

CHAMBERED SOLAR PANNEL

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Abstract

We use solar panels to generate electricity. This process can take place either in domestic or industrial purposes. The domestic solar panels can be used in generating electricity at home. And in the industrial panel we use to generate electricity in mass. For this, engineers need to install an array of solar panels from a solar power station. Solar panels can be used to generate large amounts of electricity, and this process can take place both at solar and industrial scale. A key benefit of solar panels is that they can be used in providing electricity in the remote areas as well, provided there is enough solar energy at that place. This will help the people living there. Solar energy is the energy that the sun gives to earth. Primarily as visible light and then later in electromagnetic radiations. Solar energy was developed nearly 100 years ago.

Earlier the solar energy was used in generating steam, which was then used to drive machinery. Edmond Becquerel discovered the photovoltaic effect, which allowed the conservation of sunlight solar electric energy. Sun's energy is captured by the solar panel and they convert that light into electricity, which is then used to provide the power of electrical loads. Such panels contain several individual solar cells which are composed of many layers of silicon, phosphorus and boron layers. Solar panels absorb the photons and electric current is produced in doing so. The energy which is the result of this strikes the surface of solar panels allows electrons to be knocked out of their atomic orbits and releases into the electric field generated by the solar cell. This pulls the free electrons in the directional current. This whole process is known as the photoelectric effect. For the necessary number of solar panels, an average home has more than enough roof area to produce enough solar electricity to supply the power needs.

1. INTRODUCTION

Solar power is the fastest growing means of renewable energy. This project is designed and implemented using simple dual axis solar tracker system. In order to maximise energy generation from sun, it is necessary to introduce solar tracking systems. A Chambered solar panel can increase energy by tracking sun rays from switching solar in various directions. Those solar panel can get light from all directions. A solar cell panel, solar electric

panel, photo voltaic (pv) module or just solar panel is an framework for installation. Solar panels use sunlight as a source of energy to generate direct current electricity. A collection of pv modules is called a pv panels is called an array. Arrays of a photovoltaic system supply solar electricity to electrical equipment. Solar energy is one in all the foremost promising renewable energy within the globe. On the opposite, the effectiveness of the commercially offered

solar cells is in the close between 10 and 20% [1, 2]. This means that there lies a scope for perfection as its efficiency relatively small. In general there are two methods can be employed for rising the efficiency of the solar panels, that is: (i) Use Maximum Power Point Tracking (MPPT) techniques, and (ii) Use of a Solar Tracking System (STS). MPPT is the procedure of capitalize the generated power from the PV panel; conversely this technique cannot increase the generated power when the sun isn't directly aligned with the PV system. The generation capability of solar cell respects the intensity of the sunlight. The place of the sun with regard to any position of the world changes in acyclic track through the course of a calendar year. Tracking the position of the sun in order to expose a PV panel to maximum radiation at any given time and any position is the target of a computerized. Solar energy is an unlimited source of energy which is harnessed properly will get the mankind devoid of using the conventional sources of energy he has been long using. This project's main aim of keeping this in view to make the harnessing of solar energy more efficient. It is one of the fastest growing industries in the world. Due to the constant power supply, people have started embracing the culture of generating their own power supply. The interest for power worldwide is expanding fundamentally over the most recent couple of years. The use of fossil fuels as a means of generating electricity has become expensive making cost of living very expensive, especially in the rural part of the country. Also the use of fossil fuels has brought about pollution

in the environment which in turn is not safe for our health. It releases harmful gases which leads to global warming. So people started using solar panels where the solar energy is gotten solely from the sun and does not release an harmful gases which effects both the health and the environment. Now a days solar energy is becoming one of the most reliable source of energy. Most of the solar panels are single axis solar panels which track the solar energy only from the side where it is fixed. But the direction on the other side where the sun light is having maximum intensity is not tracked by the solar panel. So to avoid that wastage we want to make a sun tracking solar panel which tracks the solar energy where the intensity of the sun light is more. The solar panel rotates in the direction of where the intensity is more. The solar panel rotates in the direction of where the intensity is more there by produces more amount of energy than normal. Using solar trackers upturns the amount of solar energy which is received by the solar energy collector and develops the energy output of the heat/electricity which is generated.

2. RELATED WORK

Regular solar panels will have few blind spots where the light won't reach them when the sun is not at an ideal position. Due to this there is a lot of loss in efficiency of electricity generation.

To eliminate this issue we propose a system which redirects sun rays directly onto the panel. It has a hemispherical dome on the top which allows the sun rays to pass through it at any time. These rays will now be passed through a reflexive chamber connected to the hemisphere.

