



Company Identity Number[CIN]:- **U40109KA2004SGC035177**

Guidelines for installation of Grid connected Solar Roof Top Photovoltaic (SRTPV) System

This document describes the general conditions and technical requirements for connecting Solar Rooftop Photovoltaic (SRTPV) system to CESC, Mysuru grid in accordance with the provisions provided by Indian Electricity Act 2003, Karnataka Solar policy 2014-21 dated: 22.05.2014 & its amendments, the KERC (Implementation of Solar Rooftop Photovoltaic Power Plants) Regulations, 2016 and Tariff orders issued by KERC as amended from time to time and distribution code approved by KERC.

Procedure for installation and commissioning the SRTPV system

1. Registration of Application:

- Applications can be submitted from **1kWp to upto 2000kWp** provided that capacity of proposed SRTPV system does not exceed the sanctioned load of the installation of the consumer.
- The application can be downloaded from CESC, MYSORE website (<https://cescmysore.karnataka.gov.in>) i.e. **Format-1**.
- An applicant shall submit the application along with necessary documents to concerned O&M sub-division, CESC, Mysuru by paying the prescribed fees.
- The fee details are as follows:

Sl.No.	Capacity	Registration fee	Facilitation fee
1.	>1 kWp upto 5 kWp	Rs.500/-	Rs.1000/-
2.	> 5kWp upto 50kWp	Rs.1000/-	Rs.2000/-
3.	> 50 kWp upto 2000 kWp.	Rs.2000/-	Rs.5000/-

Note: In case of cancellation of the Application, the application fee and facilitation fee are non-refundable.

- If the applicant is not the owner of the property or authorized person and the property is in the name of the Company, Trust, Co-operatives /partnership firms, then authorization shall be assigned to a person for correspondence, paperwork, execution of agreements, etc. in the **Format-1A**. Such person must be authorized by the management of the organization.
- In case of partnership firms, the authorized signatory must be one of the partners, to whom written consent has been given by the other partners in the **Format-1B**.
- If the consumer has availed MNRE Subsidy, sanctioned copy of **MNRE Subsidy** shall be submitted at the time of application.

- viii. The applicant shall furnish the self-certification in the **Format - 1C**, if he is not availed MNRE Subsidy.
2. The Sub-Divisional Officer (SDO) shall be **Nodal point of contact** for solar RTPV system.
3. Separate Application Register shall be maintained at sub-divisional office for Solar Rooftop installations as prescribed in the **Format-2**.
4. After registration, application shall be forwarded to Revenue Section for verification. SA/AAO of the SD shall furnish the details such as Name, RR No., sanctioned load, tariff, arrears if any, etc in the **Format-3** as **Revenue Report**.
5. a) After verification by Revenue section, the application shall be forwarded to concerned Section Office (**for capacity upto 49kWp**) for spot inspection and the concerned Section Officer shall inspect the spot & submit the **technical feasibility report** in the **Format - 4**.
b) The SDO shall inspect the spot and submit **Technical feasibility report** i.e. **Format - 4** for capacity **50kWp & above upto 2000 kWp**.

Note: Following shall be verified while furnishing the Technical Feasibility report.

- i. SRTPV plant of **less than 50kW capacity** shall be connected only to the existing Distribution transformer through which the eligible consumers are being supplied electricity as per KERC (Implementation of Solar Rooftop Photovoltaic Power Plants) Regulations, 2016, Clause 6 (1) (e).

In such cases the total capacity of the existing and proposed SRTPV plants on that distribution transformer shall not exceed 80% of the rated capacity of Distribution Transformer.

Example: If the rated capacity of the distribution transformer is 100 kVA, the total allowable capacity of the SRTPV plants to be connected shall be 68kW (80 kVA)

- ii. SRTPV plant of **more than 50kW capacity** shall be connected only to the existing 11 kV Distribution System.

In such cases the total capacity of the existing and proposed SRTPV plants shall be limited to the line current and it does not exceed 80% of the rated current carrying capacity of that line.

- iii. In case, the proposed capacity of the SRTPV system is higher than the sanctioned load of the consumer, it consequently requires an up-gradation in the infrastructure (service line, meter with CT (if required), transformer upgrading (if required)), the consumer will have to upgrade at his/ her/ its own cost.

