Joint Electricity Regulatory Commission (Draft Solar PV Grid Interactive System based on Net Metering) Regulations, 2019

Joint Electricity Regulatory Commission
(For the State of Goa & Union Territories)

Table of Contents

JOINT ELECTRICITY REGULATORY COMMISSION

(FOR THE STATE OF GOA AND UNION TERRITORIES)

In exercise of the powers conferred under Sub-Section (1) of Section 181 and Clauses (zd), (ze) and (zf) of Sub-Section (2) of Section 181, read with Sections 42, 61(h), 66, 83 and 86(1)(e) of the Electricity Act, 2003 and all other powers enabling it in this behalf, the Joint Electricity Regulatory Commission (for the State of Goa and Union Territories) hereby makes the following Regulations, namely:

1. Short Title, Commencement and extent

1.1. These Regulations shall be called the "Joint Electricity Regulatory Commission for the State of Goa and Union Territories (Solar PV Grid Interactive System based on Net Metering) Regulations, 2019" (hereinafter referred to as "Net Metering Regulations, 2019").

1.2. These Regulations shall come into force from the date of publication in the official gazette.

1.3. These Regulations shall extend to the State of Goa and the Union Territories of Andaman and Nicobar Islands, Chandigarh, Dadra & Nagar Haveli, Daman & Diu, Lakshadweep and Puducherry.

1.4. These Regulations shall apply only to the Grid Connected Rooftop mounted, ground mounted and floating Solar Power Projects.

2. Definitions, Abbreviations and Interpretations

2.1. In these Regulations, unless the context otherwise requires:

(1) **"Act"** means the Electricity Act, 2003 (36 of 2003), and subsequent amendments thereof;

(2) **"Average Power Purchase Cost" (APPC)** means the Weighted Average Pooled Price at Discom periphery at which the Distribution Licensee has purchased the electricity including cost of self-generation, if any, for the year in which solar energy is generated from all the energy suppliers on long-term, medium-term and short-term basis, but excluding energy purchased from Renewable Energy sources;

(3) **"Authority"** means the Central Electricity Authority referred to in sub-section (1) of Section 70 of the Act;

(4) **"Billing cycle"** means the period for which regular electricity bills as specified by the Commission, are prepared for different categories of consumers by the

Licensee;

(5) **"COD"** or **"Commercial Operation Date"** or **"Date of commercial operation"** mean the date on which generating plant is synchronised with the grid system;

(6) **"Check Meter"** means a meter, which shall be connected to the same core of the current transformer (CT) and voltage transformer (VT) to which main meter or solar meter is connected and shall be used for accounting and billing of electricity in case of failure of main meter or solar meter;

(7) "**Commission" or "Joint Electricity Regulatory Commission" or "JERC"** means the Joint Electricity Regulatory Commission for the State of Goa and Union Territories of Andaman and Nicobar Islands, Chandigarh, Dadra & Nagar Haveli, Daman & Diu, Puducherry and Lakshadweep referred to in sub-section (1) of Section 82 of the Act and constituted under the Act;

(8) "**Connection Agreement**" means the net-metering inter-connection Agreement entered into between the Distribution Licensee and the Consumer;

(9) "**Consumer"** means any person who is connected to the electricity distribution system of the Distribution Licensee or any other person engaged in the business of supplying electricity to the public, as per the Act or any other law in force as of now and includes any person whose premises are used for receiving power, for the time being;

(10) **"Consumer Grievances Redressal Forum (CGRF in brief)"** means the forum for redressal of grievance of Consumers, established under section 42(5) of the Act;

(11) **"Contracted Load"** or **"Contract Demand"** means the maximum demand in kW, kVA or HP, agreed to be supplied by the Distribution Licensee and as indicated in the Agreement executed between the Licensee and the Consumer;

(12) **"Credit Note"** means number of units (kWh) as credit in the account as surplus power exported to the grid or the banked solar units accounted at the end of financial year by the Consumer for which the Distribution Licensee shall make the payment to the Consumer as per these Regulations;

