

FAQ (Frequent Asked Questions on Solar)

Q. How do Solar Panels produce electricity?

Ans. Solar Panels work on the phenomenon called the Photoelectric Effect to produce electricity. Solar Panels are nothing but blocks of specially designed semiconducting material which produce a small amount of electricity when light falls on them. This small amount of electricity is produced in a large number of solar panels (Solar Arrays) to produce electricity for everyday consumption.

Q. If I install a Solar PV System at my place, how much working Life Span can I expect from it?

Ans. Solar PV System is a static system i.e. it does not consists of any rotating or moving parts. So it is not prone to any kind of damage caused due to the friction between the moving parts or any other mechanical phenomenon that causes damage to a generator or a motor. A Solar PV System can easily last from 20 to 25 years and can even work for a longer period if maintained properly.

Q. How is a Solar PV System better than Diesel Generator as a backup system?

Ans. Though the capital cost of a PV System is higher than a DG System, a DG System accounts for a high fuel cost and maintenance cost. While a PV System doesn't require any fuel and its maintenance is very minimal and easy. Apart from this a Solar PVV System is clean and environmental friendly option for a backup system.

Q. What kind of maintenance schedule do I have to follow to keep the Solar PV System in a healthy Condition?

Ans. A Solar PV System requires very minimal maintenance from the owner and is very easy to maintain. Regular cleaning of the Solar Arrays should be ensured so that the system works at its full efficiency and occasional checks should be done to ensure that there is no shading over the Solar Array because of any obstruction. The components of the system except the Solar Arrays have to be kept in a shaded area. These small steps can result in a healthier and longer life span of your Solar PV System.

Q. If the Solar Arrays are the only electricity producing unit in the system, then why do I need other components to make the system work? Doesn't it add to the cost of the system?

Ans. Yes, it is true that the only electricity producing unit in the system are the Solar Arrays and having other components adds to the cost of the system. But the electricity produced by the Arrays is in D.C. form and have to be converted into A.C. form to be able to be used by the consumer. Also a proper and safe flow of the electricity needs to be ensured so that no damage is done to the appliances used or the consumer using it. This is why additional components are added to the system to ensure better reliability of the system.

Q. What happens to the power production on an overcast day?

Ans. A Solar PV System doesn't require direct sunlight to be able to work, though direct sunlight gives the maximum efficiency. The system continues to work even during the overcast conditions but the efficiencies are going to be reduced to some extent. The efficiency generally reduces to the 70% during an overcast day. But in a place like India which receives more than 300 sunny days per year overcast conditions is not a major concern.

Q. How much do I have to invest for a Solar PV Rooftop System?

Ans. The cost of a Solar PV Rooftop Setup depends on many factors such as the connected load, type and quality of the components used in the system, total available roof area etc. As an estimate a grid connected solar PV System with Grade A manufacturer's components costs around Rs. 1 Lac per KW while a battery connected system costs around Rs. 1.25 Lacs per KW.

Q. If I invest in a Solar Rooftop Setup, in how much time will I make my money back?

Ans. In a Solar Rooftop System, the major investment is its installation cost and has a minimal maintenance cost and no fuel cost. A 5 KW Solar PV System has average pay back period of approximately 4 to 5 years. With the life span of a PV System as high as 20 to 25 years 70 to 75% power produced by it may be considered as the free electricity.

Q. How much Roof Top Area do I require to install a Solar PV System?

Ans. It is mandatory for a Solar PV Setup to have a shade free area all the time of the day. The most important factor on which the area of a Solar PV System depends is the Panel Efficiency. Generally, a Solar Panel with 15% efficiency requires 100 Sq. Ft. of shade free roof area. While a

Panel with 12% efficiency needs approximately 125 Sq. Ft. of shade free roof area. Another factor is the weight of the Solar Panels that may put pressure on the roof of the building. For very old and poorly built buildings the Panels have to be scattered in a larger area so that the construction can withstand these weights.

Q. Does the ambient temperature affect the efficiency of a Solar PV System?

Ans. Counterintuitive to the belief among the people, an increase in the ambient temperature around the Solar PV System results in a decrease in efficiency of the system. It is to be noted here that though PV Systems work on the energy from the sun, they work on the sun's light energy and not on its heat energy. But the increase in temperature may result in a lesser output voltage produced by the system which in turn results in the decreased efficiency of the system.

Q. How does shading affect the performance of a Solar PV System?

Ans. Shading has a very large impact on the performance of a Solar PV System. Since a Solar Panel is made of a large number of Solar Cells, shading on a small part of it can have a knock-on effect as the energy produced by the rest of the Solar Panel may be consumed by the part which is under the shade. Therefore, it is mandatory to install the system in a shade free area.

Q. What is Net Metering? How can I be benefited from it?

Ans. Net Metering is a policy that allows the unused power produced by the Solar PV System to be fed to the Grid to which the system is tied to. This allows the system owner to get concessions on his electricity bills as the amount for units fed to the grid will be deducted from the amount of units actually consumed by the owner and the billing will only be done for that part of the units.

Q. What will happen in a situation when the power in the grid is out?

Ans. A typical Solar PV System is designed to shut down if the power in the grid is out. This is done so that in case of maintenance any personnel doesn't get electrocuted because of the power fed to the grid by the Solar PV System. But systems can be designed that can redirect power to a battery backup system from the grid in case of a power failure in the grid.