6. The Sub-divisional officer (SDO)/DO shall verify the Technical feasibility Report of the installation and if the application is technically feasible, shall issue the **intimation letter** i.e. **Format-5** for execution the Power Purchase Agreement within 5 days from the date of intimation letter.

If the application is not technically feasible, the SDO shall cancel the application and intimate the same to the Applicant.

Example: If the applicant desires to install 50kWp SRTPV system on the existing transformer of capacity 100 KVA having existing/proposed load of 60 kWp, the total capacity on the DTC is 110kWp, which is greater than the 80% of the DTC capacity(80% of 100kVA = 80kVA (68kW). Hence, the application is technically not feasible.

However, if the applicant desires to install SRTPV System, he can avail SRTPV system for partial capacity of 8 kW only (for total 80% i.e. 68 kW/80 KVA) as against newly proposed capacity of 50kWp.

7. A) **For capacity from 1kWp to 499 kWp** : The SDO/DO shall execute the PPA with the Applicant on non-judicial Rs.200/- stamp paper in the KERC approved format.

The SDO/DO shall issue the **Approval letter i.e. Format-6** to the applicant to execute the SRTPV installation at the time PPA (for capacity upto 499 kWp).

8. B) **For capacity 500 kWp & above:** The DO shall execute the PPA with the Applicant on non-judicial Rs.200/- stamp paper in the KERC approved format. **The DO shall seek the approval for PPA from Hon'ble Commission within seven days of signing the PPA as per the KERC (Implementation of SRTPV Power Plant) Regulations, 2016, Clause 11(3).**

Procedure to get approval for PPA from the KERC for capacity 500kWp & above.

a) "The DO shall execute the PPA and forward the same to General Manager (Commercial), Corporate Office, CESC for onward submission to KERC for approval along with the following documents within 2 days from the date of submission of PPA.

1. Application Form (**Format-1**).
2. **Format-1C** if the applicant is not availing MNRE Subsidy.
3. Sanctioned copy of **MNRE Subsidy** if the applicant is availing MNRE Subsidy.
4. Technical feasibility Report (**Format-4**).
5. Original PPA.
6. Detailed Project Report (DPR).
7. DD of Rs.5000/- per MW or part thereof of contracted capacity shall be drawn in favour of **The Secretary, KERC payable at Bengaluru towards processing fee for approval of PPA.** "

b) The GM (Commercial), Corporate Office, CESC shall forward the PPA to Hon'ble Commission for Approval.

- C) On approval received from KERC, the DO shall issue the **Approval letter i.e. Format-6** to the applicant to execute the SRTPV installation.

9. **The Power Purchase Agreement(PPA) Execution Authority for SRTPV installations:**

Sl.No.	Capacity of SRTPV Plant	PPA execution Authority
1.	From 1kWp to 49kWp	Assistant Executive Engineer(Ele) of concerned O & M Sub-Division
2.	50 kWp & above upto 2000kWp	Executive Engineer(Ele) of concerned O & M Division

10. **Type of Metering applicable to consumer:**

Sl No.	Type of Metering	Eligible Consumers
1.	Gross Metering & Net Metering	Applicable for Domestic consumer's i.e. Residential, Hospital and Educational institutions consumers [HT-4, HT-2(c), LT-2(a) & LT-2(b)].
2.	Net Metering	Applicable to Industrial, Commercial and all categories of consumers other than Domestic, Hospital and Educational institution categories.

Note: The Application can be cancelled by the SDO/DO, if the consumer does not executes the PPA within 7 days from the date of intimation letter and the same shall be intimated to the consumer.

11. The Applicant/System installer of SRTPV system shall submit the following documents along with **work completion report** as per **Format-7** to the approving authority (O&M, AEE/EE of CESC, MYSORE):
- a) Specifications of all equipment's and manufacturer's test reports and test certificate of modules and inverters.
 - b) Test certificates of bi-directional meter from MT division, CESC, MYSORE.
12. The SDO/DO shall inspect the plant for commissioning the project after receipt of work completion report from the consumer and furnish the checklist for solar rooftop PV grid safety qualification as **Format-8**.
13. The SDO/DO along with MT staff shall commission and synchronize the SRTPV Plant after submission of work completion report by the applicant, after ensuring that the SRTPV applicant has attended all the observation made by SDO/DO/MT staff, if any and verification of the documents said in the Sl.No.10 submitted by the applicant.

