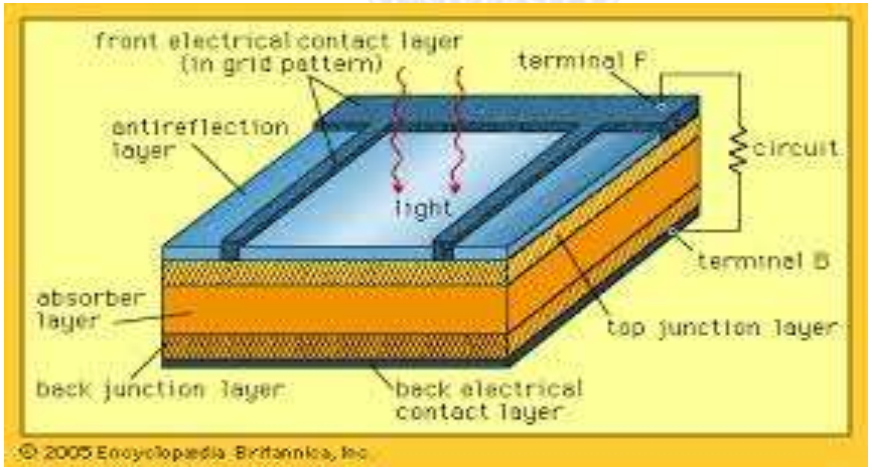
Solar cell

Solar cell, also called **photovoltaic cell**, any device that directly converts the energy of light into electrical energy through the photovoltaic cell.

The overwhelming majority of solar cells are fabricated from silicon—with increasing efficiency and lowering cost as the materials range from amorphous to polycrystalline to crystalline silicon forms.

Unlike batteries or fuel cells, solar cells do not utilize chemical reactions or require fuel to produce electric power, and, unlike electric generators, they do not have any moving parts.



Solar Cell Materials

The operation of a photovoltaic (PV) cell requires three basic attributes:

•The absorption of light, generating either electron-hole pairs or excitons.

•The separation of charge carriers of opposite types.

•The separate extraction of those carriers to an external circuit.

•The basic component of a solar cell is pure silicon, which is not pure in its natural state.

•Solar cells are typically named after the semiconducting material they are made of. These materials must have certain characteristics in order to absorb sunlight.

•Solar cells can be classified into first, second and third generation cells. The first generation cells—also called conventional, traditional or wafer-based cells—are made of crystalline silicon, the commercially predominant PV technology, that includes materials such as polysilicon and monocrystalline silicon.

•Second generation cells are thin film solar cells, that include amorphous silicon, CdTe and CIGS cells and are commercially significant in utility-scale photovoltaic power stations, building integrated photovoltaics or in small stand-alone power system.

•The third generation of solar cells includes a number of thin-film technologies often described as emerging photovoltaics—most of them have not yet been commercially applied and are still in the research or development phase.

A solar power plant is any type of facility that converts sunlight either directly, like Photovoltaics, or indirectly, like Solar Thermal plants, into electricity.

They come in a variety of 'flavors' with each using discretely different techniques to harness the power of the sun.

Solar cell array

Combining several solar panels creates an array, which is part of your solar system. The size of your solar array depends on where you live, the position of your roof and the energy needs of your family.

Solar Cell is a semiconductor device that can convert solar energy into DC electricity through the Conversion of solar light energy into electrical energy. When light shines on a Solar Cell, it may be reflected, absorbed, or passes right through. But only the absorbed light generates electricity.

When photons hit a solar cell, they knock electrons loose from their atoms. If conductors are attached to the positive and negative sides of a cell, it forms an electrical circuit. When electrons flow through such a circuit, they generate electricity. Multiple cells make up a solar panel, and multiple panels (modules) can be wired together to form a solar array. The more panels you can deploy, the more energy you can expect to generate.

Solar thermal power plants

Solar thermal power plants are electricity generation plants that utilize energy from the Sun to heat a fluid to a high temperature. This fluid then transfers its heat to water, which then becomes superheated steam. This steam is then used to turn turbines in a power plant, and this mechanical energy is converted into electricity by a generator. This type of generation is essentially the same as electricity generation that uses fossil fuels, but instead heats steam using sunlight instead of combustion of fossil fuels. These systems use solar collectors to concentrate the Sun's rays on one point to achieve appropriately high temperatures.

Benefits and Drawbacks

•These plants can produce dispatchable pay load energy, which is important as it means these plants produce a reliable amount of energy and can be turned on or up at will, meeting the energy demands of society.

•there are still associated environmental effects of these plants as a full life cycle analysis can show all associated carbon dioxide emissions involved in the building of these plants. However, emissions are still much lower than those associated with fossil fuel plants.

•Some of the drawbacks include the large amount of land necessary for these plants to operate efficiently.

•A final potential impact of the use of large focusing mirrors is the harmful effect these plants have on birds.