



# Hybrid solar power

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In the Early 90s as technologies improved the attention was drawn more towards Hybrid Solar Systems. This period saw a rapid increase in the usage of combining solar with battery storage. In the past few years, the use of solar energy has increased as more people are aware of its environmental friendliness.

This Blog aims to provide a complete overview of the Hybrid Solar System, its Definition, How it works, its Importance, Types of Hybrid Panels, Pros and Cons of each type, and much more.

A Hybrid Solar System contains solar panels, a hybrid inverter, and battery storage to create an uninterrupted energy solution. The solar panels store sunlight and convert it into electricity, while the battery storage stores excess energy for later use.

The functionality of this system starts from a Hybrid Solar Panel that helps to capture the sunlight and then convert it into DC (Direct Current) electricity. The DC electricity from the Hybrid Solar Panel is converted into AC (Alternating Current) with the help of an Inverter. Then the excess solar energy produced during the day is stored in a Battery Storage for use at night or on cloudy days for a continuous electricity supply. These systems combine the best features of grid-tied and off-grid solar systems, ensuring continuous solar power operation. When solar and battery energy are insufficient, then Grid Connection draws power from the grid and also exports excess energy to the grid. This way Hybrid Solar Systems can be used even during a blackout!

These types of Hybrid Solar Panels consist of Monocrystalline Solar Panel, Polycrystalline Solar Panel, Building Integrated Photovoltaic Solar Panel (BIPV), and Thin Film Solar Panel. Below is a brief description of each type with their pros and cons.

Monocrystalline solar panels have solar cells made from a single crystal of silicon. The Crystalline purity of Monocrystalline is higher than that of Polycrystalline solar. The efficiency of monocrystalline solar panels varies from 16 to 24%. These Solar Panels have longer energy production periods.

This Solar Panel is made up of several fragments of silicon melted together. The efficiency rate of Polycrystalline is between 14 to 20 %. The Crystalline purity is less in Polycrystalline. The production period is less compared to monocrystalline panels.

It is a solar power-generating product or system that is integrated into the parts of a building such as roofs and windows. This solar panel uses one of these two technologies: crystalline solar cells and Thin Film Solar cells. The average efficiency of this panel is around 5 to 10 %.

Like other solar panels, thin-film panels convert light energy into electrical energy via the photovoltaic effect.



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Unlike traditional systems, thin-film solar panels are lightweight and flexible second-generation cells. Each cell consists of three main parts: photovoltaic material, a conductive sheet, and a protective layer. There are various types of Thin Film Solar Panel namely amorphous silicon (a-Si) panels, Cadmium telluride (CdTe) panels, Copper indium gallium diselenide (CIGS) panels, and Organic photovoltaic (OPV) panels.

With the promise of a continuous power supply even during bad weather conditions or power outages, Hybrid Solar Systems have been proven to be a great choice. When there is an overcast or even when the grid is down, there's no need to worry because you will have an uninterrupted power supply.

Hybrid Solar Systems are often said to be a one-time investment and it is not wrong. It not only saves you from the hikes in electricity bills in the years to come but also, you don't have to spend your fortune buying the fuel because there's no fuel needed to operate these. Apart from these benefits, the value of your property also increases once you get these reliable sources installed at your place. So if we compare your initial investment and ROI, this deal will only benefit you in the long run.

Once you have installed Hybrid Solar Systems, you can proudly say that you utilize clean and renewable energy. Sunlight is the cleanest source of energy and unlike natural gas, coal, or nuclear fuel, using this doesn't affect its availability on our planet, nor is any other dangerous by-product being released into our environment. Also, it reduces carbon footprint and is a sustainable source of power generation.

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