

## School of Basic & Applied Science

Course Code :EVNS1001

Course Name: Environmental Science

- **Topic-Energy Resources: renewable & Non renewable, Solar energy**

The logo of Galgotias University is a circular emblem with a stylized 'G' shape in the center. The 'G' is composed of three curved segments in shades of yellow, blue, and red. The background of the emblem is a light, multi-colored gradient.

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## **ENERGY RESOURCES**

Energy consumption of a nation is usually considered as an index of its development. This is because almost all the developmental activities are directly or indirectly dependent upon energy. We find wide disparities in per capita energy use between the developed and the developing nations.

## **GROWING ENERGY NEEDS**

Development in different sectors relies largely upon energy. Agriculture, industry, mining, transportation, lighting, cooling and heating in buildings all need energy. With the demands of growing population the world is facing further energy deficit. The fossil fuels like coal, oil and natural gas which at present are supplying 95% of the commercial

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## RENEWABLE AND NON-RENEWABLE ENERGY SOURCES

A source of energy is one that can provide adequate amount of energy in a usable form over a long period of time. These sources can be of two types:

**(1) Renewable Resources** which can be generated continuously in nature and are inexhaustible e.g. wood, solar energy, wind energy, tidal energy, hydropower, biomass energy, bio-fuels, geo-thermal energy and hydrogen. They are also known as non-conventional sources of energy and they can be used again and again in an endless manner.

**(2) Non- renewable Resources** which have accumulated in nature over a long span of time and cannot be quickly replenished when exhausted e.g. coal, petroleum, natural gas and nuclear fuels like uranium and thorium.

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**SOLAR ENERGY** : Sun is the ultimate source of energy, directly or indirectly for all other forms of energy. The nuclear fusion reactions occurring inside the sun release enormous quantities of energy in the form of heat and light. Traditionally, we have been using solar energy for drying clothes and food-grains, preservation of eatables and for obtaining salt from sea-water. Now we have several techniques for harnessing solar energy:

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## **(1)By solar heat collectors.**

- Passive solar heat collectors are natural materials like stones, bricks etc. or material like glass which absorb heat during the day time and release it slowly at night. The active solar collectors pump a heat absorbing medium (air or water) through a small collector which is normally placed on the top of the building. Solar water heater and solar cooker are examples of passive heat collectors.

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(2) **By solar cells** which convert solar energy directly into electricity using solar cells. The solar cells are also known as **photovoltaic** cells or PV cells. Solar cells are made of thin wafers of semi conductor materials like silicon and gallium. When solar radiations fall on them, a potential difference is produced which produces electricity. Silicon can be obtained from silica or sand, which is abundantly available and inexpensive. By using gallium arsenide, cadmium sulphide or boron, efficiency of the PV cells can be improved. A group of solar cells joined together in a definite pattern form a **solar panel** which can harness a large amount of solar energy and can produce electricity enough to run street-light, irrigation water pump etc

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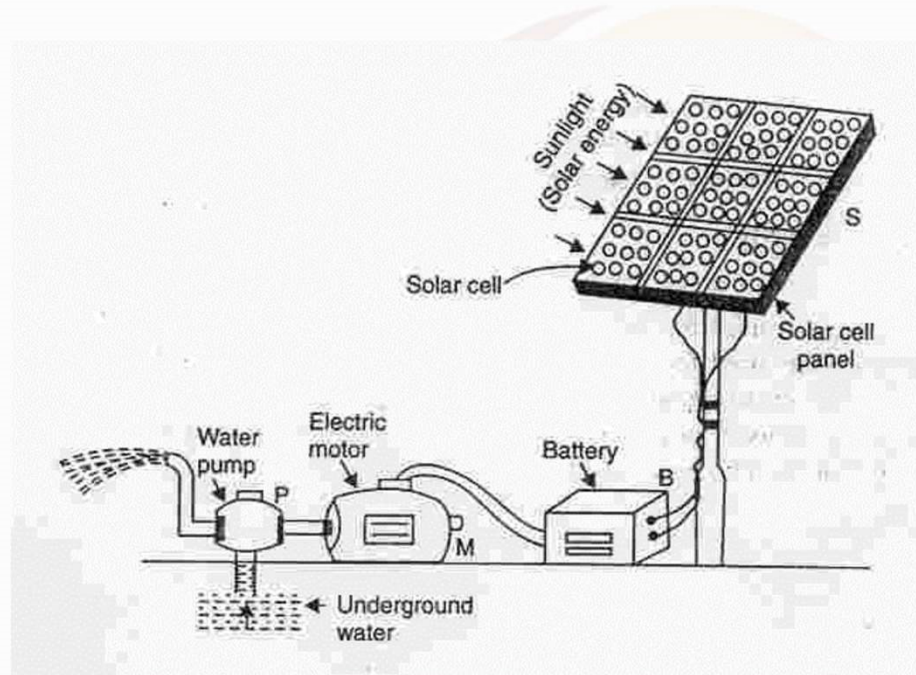
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## **Wide applications:**

Solar cells are widely used in calculators, electronic watches, for street lighting, traffic signals, operating water pumps etc. They are also used in artificial satellites for electricity generation. Solar cells are also used for running radio and television. They are more in use in remote areas where conventional electricity supply is a problem.

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## **Source & References:**

*The materials presented in this lecture has been taken from various books and internet websites. This instruction materials is for instructional purposes only.*

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**Thank You!!**



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