

# A REVIEW ON SOLAR TREE

<sup>1</sup>.Manish Dhone, <sup>2</sup>.Kishor Sonwane, <sup>3</sup>. Denis Farkase, <sup>4</sup>. Jayantsingh Baghel

*Mechanical Engineering Department, G.H. Rasoni College of Engineering, Nagpur, Maharashtra, India*

## ABSTRACT

*As conventional energy sources depleting from the Earth and as it harms the Environment Everyone is moving towards non-conventional Energy sources. In this paper, A product known as "Solar Tree" is introduced. Which requires less space than other conventional energy equipment as space availability is the main problem in cities. Solar Tree having an arrangements of more than one solar panel connected in series or parallel connection. In this Tree arrangement Nano wire solar cell is use which has higher absorption capacity therefore it is an revolution in the field of "Power Generation" which is highly beneficial for cities and for future also. This paper provides an overview on "Solar Tree".*

**Keywords:** *Solar Energy, Solar Tree, Solar Cell, Renewable Energy.*

## INTRODUCTION

As conventional energy sources are exhausted rapidly everyone looking towards non-conventional Energy sources. But it is difficult to replaced Conventional energy sources with Non-conventional Energy sources. Because the Energy consumption in today's world is in a large quantity which is quite difficult to obtain such an amount of Energy from Non-conventional Energy Sources. But, we can reach near to the quantity of required Energy by increasing the efficiency of previously invented Non-conventional Energy equipments like solar panel, wind mills. And the other way is that, we can invented a new equipment which having better efficiency with better power generation rate.

Solar energy is the best option when we looking for non-conventional energy source. Because it is very easy to trapped the solar radiations and convert it into electrical energy by using Photovoltaic (PV) cells. Now, it is also necessary to think about the environment by reducing pollution. So solar Energy is the best option when we consider all the above mention parameters. The only problem occurs when we use solar energy is that a large space is required for an installation of big solar panels for higher outputs so it can be solved by this new product known as "**Solar Tree**".

## LITERATURE REVIEW

Monish Gupta (2015) analysed that Solar tree panel's generate 20% more Energy than simple flat solar panel made up of solar cells. As its area is more and due to its tree like arrangements of solar panel it collects sun raise 2.5 hours more than simple solar panel arrangement therefore its solar radiations time reduces and electricity generation is increase up to 50% as it uses nano solar wires.[1]

Dipak M. Patil (2016) observed that the daily average consumption of smallindian family is about 3.5 kW so it can be easily so it can be easily generated by power grid system of Solar tree. The cost of solar tree and simple PV model is near about same. We can also reduce the cost of solar tree by making its design simple and innovative. The same design can be moves to different location for higher energy consumption.[2]

A P R Srinivas (2016) studied that a simple solar panel mounted on a pole has lower efficiency than number of solar panels installed on same pole having tree like structure. The roof top solar systems can be replaced by solar tree and the roof top space can be utilized for recreation purposes.so this solar tree reduces the space requirement and produces more output.[3]

## SOLAR TREE

A **solar tree** is a structure incorporating solar energy technology on a single pillar, like a tree trunk. It may be a solar artwork or a functional power generator. Solar tree having a pole made up of metal and solar panels are placed on different poles having an arrangement like branches of a tree looks like as an artificial tree like a structure which generates electricity from sunlight by using PV cells. We can also use nano solar wire for higher Efficiency. Photo-voltaic cells are arranged in Fibonacci series in place of leaves in solar tree which looks like an artificial tree. The amount of energy produced by solar tree is more than an array of solar cells. Solar Energy collected by solar panels converted into electrical Energy and then stored into Batteries which can be further used as per requirements.

