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Solar Tree

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Abstract: Developing energy efficiencies solutions from sunlight to electricity is a crucial solution for the world's energy shortage and reducing greenhouse gas emissions. However, the typical photovoltaic (PV) flat module has a poor sunlight energy collection capability without a solar tracking system. Despite its advantages, solar PV technology has difficulties with land demand, capturing effectiveness and public image, especially in metropolitan areas due to the lack of pleasant aesthetics. This article presents an overview about the recently modified solar tree technology that can address these challenges efficiently. The main technology configurations, operational aspects and types are deeply presented and discussed. Many innovations and technologies of solar trees are analyzed and several commercial prototypes are discussed. Moreover, the main challenges and limitations that restrict the technology commercialization also highlighted in comparison with the traditional PV systems along with some remarks for future incomers. Analyzed studies show that solar tree technology is a good energy conversion method as it need only 1% land compared with traditional PV systems to produce power as more as 10%. Besides, this technology could efficiently collect off-peak sunshine and reflect light, and thus, create greater solar fraction.

Keywords: PV treeSolar cellPV technologyPower generatingSolar energyPower per area

I. INTRODUCTION

As conventional energy sources are depleting day by day world is moving towards renewable energy sources. We require large amount energy as the world's population is high.As the population is high the energy utlilisation will also be high. Thus, we need non-conventional energy sources which are pollution free and easily available like solar energy. Many non-conventional energy equipment are invented like solar panels, wind mills which produce large amount of energy with high efficiency. But these equipment require large amount of space so, we need to invent a new equipment which requires less space and produce high amount of energy. This problem can be solved by the installation of SOLAR TREE.The tree like structure which contains solar panela as leaves is called as a Solar Tree.Solar Tree can be defined as the tree which generates the renewable energy sources and also the electricity.In these trees the solar panels are arranged in Fibonacci sequence for producing more energy. This sequence also helps in designing the solar tree with the less requirement of land. As these trees require less space these can be easily installed. These are required in the usage of street lightning ,home supplies and in industries. It is very easy to capture solar radiations and by using photovoltaic cells it is converted into electrical energy. This SOLAR TREE also pollution free which protects the environment. The only problem with the solar energy is it requires more space. Thus SOLAR TREE is invented to produce more amount of energy with less space.The solar trees have the same procedure of normal trees. As the normal trees produce their own food by using sunlight. The solar trees use same solar energy and produce the energy which is required to the people in the society

II. LITERATURE REVIEW

Monish Gupta in 2015 analysedthat the panels of solar tree generate 20% more energy than the flat panels as the panels are not fully exposed to sunlight where as in solar tree all the panels are exposed to sunlight and can generate 50% more electricity.Dr. Suwarna Torgal in 2016 published the paper of Concept of Solar Power Tree. As the energy sources are depleting all are shifting to nonconventional energy sources. In that energy from the sun is the best alternative among the renewable energy sources. The unconventional energy sources are the best option for future energy requirements. For this purpose the solar tree is very efficient to capture large amount of solar energy by utilising a small area of valuable land.C. Bhuvaneswari, R. Rajeswari in 2013 published the paper that is Idea to Design a Solar Tree Using Nanowire Solar Cells. In this paper they introduced the new solar technology how trees convert solar energy into energy.In the solar tree solar panels are arranged as leaves. When they are exposed to sun solar energy is absorbed. By this arrangement we introduce a new idea to design a solar tree using nanowire solar cell. In this nano wire is used in which the nano particles concentrate the sunlight upto 15 times more than the normal sunlight intensity. This gives the higher efficiency.Deepak M. Patil, Santosh R. Madiwal in 2016 published the paper that is Design and Development of Solar. In this paper they worked on flat or roof top mountings of PV systems which require large area.

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As there is scarcity of land solar power tree is the better alternative to flat mounting of PV systems. This concept is useful to fulfil the energy demand of the people saving of land and this should be implemented to provide electricity without the problem of power cut. These systems can be mounted on the terrace and cost is also equal to same capacity of PV systems.

III. METHODOLOGY

The unique nature of solar photo voltaic generation in which the systems produce large amount of electricity. In the SOLAR TREES. The Fibonacci series method is used to connect the solar panels in the ree sequence. Fibonacci sequence is defined as every term is sum of the two previous terms. In the installation of SOLAR TREE the continuous fuel is not required and the significant security and environmental advantages over fossil fuels. The characteristics of solar tree generally increase the value of solar electricity as they allow utilities to avoid the costs of fuel, plant generation, reserve capacity, transmission and distribution in their centralized assethe

COMPONENTS OF SOLAR TREE:
- Solar panels
- Long tower
- LED’s
- Batteries
- Stems for connecting panels

IV. CONSTRUCTION AND WORKING OF SOLAR TREE

The gap of semiconductor helps to determine the color of light. An LED is often small in size, and to shape its radiation pattern integrated optical components can be used. The batteries of the solar panels are charged during the day time.These batteries produce energy at the night time.The LED's will be directly switched on by the solar tree at the dusk. The amount of light produced which is regulated by the internal control depends on the charge left in the batteries. The energy can be used in the night time by utilizing the energy stored in the batteries. The cloudy day that is when there is no sunlight the energy can be used that in stored in the batteries.

ADVANTAGES OF SOLAR TREE:

- It will not cause any air pollution.
- The energy scarcity will not be there.
- We need not worry about the future energy sources.
- People in poor country also can be access to electricity.
  One time installation is enough.
- Less Land is required.
- Continuous power supply is available.

DISADVANTAGES OF SOLAR TREE:

- Equipment is expensive.
- Solar energy is weather dependent.
- This do not work efficiently on rainy days.
- Birds and insects can be effected.
- We may cause eyesight from the solar reflectors

APPLICATIONS OF SOLAR TREE:

- Street lightning
- House supply
- Industrial power supply
- Wireless data transmission
- Charging slots for cars.

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V. CONCLUSION

In this review paper we add the review of solar tree by studying the various research papers about how to use the solar tree and what are its advantages, disadvantages and applications. As the population is more in India. India rank second in the world as per energy consumption. This project increases the energy production as per the requirement. This project meets the needs of the energy requirement in the country. In India the temperature ranges are high so that can be used to generate electricity in large quantity. This solar tree does not require any maintenance or other activities. As the solar energy is the non-conventional energy source there will not be any scarcity. SOLAR TREE is one time installation process which gives us continuous power supply for long time. Government should be supported by these innovative ideas and every individual should start this project which makes environment healthy for human life.

- It fulfills the energy consumption needs
- This project is very successful in saving the land
- The extra energy is provided to the grid.

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