

## Solar Energy – Today's Resource for a Brighter Tomorrow!

**Gore A.M.**

Assistant Professor, Department of Agricultural Engineering, Maharashtra Institute of Technology,  
Aurangabad, (M.S.)

### SUMMARY

Solar energy originates with the thermonuclear fusion reactions occurring in the sun. Represents the entire electromagnetic radiation (visible light, infrared, ultraviolet, x-rays, and radio waves). This energy consists of radiant light and heat energy from the sun. Out of all energy emitted by sun only a small fraction of energy is absorbed by the earth. Just this tiny fraction of the sun's energy is enough to meet all our power needs. The surface receives about 47% of the total solar energy that reaches the Earth. Only this amount is usable. With the lack of energy source in the world, solar energy source is playing an important role in the development of Indian economy. So this energy source is the best choice for India. We should develop the application of solar farm in India.

### INTRODUCTION

The sun is responsible for all of the earth energy. Plants use the sun's light to make food. Decaying plants hundreds of millions of years ago produced the coal, oil and natural gas that we use today. Solar energy is most commonly collected by using solar cells. Of course solar energy can be put to use to heat or light up a room by simply having well placed windows and skylights. We can also use solar energy to dry our clothes in the sun. To use solar energy to power electrical appliances solar cells are used. Solar energy is created by light and heat which is emitted by the sun, in the form of electromagnetic radiation. With today's technology, we are able to capture this radiation and turn it into usable forms of solar energy such as heating or electricity. The technical feasibility and economical viability of using solar energy depends on the amount of available sunlight (solar radiation) in the area where you intend to place solar heaters or solar panels. This is sometimes referred to as the available solar resource. The amount of sunlight available is one factor to take into account when considering using solar energy. There are a few other factors, however, which need to be looked at when determining the viability of solar energy in any given location. These are as follows:

- Geographic location
- Time of day
- Season
- Local landscape
- Local weather

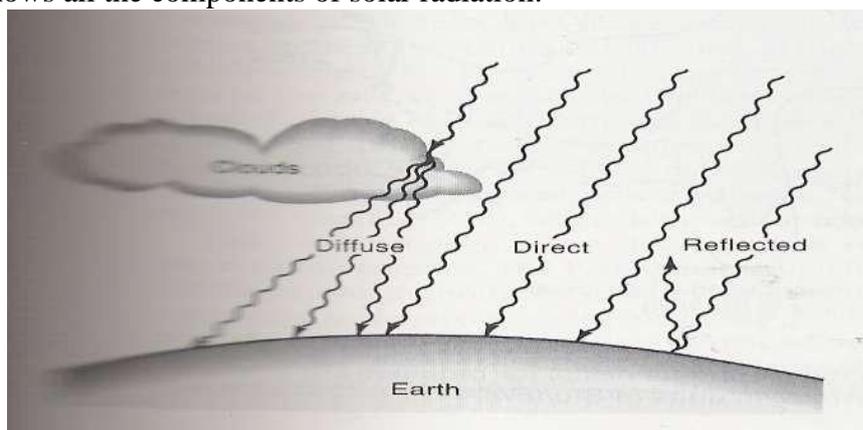
Solar energy is used for various applications and it is also called as green energy source

### Components of Solar Radiation

There are three main components of solar radiation as follows

- Direct radiation
- Diffuse radiation
- Reflected radiation

Following fig shows all the components of solar radiation.



## Why Solar Energy?

The fossil fuels are nonrenewable sources so we cannot depend on them forever. So the only option we have is solar energy because it is a nonpolluting and silent source of electricity and also low maintenance and long lasting energy. Solar energy plays vital role if we consider for alternate energy sources.

## Application of Solar Energy

Some of the major applications of solar energy as follows

### Solar Water Heating:

A solar water heating unit comprises a blackened flat plate metal collector with an associated metal tubing facing the general direction of the sun.

### Solar Heating of Buildings:

Solar energy can be used for space heating of buildings. Collecting the solar radiation by some element of the building itself i.e. solar energy is admitted directly into the building through large South-facing windows.

### Solar distillation:

Solar distillation is the use of solar energy to evaporate water and collect its condensate within the same closed system.

### Solar-pumping:

In solar pumping, the power generated by solar-energy is utilized for pumping water for irrigation purposes.

### Solar Drying of Agricultural and Animal Products

Various types of solar dryers are used for agricultures crops drying, Food processing industries for dehydration of fruits and vegetables, Fish and meat drying.

### Solar Furnaces:

In a Solar furnace, high temperature is obtained by concentrating the solar radiations onto a specimen using a number of heliostats (turn-able mirrors) arranged on a sloping surface.

### Solar Cooking:

Solar cookers are passive solar devices. Sunlight is converted to heat energy which is retained for cooking.

