Solar FAQs

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Is Solar for me?

Absolutely! Solar is for everyone. Whether you are a residential solar, commercial or industrial consumer, a smart city developer or a public utility service provider, you can use solar in a variety of ways and save big on your electricity bills year after year, for a lifetime. In addition, if you are a rural consumer or situated at a remote location, solar is the most economical solution to fulfil your electricity needs. The cities and villages can use solar for public areas and buildings.

By using Solar PV power, you also stabilize your existing electricity supply as well as reduce your dependence on more expensive sources of power like Diesel Generators and Inverters. You can install Solar systems at a variety of places - on ground, rooftops, elevated structures, walls, roads, canal tops, etc.

Residential Solar

Independent house or Farm House	Housing society	Independent house in housing society

Commercial Solar

Malls, Shopping complexes, Business centers		Petrol pumps, gas stations	Toll plazas, highways
Hoardings, Billboards	Telecom Companies	Corporate Offices	Independent shops
Golf course, Clubs, Sports complex, Stadium		Hospitals, Diagnostic Centers	Hotels, Banquet halls, Restraunts, Resorts

Industrial Solar

Small sized Industries	Medium sized Industries	Large sized Industries

Institutional Govt/ PSUs

Schools, Colleges, Universities		Aashrams, Yoga Centres, Religious Institutes	R&D centres, Laboratories
Armed forces, Paramilitary forces		Municipal corporations, Smart Cities	Police Head Quarter, stations, Police lines
Railways, Metro	Airports	Government buildings	Bus stand, bus stops
Gas plant (PNG, LPG)		Agriculture	Utilities

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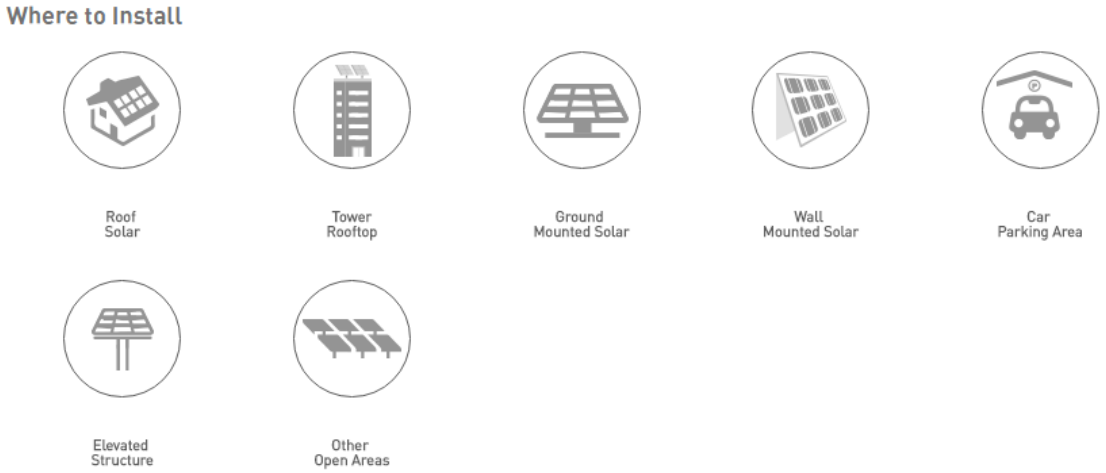

Which type of solar system is right for me?

- "My factory or school is closed over weekends."
- "My home is locked during daytime. My daytime electricity consumption is very less."
- "We switch off ACs during the day to save on electricity bills."
- "I have a 4 hours power-cut during the day."

Well, each user has a different electricity load profile. The good news is that your solar system can be customized depending on your electricity load profile, energy consumption pattern and requirements.

The Solar PV systems can be broadly categorised as: On-grid systems, which are connected to the main electrical supply in your building; Off-grid systems, which are completely off the grid (not connected to your main electrical supply) and Solar PV hybrid systems.

On-Grid System

There are two ways in which an on-grid system can be configured:

- Solar system is solely connected to the main electrical supply
- In addition to the main electrical supply, Solar system can also be connected to other power sources like batteries.

