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OFF GRID SOLAR PV SYSTEM

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Introduction:

The sun gives the energy to manage continuity of life in our solar system. In 60 minutes, the earth gets enough energy from the sun to meet its energy requirement for about a year .Harnessing solar energy to control electrical machines begins by altering the energy from the sun to power. Solar PV is the direct transformation of solar energy into power. PV systems can be utilized to utilize the solar energy in all applications and with fossil fuel assets and the truth that they are going to be depleted this century. Today, more than 1.4 billion individuals everywhere throughout the world need access to power. To enhance access to power to the next level in the rural areas on the planet, a decentralized off-grid installations are considered in type of solar PV. An Off-grid PV Systems are systems which utilize photovoltaic innovation. The systems utilize the DC yield of the PV modules to power DC loads, while a battery bank is utilized to store energy when there is demand.

Solar energy is the solar radiation that reaches the earth which is then being converted to electrical Power through several strategies. Solar buildings generally utilize solar PV panels to produce electricity. Solar PV panels produce DC electric power when exposed to sun light, and a DC-AC inverter normally converts this to AC power, which is the conventional form of the electric power in a typical building. Using DC electric power directly from solar PV panels is a bit challenging as most of the electric appliances are functioning using an AC power.

Solar Tree or Solar Photovoltaic Trees are a kind of construction that looks similar to trees. They may be framed from small scale to big scale. It is an artwork which is a combination of creative and technological effort. This exceptionally new concept is conceived in an effort to utilize new technology relating to harvesting and use of solar energy.

Literature Survey

The discovery of fundamental principles of generation of power was taken place within 1820s and early 1830s by Michael Faraday. His method of generation of electric power by the movement of loop wire or a disc between the poles of magnet is still being used today. Later on production of electric power by mechanical means started the second industrial revolution and made possible several scientific inventions using electricity. Before that the method of electricity produced by using battery cells. Later on, the technology that produced DC current by steam engine driving a dynamo was quickly adopted by many cities around the world after 1882. Coal and water used in the first power plant and today different types of energy resources are available such as nuclear, natural gas, wind as well as solar energy and tidal power. Over the period of time the evolution also taken place in the methods of electricity generation. The key methods of generation of electricity include Generators, Electrochemistry and Photovoltaic effect. The source report of World electricity generation in 2017 shows that only 2% electricity was generated by solar. Currently, Utility scale production is achieved by rotating electric generators or by photovoltaic systems. The 21st century is going to be the age of sun (Solar Energy) as the 19th and 20th century was of coal and oil respectively. In the world oil is being finish out and it is projected that 80% of the world's supply will be utilized at our lifetimes. Coal storage appears to be very massive but this stock will be gone if rapidly uses. . Solar energy is the solar radiation that reaches the earth which is then being converted to electrical Power through several strategies. Solar buildings generally utilize solar PV panels to produce electricity. Solar PV panels produce DC electric power when exposed to sun light, and a DC-AC inverter normally converts this to AC power, which is the conventional form of the electric power in a typical building. Using DC electric power directly from solar PV panels is a bit challenging as most of the electric appliances are functioning using an AC power. It is common that Jordan is characterized by being one of those regions which experience a high solar radiation in the globe because it is located in the earth-sun area that has high potential of solar energy. Jordan is a country located in the Middle East which suffers from lack of oil reserves. It is completely reliant on oil imports from neighboring countries to satisfy its energy needs.

Advantages of off grid solar system over on grid solar system

- These self-sustainable systems can work independently and do not rely on the grid.
- They generate enough power that can be stored and used at night or when the power grid is down.
- These are ideal for remote areas where there is no power access from the grid.
- Grid failures and shutdowns will not affect your power supply.

- Off-grid systems work independently of the grid but have batteries which can store the solar power generated by the system.
- The system usually consists of solar panels, battery, charge controller, grid box, inverter, mounting structure and balance of system.
- The panels store enough sunlight during the day and use the excess power generated in the night.
- These systems are self-sustaining and can provide power for critical loads in areas where a power grid is not available. However, these systems require specialized equipment to function and can be costly to install. These are ideal for businesses which can sustain for a short period of time with no electricity.

Monocrystalline Solar Panels

Monocrystalline solar panel are generally thought of as a good solar product. The main advantage of monocrystalline panel are higher efficiency and sleeker aesthetic. To make solar cell silicon converted into long strips and thin sheets.

This panel is monocrystalline panel and silicon used is single crystal. The cell made up of single crystal, the electron generate electricity have more space to move. As a result single crystal silicon panel are better than polycrystalline panel.

Polycrystalline solar panels

Poly-crystal silicon panel are less good than single crystal panel. It also have advantage is cheap in price. In addition poly crystal silicon panel have blue color instead of black color. Poly crystalline solar panel are also made out of silicon. For manufacturing poly crystal silicon other particle also added to make wafers for panel. Poly crystal solar panel also referred as multi crystal or many crystal silicon. In poly crystal panel there is less space to move electron.

Conclusion

In this study, the solar PV system is intended to cover 100 % of the energy demand needed by the shelter electric appliances. As the system captures the sun's energy using the solar PV array, it stores the excess of its need in the batter bank and uses it at the night times when the solar PV system is incapable of providing it with its need. It is quite unambiguous that this project perfectly serves the energy demand of such shelters/cabins as it seems so encouraging and feasible and ideally suited for migration away from non-renewable fossil fuel towards sustainable solar.

The arrangement of solar PV system for the shelter is conducted through several process in order to best optimize the selection of the rating main component used by solar pv system. The location where site is installed has the best availibity of light from solar arrangement point of view. Solar PV system become more affordable relative to fossil fuel.

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