



SOLAR ENERGY





Definition

Solar energy is renewable energy derived from the sun's radiation. capable of producing heat, causing chemical reactions, or generating electricity. The total amount of solar energy received on Earth is vastly more than the world's current and anticipated energy requirements. If suitably harnessed, solar energy has the potential to satisfy all future energy needs. Plants absorb it and convert it into starch and sugar and this process is called photosynthesis



Utilization

Solar cell panels are used to convert this energy into electricity

Some of the techniques to utilize solar energy are

1. Solar Photovoltaic (PV) Technology:

Solar panels, composed of semiconductor materials like silicon, convert sunlight directly into electricity through the photovoltaic effect.

Usage: Widely used for residential, commercial, and industrial electricity generation.

Solar Thermal Technology:

Utilizes sunlight to generate heat, often used for electricity production or heating applications.

Usage: Large-scale power plants, solar water heaters, and industrial processes.

Concentrated Solar Power (CSP):

Concentrates sunlight using mirrors or lenses to produce heat, which is then used to generate electricity.

Usage: Large-scale power plants, especially in regions with high solar radiation.



Advantages & challenges:



Renewable Resource: Solar energy is a renewable source of power, harnessed from the sun's rays, making it a sustainable and inexhaustible energy option.

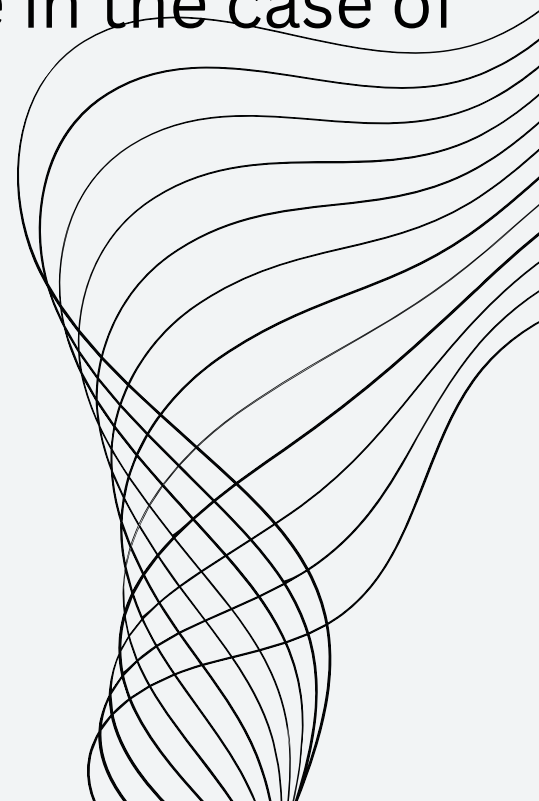
Environmentally Friendly: Solar power generation produces minimal environmental impact, as it does not release harmful pollutants or greenhouse gases, contributing to a cleaner and greener environment

Energy Independence: Utilizing solar energy reduces dependence on non-renewable energy sources, contributing to greater energy independence for countries and communities.

Clean: It is considered to be the cleanest form of energy as there is no carbon dioxide emission like in the case of fossil fuels which is one of the causes of global warming.

Reliable: The energy can be stored in the batteries, so there is no unreliability.
reduction in utility costs.

Free energy because it can be trapped easily.





Disadvantages of solar energy:

The production is low during winters and on cloudy days.

Installation and the initial cost of the materials are expensive.

Space consumption is more

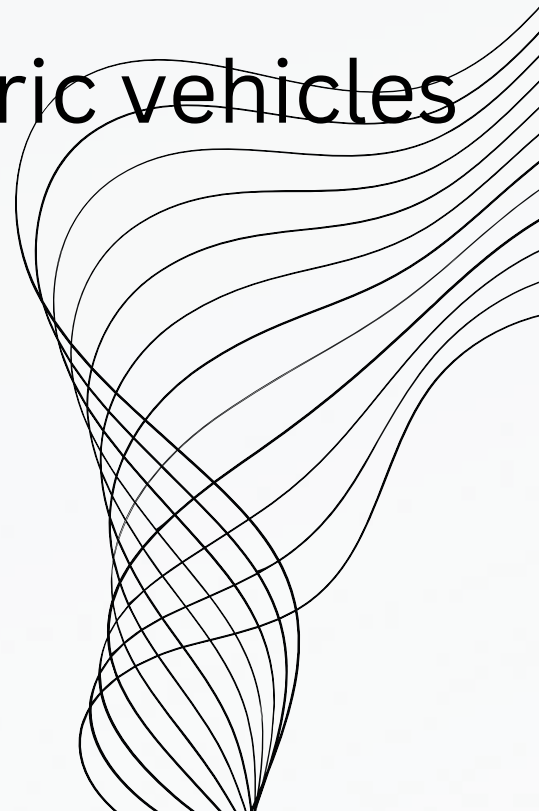


Future Trends

Increased Efficiency: Ongoing research aims to improve the efficiency of solar panels, enhancing the amount of electricity generated from sunlight.

Floating Solar Farms: Expansion of floating solar installations on bodies of water, offering land-efficient solutions and reducing water evaporation.

Solar for Sustainable Transportation: Integration of solar technology in electric vehicles and infrastructure to support sustainable transportation.





THANK YOU