Hybrid Solar PV System

The solar PV system combined with another power generating source is called Hybrid Solar PV system. The most commonly used hybrid system is Solar PV with DG and Grid electricity. You can also include a battery bank, which can be used when solar is not generating enough power. Solar PV hybrid system with battery backup is the most suitable option for remote locations such as rural area, mining sector and island etc. where grid supply is either poor or not available. Also, transportation of diesel to remote locations and its storage is very expensive.

Off Grid Solar System

Off grid Solar system is a battery-backed system and does not need to be connected to your electrical supply. This system is commonly used for backup power which may be used for running the loads in non-sunny hours e.g. powering traffic signals & streetlights, billboards, backup power for houses, pumps, etc. in cities and remote rural locations that have either fluctuating grid connectivity or do not have access to grid electricity.

The design of your Solar PV system depends on the availability of electricity, power quality, electricity tariff and your energy consumption pattern.

If you have grid connectivity, we recommend on-grid systems because they can more economically meet your energy requirements and provide flexibility of using a grid-hybrid system also. By using grid-hybrid systems, you can even store solar energy generated during the day for your night-time loads. If you need to choose Solar PV systems for schools, colleges, etc. which are closed on weekends, you can use net-metering mechanism to feed-in the extra power to the grid thereby avoiding any loss of solar power generated.

If you don't have grid supply or have a poor (fluctuating) voltage, you may consider an off-grid system. This system is more expensive than an on-grid system because of the additional installation and maintenance cost of batteries.

What is a Solar PV System and how does it work?

PV, short for Photovoltaic, derives its name from the process of converting light ('photo') directly into electricity ('voltaic'). Simply put, a Solar PV system is a power station that generates electricity from sunlight.

The main components of a Solar PV system are:

- **Solar Panels or Modules:** Solar panels consist of a group of small cells made from semiconductor material. When the sun's light falls on the modules, it excites the electrons, thereby creating direct current (DC).
- **Solar Inverter:** The DC electricity goes into an inverter that converts it into alternating current (AC). We use AC for running our household or office or factory equipment.
- **Storage Battery (optional):** The best use of solar energy is to consume it while it is being generated. If the requirement is to store this power and consume it in the non-sunny hours, then solar energy can be stored in batteries for later consumption.

Does a Solar PV system produce same energy output throughout the day?

Since Solar PV works on the basis of the intensity of sunlight it gets, your solar system typically wakes up at around 6am in the morning and goes to sleep at about 6 or 7pm in the evening. The energy output increases gradually and peaks at around noon and then gradually decreases as the Sun starts setting. But since the solar energy produced integrates either with your existing electrical connection or with your batteries, the running of your electrical equipment is not impacted. Moreover, if your Solar PV system is designed well, all your electrical equipment is totally safe.

What are my savings with Solar?

Solar power is cheaper than grid power for a lot of consumer categories across India. Electricity tariffs for consumers in the middle to high consumption categories are very high in India. Also, these tariffs keep increasing every year. This means, if your current tariff in the highest slab is Rs 6.5/kWh and it increases @5% per annum, you will be paying Rs 25/kWh in 2040.

Whereas, by choosing to go solar today, you are actually locking in a fixed electricity tariff for the next 25 years or more. Moreover, since your electricity tariff is slab-based, your savings are high because solar power displaces the most expensive electricity that you consume. By going Solar, you can expect 20-60% savings on your electricity bill depending on your system size, electricity tariff, location, etc.

What factors are important to consider when planning to go solar?

When planning to go solar, it is important to consider:

- How much of your energy needs can you meet with solar?
- How much can you save by going solar?
- Do you have enough shadow-free space (land or roof)?
- How much do you want to invest in your solar PV system?

Every Solar PV system is customized based on your site conditions. Therefore, you need a fair assessment of your energy requirements, site conditions and the solar energy generation potential at your site which would directly impact your savings.

Can solar be my sole energy source?