### Solar Electric Power Generation:

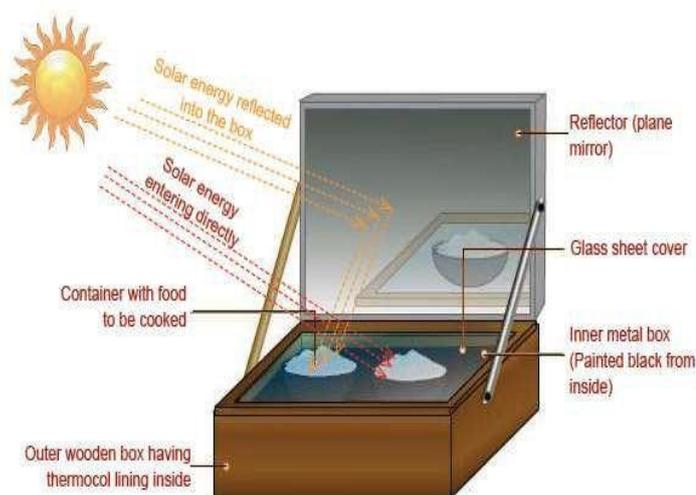
Photovoltaic systems convert sunlight directly into electricity, and are potentially one of the most useful of the renewable energy technologies

### Solar Thermal Power Production:

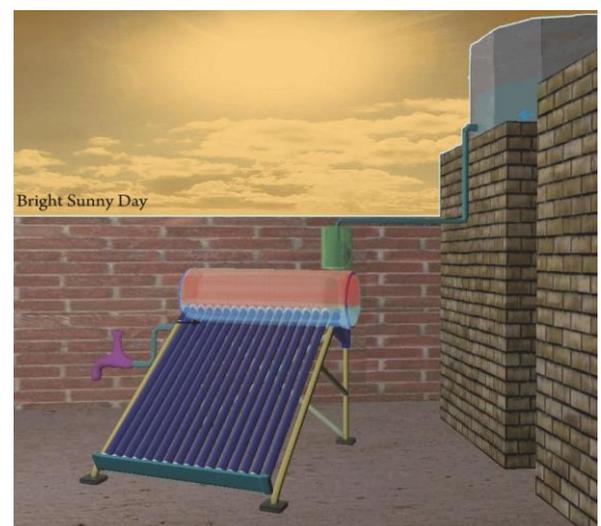
Solar thermal power production means the conversion of solar energy into electricity through thermal energy

### Solar Green Houses:

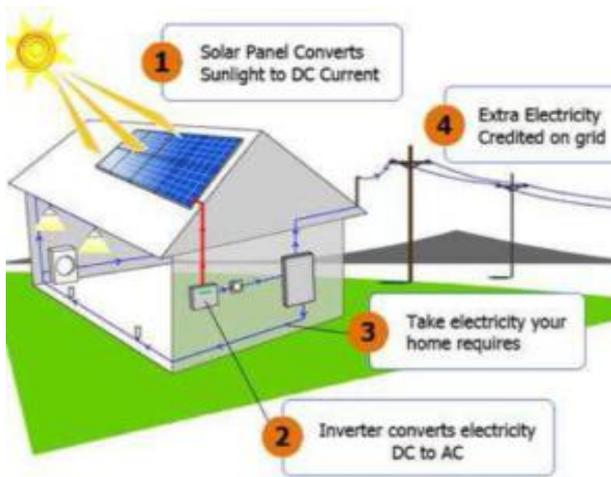
Used for growing plants.



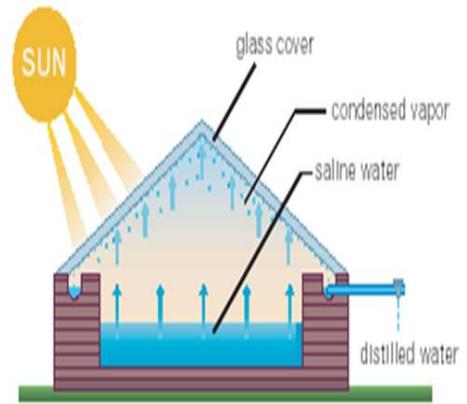
Solar cooker



Solar water heating



**Solar Photovoltaic system**



Solar stills can differ in size and shape. Using the sun's radiation, they effectively remove many impurities such as salts and microorganisms.

**Solar Distillation**



**Solar Irrigation Pump**



**Solar Dryer**



**Solar Farm for Electricity generation**

**CONCLUSION**

We can collect the sunlight by different collectors. Application of solar energy can be divided into different types. The solar thermal application is commonly used, it turn solar energy into thermal energy, it uses the chemical material to store the thermal energy. The other uses the silicon panel to change the solar energy into electricity power. The energy situation in India is not good, the government now has the plan to create more green energy farms, like solar energy farm and wind energy farm, and more and more people use the solar energy in their normal life. In the future, we can see we cannot live without solar energy, without green energy.

**REFERENCES**

<http://www.energyquest.ca.gov/story/chapter15>,JAN 2010

Ronal,L& Ronald E, 1996. Implementation of solar thermal energy, The MITPress, 2003.

<http://www.smh.com.au/business/with-green-power-responsibility>,JAN 2010