Ministry of Micro, Small and Medium Enterprises, Government of India

WRI INDIA

FAQs

SETTING UP OF ROOF TOP SOLAR SYSTEM FOR MSMEs IN HARYANA

Compiled by MSME Development Institute, Karnal with the support of WRI, India and RESCO companies

1. What is a Rooftop Solar System?

Rooftop solar system uses solar panels with small solar photo voltaic (SPV) system mounted on the rooftop of a residential, institutional or commercial building. The DC power generated from these solar panels is converted to AC power using power conditioning unit/inverter and is fed to the grid or is used directly.

Though the generation of electricity depends on various factors such as project location, module cleanliness etc. However, as a rule of thumb up to 4.5 kWh per day can be generated by a 1kW system. Hence, a 25 kW system will generate about 110 kWh per day and about 40,000 units per year.

2. How much area is required for the installation of a 100 KW Rooftop Solar?

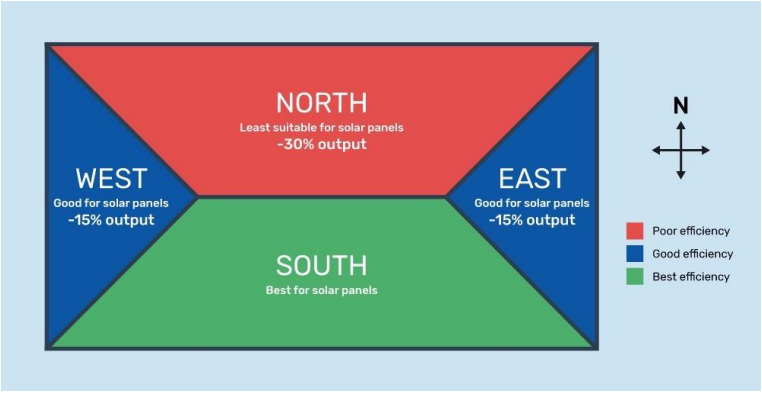
1 kW rooftop system generally requires 10 sq. meters of shadow-free area. However, the actual area requirement may vary depending on the efficiency of solar module and their placement etc.

3. Do we need to have a battery backup for our solar installation?

This varies from location to location. Generally, for an industry that operates during the daytime, there may not be a need for a battery backup if the rooftop solar system is grid connected. However, based on the industry's consumption pattern, clean energy goals and cost sensitivity; the need for storage system can be decided.

4. If my factory shed is in East-West direction, what will be the efficiency of the solar panel? Is it necessary to have panel facing south direction?

Although the best results of solar installation achieved is south direction, but it is not necessary that panels should be facing south only Solar panel can be installed at the East-West and other directions as well. Though, there may be reduction in energy conversion/generation.



The graphic shows ballpark figures for the output losses experienced by pointing your panels in a direction other than south. Source: Solar Reviews

Apart from the orientation of the panel, the shadow on the panel also reduces the energy output. The partial shadow result in 5-25% loss in the energy yield.

5. Which is the best technology for solar rooftops and companies that are supplying these products?

Solar rooftops are available in different technologies such as crystalline silicon, thin film silicon, CIGS, CdTe, HIT, etc. Crystalline Silicon Solar PV panels are most commonly used in the solar rooftop system. Multiple panels are connected together to form arrays as per the desired capacity of the system.

In addition to solar rooftop system, it is important to look at balance of plant/support utilities. Such as Inverter, the new generation invertors features a power optimizer integrated into each solar panel, replacing the solar junction box and maximizing energy output from each module in the array through maximum power point tracking.

6. If the roof top is of AC sheets, can we install solar?

Generally, it is not recommended to install solar rooftop system on asbestos or cement sheets as the weight bearing capacity is less than metal sheets. Further, the life of an AC sheet is 15 years approximately, while the life of a solar panel is 25 years.

7. What is the life of solar panels? Does efficiency of solar panels reduce with passing of time?

The life of a solar panel is about 25 years. Research shows that within the first year, the panels decrease their outputs by 3% and subsequently 0.5% each year there after.

8. What are the financial models for setting up of a Rooftop Solar?

CAPEX Model: In this model the system is owned by the consumer (MSMEs)They bear the cost and gain from the installation of the system. CAPEX is the most common form of solar power plant business model in India.

RESCO (Renewable energy service company) Model: In this model, the entire system is owned by a 3rd party (RESCO) who is the project developer. No investment is needed from the user (MSME). The consumer only purchases the generated energy by paying the agreed tariff as per the Power Purchase Agreement (PPA). There is a minimum guarantee for power off take. Responsibility of O&M for the system lifetime (25 years) is also with the developer.

9. What are the details of the RESCO Model?

- The contract is signed between RESCO (which is making the investment) &User Company (MSME) for 25 years.
- After 25 years; the solar installation becomes the property of MSME.
- If the MSME wants to terminate the contract before 25 years, the MSME must pay the depreciated value of the roof top solar to the RESCO. The depreciated value after each year is decided as per the contract.
- If the contract is for 10 years or 15 years, the cost of electricity per unit increases. For example, cost of one unit may increase from Rs. 4.00/Rs. 4.50 in case of 20 years contract to Rs. 5/ Rs. 5.50.

10. What is the minimum size of solar installation under the RESCO model?

The minimum size of the solar installation varies for different vendors. MNRE and HAREDA has compiled a list of empanelled suppliers of solar PV system.

