



Bangalore Electricity Supply Company Limited

(wholly owned Government of Karnataka undertaking)

Ref No.: BESCOM/BC-51/2023-24/1317

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Guidelines for Grid connectivity of Solar Rooftop Photo Voltaic (SRTPV) systems installed as per the KERC (Implementation of Solar Rooftop Photovoltaic Power plants) Regulations, 2016:

1. The SRTPV Application is invited from all the consumers of BESCOM through **On-line mode only and no off-line Applications are allowed.**
2. Applications can be submitted from **1kWp to upto 2000kWp.**
3. The fee details:

Sl No	Capacity of the proposed SRTPV system	Registration Fee	Facilitation Fee	Total Amount
1	From 1kWp Upto and inclusive of 5kWp	Rs.500/-	Rs.1000/-	Rs.1,500/- plus applicable GST Charges
2	Above 5kWp Upto and inclusive of 50kWp	Rs.2000/-	Rs.3000/-	Rs.5,000/- plus applicable GST Charges
3	Above 50kWp and Upto 1000kWp	Rs.5000/-	Rs.10000/-	Rs.15,000/- plus applicable GST
4	Above 1000kWp and Upto 2000kWp	Rs.5000/-	Rs.25000/-	Rs.30,000/- plus applicable GST Charges

Note : Payment of Additional Rs.10/- plus GST charges towards E-sign fee of the PPA applicable for 1kW to 10kW Domestic consumers

4. The Sub-divisional officer (SDO) shall be **Nodal point of contact** for Solar RTPV program.
5. Type of Metering:

Slno.	Type of Metering	Eligible Consumers
1	Gross Metering & Net Metering	Applicable for Domestic consumers, Hospital and Educational institutions consumers. (HT-4, HT-2(C), LT2(a) & LT2(b)) Note: Commission vide order dated 19.09.2016 has allowed one time irrevocable option of either gross or net metering for consumers at the time of signing of PPA
2		Applicable to Industrial, Commercial and all categories of consumers other than Domestic consumer's. Note: Consumers who has availed open access and intending to install Solar Rooftop shall Opt for either gross metering or captive for self-consumption as per KERC order dated 18.07.2022.

6. The Power Purchase Agreement(PPA) Execution and Approval letter issuing Authority for SRTPV installations:

Sl. No.	Capacity wise SRTPV PPA execution	PPA signing Authority (BESCOM Officer)	PPA Approving Authority	Approval letter issuing Authority
1	From 1kWp to 500kWp	Assistant Executive Engineer(Ele) C, O & M Sub-Division	Assistant Executive Engineer(Ele) C, O & M Sub-Division	
2	Above 500kWp upto 1000kWp	Executive Engineer(Ele) C, O & M Division	General Manager, DSM section, Corporate office, BESCOM	Executive Engineer(Ele) C, O & M Sub-Division
3	Above 1000kWp upto 2000kWp	Executive Engineer(Ele) C, O & M Division	KERC	Executive Engineer(Ele) C, O & M Sub-Division

7. The SRTPV plant Commissioning & Synchronizing Authority:

Sl. No.	Capacities	BESCOM Officer's
1	1kW to 17.5kWp	Assistant Executive Engineer(Ele) C, O & M Sub-Division
2	Above 17.5kW to upto 500kWp	Assistant Executive Engineer(Ele) C, O & M Sub-Division in Co-ordination with Meter Testing (MT) staff
3	Above 500kWp to upto 2000kWp	Executive Engineer(Ele) C, O & M Division in Co-ordination with Meter Testing (MT) staff

8. For 1kW to 10kW SRTPV plants (Residential consumers) : The consumer shall execute PPA through e-Sign at the time of submission of Application, however the details of Distribution transformer and feeder shall be updated in the SRTPV online portal by the BESCOM field officers at time of commissioning.
9. The PPAs of SRTPV plants with an installed capacity upto and inclusive of 1000kW executed as per the approved standard PPA format shall be considered as deemed to have been approved by the Commission. The PPAs for a capacity above 1000 kW shall be submitted to the Commission for approval.
10. Approval of the Commission shall be obtained in case there is any deviation from the standard approved format of PPA.
11. The Commission reserves the right to review any of the PPAs, at its discretion, to verify its conformity to the standard format and other applicable Orders/ Regulations.

