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Design and Fabrication Non-Conventional Energy

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Abstract: ***Energy is important to the economic process and social development of any country. Indigenous energy resources important to be developed to the optimum level so attenuate dependence on foreign fuels, subject to partitioning economic, environmental and social constraints. This is important to a lift in analysis and development likewise as investment in renewable energy business in search of how to satisfy energy demand and to cut back dependency on fossil fuels. Wind and solar power are getting standard due to abundance, handiness and simple harnessing for electric power generation. Reaching the non electrified rural population is presently unfeasible through the extension of the grid, since the affiliation is neither economically possible. Further, there will be increase in oil costs, and also the intolerable impacts of this energy supply on the users and on the surroundings, square measure slowly removing standard energy solutions, like fuel agents based mostly systems, from the agricultural development agendas, "Hybrid Power Generation" i.e. Solar and wind based energy generation. This paper presents the design of hybrid electricity generation system by utilizing both solar and wind renewable energy to the domestic household in the remote area which is unable to connect to the grid. Hybrid systems have tested to be the most effective choice to deliver, "high quality" power.***

Keywords: ***Solar Panel, Solar Tree, Wind Turbine.***

I. INTRODUCTION

Solar Energy is accepted as a key resource for the future of theworld. The utilization of solar energy could cover a significantpart of the energy demand in the countries. One of the most popular example of utilized solar energy that is solar tree. In this paper illustrates the various review about the solar tree and development of Solar Tree for domestic application considering the average requirement of small Indian house. Therefore, in this paper, an attempt has been taken to summarize the past and current research in the field of solar tree technology. The main objective of this paper is to present the review about the solar tree. In the world the utilization of energy is increasing day by day and therefore we required the renewable energy sources which are pollution free and easily available like sun light. Sun light is utilized by solar panels butwhen we required an array of panels the land requirement also increases which arises as a problem. For solution of this problem and for getting more energy we use solar trees. In these trees basically there are solar panels which are arranged in Fibonacci series for getting more energy and the requirement of the land is less. Because of less requirement these are easily installed and these can be used in straight lighting, home supplies and in industries etc. The sun light easily available so these are very beneficial there is no worryof availability of sun light in future because till the end of the world this is also available. Meaning of the TREE in Solar Trees

T= Tree generatingR= Renewable
E= Energy andE= Electricity

Rein Trifled is a solar environment a list artist that has also begun to construct solar trees. He is one of the founders and the current president of the Solar Tree Foundation which began in 2008. The Solar Tree Foundation designs programs For elementary school students to show them the creative process for constructing a Solar Tree in order to educate a broad audience on the environmental and technological material. It's also designed with the intention of instilling an appreciation for artistic aesthetics interpreted throughsculptures as a medium of expression. This is performed by online lectures and webcams in which the students can engage with the architects and see the construction process in real time. Trifled believes that his Solar Trees will help preserve natural trees in the long run. The latest solar tree constructed by the Solar Tree Foundation was erected for North Hillsborough Elementary School in Hillsborough California. At peak efficiency, the 10,000 lb. Solar Tree is claimed to produce 20,000 watts of energy per day.

A. Wind

Energy demand is a key factor in the economy of a country. The energy demand in India increased rapidly to an average of6.4%

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during 1990–2010, thanks to the significant economic growth in this period. As a consequence of this drastic increase in energy demand, the conventional sources of energy are depleting very fast. An ill-effect of usage of conventional energy sources to meet the demand, is the loss to environment and public health. The result of pollution like global warming, skin cancer, etc., has forced the scientific community all over the world to focus on alternative source of energy which can be renewed and should cause considerably less damage to the environment. Use of renewable energy sources results in less emission of greenhouse gases and other harmful gases such as SO_2, different oxides of nitrogen and by-products of fossil fuel which are responsible for the environmental degradation, health problem etc.

The continuous attention and increased use of renewable energy may restrict the dependency of country on imported fossil fuel and will lead India toward self- sufficiency and energy independence. Hence, it is necessary to expand and utilize the renewable energy sources like wind, solar, biomass, hydro power, waste to energy etc

Wind is air in motion. The uneven temperature distribution due to solar radiation and earth's rotation are the two main causes of wind. Wind energy is a renewable, inexhaustible and non polluting source of energy. It is an environment friendly, developing and popular alternative source of clean energy. As a source of power, the potential of wind energy is huge. This is clear from the rapid increase in cumulative global capacity, reaching 539 GW at the end of 2017 representing 10.7% of cumulative market growth.

