

FAQs

HOW THE REGULAR SOLAR PV SYSTEM WORKS.

The solar PV System works as under;

- ✚ The Sun-rays falls on the exposed surface of the solar photovoltaic panel.
- ✚ The photon in the Sun's ray will stimulate the free electron in the photovoltaic material, normally crystalline silicon to get activated and as a result, it starts flowing through the circuit provided in solar panels towards load.
- ✚ The electricity so generated is Direct Current (DC) and all the electrical power collected from series of panels comes to inverter by help of DC solar cable strings.
- ✚ The inverter converts the Direct Current (DC) power in to Alternating Current (AC) power by help of sophisticated power electronics.
- ✚ The resultant AC power is according to the reference parameters given to Inverter. The grid tied inverter used for net metering purpose is connected to grid and the reference parameter for it is the parameter of Grid itself.
- ✚ Hence the resultant AC power is identical to grid power and hence both powers get synchronized or mixed easily.

WHAT IS NET METERING AND HOW DOES IT WORK?

A net-metered PV system is connected to the grid network through internal wiring of a home or a building. This way, the electricity generated by the PV system is 'mixed' or "synchronized" with the electricity flowing in from the grid. Let us consider a case where a grid-connected PV system of 6 kW is connected to a building, which is being net-metered.

Now let's say, that on a cloudy day, the building's load is 3 KWH (UNITS) and the PV system is generating only 2 KWH (UNITS) at that moment. In such a case, the building will "IMPORT" 1 KWH (UNIT) from the grid. The consumer will not know that electricity from which source is being used, but the net-meter will record a consumption of 1 KWH (Unit) at that instant.

Same way on a sunny day, when the building's load is 3 KWH (Units) and the solar system is generating 4 KWH (units) at that particular moment, then the building electrical system will "EXPORT" 1 KWH (Unit) to Grid and the net –meter will record export of 1 Unit.

The said "EXPORT" units shall be adjusted on unit to unit basis with the "IMPORT" done by consumer's building during the night time or high demand time during the banking period specified by respective DISCOMS.

Hence, all the electrical units generated by consumer's solar PV system shall be useful to run the load of the building and there is no need to store the energy generated by Solar PV System and

expensive and fragile storage systems like batteries can be eliminated from the system to bring down the capital as well as running costs and maintenance requirements of the solar PV System.

The net metering system contains neither moving part nor any chemical reacted component like battery and hence, it truly becomes fit and forget system.

A similar analogy for net metering solar PV system is having two incoming sources for water in a tank and one common outlet from the tank to cater the demand.

You cannot differentiate that water from which source is coming into Tap but inflow from one source definitely reduces the inflow from other source for same amount of consumption.

CAN I RUN AIR-CONDITIONERS USING MY PV SYSTEM?

Yes, you can easily run air-conditioners or any equipment with heavy loads along with your net-metered (or any other scheme of grid- connected) PV system. To some extent, this question is addressed in the previous answer. Using the same logic in the previous answer, if the load of the air-conditioner is higher compared to the electricity being generated by the PV system, then the remaining amount of electricity will be supplied by the grid. This way, the PV system will reduce your consumption from the grid.

IS PV A MATURE AND RELIABLE TECHNOLOGY? I'VE HEARD THAT THIS TECHNOLOGY IS STILL EVOLVING. I SEE THAT MANY SOLAR STREETLIGHTS DON'T WORK!

Let us assure you that PV is a very mature and reliable technology. It has been around for several decades. Earlier, it was mainly used in space applications (since 1958, to be precise), but lately it is becoming a popular substitute for conventional electricity as the prices have drastically dropped. PV modules are designed to last 30-35 years, and come with a 25-year performance warranty. This itself is proof of its reliability!

As to evolution, it is the nature of technology to be evolving, whether it is a mobile, internet, TV or a car! If the technology does not evolve, companies go out of competition. PV is no different. Streetlights often stop working due to other issues, such as improper cleaning and battery maintenance, or even thefts of its components. However, net-metered PV systems have a very good performance track record and one of the most popular ways of deploying solar technology.

WILL MY PV SYSTEM WORK WHEN THERE IS A GRID OUTAGE?

This is very important for a consumer to understand. The electricity grid's safety standards require the grid-connected PV system to shut down if there is ever a grid outage; this is called 'anti-islanding'. The IEC international standards that we follow require the grid-connected PV inverter to shut down if the grid voltage, frequency or certain other parameters go out of a pre-determined 'safe' range even for a split-second! This way, if a Utility Engineer is doing some maintenance or repairs after shutting down the grid, he will not have to worry about getting a shock if some grid-connected PV system is still injecting electricity into the grid.