12. The draft PPA shall be submitted to DSM Section, Corporate Office for capacity above 500kWp upto 2000kWp. KERC approval is mandatory for PPA capacity above 1000kWp upto 2000kWp, along with following documents:
- a) Demand Draft of Rs.5000/- in favour of The Secretary, KERC (For capacities 1000kWp to 2000kWp)
 - b) Online Application and Technical Feasibility Report.
 - c) The Detailed Project report.
 - d) Self-Declaration from the applicant for investment under CAPEX scheme
 - e) Specifications of the roof type along with photographs certified by concerned EE.
 - f) Land ownership or lease agreement documents whichever is applicable.
 - g) Latest Electricity bill copy.

Note: In case of lease agreement, the PPA shall be executed for the duration of lease period or maximum for 25 years, whichever is earlier.

13. The **Applicant** can **select** any **PV modules / Grid tied inverter** and **system installer** to install the SRTPV System. The equipment's used shall comply with the relevant International (IEEE/IEC) and Indian standards (BIS) and safety standards issued by IEEE/ BIS/ MNRE/ CEA/ KERC/ BESCO issued from time to time.
14. The Applicant shall use only **tested Bi-directional Meters** from **BESCO empanelled firms available at Vendor outlets**.
15. The **check meter** shall be provided for SRTPV systems capacity of **more than 17.5 kW**.
16. CT's, PT's and Metering Cubicle shall be procured from BESCO approved Vendors only.
17. For Gross Metering and Net Metering, meters shall be procured from BESCO approved/ empanelled Vendors only.
18. For HT installations, as per BESCO order no. BESCO/GM (M & C)/DGM (M)/BC-24/F-1013/12-13 dated 12.02.2013, if the existing metering system is 3 phase 3 wire, it shall be converted to 3 phase 4 wire.
19. The SRTPV applicant shall be fully 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 Standardized PPA clause 1.6 (a).

20. The Technical, Safety, Grid Connectivity standards are to be followed as per KERC Standardized PPA as below:
1. **clause 1, Technical and Interconnection requirement,**
 2. **clause 2 (Safety) &**
 3. **Clause 7 (Metering)**
21. OM personnel reserve the right to inspect the entire plant routinely at any time as per the Conditions of Supply to the Distribution Licensees clause 18:00, access to Consumer Premises.
22. **Interconnection voltages** as per KERC Regulation-2016, sl. No. 6 (1)(a) shall be as below:

Sl No.	System Capacity	Voltage level
1	From 1kWp Upto & inclusive 5kWp	230 Volts
2	Above 5 kWp & upto 150 kWp	400 Volts
3	Above 150 kWp & above upto 2000 kWp	11 kV

23. Each SRTPV plant of **less than 150kW** capacity shall be connected only to the existing distribution transformer through which the eligible consumers are being supplied electricity. 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 (The Clause 6(1)(e) of SRTPV Regulation 2016 is being substituted by KERC vide its order dated 01.06.2023)
- 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 68kWs (80 KVA)
24. Every SRTPV plant of more than 150kW shall be connected only to the existing 11kV Distribution System. In such cases, the total capacity of the existing and proposed SRTPV plants on that feeder shall not exceed 80% of the rated current carrying capacity of that line. (Clause 6(1) (f) of SRTPV Regulation 2016 is being substituted by KERC vide its order dated 01.06.2023).
25. The Distribution Licensee while evaluating the technical feasibility of any proposed SRTPV plant shall ensure that the above said parameters are adhered to and any system improvement works beyond interconnection point shall be taken up by the Distribution Licensee for the purpose of connecting the SRTPV plant with the grid. (clause 6(1) (g) of SRTPV Regulation 2016 is being substituted by KERC vide its order dated 01.06.2023).

26. The Sub-divisional officer (SDO) shall verify for Technical feasibility of the installation and if the application is technically feasible, shall issue the intimation letter for execution the Power Purchase Agreement (either for full or partial SRTPV capacity).