II. LITERATURE

C. Bhuvaneswari, R. Rajeswari: He was publish the paper that is Idea to Design a Solar Tree Using Nanowire Solar Cells in International Journal of Scientific and Research Publications, Volume 3, Issue 12, December 20131 ISSN 2250-3153,To introduces a new solar technology that emulates how trees convert sunlight into energy. Trees, shrubs and plants use an inherent structural design to expose their leaves, height dense to sunlight for photosynthesis. They do this determines their survival. Based on this we describe the coconut tree growing u to 30m(98 feet) tall, with pinnate leaves 4-6m(1320feet) long to design a solar tree. Pinnate refers to a leaf resembling like a feather having the leaflets on each side of a common axis. It can be either even or odd. By this structured pattern that leaves follow to arrange themselves on a tree. With this arrangement we introduce a new idea to design a solar tree using nanowire solar cell. Nanoparticles exhibit a number of special properties relative to bulk material. A single Nanowire concentrates the sunlight upto 15 times of the normal sunlight intensity. The solar new technology presented in this paper will provides nearly high efficiency. The number of papers and patents published in this area has grown up exponentially over the last 10 years. However at the present, research efforts have largely focused on solar trees. Nanowire can concentrate the sunlight up to 15 times of the normal sunlight intensity and hence the surprising results have the potential for developing a new kind of highly efficient solar cell. This can be used to give a higher concentration efficiency of the sun's energy [1].

Dr. Suwarna Torgal: She is publishing the paper that is Concept of Solar Power Tree in International Advanced Research Journal in Science, Engineering and Technology Vol. 3, Issue 4, April 2016. Demand for energy is increasing with each period, to fulfill the required demand we must have to concentrate on utilizing non-conventional sources of energy. Energy from the Sun is the best alternatives among the renewable energy sources. It is free, inexhaustible, nonpolluting, eco-friendly and continuous source of energy. The paper detailed Solar Power Tree that generate large amount of energy by capturing very small land area throughout the year. Silicon-crystalline Photo-Voltaic (SPV) mounted on tall pole which direct convert solar energy in to electrical energy by means of the photo voltaic effect. In the world, oil is running out and it is estimated that 80% of the world's supply will be consumed in our lifetimes. Coal supplies appear to be very large but this stock is also stock out if rapidly uses. Nuclear power having a dangerous aspect. Thus unconventional energy sources such as geothermal, ocean tides, wind and sun is best option to meet future energy requirements. Cultivable land is the greatest crisis of the earth rather it is already a burning crisis in major countries, the cultivable land is god of the farmers, if used for other than agriculture, it will be unpredictable loss to the society. Therefore Solar Power Tree is very efficient to capture large amount of solar energy by utilizing a very small surface area of valuable land [2].

Deepak M. Patil, Santosh R. Madiwal: He was publish the paper that is Design and Development of Solar Tree For Domestic Applications in International Journal of Engineering Sciences & Research Technology, August 2016 ISSN: 2277- 9655, he work Flat or roof top mountings of PV systems require large area or land. Scarcity of land is greatest problem in cities and even in villages in India. Solar Power Tree provides better alternative to flat mounting of PV systems. For domestic lighting and other applications use of Solar Tree is more relevant when PV system is to be used. In this article load or energy requirement of small house in India is estimated to 1.75kWhr/day.

All the calculations are done considering solar radiation data at Kolhapur, Maharashtra (16.760). The solar tree concept is very successful to fulfill the increasing energy demand of the people, saving of land, and should be implemented in India to provide

electricity without the problem of power cut-off and reduce the dependence on grid power. Daily average energy requirement of the small Indian family is calculated about 3.5kW. Such systems can be mounted on the terrace, in front of the house or near the wall avoiding shading areas. The initial investment cost of the solar tree is also equal to same capacity PV systems as other system components are similar [3].

Mr. A P R Srinivas: He was publishing paper that is Design and Development of a SOLAR TREE in International Journal of Scientific & Engineering Research, Volume 7, Issue 10, October-2016, 1319 ISSN 2229-5518. a new product called, 'solar tree' has been designed to increase the power output by many folds by consuming solar energy. It can be installed on the sides of heavy traffic roadways and on roof top buildings. The tree consists of numerous solar panels connected to one another in series and parallel connections. The solar tree consists of number of branches welded to a stem and each stem has a solar panel mounted on it. It adds up voltage in series and current in parallel connection. The paper calculates the sun earth angles at different times of the day and designs solar tree based on these sun earth angles. The panels are put on the structure in a spiral fashion. It proves to be a useful system to meet the energy demands of the world and to use a given space more efficiently. The present system of roof top solar systems can be replaced by solar tree and the roof top space can be utilized for recreation purposes. The solar tree can be installed on ground also in addition to roof top spaces. So, this solar tree proves to be advantageous in saving space and increasing the power output by many folds. It saves a lot of energy over the years to come. The number of solar trees that could be installed in a given space depends on the wattage needed [4].

