

# GROUND MOUNT

## Frequently Asked Questions

### Q• HOW MUCH LAND IS REQUIRED TO SETUP A 1MW SOLAR POWER GENERATION UNIT?

=> • The land required for a 1 MW power plant setup is around 4.5-5 acres for crystalline technology and around 6.5-7.5 acres for Thin-Film technology. This is only a rough benchmark and may vary based on technology and efficiency of panels.

### Q• WHAT IS THE LIFE-TIME OF A TYPICAL SOLAR POWER PLANT?

=> • The useful life of a typical Solar Power plant is considered to be 25 years. This is the duration for which long-term PPAs are signed and financial models are built.

• However, Solar Power plants can run beyond 25 years while producing a lower output. Many Solar Panel manufacturers guarantee an output of 90% at the end of 10 years and 80% at the end of 25 years.

### Q• WHAT IS THE ANNUAL ENERGY GENERATED FROM A 1 MW SOLAR POWER PLANT?

=> • The usual benchmark for energy generated from a 1 MW Solar Power plant is considered as 1.5 Million units. This is only a benchmark and should not be considered as the actual output for a given location. The amount of actual energy generated from a Solar Power Plant in an year depends on both internal and external factors. External factors which are beyond the control of a Solar developer can include the following:

- Number of sunny days
- Solar Irradiation
- Day Temperatures
- Air Mass

The output also depends on the following internal factors all of which are within the control of a Solar Developer:

- Plant Location
- Usage of Solar Tracking systems
- Quality of equipment used
- Workmanship of the EPC contractor
- O&M activities

### Q• WHAT ARE THE VARIOUS MODES UNDER WHICH WE CAN SETUP A SOLAR POWER PLANT?

=> The various modes under which a Solar Power plant can be setup depends on the specific requirement. All the following are valid modes and the costs for each kind of system varies based on various factors:

- Off-Grid Captive Consumption for domestic premises
- Off-Grid Captive Consumption for commercial premises
- Grid Connected (Net Metered) Captive Consumption for domestic premises
- Grid Connected (Net Metered) Captive Consumption for commercial premises
- Sale of Power generated to local Distribution Company (DISCOM)
- Sale of Power generated to 3rd Party consumer (Industry or Commercial entity)

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### **Q• WHAT IS THE COST OF SETTING UP A ROOFTOP SOLAR POWER PLANT FOR DOMESTIC OR COMMERCIAL USE ?**

=> • The various modes under which a Solar Power plant can be setup depends on the specific requirement. All the following are valid modes and the costs for each kind of system varies based on various factors:

### **Q• WHAT SIZE SOLAR POWER PLANT IS REQUIRED FOR DOMESTIC OR COMMERCIAL USE?**

=> Identifying the Solar Power plant size for your domestic or commercial premises depends on the following factors:

- Wattage of appliances to be run on Solar
- Monthly energy consumption from these appliances
- Energy Backup or Days of Autonomy required
- Roof space available for plant setup

Based on these factors, the power plant sizing can be accordingly done at your end.

### **Q• WHAT PERMISSIONS/CLEARANCES ARE REQUIRED TO SETUP A SOLAR PV PLANT?**

=> A certain set of permissions need to be obtained and documents need to be submitted in order to setup a Solar PV plant. While these may vary from state-to-state, in order to get a Solar PV Project Accredited by all State Load Dispatch Center (SLDC), the following are the statutory clearances and environmental clearances to be furnished:

- 1. Industrial Clearance
- 2. Land conversion (Agricultural to Non-Agricultural)
- 3. Environmental Clearance Certificate from PCB of respective state agency
- 4. Contract labour license from state Labour Department
- 5. Fire Safety certificate from state Fire Department
- 6. Latest tax receipt from the Municipal/Gram Panchayat for the factory land.
- 7. Auditor compliance certificate regarding fossil fuel utilization
- 8. Approval from Chief Electrical Inspector
- 9. Clearance from Forest department

Also, all necessary approvals/agreements before start of Solar PV project construction are to be furnished as and when necessary. These include the following:

- 10. Land purchase
- 11. Power Evacuation arrangement permission letter from DISCOM
- 12. Confirmation of Metering Arrangement and location
- 13. ABT meter type, Manufacture, Model, Serial No. details for Energy Metering.
- 14. Copy of PPA (important as Preferential PPA projects are not eligible for REC mechanism)
- 15. Proposed Model and make of plant equipment
- 16. Undertaking for compliance with the usage of fossil fuel criteria as specified by MNRE
- 17. Details of Connectivity with DISCOM

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- 18. Connectivity Diagram and Single Line Diagram of Plant
- 19. Details of pending court cases with APERC, Supreme
- 20. Court of India or any other state courts
- 21. Any other documents requested by SLDC

While these are the documents that SLDC requires for project accreditation, these are typically the clearances/documents required in general for a Solar PV project.

