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Solar Trees – An Ergonomic Solution for Rural and Urban India

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Introduction

About from decade we all are listening that the natural sources will lost in coming 50-60 years. The time limit of the natural sources is decreasing day by day. In this era we all are talking about the renewable source of energy. Sun light is one of the renewable energy. Sun is common in both Solar Energy & Food Production. The various studies have found that sun light a clean and ultimate energy source, low-cost energy solution without affecting the environment. Because of the sun's lifetime, it seems to be a sustainable energy solution with lots of agri-energy potential. India's unique geographical location shows tremendous potential for solar power generation. One study estimated energy potential of about 6000x106 Gigawatt per hour (GWh) per year.

India is known for its rural population and its agriculture. Agriculture is both a producer and a consumer of energy. Like other businesses agriculture also expanding due to huge demands for food materials, but have certain ecological limitations. The perishable nature of agriculture produce has increased the energy consumption in crop production, processing, packaging, and distribution process. Various works has been done to find out different ways to harvest energy from agricultural production and wastes, such as biofuel, biogas, combustion, gasification, and pyrolysis. The quantum of energy produced through such techniques is not sufficient to meet agro-energy demands and also degrade the environment. Recent development has shown solar energy is a clean and sustainable energy solution. It has vast potential to meet our all energy demands, as well as agricultural ones. Solar energy is a vital component for photosynthesis and solar energy generations.

What is solar tree?

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A solar tree is a structure where solar modules are planted on a single pillar, which looks like a tree trunk. It serves the dual purpose of being an artwork and an energy generator. Meaning of the TREE in Solar Trees T= Tree generating R= Renewable E= Energy and E= Electricity

The Council of Scientific and Industrial Research (CSIR) and the Central Mechanical Engineering Research Institute (CMERI) have developed the world's largest solar tree in India.

Uses of solar tree:

- It can generate 12,000 to 14,000 units of clean power annually.
- The energy generation data can be monitored either in real-time or daily.
- The solar tree is designed to ensure maximum exposure of each solar panel to sunlight while creating the least amount of shadow.
- The solar trees can also cater to the agricultural community's needs in providing electricity for high-capacity water pumps, e-tractors and e-power tillers.
- Potentially useful for widespread application in agricultural activities such as high-capacity pumps, e-tractors and e-power tillers.
- provide a consistent economic return and help the farmers counter the effects of the uncertain variations in agriculture-related activities, thus making farming an economic and energy sustainable practice
- The IoT-enabled solar tree can also allow round-the-clock CCTV surveillance and precision agriculture through real-time humidity, wind speed, rainfall prediction and soil health monitoring.
- the trees can be connected to solar-powered e-Suvidha Kiosks developed by CSIR-CMERI for real-time access to the vast majority of the agricultural database
- The trees can be connected to the eNAM national agricultural marketplace for instant and real-time access to a unified online market.
- **Other Benefits**

- Pollution free
- Solution of future related energy problems
- People can save money
- Less land required

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- Future energy source

Disadvantages of solar energy:

- The initial cost of purchasing a solar system is fairly high. This includes paying for solar panels, inverter, batteries, wiring, and the installation.
- Solar panels are dependent on sunlight to effectively gather solar energy. Therefore, a few cloudy, rainy days can have a noticeable effect on the energy system.
- Solar PV panels require a lot of space and some roofs are not big enough to fit the number of solar panels that you would like to have
- Transportation and installation of solar systems have been associated with the emission of greenhouse gases.

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