Sushma Gupta, Monish Gupta: She is publish the paper that is The Benefits and Applications of Solar Tree with Natural Beauty of Trees in SSRG International Journal of Electrical and Electronics Engineering (SSRG-IJEEE) –EFES April 2015, ISSN: 2348 – 8379. Now a days oil supply is decreasing therefore energy sources are becoming limited throughout the world. In all this Solar Tree proves to be most beneficial source of energy. This paper presents Solar Tree implementation as alternate source of energy in urban cities. A new idea of a solar tree design us in Nano wire solar cell is presented. Nano wires possess high physical light absorption properties which can be improved tremendously Hence we can say that it is a revolutionary urban lighting concept and these technologies lead to the development of high efficiency solar energy. Keywords -- Solar Tree, Renewable Energy, Nano-wire, solar cell, Solar Energy. To fulfill the increasing energy demand of the people, saving of land, the solar tree concept is very successful one and should be implemented in India to provide electricity without the problem of power cut and the extra energy can be provided to the grid. India as the 2nd largest country of the world in the increasing demand of the energy and try to find a way from which efficient and abundant source of energy cab be available. Also a solar botanic tree is a nonconventional source having many advantages of producing electricity as compared to the other sources. It is therefore the responsibility on the shoulders of the youngsters of the earth to think smartly and take the right decision. Everyone should starts as an individual to cooperate with the government to make life favorable for mankind [5]. Global scenario of wind energy

International Energy Agency (IEA) reported that in 2015 the wind power supplied more new power generation than any other technology . China is a leading nation in wind power installed capacity and has grown rapidly, from 300 MW in 2000 to 188,232 MW last year and today accounts for 35% of the world's total wind power capacity

A. Wind Power Potential in India

The growth of wind energy in India is enormous and proves to be an option to mitigate the challenges to meet electricity demands, environmental pollution, greenhouse gas emission and depleting fossil fuel etc. India has the second largest wind market in Asia after China and fourth amongst the global cumulative installed countries of the world after USA and Germany. During this year, 4148 MW wind projects were commissioned. Wind Energy contributes the major portion of 64.09% of total renewable energy capacity of the country [5]. The Indian government is also focusing on policy development to attract investor in wind energy sector. Recently in October 2015, the Government of India, along with the National Institute of Wind Energy (NIWE) formulated and announced the policy framework for the first offshore wind development in India. National Institute of Wind Energy, formerly known as Centre for Wind Energy Technology (C-WET) located in Chennai serves as a research focal point in the improvement and development in the entire spectrum of the wind energy sector in India [13]. NIWE also coordinate wind energy assessment program and initially estimated 49 GW of wind potential at 50 m hub-height and on further survey, at 80 m hub-height, wind potential grows as much as 102 GW assuming 2% land availability for all states except Himalayan states, North-eastern states and Andaman and Nicobar Islands where 0.5% of land availability was assumed for energy estimation at both heights, however land availability significantly effects the potential in windy area and recently in 2015, using the advanced meso-micro coupled numerical wind flow model, and with the corroboration of almost 1300 actual measurements spread all over India, NIWE announced estimated wind potential at 100 m hub-height i.e.302 GW assuming actual land availability [13].

B. Problem Identification:

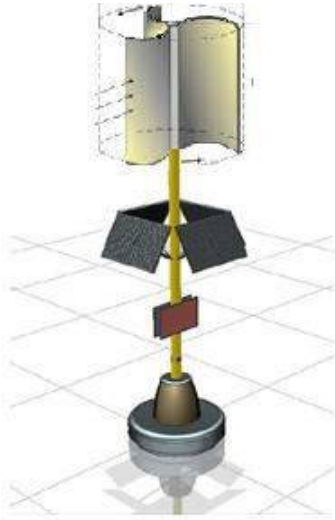
Due to less land requirement It require less land as compare to traditional PV system. So we require such a plant which can generate maximum energy using minimum land. Main problem is solar panel won't work in dark. Overcome this is very needy.
As setup for solar tree is quite costly as compare to rational solar placement so this could be used so wind turbine on same setup. Wind turbines are rarely found in cities though it is also a free energy source of energy.

C. Objective

"Use traditional free source of energy in untraditional way to increase efficiency of energy generation" is the main objectiveof the proposed work.
Secondly we have to reduce the land area used to be engaged in traditional solar system setup.
To generate energy tree.