On the down side, the consumer may not be able to utilize the electricity generated from its own PV system when the grid is shut down. This is not a major issue at locations where grid outages are not frequent. However, at places where the grid is unreliable, we offer hybrid PV systems, which use batteries, and will continue supplying power to the consumer by disconnecting the consumer's house from the grid. However, such hybrid systems are more expensive compared to regular net-metered PV systems and also require more maintenance.

WHY CAN'T WE ACCURATELY PREDICT THE OUTPUT OF A PV SYSTEM?

The performance of a PV system, whether a large megawatt-scale system or a small kilowatt-scale rooftop system, is dependent on nature: particularly, sunlight. Some days, months or years are sunnier than others, and hence, the PV system will generate more electricity. While on a cloudy day, the PV system will generate less electricity.

However, fortunately there is ample recorded weather data (radiation, temperature, etc.) over the last several decades using ground-based weather stations and satellites, which allow us to predict the performance of a PV system with a fair amount (~95%) of accuracy. Moreover, if the output of the PV system is low during a particular year due to lower irradiation or a prolonged monsoon, this deficit might be covered up during the subsequent year.

WILL MY PV SYSTEM GIVE ANY OUTPUT DURING MONSOON?

Yes, of course, because there will still be sunlight during monsoon! However, depending on the cloud cover, you may experience 20-40% less generation compared to other months. Further, generation during the monsoon months may vary from year to year, while the generation from the same month in different years should be fairly similar.

Whenever a responsible solar installer talks about electricity generation from its PV installation for the entire year, the installer always considers these cloudy conditions to give a realistic scenario to the consumer.

WHY DOES A DISCOM SELL THE ELECTRICITY AT HIGHER RATES THAN THE RATES IT GIVES TO THE CONSUMER IN CASE OF EXPORTS?

The selling price of power by DISCOM to any particular consumer is dependent on many factors like T&D Losses, Cross-subsidy charges, cost of all sources of power Govt. Tax and electricity Duty etc.

Whereas the DISCOM buys excess solar power from consumer at its Average Pool Purchase Price (APPC) rates. These rates are decided by regulatory authority of the particular states every year.

Hence, due to these reasons DISCOM sell the electricity at higher rates than the rates it gives to its consumer for buying back the solar power.

WHAT IS THE GUARANTEE ON THE EQUIPMENT COMPONENTS USED IN THE SOLAR SYSTEM?

The Guarantee for solar components are varying;

The solar panels have warranty of 12 years and also it has generation guarantee as per IEC standards for 25 years.

- ✚ The solar inverters normally carry warranties from 5 years to 7 years. The same can be extended by few more years by paying extra charges to manufacturers for an extended warranty.
- ✚ The rest of the components carry 1 year warranty.
- ✚ It is normal practice of the market that the system installers offers five year limited warranties for the solar PV System.

Nevertheless, it is pertinent to note that leaving aside the warranties, the selection of system installer and the system components are very important.

One shall ensure that the components like Panel, Inverter and Structure used in the system shall be of highest quality, reliable brand and having repute in the market.

Same way the reputation of system provider, its track record, its service history and reference play important role in selection of solar PV system.

Zodiac Energy Limited is providing energy solutions since last 28 years and working in solar space since 2012. An ISO 9001:2015, ISO 14000 certified, NSE Listed Company.

Zodiac Energy Limited has installed more than 56000 KW of rooftop & Ground Mounted Solar Power projects across India till the end of FY 2019-20 and having more than 5000 satisfied clients for Solar power plants.

Zodiac Energy Limited is India's number 1 solar EPC players in Residential Rooftop Systems with more than 20,000 KW installations and more than 4500 satisfied Residential Clients.

You can always rely on Zodiac Energy Limited for best of the class products and services.

IS THE SOLAR SYSTEM SAFE ENOUGH FOR HOUSEHOLDS? DOES IT HAVE ANY RISK OF A FIRE AND SHOCK?

Like any electrical installation, solar system shall also have its safety norms to make it risk free installation.

While, installing solar PV system, all the protective circuits as required by law as well as good engineering practices shall be installed properly to avoid any accident hazard.



The solar system is totally safe system if it is installed properly and with all safety.

The experience of installer, the quality of material used and the protections used as required shall reduce the risk of accident to near zero level.

The client should ensure to know about qualification and experience of system installer and the protection used in solar system.

HOW CAN ONE FIND THE EXACT CALCULATION OF NET IMPORTS AND EXPORTS AND TOTAL SOLAR GENERATION?

The rooftop solar PV system with net metering shall be installed with two meters.

-  Solar meter
-  Bi-directional OR Import-Export meter OR Tariff Meter.

The solar meter measures the total power generation by the solar PV system

Whereas, the Bi-Directional or Import –Export meter records the power coming from grid as Import and Power exported by solar power system after catering the building load.

The net metering is to charge the consumer for units imported after adjusting the units exported.