Q. Are there any Government rebates that I get for the installation of a solar PV System?

Ans. Yes, there are several schemes from the Central & state Government of India which allows owner some rebates to promote the use of Solar Power in India. Accelerated Depreciation is available under the Income Tax Act for Rooftop PV Systems for a company which allows to save the tax value on the System reducing its net cost. MNRE (Ministry of New and Renewable Energy) also provide 15% capital expenditure subsidies residential households & 30% to educational, health & NGO institutions & to those who wish to setup a Solar PV System. Apart from that there are other incentives and rebates that are provided by the State Government that are specific for different states.

Q. Why should I setup a Solar PV System at my premises?

Setting up a Solar PV System at your premises gives you a chance to be self sustainable in your power consumption as you are not depended on the grid to supply you the required electricity. Also a PV System is a clean and environmental friendly form of Power Generation. You can sell electricity to the already power deficit grid in the country thereby playing a role to fulfil the electricity requirement of the country. To sum up, it is a reliable, economic, social and environmental friendly form of Power Generation.

Q. While buying Solar Panels online, should I take my desired output rating equivalent to the KW (peak) rating given in manufacturer's specifications?

Ans. KW (peak) rating in the manufacturer's specification is actually the output that a Solar Panel will generate in the optimum conditions which can only be practised in a lab. The actual system can never achieve the same output in a practical situation. Generally the actual KW rating of a Solar Panel is 15-20% lesser than its KW (peak) rating. So a Solar Panel with a higher rating than required should always be considered.

Q. While looking for Solar PV Systems , I found a system of 1 KW output of Solar Array and 5 KW rating of Inverter considered as a 5 KW system. Can it really produce 5 KW?

Ans. The output given by a Solar PV System is determined by the output received from its solar panel. Though an Inverter of 5 KW rating can be applied to a 1 KW Solar Array but its output will

never exceed 1 KW as it is the output that is produced by the Solar Panels. But this system can later be expanded if required as the Inverter can work up to 5 KW rating.

Q. What is an Output Warranty? What Output Warranty should I expect from a Manufacturer?

Ans. An Output Warranty is the Guarantee provided by the manufacturer that a certain percentage of output will be provided by its Solar Panels for a Specific period of time. An Output Warranty may last up to 25-35 years after the manufacturing of the Panels. For a good quality Solar Panel the Output Warranty is expected to be 90% for the first 10 years and 80% for 11 to 25 years.

Q. What Product Certification should I look for while buying Solar Products?

Ans. Product Certifications should be checked before buying any solar products online to ensure better functioning of the product. The major standard certificates are: for panels- IEC 61215/IS 14286 (design qualification and type approval), IEC 61730 (safety); for Inverters- IEC 61683/IS 61683 (efficiency), IEC 60068-2 (environmental testing); for Charge Controllers- IEC 60068-2 (environmental testing); for Junction boxes- IP 54, IP 21 etc.

Q. How do I decide the Output Rating of the Solar PV System that I want to buy

Ans. The output rating of the PV system should be known beforehand while buying any component online. The total mVA value of the equipments to be connected should be found out and should be divided by the power factor it gives. This gives the KW rating of the system. The system of approximately double the value of the KW rating should be brought to account for any high start up currents of the equipments and losses in the system. But it is recommended to consult a professional if a large system is required to be installed.

Q: What is the difference between an off-grid and on-grid solar roof top kit?

A: An off-grid roof top kit produces power to recharge the battery which later is used as a backup during the night. In on grid system the electricity produced is sent to the main grid and the power is taken from the grid during the night time for use.

Q: Can I sell my extra power through an on-grid system?

A: Yes, the extra power produced through an on-grid system can be sold to the power grid if there is net metering system available in your area. The grid though has to be notified prior to using this scheme and proper permissions have to be taken.

Q: Why the solar panels are tilted in a roof top system?

A: The panels are tilted because the earth has a tilted axis towards the sun. So the solar panels have to be tilted accordingly to bring out the maximum efficiency from the light that from the sun to your solar panels.

Q: Can my solar roof top kit be modified according to my requirement?

A: Yes, the solar kit can be easily modified according to the required load and the time for which the backup is needed. It can be arranged to be expanded further in case the requirement is expected to increase later from your roof top system. But if you are planning to expand it later it is recommended that the inverter and battery should be selected beforehand according to the later requirement so that they do not require a replacement once the expansion is done.

Solar Water heater Questions

Q: We have monkeys in our locality. Can they damage my solar water heater?

A: Solar water heaters are very tough and sturdy and do not get damaged from small impacts. They are designed to operate in an open environment. So damage done by a monkey is not very likely to happen.

Q: Which type of solar Water heater would you like to suggest me, ETC or FPC?

A: An ETC type solar water is always suggested as it is economical, provides high efficiency, and keeps the water warm for a longer period of time as it accounts for lesser losses.

Q: How come an ETC type water heater economical and better at the same time?

A: The recent advancement in the glass tube manufacturing processes has made them very cheap. These glass tubes accounts for a major part of the cost of an ETC solar water heater. So as the glass tube prices have declined rapidly ETC water heaters are now cheaper.

Q: How is ETC water heater better than FPC water heater?

A: An ETC water heater has glass tubes which concentrates the sunlight towards the water while FPC has a plate which could not do so. So EPC provides good heating at all the times of the day while FPC heats best in the noon. Also water gets warmer in an ETC water sooner than FPC one and stays so for a longer period of time.

Q: Does the water in my solar water heater will stay hot in the night?

A: The tank of the water heater is manufactured with highly insulated material. This material does not allow the heat of the water to escape during the night time when the heater is not working. Also the technology keeps the hot water in the tank and never let it come out towards the tubes.

Q: How do I decide what capacity of solar water heater I need?

A: Generally, a household of three to four people require 100 L of water for their daily usage. But if you have more people using the water heater than you can plan accordingly for a larger capacity. Water heaters of variable capacities are available in the marke.