Example:

- Existing DTC capacity of 100kVA
- Already connected/ under progress (SRTPVs) is 60 KWs
- Newly proposed is 50 KWs capacity
- Then total Solar capacity on the DTC is 110kW (> 80% of the DTC capacity
- Hence, the application is technically feasible for partial capacity of 8 kW only (for total 80% ie 68 Kws/ 80 KVA) as against newly proposed capacity of 50kWs.

27. If the application is not technically feasible, the SDO shall **cancel the Application** and **intimate** the same to the Applicant.
28. The SDO/DO shall execute the PPA and issue the Approval letter for start of SRTPV work to the applicant.

Note: For above 1000kWp SRTPV plants, draft PPAs are to be approved by KERC through Corporate Office.

29. The Application shall be cancelled by the SDO/DO, if the consumer does not come forward for execution of the PPA within 03 days from the date of intimation letter (All other consumers excluding 1kW to 10kW domestic consumers).
30. The **consumer** portion of work has to be completed and **work completion report** has to be submitted within **150 days** from the date of approval letter for having entered into PPA.
31. The SDO/DO shall inspect the SRTPV plant within 5 working days from the date of receipt of work completion report for commissioning of the project and commission the project after ensuring satisfactory completion of the work.
32. The **SRTPV plant** shall be **commissioned** within **180 Days** from the **date of approval or deemed approval of PPA**, after ensuring that the SRTPV applicant has attended all the observation made by SDO/DO/MT staff, if any.

33. The SRTPV Consumer shall pay the Electricity tax and other statutory levies, pertaining to SRTPV generation, as levied from time to time as per KERC PPA clause 6 (c).
34. As per Government of Karnataka Notification No. EN 135 EBS 2018 dated: 27.08.2018,
- i. 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.
 - ii. Solar Rooftop generation units installed as per the KERC (Implementation of Solar Rooftop Photovoltaic Power plants) Regulations, 2016 shall be inspected periodically as per Regulations 30 of Central Electricity Authority (Measures Relating to Safety and Electric Supply) Regulations, 2010.
35. In case of consumer intending to install SRTPV plant with multiple RR nos. in single premises with or without SRTPV unit, any change in sanctioned load/contract demand, change in tariff category of consumer already having SRTPV unit in his/her premises, the KERC order dated: 15.09.2017 and tariff order dated:01.06.2023 (clause xiv, c, page 17) shall be referred.

KERC order 15.09.2017

<https://bescom.karnataka.gov.in/storage/pdf-files/DSM-Solar/Tariff%20applicable%20for%20multiple%20combined%20SRTPV%2015%2009%202017%20.pdf>

36. In case of installation of SRTPV plants on the Government buildings by the ESCOMs under funding from the Government, the KERC order dated 11.11.2016 and tariff order dated: 01.06.2023 (clause xiv, b, page 25) shall be referred.

KERC order 11.11.2016:

<https://bescom.karnataka.gov.in/storage/pdf-files/DSM-Solar/KERC%20order%20for%20govt%20buildings%20dated%2011%2011%202016.pdf>

37. The Non-Residential consumer such as Educational institutes, Hospitals, IT parks, Industries, to implement the SRTPV plant on their rooftops of the building and also on the roof of the carport duly limiting the capacity of the SRTPV plant to the sanctioned load of the consumer (As per KERC order dated 01.06.2023)