Technically speaking, yes, if batteries are used. But practically, if grid power is available, then it is recommended to use solar in combination with grid. Solar PV can be integrated with your existing power sources (like grid power, inverter, diesel generator, etc.) in such a manner that the first priority is automatically always given to the solar power to be consumed first. However, if you are using Solar PV for night time usage or in a remote location, it is quite common to have Solar systems which are battery-backed.

What is the life and reliability of a Solar PV System?

Solar PV is a highly proven and reliable technology and have been in use since 1950s. A PV system that is designed, installed, and maintained well will operate for 25 years or even more than 25 years. The Inverters, which are an integral part of a Solar PV system, may need a replacement once in the 25 years lifetime of the system. Moreover, since there are no moving parts (unless you are using tracking devices to move modules tilt with the movement of the Sun), there is practically negligible wear and tear.

What is net metering?

Net metering allows you to sell excess (unconsumed) solar power back to the grid. For example, if on a given day you generated 20 units from solar and consumed only 18 units, the balance 2 units will be sold back to the grid. This ensures that you maximize your savings from solar

Is my roof suitable for solar?

Well, most of the building roofs in India are suitable for solar. In case the building is too old, it is advisable to get an expert opinion before going with a solar system. In India, generally, the roofs are flat. But we do have sloping roofs too in many parts of our country. The good news is that solar panels can be easily installed on sloping roofs also.

You can do a quick check to ascertain the suitability of your roof for solar. Roof orientation, shading objects and the condition of the roof play a major role in this check.

Age of Roof

Most of the building roofs are suitable for installation of Solar PV systems provided there is no major structural damage to the roof. The life of Solar PV systems is about 25 years. Solar PV systems weigh about 10 to 22 kg per sq meter, which is not a very heavy load and most buildings are designed for much heavier loads. Systems with aluminium structures weigh less in comparison to systems having steel structures, but they cost a little more.

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Space Requirement

It is a common question - "How much space will it require?"
Answer to this is quite simple and straight forward - It depends upon your system size as well as the solar panel efficiency. Typically, 10~12 square meter (100 to 120 square feet) per kilo Watt shadow free area is required for solar PV system.

Type of roof

Solar PV system is versatile enough to be easily installed on any type of roof (flat or sloped) made of materials like RCC, wood, cement tiles and fibre / metallic /cement sheets etc. However, if the roof is sloped, roof orientation and tilt angle must be checked. Solar panels will perform the best if their tilt angle is kept at latitude of the location i.e. between 25 to 36 degrees in Northern part, 20 to 25 degrees in central part and 8 to 20 degrees in southern part of India.

Orientation of the Roof

For flat roofs, it does not matter as your solar panels can always be put-up in the most optimum direction. For sloping roofs, south facing slope is the best for Solar PV systems, but south-east and south-west facing roofs are also good enough to generate solar though a bit less.

Shading Objects on Roof and nearby

To get adequate power generation or efficiency from Solar PV system, it is important to install solar panels at a location where the sunlight falls for whole day. High shading objects such as water tank, air Cooling system, lightening arresters, chimneys, antennae, nearby buildings, trees, etc. impact the power generation to some extent.

So, a thorough assessment of your roof is important for a safe, optimum and reliable Solar PV system that will perform at its peak for the next 25 years and even more.

For a Site Assessment by professionals equipped with advanced technical tools, Contact Us now.

Guarantees, Warranties and Insurance:

In case of Solar PV systems, the solar panel and most other equipment manufacturers offer guarantees and warranties. Before finalizing/signing the purchase contract with the solar installer, you should ensure to check the warranty and guarantee terms of Solar PV components and system. Some of them are mentioned below:

Solar PV Panels

- 10 years of product warranty against defect on materials and workmanship
- **Performance Guarantee** of 25 years. In most of the cases, this guarantee is for 10 years at 90% of rated peak power output and for 25 years at 80% of rated peak power output. Peak power output is the nameplate capacity of a Solar PV panel.

Solar PV panels degradation trend

Degradation of solar PV panel should not be above 2.0% for first year, 8.0% for next 11 years and should not be above 9.0% linear for 13 years to follow thereafter.

Inverter

Typically inverter warranties last for 5 years; however installer or manufacturer may give extended warranties for a period of 20 years though for a fee.