Note:

i. O&M, AEE/EE shall inspect the PV modules connections, earthing, isolating switches, functions of inverter, sealing of the energy meters, meter boxes, recording of readings, preparation of testing and commissioning reports.

ii. Equipment earth:

- All the non-current carrying metal parts are bonded together and connected to earth to prevent shocks to the manpower and protection of the equipment.
- Earthing shall be done in accordance with IS 3043-1986, provided that earthing conductors shall have a minimum size of 6.0 mm² copper or 10 mm² aluminum wire or 3 mm² X 70 mm² hot dip galvanized steel. Unprotect aluminum or copper-clad aluminum conductors shall not be used for final underground connections to earth electrodes.
- A minimum of two separate dedicated and interconnected earth electrodes must be used for the earthing of the solar PV system support structure with a total earth resistance not exceeding 5 ohm.

- The earth electrodes shall have a pre-cast concrete enclosure with a removal lid for inspection and maintenance. The entire earthing system shall comprise non-corrosive components.

iii. Surge Protection:

- Surge protection shall be provided on the DC side and the AC side of the solar system.
- The DC surge protection devices (SPDs) shall be installed in the DC distribution box adjacent to the solar grid inverter.
- The AC SPDs shall be installed in the AC distribution box adjacent to the solar grid inverter.
- The SPDs earthing terminal shall be connected to earth through the above mentioned dedicated earthing system. The SPDs shall be of Type 2 as per IEC 60364-5-53.
- The PV module structure components shall be electrically interconnected and shall be grounded

14. The Commissioning & Synchronizing report of SRTPV system shall be as per the prescribed format i.e. **Format-9**.
15. The SDO/DO shall issue Synchronization certificate to the Applicant in **Format-9A**.
16. The SRTPV plant Commissioning & Synchronizing Authority:

Sl. No.	Capacities	Commissioning & Synchronizing Authority
1.	From 1kWp to 49 kWp	Assistant Executive Engineer(Ele) , Concerned O & M Sub-Division in Coordination with Meter Testing (MT) staff
2.	50 kWp & above upto 2000kWp	Executive Engineer(Ele) , Concerned O & M Division in Coordination with Meter Testing (MT) staff

17. The Applicant can select any PV modules and system installer to install the SRTPV System who has experience in design, supply and installation of SRTPV system.
18. The cost of distribution network upto the interconnection point shall be borne by the applicant as per KERC (Implementation of Solar Rooftop Photovoltaic Power Plants) Regulations, 2016, Clause 6 (1) (d).
19. **Interconnection voltages** as per KERC Regulation-2016, Sl. No. 6 (1) (a) shall be as below:

Sl.No.	System Capacity	Voltage level
1.	Upto 5kWp	240 V-Single Phase
2.	Above 5 kWp & upto 50 kWp	400 V-Three Phase
3.	Above 50 kWp & upto 2000 kWp	11 kV

20. SRTPV applicant shall be totally responsible for planning, design, construction, reliability, protection and safe operation of all the equipment's subject to the regulations for construction, operation, maintenance, connectivity and other statutory provisions as per KERC notified PPA clause 1.6 (a).
21. The Technical, Safety, Grid Connectivity standards are to be followed as per KERC notified PPA as below:
 - a) **Clause-1, Technical and Interconnection requirement,**
 - b) **Clause-2 (Safety) &**
 - c) **Clause-7 (Metering)**
22. The CESC reserves the right to inspect the entire plant routinely at any time as per the Conditions of Supply to the Distribution Licensees clause 18, access to Consumer Premises.
23. The check meter shall be provided for SRTPV systems capacity of more than 20kWp.
24. CT's, PT's and Metering Cubicle shall be procured from CESC approved Vendors only.
25. As per Government of Karnataka Notification No. EN 135 EBS 2018 dated: 27.08.2018, Generating units having capacity to produce electricity above 1 MW from Solar Rooftop sources of energy shall be inspected by the Electrical Inspector before commissioning.
26. Solar Rooftop generation units installed as per the KERC (Implementation of Solar Rooftop Photovoltaic Power plants) Regulations, 2016 shall be inspected periodically by the Electrical Inspectorate as per Regulations 30 of Central Electricity Authority (Measures Relating to Safety and Electric Supply) Regulations, 2010.
27. **In case, the existing SRTPV consumer desires to change the sanctioned load/tariff category of the existing SRTPV installation, the PPA of such consumer shall be canceled and shall enter into a new PPA with the tariff prescribed in the prevailing Order.**
28. As per GoK Letter No. EN 70 VSC 2015 dated: 17-08-2016 Solar Roof Top PV plants must be mandatorily mounted in the space available on the roof of any residential, commercial, institutional, industrial and other buildings which are as per the building construction acts/norms.

