

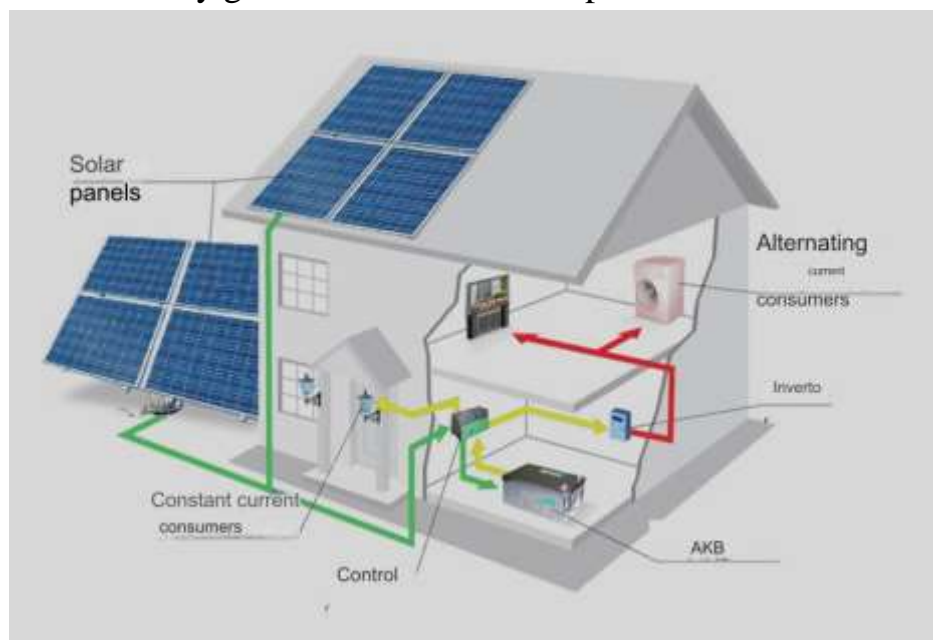
**DESIGN OF 10 KW SOLAR PANELS WORKING IN OFF GRID SYSTEM.**

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**Abstract:** This Article Off Grid Solar Panels An off grid solar system is a solar panel system that generates electricity, stores it in solar cells, and operates independently of the grid. Implementing these systems to encourage off-grid living based on energy independence and self-sustainability.

**Key words:** solar cells, monocrystalline, polycrystalline and silicon solar panels.

Alternative energy sources that meet the demand are currently solar powered equipment. First of all, the panels differ depending on the materials, the principle of operation and the type of production. Solar panels made of silicon - The first difference between these types of panels is the material used. As you can tell from the name, these are silicon solar panels. The most common panel on the market today. This silicon is easy to find, affordable, and produces much better energy than other panels. In the production of such panels, not only silicon is used, but also mono, polycrystalline and amorphous silicon. Monocrystalline solar panels - The purest silicon is used in the production of monocrystalline solar panels. In appearance, all cells are connected to one system. Once the monocrystal is cleaned, it takes time for it to solidify. After hardening, it is divided into very thin plates. These plates are connected to each other with a thin wire made of an electrode. Compared to amorphous panels it costs more. The reason is that these types of panels are very difficult to manufacture. However, it is also good to choose this type of panels, because the efficiency of these panels is around 20%, which is a very good indicator for solar panels.



**Polycrystalline Solar Panels-** To isolate the polycrystalline, the silicon wafer is cooled. The production of this type of panels is cheaper than the production of monocrystalline panels. Therefore, these panels are also cheaper. The production of these panels also requires less energy, which also has a positive effect on the price. Why do these types of panels have an efficiency of 18% or less? Due to the impurities that appear inside the polycrystal, the useful work coefficient decreases. Where it can be used - solar panels have started to be used in many areas of human life. At the beginning, it was used only for household chores and as a substitute for electricity, but now it is breaking out of its shell and entering other areas.

- In agriculture and other production structures
- In small enterprises.
- To maintain heat in private houses.
- For energy-saving lamps in street lighting.
- In public utilities, for city lighting.

**Advantages of Solar Panels-** There are several advantages of using solar resources.

- Unlike other sources of energy, solar energy does not run out. Installing and using solar panels is a great solution for using electricity and heat. According to NASA research, the sun will not spare our planet for another 6.5 billion years.

- The potential of solar energy is very high. A usable energy source is measured in terawatts. This is 20 times more than the demand. In addition, it is impossible to waste solar energy, so the future generation can easily use this energy.

- The sun's rays can reach any point on the planet Earth, it is not only about the countries located around the equator, even in the North Pole, solar energy can be easily used. Currently, Germany dominates among the countries in terms of the use of this energy.

- Safe for the environment. Currently used energy sources not only cause great damage to the environment, but it is impossible to replace them. Solar energy is an exception. Production and use of solar panels are absolutely safe for the environment. - Without noise. There is absolutely no noise during production and use. - Economical, low cost of use. - There are many fronts that can be used.

**Structure of solar panels-**solar panels consist of a large number of solar cells and use light energy (photons) from the sun to generate electricity through the photovoltaic effect. It also includes a backsheet, frame and junction box, and possibly a concentrator, one of which works together to keep the solar panels working normally.

**Off Grid Solar Energy System** An off grid solar system is a solar panel system that generates electricity, stores it in solar cells, and operates independently of the grid. These systems encourage off-grid lifestyles based on energy independence and self-sustainability. Advantages of open grid solar energy systems

- 1) Avoid power outages Being off the grid means you won't have to deal with unpredictable power outages at home. That's because you're not connected to the city's power supply, which can be damaged by freezing rain, blizzards, or high winds, which can damage power lines and equipment.
- 2) Lower electricity costs Using off-grid renewable energy eliminates reliance on limited resources, such as fossil fuels, which increase in price as they run out, while eliminating the need to pay electricity bills does.
- 3) Easier Installation Since the equipment associated with off-grid solar systems is not dependent on the grid, the installation process is much simpler than relying on complex infrastructure to operate.
- 4) Keeps the environment clean and green As with any form of renewable energy, solar energy is greener and cleaner for the environment than fossil fuel energy. Going off the grid is good for nature because it reduces the environmental impact of electricity without relying on burning fossil fuels. it pollutes the air.

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