Mounting Systems

Generally suppliers provide 5 to 10 years product warranty against any manufacturing defect.

Solar PV System Warranty

Installers give you workmanship warranty for a period of 1~2 years or even more in some cases. It includes repair/replacement against manufacturing defects and engineering defects.

Plant performance guarantee

Generally Installers provide plant performance guarantee for a predetermined period of at least 1 to 2 years or even more in some cases. Plant performance percentage value should be pre-determined and mentioned in the purchase contract agreement. In addition, you may ask for additional guarantees like Liquidated Damages for delay in execution or poor performance, etc.

System Insurance

Most insurance companies now offer insurance products for Solar PV systems. Typically, the premium amount for a policy that covers fire & burglary of the system would be approximately 0.75% of sum insured/ capital cost. For example, if you have a 1 kWp solar PV system which costs approx. Rs. 65,000/-, your payable annual insurance premium will be approximately Rs. 487.50 under Fire & Burglary coverage. However, it is recommended that you take quotes from multiple insurance companies before you choose one.

Subsidies and Incentives

Several incentives are available for rooftop solar PV plants in India. The specifics of the incentives could vary from one state to another. These incentives broadly fall under the following categories:

- Accelerated Depreciation (For companies)
- Capital Subsidy
- Priority Sector Lending
- Net-metering

There may be more incentives made available which may vary from state to state.

Accelerated Depreciation (AD)

Accelerated depreciation is an accounting method of depreciation per the Income Tax Act of 1961 under which greater deductions can be taken in the earlier years of the life of certain types of assets than in the later years. In order to promote solar, AD has been allowed for solar PV. For a normal asset yearly depreciation of 15% is allowed on plant and machinery. However for solar PV systems, 80% of the system cost can be depreciated in the first year itself. This can provide significant savings to tax paying Companies that own solar PV systems.

Capital Subsidy

The Solar PV system costs have dropped significantly and today, they don't need subsidy support for financial viability. However, in some cases, Government of India, through Ministry of New and Renewable Energy and its state-wise nodal agencies, provides a capital subsidy for the investments in solar power systems.

CFA (Central Financial Assistance) is a subsidy being offered to residential, institutional, governmental and social sector users that differs from state to state

- General category states & Union Territories – 30% subsidy on the system cost
- Special category states i.e. NE, Sikkim, Uttarakhand, HP, J&K, Lakshadweep, A&N Islands - 70% subsidy on the system cost
- The policy mandates the use of 'Made in India' components to be eligible to receive CFA

Priority Sector Lending

Reserve Bank of India (RBI) has notified solar as a sector that is eligible for priority sector lending. This scheme includes bank loans to individuals of upto10 lacs and to other developers of upto Rs. 15 crs at lower interest rates. Individuals can also avail this loan as a part of their existing home loan or as a fresh home improvement loan.

Other incentives include:

- Custom Duty concessions and Excise Duty Exemptions on solar equipment
- 10 year Tax holiday on solar projects for Companies
- Contact Us to know which incentives and subsidies are applicable for You

Permits and Approvals

Permit is usually not required for off-grid systems and on-grid systems installed for captive consumption. You should take care in choosing experienced installer to install the system as per best practices.

For on-grid systems, if you choose to go for net metering or gross metering, certain approvals are required. These approvals usually vary from state to state and based on the type and system size.

Typical required permits and approvals are given below:

- Interconnection permission from your power distribution agency (DISCOM).
- CEIG's (Chief Electrical Inspector to the Government of state) permission (pre & post-installation) as applicable. Generally it is required for systems of 10 kW and above.

Permission and Approval process for grid connected system under Net or Gross metering mechanism:

- Submission of application to your local distribution company with details of rooftop project planned along with the required permit fee.
- The distribution company will conduct a feasibility analysis of the rooftop solar PV project. Based on the report, Distribution Company will approve or reject the proposal.
- After receiving the approval from the distribution company ("DISCOM"), an application for registration of the rooftop project is to be submitted to the DISCOM.
- An interconnection agreement is also to be executed between the project owner and DISCOM.