### **Q• •CAN SOLAR POWER DEVELOPERS AVAIL LOANS FROM BANKS FOR SOLAR POWER PLANT SETUP? WHAT IS THE LOAN % AND WHAT CRITERIA DOES A BANK/LENDING INSTITUTION LOOK FOR?**

=> The various modes under which a Solar Power plant can be setup depends on the specific requirement. All the following are valid modes and the costs for each kind of system varies based on various factors.

### **Q• SETUP COSTS AND POWER SALE TARIFF**

=> Total project cost per MW would be in the range of Rs.5.5 Crores-Rs.6 Crores depending on the kind of technology you are using, whether or not you are using tracking systems, the kind of EPC Contractor you choose for power plant system etc. CERC recently announced the benchmark tariff for setup of Solar PV and Thermal Plants in India.

### **Q• WHAT WOULD BE THE O & M COST?**

=> Central Electricity Regulatory Commission (CERC) benchmark costs for O&M is Rs.4.63 lakhs/year/MW for 2017-18 with a 5.00% increase every year. This varies from project to project based on the number of people you employ for maintenance, frequency of cleaning of panels, onsite-engineer availability etc.

### **Q• WHAT WOULD BE THE PER UNIT EXPECTED SALE PRICE?**

=> This depends on the mode of sale of power and the consumer of power. In the case of sale of power to DISCOM, the prevailing Average Pooled Power Purchase Cost (APPC) will be applicable.

In the case of sale of power to 3rd Party consumer, a mutually agreed price can be agreed upon and accordingly a PPA can be signed.

It is to be kept in mind that several additional charges such as Wheeling Charges, Distribution Charges, Open-Access Charges, Cross-Subsidy Charges are applicable in the case of sale of power to 3rd party. These charges vary from State-to-State and DISCOM-to-DISCOM and even based on voltage levels.

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### Q• RECS AND CARBON CREDITS (CERS)

=> Solar Power Plants need to be Grid-Connected on order to avail REC benefits. Though there have been recommendations on multiple occasions that Off-Grid Solar Power plants be made eligible for RECs, the proposal is still under discussion. Solar Power plants setup under the following 3 modes are eligible for REC benefits:

- Power plants
- Sale of power to Govt. at APPC
- Sale of power to 3rd party at mutually agreed price

Captive Power Plants are eligible for RECs subject to the condition that Concessional/Promotional Transmission or Wheeling Tariffs and/or banking facility benefit are not availed. Also, Solar Power plants setup under Preferential Tariff schemes are not eligible for RECs. Check out more information on RECs

### Q• CAN CDM BENEFITS (CARBON CREDITS) BE AVAILED FOR A SOLAR POWER PLANT?

=> • Yes. REC Mechanism and CDM are mutually exclusive and hence a power developer can claim CDM benefits (Carbon Credits) also. However, it is to be noted that the current trading prices of Carbon Credits or Certified Emission Reductions (CERs) at the European ETS system is less than 0.7 Euro which are pretty low compared to the 15-20 Euro trading prices a few years back. At these prices, getting a Solar project registered under CDM mechanism does not make any sense as the payback for the expenses in the process itself takes several years. Unless the Solar Power Plant is of size 10 MW or more it does not make financial sense to go for Carbon Credits (CERs).

### Q• BENEFITS FOR SOLAR POWER PLANTS, WHAT KIND OF CENTRAL/STATE BENEFITS ARE AVAILABLE FOR SOLAR POWER PLANT SETUP?

=> Solar plants can be categorized into 2 broad categories – Grid Connected and Off-Grid plants. The usual Govt. support available for an Off-Grid plant is a Capital Subsidy of 30% on the project cost upto a maximum size of 500 KW. This can be claimed by the Manufacturer/Supplier/EPC Contractor (should be an MNRE accredited supplier) on behalf of the customer. Subsidy is not available for Grid Connected plants that engage in sale of power either to the local DISCOM or a 3rd party. Following are the benefits a Solar Power Developer involved in Sale of Power Generated can avail:

- Accelerated Depreciation – Upto 90% of asset value with 80% depreciation allowed in the first three year.
- 10 years Tax Holiday – Tax holiday can be availed for 10 years during which time Minimum Alternate Tax is still applicable (19.9305%) which can be offset against tax payable later.
- Other State specific exemptions which vary from state to state.

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### **Q• CAN ACCELERATED DEPRECIATION BENEFITS BE CLAIMED BY SOLAR POWER DEVELOPERS?**

=> • Yes. Accelerated Depreciation benefits can be claimed by Off-Grid and Grid-Connected Solar Power Developers in order to offset taxes on profits from their connected businesses. Typically, 90% depreciation is allowed with 80% allowed in the first three year.

### **Q• •SETTING UP SOLAR POWER PLANT IN INDIA ?**

=> •The setting up of solar power plants is monitored by respective state renewable agency laws and will depend upon the various regularions issued by MNRE from time to time.r