D. Proposed Work

In this work, we have presented our thought that Solar Tree concept for domestic electrification is big step to reduce electricity bills and dependence on grid power which is unreliable nowadays in India. It also provides clean energy source to reduce the global warming. Energy demand (load) ofthe small family is considered and taken for determining the capacity of proposed system and system component sizes. It can generate energy very efficiently as compare to traditional system.



In this system we are connecting solar panel on tree like structure along with wind turbine.

III. CONCLUSION

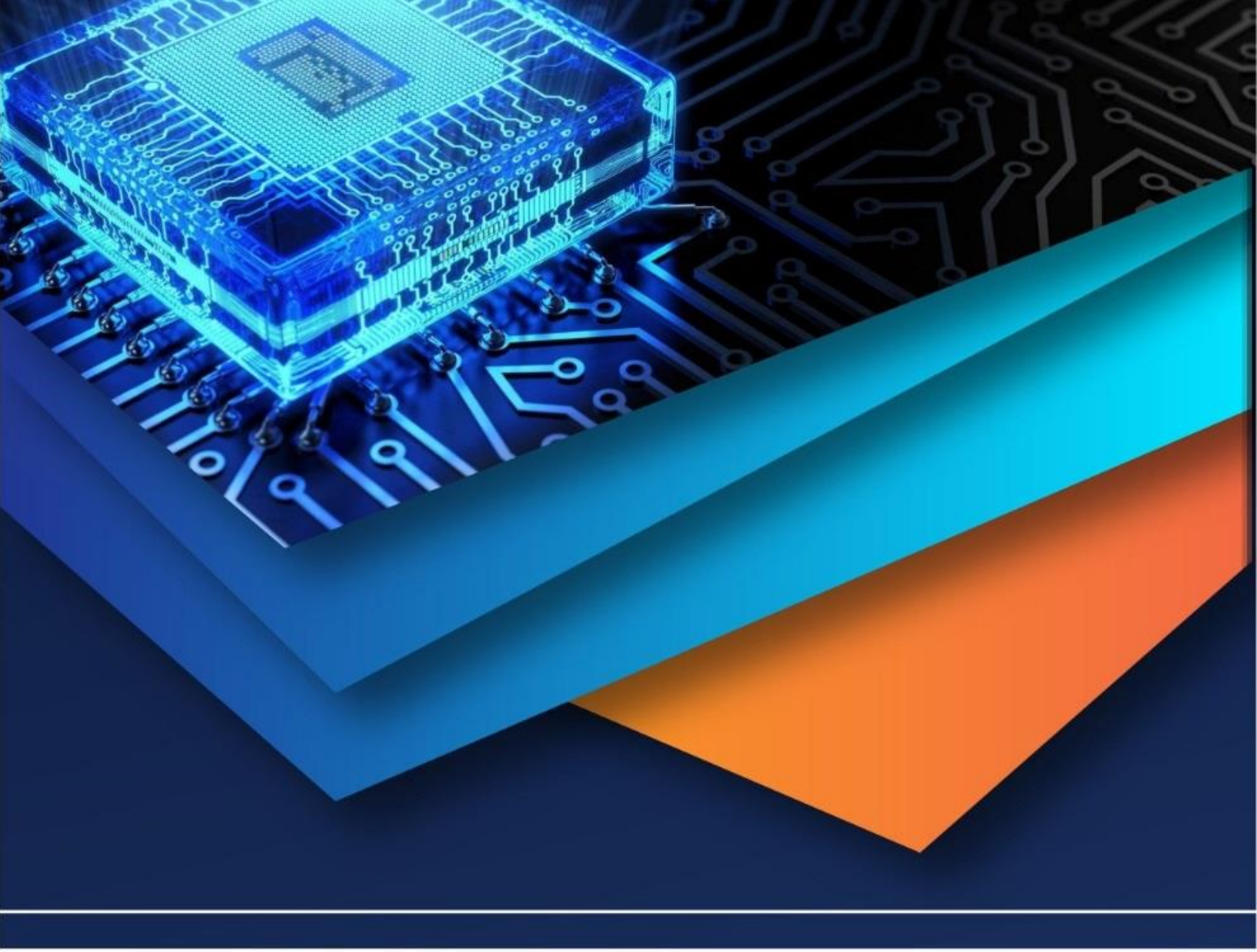
So as per the study on proposed system we are pretty much sure about the solar tree with wind turbine will be the best solution to generate energy day and night. Tree structure like design will most efficient than the traditional one. 3 solarpanel of 15W each will be used along with wind turbine. Combinedly 45W will be produced. In addition to that 12W will be generated by wind. Overall 57W will be generated. 12Volt 7Amp battery will be charged within few hours.

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