Solar panels installed on the ground/ground mounted by constructing structures using Steel/iron/wooden/concrete supports are not be considered as SRTPV plants.
29. The SRTPV Consumer shall pay the Electricity tax and other statutory levies pertaining to SRTPV generation as levied from time to time.
30. **Periodical inspections:**
 - The meters, both uni-directional and bi-directional, are to be tested as per Schedule by MT staff once in 6 months as per KERC norms.
 - The inverter functionality of every installation is to be checked by MT staff of CESC, MYSURU once in 6 months.

- Periodical test reports/inspection reports shall be submitted to the concerned O&M sub-divisional office.
31. As per order of the Hon'ble Commission vide No.: S/03/1 dated 15th September 2017, has allowed Tariff and other Operational procedures applicable in respect of Multiple/Combined Solar Rooftop Photovoltaic (SRTPV) installations in a single premises.
 32. The Commission has allowed third party investments in all the categories of consumers as per its order dated **09th December 2019 "In the matter of: Decision on Various Models and Guidelines for Solar Rooftop Photovoltaic Plants allowed to be installed on rooftops of the consumers' buildings"**
 33. After commissioning the SRTPV System, SDO/DO shall submit copy of the following **documents to the General Manager (Commercial), Corporate Office, CESC, MYSORE.**
 1. Application Form (**Format-1**)
 2. PPA (**Format-6A/Format-6B**)
 3. Approval Letter (**Format-7**)
 4. Synchronization and Commissioning Certificate (**Format-9 & Format-9A**).
 34. Concerned Officers shall submit the details of SRTPV commissioned & generation from SRTPV plants by 5th of every month in the prescribed format as per the letter No.:GM(Commercial)/DGM(RA-1)/AGM(RA-1)/Manager(RA-1)/2020-21/CYS-1805 dated: 22-03-2021.
 35. **Off Grid Solar Generating Plants:** The solar generating plant installed in the existing consumer's premises for their own captive use and which is completely isolated from the CESC's grid and having battery backup for reference voltage, such plants will be treated as Standalone/Off-Grid project, for such plants, CESC's approval is not necessary but Consumer has to obtain electrical safety clearance certificate from Department of Electrical Inspectorate & installation of such plants shall be in co-ordination with the CESC's officer. The monthly progress report of such solar plants has to be sent to KPTCL/Concerned ESCOMs/Karnataka Renewable Energy Development Limited (KREDL).
- Note:** Necessary action shall be taken by the consumer in order to avoid the back feeding.

36. **Billing procedure:**

- The consumer shall receive a monthly net import/export bill indicating either net export to the grid or net import from the grid.
- **“Import”**- means energy supplied by the CESC, MYSORE grid.
- **“Export”**- means energy delivered to the CESC, MYSORE grid.
- The meter reader has to read/record present reading of Uni-directional meter provided at solar side.
- Solar side uni-directional meter reading is used only to measure the quantum of generation and shall not be used for billing purpose.
- The meter reader has to read/record import & export energy and other billing parameters recorded in the bi-directional meter.
- In case of net metering, the consumer shall pay the bill for import energy at the existing tariff.
- In case, the export energy is more than the import energy, AEE, O&M sub division will arrange for the payment through NEFT for energy exported as per the prevailing tariff orders of the Hon’ble KERC.
- Minimum charges/Electricity dues/Statutory levies, if any, shall be adjusted against the energy purchase bill.
- The amount payable by the CESC, MYSORE to the Seller for energy injected to the CESC, MYSORE grid (excluding self-consumption) during the billing period becomes due for payment, which shall be settled within 30 days from the date of meter reading and credited to the bank account through NEFT.