1. Procedure and Time Lines for Grid connected SRTPV plants

A. For SRTPV plants ranging 1kW to 10kW domestic consumers

Step	Procedure	Responsibility	Time lines
Step - 1	<p>The Applicant shall submit On-line Application Only in the SRTPV portal.</p> <p>The Registration process is complete with below of 3 steps:</p> <ol style="list-style-type: none"> 1. Entering Rooftop details such as Solar capacity, shadow free area, type of connection, Enter Email id and mobile no. etc. 2. Payment of fee such as Application, processing & e-Sign. 3. Verification of draft PPA and execute the PPA in Online mode through E-Signing. <p>After successful Registration process an approval letter is auto generated for installation of SRTPV work.</p> <p>Note: If consumer submits the application, and not make payment or will make payment & not e-Sign in such cases 15 days, time period is allowed to the consumer to complete the process (ie. all 3 steps) else the Application will be auto cancelled and no refund of amount will be made (if payment is already made). However, the consumer shall resubmit the fresh Application.</p>	Consumer	Zero date
Step - 2	Online uploading of Work Completion Report by the Consumer.	Consumer	150 (One hundred and fifty) days from the date of uploading/ submission of application.
Step - 3	Inspection by Sub-divisional officer commissioning the project, after receipt of work completion report from the consumer.	-	<p>Within 5 (five) working days from the receipt of work completion report, after ensuring satisfactory completion of work.</p> <p>If the plant is not commissioned within 5 days from the date of work completion report, the concerned officer shall be liable to pay penalty of Rs.1000 per day, till the date of commissioning, to the applicant.</p> <p>After five days of work completion, in case the plant is not commissioned, the consumers are entitled to deemed generation benefit.</p>
Step - 4	Commissioning of Rooftop Solar System in case work completion is delayed by the Consumer	-	Within six months from the date of uploading the application. In case of delay of more than six months, the tariff payable will be as per the terms of PPA.
Step - 5	Billing Process	-	30 days from the date of commissioning of the Solar plant.

**B. For SRTPV plants ranging from 1kWp to upto 500kWp:
(Applicable to all other consumers excluding 1kW to 10kW domestic consumers)**

Step	Procedure	Responsibility	Time lines
Step - 1	The Applicant shall submit On-line Application Only in the SRTPV portal along with Fees.	Consumer	
Step - 2	The SDO shall upload the signed copy of the Technical feasibility details such as Transformer details, feeder details and existing SRTPV details. a. If the Application is Technically feasible (Fully/ Partially): An Intimation letter is auto generated intimating Applicant for Execution of the Power Purchase Agreement (PPA). b. If the Application is not Technically feasible: The SDO shall cancel the Application.	SDO BESCOM	3 days from the Date of Registration of Application
Step - 3	The Applicant shall submit the PPA to SDO for execution, in the non-judicial Rs.200/- stamp paper as per the KERC standard PPA Format: a. Gross Metering b. Net Metering	Consumer	3 days from the Date of Intimation letter for execution of PPA issued by SDO
Step - 4	The SDO shall execute the PPA and upload in the Online SRTPV portal and an approval letter is auto generated for installation of SRTPV work. If the Applicant fails to submit the PPA within 3 days from the date of intimation letter, the SDO shall cancel the Application and intimate the same to the Applicant.	SDO of BESCOM	2 days from the Date of submission of the PPA
Step - 5	Submission of work completion Report by consumer	Consumer	Within 150 days from the date of execution of PPA
Step - 6	Inspection by BESCOM official for commissioning the project, after receipt of work completion report from the consumer.	-	Within 5 working days from the receipt of work completion report, after ensuring satisfactory completion of work <u>If the plant is not commissioned within 5 days from the date of work completion report, the concerned officer shall be liable to pay penalty of Rs.1000 per day, till the date of commissioning, to the applicant.</u> <u>After five days of work completion, in case the plant is not commissioned, the consumers are entitled to deemed generation benefit</u>
Step - 7	Commissioning of Rooftop Solar System	SDO/ MT of BESCOM	Within 180 days from the date of deemed approval of PPA .
Step - 8	Billing Process	-	30 days from the date of commissioning of the Solar plant.

**C. For SRTPV plants ranging from 500kWp to upto 1000kWp:
(Applicable to all other consumers excluding 1kW to 10kW domestic consumers)**

