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The raising demand of solar energy- a technological review

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Abstract:

Now days, the solar energy technologies has experienced phenomenal growth. Solar energy is definitely set to become economical in the coming years and growing as better technology in terms of both cost and applications. Solar energy is environmentally friendly technology, a great energy supply and one of the most significant renewable and green energy sources. In this article, we have reviewed a progressive development in the solar energy research from one generation to other, and discussed about their future trends and aspects. The article also tries to emphasize the various practices and methods to promote the benefits of solar energy

Keywords:

Solar energy, PV panel, Applications of solar energy

1. Introduction:

Power is essential for any nation for urbanisation, industrialisation, and cash related progression and change of want for standard comforts of society the energy received by the Earth from the Sun is by far larger than the current world energy consumption. Solar energy constitutes the most abundant renewable energy resource available and in most regions of the world even its technically available potential is far in excess of the current total primary energy supply. Solar energy has emerged as a viable, cost-effective and commercial option for grid connected power generation. During the past few years, a significant trust has been given to the development and induction of solar energy technology for use in different sectors. Energy is an essential need for the existence and growth of human communities.

Consequently, the need for energy has increased gradually as human civilization has progressed. Additionally, in the past few decades, the rapid rise of the world's population and its reliance on technological developments have increased energy demands. Furthermore, green technology sources play an important role in sustainably providing energy supplies, especially in mitigating climate change

2. Solar photovoltaic (PV):

Solar Photo-voltaic (PV) is a method of generating electrical power by converting solar radiation into direct current electricity using semiconductors that exhibit the photovoltaic effect. Photovoltaic power generation employs solar panels composed of a number of solar cells containing a photovoltaic material. It is a device that directly converts solar energy into electricity by photovoltaic effect. Due to the increased demand for renewable energy sources, the manufacturing of solar cells and photovoltaic arrays has advanced considerably in recent years. The amount of power available from a solar cell depends on area and type of material, Intensity of sunlight and Wavelength of sunlight

2.1. Working principle:

Sunlight is made out of tiny energy pockets called photons and that each individual solar cell is designed with a positive and negative layer thus being able to create an electric field (similar to the one in batteries As photons are absorbed in the cell their energy causes electrons to get free, and they move to the bottom of the cell, and exit through the connecting wire which creates flow of electrons thus generate electricity.

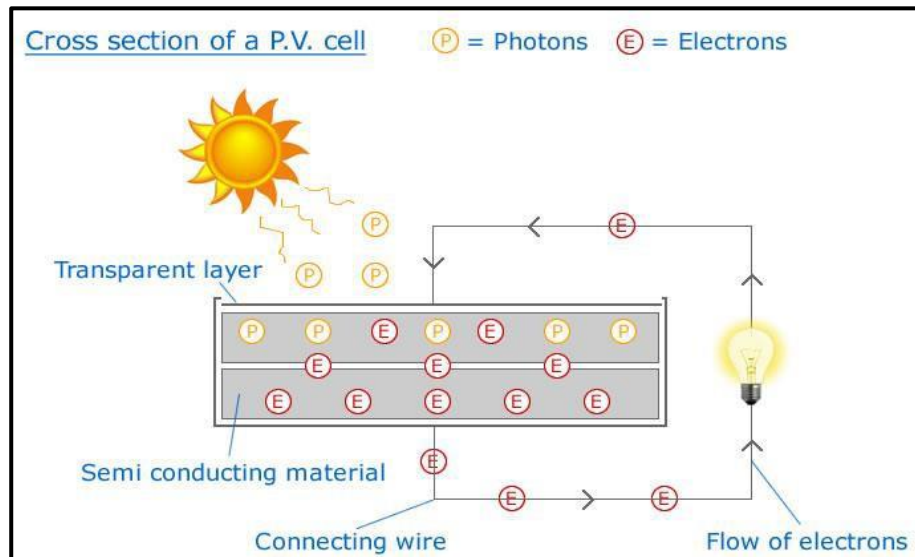


Figure. 1: Generation of electrical power using Solar Photo-voltaic (PV)

The technology that converts solar radiation into electricity is well known and utilizes PV cells, which are already in use worldwide. In addition, various solar PV technologies are available today, including hybrid solar cells, inorganic solar cells and organic solar cells. So far, solar PV devices made from silicon have led the solar market.

Limitations of Solar Photovoltaic Energy Generation:

1. High initial cost
2. Low Efficiency
3. Require large area
4. Irregular supply of solar energy
5. Do not generate power during cloudy season

3. Application of solar energy:

Energy can be obtained directly from the Sun so-called solar energy. Globally, there has been growth in solar energy applications, as it can be used to generate electricity, desalinate water and generate heat, etc. Solar cells are devices that convert sunlight directly into electricity; typical semiconductor materials are utilized to form a PV solar cell device. These materials' characteristics are based on atoms with four electrons in their outer orbit or shell

A PV water-pumping system is typically used to pump water in rural, isolated and desert areas. The system consists of PV modules to power a water pump to the location of water need. The water-pumping rate depends on many factors such as pumping head, solar intensity, etc.

A PV-powered cathodic protection (CP) system is designed to supply a CP system to control the corrosion of a metal surface. This technique is based on the impressive current acquired from PV solar energy systems and is utilized for burying pipelines, tanks, concrete structures, etc.

4. Conclusion:

This paper highlights the significance of solar energy development solar power generation has been developed as one of the most demanding renewable sources of electricity. It has several advantages compared to other forms of energy like fossil fuels and petroleum deposits. It is an alternative which is promising and consistent to meet the high energy demand. Though the methods of utilizing solar energy are simple, yet need an efficient and durable solar material solar energy would help steady energy prices and give numerous social, environmental and economic benefits. This has been indicated by solar energy's contribution to achieving sustainable development through meeting energy demands, creating jobs and protecting the environment.

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