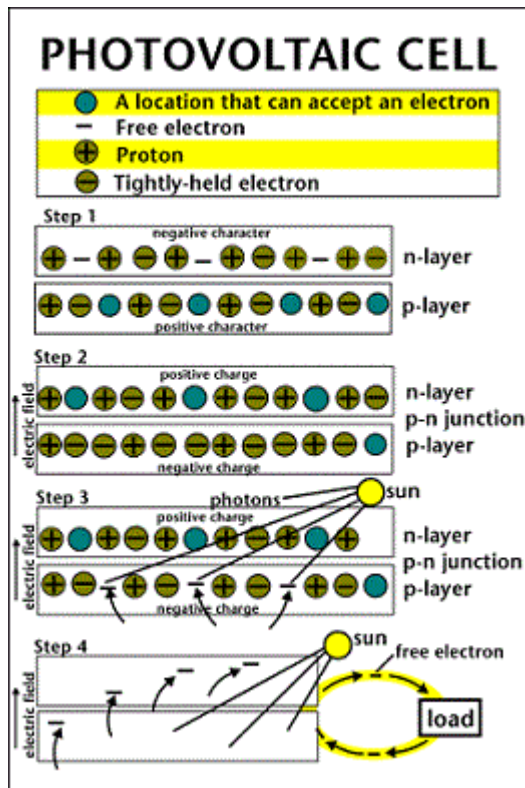


# How to Make Solar Cell and Its Working

## What is Solar Cell (or) Photovoltaic Cell?

We all know how important solar energy is to live life on earth. Solar energy is the energy derived from sun and it is used for many purposes. Due to the advancement in technology the energy of the sun is turned into usable forms of solar energy.

There are these devices that run on solar energy and helps in doing various activities. Talking about solar cell, it is a device that converts the light energy to electricity with the help of the photovoltaic effect. Photovoltaic as the name states is derived from a Greek word “phos”, which means light and volt that comes from the name of an Italian physicist. The photovoltaic cells or solar cells helps in producing electricity with the help of light. In other words it can be said that solar cell make use of the sunlight to produce electricity. These cells are called photovoltaic even when it does not make use of sunlight for producing light. Photovoltaic cell requires three attributes namely, absorption of light for making electron hole pairs, separate charge carriers of opposite kinds and separate extraction of charge carriers to a circuit which is external.



## How to Make Solar Cell?

As electricity are increasing with each passing day people are unable to pay huge long bills. Also they are trying their level best to reduce electricity costs. In that case, a brilliant way to cut down your electricity cost would be by building your own electric solar panel. The solar panel can help in powering DC electronics, charging batteries and lighting lamps. By making a solar panels you can very easily cut down the electricity cost. Now for making a solar panel you require solar cells or photovoltaic cell as they are popularly known. They are vital for making solar panels because they help in converting sunlight into electricity. For the solar cells to work properly and capture sunlight, they need to be wired together with the help

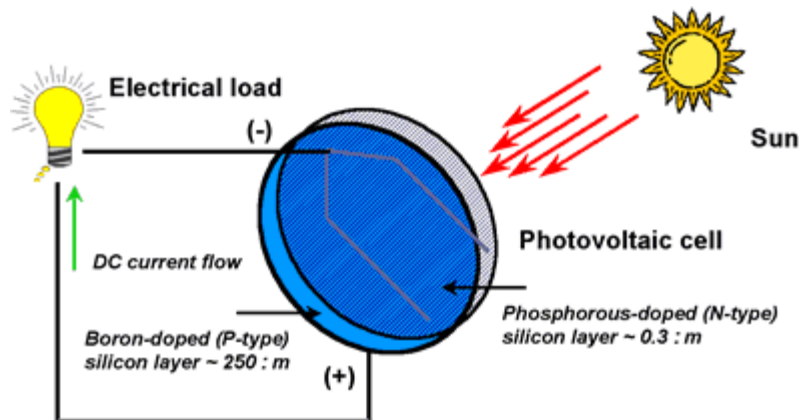
of a copper wire and must be put together horizontally. Then they must be placed in such an angle so that the rays of the sun hit directly these cells for capturing maximum amount of sunlight.

The electricity generated with the help of solar panels can be used for charging batteries and lighting houses however it depends upon the watt of the solar panel. Making of solar panels does not require any experience and can be made very easily with the help of a guide. However as stated before the making of solar panels require solar cells and for that you need visit your local hardware to check whether all materials are available or making it. If you are unable to find it in that store then you can always check on the internet. For making a solar cell you require copper sheet as a conductor of electricity, two crocodile mouth clamps that are used to start a car battery. An ammeter too is required to read the signal of the power and to know how much amount of electricity is produced. Apart from these you require a plastic bottle, salt, tap water and an instrument for cleaning.