In case of net export, the DISCOM credit money to consumer account at predefined Average Purchase Pool Cost (APPC) rates.

The modern day good quality inverters are also equipped with cloud based monitoring system. With the help of internet, one can check the generation from solar power plant on mobile or computer with the help of internet.

WHAT IS ENERGY BANKING?

Energy banking is nothing but an arrangement to store the excess energy produced during peak generation period for use at high load period.

In the net metering system the excess energy generated by solar PV system is fed to grid which is infinite pool of energy flowing through it like Ocean in case of water. The energy fed to grid is measured by net meter as an export and when excess energy drawn from grid the same is considered as import. Just like normal banking transaction of credit and debit, the difference of import and export of energy shall be billed. This is called energy banking. As per Gujarat Solar Power Policy 2015, energy banking is available for one billing cycle for net metered systems.

HOW TO READ THE DISCOM METERS?

The latest DISCOM meters are equipped to meter all the parameters of the electricity flowing thru it like KWh, KW, Volts, Amps, Import KWh, Export KWh, KWRh etc., all the parameters are scrolling one by one at a given interval. Our representative will help you acquaintance and learning that same.

WHAT KIND OF MAINTENANCE IS REQUIRED FOR A SOLAR PV SYSTEM?

The output of solar panels reduced when dust get accumulated on it. It reduces the penetration of Sunrays through the glass of solar panel. In order to get optimum generation, one should clean the solar panels, between twice a week to twice a month depending upon the dust generation in the area.

IN HOW MANY DAYS SHOULD ONE CLEAN HIS SOLAR SYSTEM?

As mentioned above, the solar panels shall be cleaned between twice a weeks to twice a month depending upon the dust generation in the area.

IS THERE ANY WAY TO CLEAN THE SYSTEM? IS THERE A SPECIFIC CLEANING EQUIPMENT TO CLEAN THE SOLAR SYSTEM?

Solar panels can be cleaned by normal duster or a water jet from garden pipe to special panel cleaning robots depending upon size of the solar plants and availability and cost of labour.

WHAT IS WEIGHT OF SYSTEM?

Normally the weight of solar panels along with structure is roughly in range of 3.5 to 4 Kg per square foot. Apart from that the foundation made to protect the solar panels from high wind can be weighed between 10 to 12 Kgs where it has been installed.

WHAT IS THE STRUCTURE LIFE AND HOW ITS FIXING IS DONE?

Structures can be of various types. It can be penetrative or non-penetrative structures, the height of the structure can also vary depending upon the site and client's requirements. A consultation with our engineer to explain more on this. We are always at your service though our Toll Free Number 1-800-233-2309

WHAT ABOUT CRACK DEVELOPMENT IN ROOF DURING STRUCTURE FIXING?

If one opts for penetrative structure, it will be fixed by anchor fasteners fitted on surface of the roof. However, once installed the same will be covered by the foundation blocks made for providing stability to the structure. So there shall not be any leakage problem in the roof.

WHAT HAPPENS IF MONKEY JUMPS ON PANEL?

Normally, the solar panel glasses are toughened glass. It is just like wind-screen of Car. If the monkey jumped on it from a normal height, it will not break the solar panels. However, if the monkey jumps from one or two floors high on solar panels then it will be broken with impact on it. Also if the solar panels shall be hit by any sharp object like stone or spanner, it will break too.

WHAT IS THE LIFE OF THE PANELS AND SOLAR SYSTEM?

The life of solar system is 25 or 30 years.

HOW DO I FIND THE CAPACITY OF SOLAR PLANT TO BE INSTALLED AT MY PLACE?

The solar system capacity can be decided based on following of the three criteria;

- ✚ The sanctioned load from DISCOM.
- ✚ The shadow free space available at roof.
- ✚ The usage pattern of the user.

Our team member will help you in ascertaining the correct capacity of the solar system. Please feel free to contact us at our Toll Free Number 1-800-233-2309, Telephone +91-9879106443, +91-79-27471197.

HOW MUCH SPACE DOES A SOLAR SYSTEM USE?

The typical solar system needs approximately 10 Sq. Mtrs. Or 100 Sq. Feet per KW installed. However, exact space can only be ascertained after inspection of site and shadow analysis of the site.

CAN CONSUMER GET THE CLEAN DEVELOPMENT MECHANISM (CDM) CARBON CREDIT/CARBON EMISSION REDUCTION OR RENEWABLE ENERGY CERTIFICATES (REC) BENEFITS?

Yes, as per the Gujarat Solar Power Policy the consumer will be eligible for CDM benefits. For e.g. 1 kWh of Solar energy reduces 0.5 Kg of CO² e (Carbon dioxide equivalent), as Carbon credit or Carbon emission reduction.

The REC benefits will be applicable to the DISCOM to meet their Renewable Purchase Obligations (RPO). Consumer cannot get this benefit.

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