it is not available in the night or cloudy (rainy) days. Similarly Wind turbines can't operate in low wind speeds. Solar hybrid power systems are hybrid power systems that convert solar power from a photovoltaic system with another power generating energy source. This would create more output from the wind turbine during the winter, whereas during the summer, the solar panels would produce their high output.

2. LITERATURE SURVEY

demand for more energy makes us seek new energy sources. Researches for renewable energies have been initiated first for wind power and then for solar power.[1].The thermal power stations are causing pollution which severely affects mankind and nature. These power stations result in causing many diseases. Also natural resources like coal, oil, radio-active materials etc. will get extinct in near future.[2].This project as proto type we generated the power from the solar panels it saved in the batteries for later usage. The scope of the project is to implement this system in industries and gated communities for the usage of the power in the power cries world.The main dram back is to require the large power storage devices to store the energy.[3]

3. COMPONENT

3.1 Solar Panel:

Solar panel are used to convert the renewable power coming from the sun into electrical energy. The principle of working solar panel is with semiconductor. Due to ease of availability, easily interpretation, large amount of source therefore it is preferred for project. Solar panels are photovoltaic which, generates electrical energy using sun light. Depending on the position and intensity of the sun radiation the amount of electrical DC energy will produced. For the proposed project specifications and design, a12V, 10 watt off grid solar panel is required. The standard size of the panel, available in the market, 25inch x 11.5inch x 1.1inches is selected for our project, other sizes can be considered.

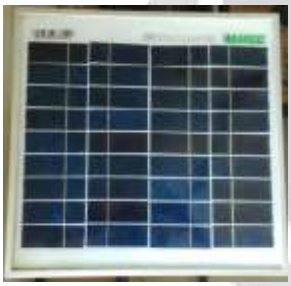


fig 3.1 . solar panel & its specification

3.2 Wind Turbine

The wind is available continuous with flexible in sometimes it is at high speed and sometimes at very low speed . in earth's eco system. Wind turbine having blades which are made up from Aluminium joined to rotor of generator leading to produce electrical energy as moves by flow of wind. Wind energy is also renewable energy source and easily available within atmosphere. Wind turbine power plants are more popular providing much more efficiency considering the space of implementation. Wind Turbine is an mechanical system which generates electrical energy from renewable wind energy source. Depending on the speed of the wind the amount of electrical DC energy will produced. The height of the wind turbine is to be 8 foot.

3.3 Battery

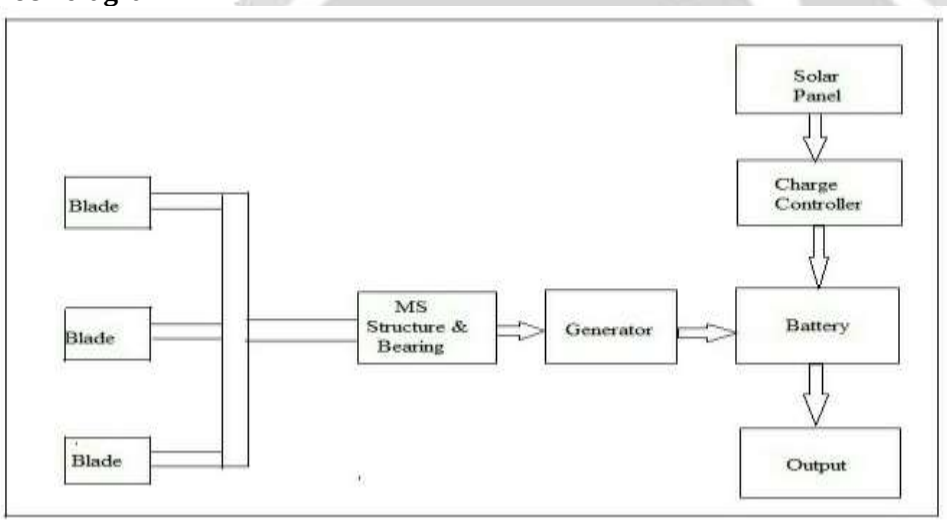
The electrical energy produced by the hybrid system is need to be either utilized completely or stored. Complete utilization of all the energy produced by these system for all the time is not possible. therefore, it should be store rather than useless wasting it. Electrical batteries is the most relevant, rechargeable, low cost, maximum efficient storage of electrical energy in the form of chemical reaction. Hence, 12 Volts battery is preferred.