After you have the following apparatus ready, you can make use of gas or stove to heat the copper. When the copper sheet gets heated up to its maximum level, you can see the oxidized metal and can see purple and green colors coming up. That metal should completely turn black and after it's turned black totally let it cool. You could see black flakes as the metal cool downs. Now take another copper sheet and place both between the plastic bottles. Now, attach the crocodile clips to the metal sheets and hook them to the ammeter on the negative end, add salt to the hot water and pour that water into the plastic bottle. Make sure the crocodile clips that have been attached to the sheets do not get wet because of the water and for that leave one inch space in between. Now the solar cell is set and can help in generating 60 MA of current.

## Solar Cell Working Principle:

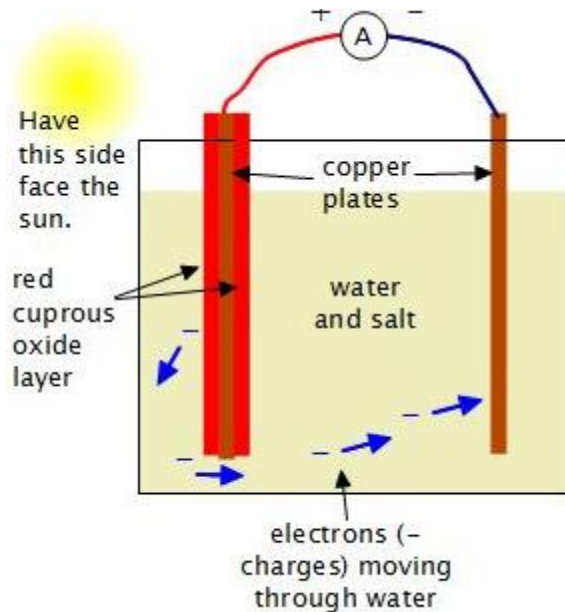
Sun is the ultimate source of solar energy the energy that is received from the sun is abundant and available free of cost. We however use very less of this energy which is available in abundance. Talking about the working principle of a solar cell, we initially must know sunlight is made up of what. The sunlight is basically made of photons and each individual solar cell is designed with a positive and negative layer to create an electric field. When the photons are absorbed in the cell, the energy helps in setting the electrons free. In this process it moves to the bottom of the cell and exits via the wires which create electricity.



The greater the amount of sunlight received, the greater the flow of electrons and conduction of electricity. Now solar panels help in converting the sunlight into electricity. These panels consist of solar cells that absorb heat available from the sun. The solar panels can be placed anywhere for production of electricity in this way you can cut down the cost of electricity. One important thing that has to be kept in mind is that you can produce more amount of electricity with the help of sun only in areas where there is greater amount of sunlight.

## ***Working of Solar Cell:***

Photovoltaic cells help in converting the light into electricity i.e. with the help of sunlight. Solar cells or photovoltaic cells are made of two layers of conductors i.e. positive and negative. As mentioned before sunlight consists of photons. As soon as the solar cell is exposed to the sunlight many of the photons are absorbed by the solar cell. After the negative layer of the solar cell has absorbed enough photons, the electrons are freed from the negative semiconductor material. Due to the manufacturing process of the positive layer the freed electrons flow to the positive layer carrying a voltage differential.



When both the layers are connected to an external load the electrons start flowing via the circuit which leads to the creation of electricity. An individual solar energy can produce just 2 watts of electricity. To increase the power of electricity, the cells are grouped together inside a solar module. These models are later wired either serially or in a parallel way. This helps in creating the required voltage or power.

Solar cells are made of silicon and these cells are very user friendly and also do not cause any pollution, hence they are clean and silent. On the whole we can say that solar cells help in conducting electricity and prove to be very helpful.

## ***Types of Solar Cell:***

Now that we know what a solar cell is, we can discuss about the types of solar cells that are used for different purposes. To list out a few we have:

- **Nanocrystal Solar Cell** – These are solar cells with nanocrystal coating. The nanocrystals are based on CIGS, silicon and the substrates are either silicon or other organic conductors of electricity.
- **Polymer Solar Cell** - It is one of the flexible solar cells made of polymers. Polymers are large molecules which help in producing electricity with the help of sunlight. Polymer solar cells include organic solar cells and are also called as plastic solar cells.
- **Solid State Solar Cell** – This cell is made of solid materials which include crystalline, polycrystalline and amorphous solids.

- **Thin Film Solar Cell** - This solar cell is made by depositing one or more thin films which is made of photovoltaic material.
- **Wafer Solar Cell** – This is a solar cell which is square in shape and is made of wafer. Wafers are semi conductor materials that are used in the production of integrated circuits.
- **Organic Solar Cell** – An organic solar cell makes use of organic electrons for the absorption of light to produce electricity from sunlight with the help of photovoltaic effect.

These were a couple of solar cells, apart from these we have plastic, hybrid, plasmonic and buried contact solar cells.

Source: <http://www.electronicshub.org/how-to-make-solar-cell-and-its-working/>