Light will be able to pass directly onto the panel as it passes out of this chamber. rotates the panel with the help of servo motor. Servo motor are used for panel rotation which also fulfils the low cost and lightweight criteria. A solar cell is a device which converts light energy to electrical energy through photovoltaic effect. Solar cells are the building blocks of photovoltaic modules known as solar panels. In solar tracking systems the module's surface tracks the position of the sun automatically as the days runs by. The position of the sun varies as the sun moves across the sky. For a solar power equipment to work good, it must be placed near the sun and the solar tracker can increase the efficiency of that equipment at any fixed position. Due to the constant power supply, people have started embracing the culture of generating their own power supply. The interest for power worldwide is expanding fundamentally over the most recent couple of years. The use of fossil fuels as a means of generating electricity has become expensive making cost of living very expensive, especially in the rural part of the country. Also the use of fossil fuels has brought about pollution in the environment which in turn is not safe for our health. It releases harmful gases which leads to global warming. So people started using solar panels where the solar energy is gotten solely from the sun and does not release an harmful gases which effects both the health and the environment. Now a days solar energy is becoming one of the most reliable source of energy. Most of the solar panels are single axis solarpanels which track the solar energy only from the side where it is

fixed. But the direction on the other side where the sun light is having maximum intensity is not tracked by the solar panel. So to avoid that wastage we want to make a chambered solar panel which tracks the solar energy where the intensity of the sun light is more. The solar panel is connected to dome rotates in the direction of where the intensity is more. This results in producing more energy in the direction of where the intensity is more there by produces more amount of energy than normal. Solar energy is an unlimited source of energy which is harnessed properly will get the mankind devoid of using the conventional sources of energy he has been long using .This project's main aim of keeping this in view to make the harnessing of solar energy more efficient. It is one of the fastest growing industries in the world.

3. IMPLEMENTATION

Regular solar panels will have few blind spots where the light won't reach them when the sun is not at an ideal position. Due to this there is a lot of loss in efficiency of electricity generation To eliminate this issue we propose a system which redirects sun rays directly onto the panel. It has a hemispherical done on the top which allows the sun rays to pass through it at any time. These rays will now be passed through a reflexive chamber connected to the hemisphere. Light will be able to pass directly onto the panel as it passes out of this chamber. Asweknowthatregularpanelswillhavealotof blindspotswherelightwon'treachthemwhenthe sun is not at an ideal position. Due to this there is a lot of loss in efficiency of electricitygeneration. To eliminate the loss

of efficiency with power generation due to blind spots on panel we need to create a system that can redirect sun light such that panel gets enough light onto it directly at all times of the day. To eliminate this issue we propose a system which redirects sun rays directly onto the panel. It has a hemispherical dome on the top which allows the sun rays to pass through it at any time. These rays will now be passed through a reflexive chamber connected to the hemisphere. Light will be able to pass directly onto the panel as it passes out of this chamber.

Hardware Description

1. Solar panel
2. Reflexive chamber
3. Poly carbonate Dome
4. Supporting stand
5. Flat surface

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Regular solar panels will have few blind spots where the light won't reach them when the sun is not at an ideal position. Due to this there is a lot of loss in efficiency of electricity generation. But in our project domes are present which takes the sun rays even when the sun is at any position. This rays are absorbed by reflective chambers .So, as a result it has more efficiency compared to regular solar panel which are fixed at one position. Thus more electricity can be generated through our model.

4. EXPERIMENTAL RESULTS

The aim of this project is to ensure that sunlight rays are falling directly on the solar panel to give the maximum solar energy which is harnessed into electrical power with the maximum energy being between the period of 1200hrs to 1400hrs with the peak around midday when the sun is almost directly above the solar panel and there is no energy used to move the solar panel, further increasing the efficiency of the tracker.

A typical solar panel converts only 30-40 percent of the incident solar radiation into electrical energy. Thus to get a constant output, an automated system is required which should be capable to constantly rotate the panel. Thus the Chambered system was made as a prototype to solve the problem, mentioned above. The unique feature of this system is that instead of taking the earth as its reference it takes the sun as a guiding source. In order to maximize the power output from the PV panels, one needs to keep the panels in the optimum position perpendicular to the solar radiation during the day.



5. CONCLUSION

So comparing to regular fixed solar panel our chambered solar panel has more efficiency. As regular solar panel has blind spots so when sun is at particular position it can absorb at that particular time only but when domes are kept it absorbs in all directions at any time. So by this the efficiency of our chambered solar panel is more approximately it is about 1.5%

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