Step	Procedure	Responsibility	Time lines
Step - 1	The Applicant shall submit On-line Application Only in the SRTPV portal along with Fees.	Consumer	
Step - 2	The SDO shall upload the signed copy of the Technical feasibility details such as Transformer details, feeder details and existing SRTPV details. a. If the Application is Technically feasible (Fully/ Partially): An Intimation letter is auto generated intimating Applicant for Execution of the Power Purchase Agreement (PPA). c. If the Application is not Technically feasible: The SDO shall cancel the Application.	SDO BESCOM	3 days from the Date of Registration of Application
Step - 3	The Applicant shall submit the PPA to SDO for execution, in the non-judicial Rs.200/- stamp paper as per the KERC standard PPA Format: a. Gross Metering b. Net Metering	Consumer	3 days from the Date of Intimation letter for execution of PPA issued by SDO
Step - 4	The Divisional officer(DO) shall execute the PPA and upload in the Online SRTPV portal and an approval letter is auto generated for installation of SRTPV work. If the Applicant fails to submit the PPA within 3 days from the date of intimation letter, the DO shall cancel the Application and intimate the same to the Applicant. Note: The PPAs above 500 to 1000kWp shall be submitted to Corporate office, BESCOM.	DO of BESCOM	2 days from the Date of submission of the PPA
Step - 6	Submission of work completion Report by consumer	Consumer	Within 150 days from the date of execution of PPA
Step - 7	Inspection by BESCOM official for commissioning the project, after receipt of work completion report from the consumer.	-	Within 5 working days from the receipt of work completion report, after ensuring satisfactory completion of work <u>If the plant is not commissioned within 5 days from the date of work completion report, the concerned officer shall be liable to pay penalty of Rs.1000 per day, till the date of commissioning, to the applicant.</u> <u>After five days of work completion, in case the plant is not commissioned, the consumers are entitled to deemed generation benefit</u>
Step - 8	Commissioning of Rooftop Solar System	DO/ MT of BESCOM	Within 180 days from the date of deemed approval of PPA i.e Date of execution of the PPA.
Step - 9	Billing Process	-	30 days from the date of commissioning of the Solar plant.

D. For SRTPV plants ranging from 1000kWp to upto 2000kWp:

(Applicable to all other consumers excluding 1kW to 10kW domestic consumers)

Step	Procedure	Responsibility	Time lines
Step - 1	The Applicant shall submit On-line Application Only in the SRTPV portal along with Fees.	Consumer	
Step - 2	The SDO shall upload the signed copy of the Technical feasibility details such as Transformer details, feeder details and existing SRTPV details. a. If the Application is Technically feasible (Fully/ Partially): An Intimation letter is auto generated intimating Applicant for Execution of the Power Purchase Agreement (PPA). d. If the Application is not Technically feasible: The SDO shall cancel the Application.	SDO BESCOM	3 days from the Date of Registration of Application
Step - 3	The Applicant shall submit the PPA to DO for execution, in the non-judicial Rs.200/- stamp paper as per the KERC standard PPA Format: a. Gross Metering b. Net Metering	Consumer	3 days from the Date of Intimation letter for execution of PPA issued by SDO
Step - 4	The Divisional officer (DO) shall execute the PPA, upload in the Online SRTPV portal and submit the same to Corporate office(CO), BESCOM for KERC approval to the PPA. If the Applicant fails to submit the PPA within 3 days from the date of intimation letter, the DO shall cancel the Application and intimate the same to the Applicant.	DO of BESCOM	2 days from the Date of submission of the PPA
	The CO, BESCOM shall forward the PPA to KERC for approval and upload the approval letter of KERC in the Online SRTPV Portal. An approval letter is auto generated for installation of SRTPV work.	CO, BESCOM	3 days from the Date of receipt of PPA by DO / PPA approval by KERC
Step - 6	Submission of work completion Report by consumer	Consumer	Within 150 days from the date of execution of PPA
Step - 7	Inspection by BESCOM official for commissioning the project, after receipt of work completion report from the consumer.	-	Within 5 working days from the receipt of work completion report, after ensuring satisfactory completion of work <u>If the plant is not commissioned within 5 days from the date of work completion report, the concerned officer shall be liable to pay penalty of Rs.1000 per day, till the date of commissioning, to the applicant.</u> <u>After five days of work completion, in case the plant is not commissioned, the consumers are entitled to deemed generation benefit</u>
Step - 8	Commissioning of Rooftop Solar System	DO/MT of BESCOM	Within 180 days from the date of deemed approval of PPA i.e Date of execution of the PPA.
Step - 9	Billing Process	-	30 days from the date of commissioning of the Solar plant.