## COMPONENTS OF SOLAR TREE

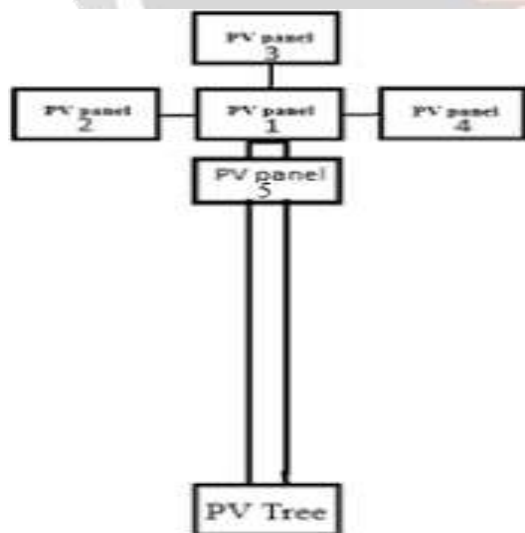
The solar tree have following parts:

- Solar panels
- Long tower
- LEDs
- Batteries
- Stems for connecting the panels

## DESIGN OF SOLAR TREE

Solar Tree having a tree like structure made of metal bars and solar panels. Arranged in such a manner that shadow of any solar panel is fall on other solar panels therefore spiral fashion arrangement of solar panels are generally used. Because of such structures it requires less space and it can be installed beside the roads or in a garden. The only thing that have to be care about that shadow of anything not fall on the panels it may reduce the efficiency of solar Tree.

The Fig. shows the typical wire diagram of solar tree, in which all solar panels are connected with each other mounted on a single pole and the electricity generated by them are stored in a battery which can be further used as per requirements.



**Working of Solar Tree**

The main Problems which has been faced while non-conventional type energy generation is that the batteries which are used to store energy because the large amount of electricity generation requires large size of battery which increases the cost. As it mainly used as street light so LDR can be used which measures the intensity of

light and according to that it switch ON/OFF the light. It also reduces the fluctuation of output energy produced by the solar panels.



#### **The advantages of solar tree are:**

- In all locations street light can be easily installed.
- In villages Electricity can be easily generated.
- Space requirement is less.
- Money can be save by this project as efficiency is high.

#### **The disadvantages of solar tree are:**

- It is dangerous to eyesight due to solar reflections.
- Its initial cost is high.

#### **Applications of Solar tree**

- It can be used on Highways.
- It can be used in Urban and Rural areas both.
- It can be used on Airports, Parks.
- It can be used in De-forested areas.

#### **CONCLUSION**

As India is the second largest country in the world as per energy requirement that can be easily reduces up to some requirements by this project. Due to global warming , the temperature is always on a higher range usually than assumption range so that can be used and generate electricity in large quantity. As this is the efficient way to produce electricity without any maintenance or other activities. Just a onetime installation and gives us a continuous output for long time. So this energy requirements can be solved by the innovative ideas by our youth generations and everyone should start such individual project to support government and make environment healthy for human life.

#### **REFERENCES**

Deepak M. Patil, Santosh R. Madiwal, "Design And Development Of Solar Tree For Domestic Applications" International Journal Of Engineering Sciences & Research Technology, Issue August 2016, ISSN: 2277-9655

Sushma Gupta, Monish Gupta, "The Benefits And Applications Of Solar Tree With Natural Beauty Of Trees", SSRG International Journal of Electrical and Electronics Engineering, Issue April 2015

Mr A P R Srinivas, "Design and Development of a SOLAR TREE", International Journal of Scientific & Engineering Research, Volume 7, Issue 10, October-2016 ISSN 2229-5518

C.Bhuvaneswari, R Rajeswari, C.Kalaiarasan and  
K.M.S. Muthukumararajaguru "Idea to Design a Solar Tree Using Nanowire Solar Cell" International Journal of Scientific and Research Publications, Volume 3, Issue 12, December 2013 1 ISSN 2250-3153

Dr. P. Jayakumar, "Guiding Principle For a Resource Assessment Programme," Solar Energy Resource Assessment Handbook Prepared for APCTT, Of the United Nations – Economic and Social Commission for Asia and the Pacific (ESCAP) September 2009.