Fig- 3.3 battery

3.4 Charge Controller

Charge controller has the basic function is that it control the source which is to be active or inactive. The absorbed radiation in solar panel is converted into DC output. These output is connected to the battery, and also gives power to the load. The controller has over-charge protection, pole confusion protection, short-circuit protection, and automatic dump-load function. It also the main function is that it should vary the power as per the load demand. Controller add the both the power ie. from solar and wind so that the load demand can fulfill . when power is not generating it should take power from battery and give it to the load.

Block diagram



1. Above block diagram shows the hybrid energy generation structure.
2. That means we can generate the power by solar as well as wind energy.
3. In these project solar panels absorbs the solar energy and with the help of charge controller generates the electrical energy and provide to the battery and PVC blades revolves as wind flows the generator produce DC energy which is stored into the battery.
4. When solar energy is efficient then, solar panels by the operator in parallel to the ground surface.
5. At the time of wind energy generation, blades are perpendicular to the ground surface.
6. That means when blades are perpendicular, it rotates automatically and generate the energy by the DC generator.
7. This energy generated is stored in to the battery.
8. We can provide this energy to the o/p.

4. DESIGN SPECIFICATION:-

Power developed by wind turbine:

Calculations the Following Data
Blade length l = 0.762 m (This is the actual length of blade used on this deign)
Assumed wind speed, V = 3 m/sec
Assumed power Coefficient, CP= 0.4

Air density, ρ = 0.4
Inserting the values for the blade length into equation
We get:
l = r = 0.762m
$A = \pi r2 = \pi$ x 0.7622 = 1.824m2
Now we can calculate the power output of the turbine.
Pavail = 1/ 2 ρAV 3 C
= 0.5 x 1.23 x 1.824 x 33 x 0.4 = 12 W

Fig- 4 Actual set up

5. CONCLUSION

Hybrid energy generation system is good and effective solution for power generation than non-renewable energy resources.It can provide electricity to remote places where government is unable to reach. So that the power can be utilize where it is generated so that it will reduce the transmission losses and cost. Cost reduction can be done by increasing the production of the equipment and efficiency of production of power. People should motivate to use the renewable energy resources. It is highly safe for the environment produce pollution free energy.

5.1 ADVANTAGES

- It is easily available.
- Within certain time period installation costs gets covered.
- No pollution.
- Clean and pure energy.
- Efficient and easy installation, longer life.

5.2 APPLICATIONS

- Street lighting.
- Home applicenses.
- Pump irrigation system.

REFERRENCE

[1] Ugur FESLI, Raif BAYIR, Mahmut OZER, "Design & Implementation of Domestic Solar- Wind Hybrid Energy System", Zonguldak Karaelmas University, Department of Electrical and Electronics Engineering, Zonguldak, Turkey.16th IEEE Annual Industrial Electronics Society Conference, Pacific Grove, USA, 1990, pp.

[2] M .S. Sivagamasundar International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering Vol. 2, Issue 11, November 2013

[3] N.Sivaramakrishna & Ch.Kasi Ramakrishna Reddy," Hybrid Power Generation through combined solar –Wind power and modified solar panel" International Journal of Engineering Trends and Technology (IJETT) - Volume4Issue5- May 2013,pp1414-1417

[4] International Journal of Engineering Research and General Science Volume 4, Issue 2, March- April, 2016 ISSN 2091-2730546 Solar-Wind Hybrid Energy Generation System Pritesh P. Shirsath1 , Anant Pise2 , Ajit Shinde3 ,B.E., Department of Electronics, NMIET, Savitribai Phule Pune University, Pune, India – 410507

[5]International Journal of Scientific and Research Publications, Volume 5, Issue 3, March 2015 1ISSN 2250-3153 Hybrid Power Generation System Using Wind Energy and Solar Energy Ashish S. Ingole*, Prof. Bhushan S. Rakhonde.