11. If my factory is very small i.e 250Sq.M., can I go for solar installation with other units (cluster form)under RESCO Model? If yes, which company allows such kind of arrangements?

1 kW needs around 10 sq m. Hence an installation of 15-20 kW can be planned for over 250 sq m roof space. However this also depends on the roof structure, orientation, shadow etc. As per the MNRE guidelines, the approx. cost will be 10-12 lacs on capex model excluding the documentation charges.

In addition, the allowed size of the rooftop solar system also depends on the regulations and rules mandated by the respective State Electricity Regulatory Commission (SERC) and Discom.

There are solar vendors working on small projects as well. MNRE has developed a portal for calculating the possible size, approx. cost, and possible cost saving.
https://solarrooftop.gov.in/rooftop_calculator

12. Who will do the maintenance of solar installation under RESCO model?

Responsibility of O&M for the system lifetime (25 years) is with the developer/RESCO.

13. What is the approximate cost of electricity per unit under RESCO model?

Rs 4-6/Unit depending on the project size and duration of PPA.

14. How are charges implied under the RESCO Model? Is it based on consumption/usages or on production?

RESCO will charge based on consumption.

15. What is the CAPEX model and what are the benefits of this model?

In the CAPEX model, the whole investment is made by MSME units. There are few organizations which provide loans for solar installations.

The CAPEX model provides you accelerated depreciation of 40 % each year, so the whole cost of Rooftop installation depreciates in 3 years. Most industries like the CAPEX model because of this feature, specifically if the size of the plant is less than 100 kWp.

16. What is the kind of support one gets from the Government of India (MNRE or other departments) for roof top installation?

Information on state subsidies can be seen on the website of the concerned electricity distribution company. The rooftop solar portals of electricity distribution companies can be assessed at:
https://solarrooftop.gov.in/grid_others/discomPortalLink
https://esolarconn.dhbvn.org.in/

17. Isnet metering is allowed in Haryana? if yes, what are the conditions?

Yes, net metering is allowed in Haryana. The details of terms and conditions can be found on Haryana electricity regulatory commission website. Few important points are summarized below:

1. The cumulative capacity of the Rooftop Solar System at a particular distribution transformer should be allowed up to 100% of its distribution transformer capacity in line with the Govt. of India instruction.
2. The maximum rated capacity of rooftop solar system, to be installed by any eligible consumer in his premises, shall not exceed its connected load/sanctioned load in case of Low-Tension connection and contract demand in case of High-Tension connection. Provided that net metering to the consumer shall be allowed for the loads up to 500 kW or up to sanctioned load/contracted demand, whichever is lower and in case of gross metering for the loads up to sanctioned load/contracted demand of the eligible consumer. Provided further that minimum rated capacity of rooftop solar system that can be set up under net metering/gross metering arrangement shall not be less than 1 kW. Provided also that a variation in the rated capacity of the system within a range of

five percent shall be allowed with reference to the capacity caps given above Provided also that distribution licensee shall accept SPV Power as per useful life of SPV System.

3. Electricity generated from a rooftop solar system shall be cumulatively capped at 90% of the electricity consumption by the consumer at the end of settlement period which shall be the relevant financial year.

18. What are the net metering rates and time of credit from DISCOM?

For details, please visit the websites mentioned:
https://esolarconn.dhbvn.org.in , https://solarconnection.uhbvn.org.in

19. What kind of support is provided by the Government of Haryana for installation of roof top for industries?

Under HEEP-2020 scheme, there is provision of interest subsidy on term loan to the tune of 5% (maximum up to INR 5 lakhs per year) for three years for adoption of renewable energy technologies like rooftop solar.
Although notification of the scheme is yet to be done. For details, visit the website https://haryanaindustries.gov.in

20. Who will do the maintenance in CAPEX model?

For the initial 1-3 years, Solar EPC (engineering, procurement, and construction) company takes care of the maintenance. Later they provide an AMC for maintenance of rooftop solar system.

21. What are the pros and cons of capex and RESCO models?

	Capex Model	RESCO Model
Ownership	Industry/MSME unit owns the asset	RESCO company owns the asset till the agreement duration
Investment	Investment by MSME unit/industry, however they can take loans at competitive prices	Zero upfront investment by the customer.
Tax Benefits	Customer can claim tax benefit through accelerated depreciation	No tax benefit
Monetary Saving	Through savings on units notconsumed from the grid; andexcess generated electricity exported to the grid	Per unit cost Rs 4-6/Unit depending credit rating , tenure of project, size of project etc.
O&M	For the first 1-2 years, EPC manage the Q&M, post that industry can pay for AMC	RESCOs bear O&M cost

22. Do banks provide funding/loans?

Yes, there are several banks and non-banking institute providing loans at competitive rate of interest. Such as the Suprabha Scheme by the State Bank of India, where It is collateral free up to Rs. 50 lakhs.

Other Banks: Bank of Baroda, Union Bank, PNB, etc. and private sector banks, such as HDFC, Yes Bank, and Kotak Mahindra Bank.

NBFCs :
https://www.sunvestcapital.com/
https://www.efl.co.in/

SIDBI – Tata Power

23. What are the terms & conditions of the NBFCs on providing loan for solar rooftop system?

Terms and conditions of each NBFC varies from customer to customer based on the credit rating system.

24. What are the general Terms &Conditions and documents required for getting credit for CAPEX and RESCO model?

This can vary from one institution to another. The general T&C for the SBI rooftop solar program can be found here - https://www.suprabha.org/sbi-rooftop-solar-product.html

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