(13) **"Distribution Licensee"** means a person granted a Licence under Section 14 (b) of the Act authorizing him to operate and maintain a distribution system and supply electricity to the consumers in its area of supply;

(14) **"Electricity Supply Code"** means the Electricity Supply Code specified by

the Commission under Section 50 of the Act and subsequent amendments thereof;

(15) **"Eligible Consumer"** means a consumer of electricity in the area of supply of the Distribution Licensee, who uses a self-owned or third party owned solar power project installed in the consumer premises, to offset part or all of the consumer's own electricity requirements;

(16) **"Feed-in-Tariff"** means the Generic Tariff determined by the Commission for generation from Solar Photovoltaic projects for Gross Metering in accordance with the Joint Electricity Regulatory Commission for the State of Goa and UT's (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2019 or as amended from time to time;

(17) "**Grid**" means the low voltage electrical network, the distribution and transmission network or the high voltage backbone system of inter-connected transmission lines, sub-stations and generating plants for sale of energy or wheeling of energy as defined in these Regulations;

(18) "**Installed Capacity**" means the summation of the name plate capacities expressed in kWp of all the units of the solar generating station or the capacity of the project reckoned at the output terminals of the solar project approved by the Commission;

(19) "**Interconnection Point**" means the interface point of a Solar Power Project with the distribution network of the Distribution Licensee at appropriate voltage level as defined in the Joint Electricity Regulatory Commission for the State of Goa and UT's (Electricity Supply Code) Regulations, 2018;

(20) **"Invoice"** means a periodical Bill / Supplementary Bill or an Invoice/ Supplementary Invoice" by the Distribution Licensee to the Consumer;

(21) **"Month"** means English calendar month starting with 1st day / date of the month and ending with last day/ date of the month. Part Month will be applicable for number of days in proportion to total number of days in the specific month;

(22) **"Net metering"** means an arrangement under which Rooftop Solar PV System installed at Eligible Consumer's premises delivering surplus electricity, if any, to the grid of the Distribution Licensee after off-setting the electricity supplied by the Distribution Licensee to such Eligible Consumer during the applicable billing period;

(23) **"Net Meter"** means an appropriate bi-directional energy meter capable of recording both import from the grid and export of electricity generated at solar

Power Plant;

(24) **"Obligated Entity"** means the licensed Supplier of Power, Distribution Licensee(s), Captive user(s) and Open Access Consumer(s), identified under Joint Electricity Regulatory Commission for the State of Goa and Union Territories (Procurement of Renewable Energy) Regulations, 2010 as amended from time to time and mandated under clause (e) of subsection (1) of Section 86 of the Act to fulfil the Renewable Purchase Obligations as determined by the Commission from time to time;

(25) **"Ombudsman"** means the person appointed in accordance with Section 42 (6) read with Section 181 of the Act;

(26) **"Open Access consumer"** means a person permitted to use Intra-State Transmission System and / or Distribution System to receive supply of electricity from a person other than the Distribution Licensee of his area of supply, and the expression includes a generating company and a Licensee, who has availed of or intends to avail of Open Access;

(27) "**Project Developer**" means the developer of the Solar Power project, who shall develop such a project on his own premises or on premises taken on lease or rent;

(28) **"Prosumer"** means a Consumer who is also a Producer of Solar Power;

(29) **"Producer of Solar Power"** means an individual or an entity or a group of people intending to set up or who has/have set up a Solar Power Project for the purpose of generation of Solar power for its own consumption and sale of surplus power to Distribution Licensee;

(30) **"Premises"** means Rooftop of a house / factory/ Ware house / Government building/ Panchayat Bhavan / Community Centre/ School/ dispensary / hospital / parking place / Bus Stand / Group Housing Society/ Market Society / market roof top / Canals / Water Reservoir/ any such place/ or vacant space and elevated area on the land, building or the Infrastructure or part or combination thereof, or the area taken on rent or on lease, or the area for the common facility in the premises of any multi-storeyed building, Group Housing Society / Residential Welfare Association / Market Welfare Association/ Industrial Welfare Group and in respect of which a separate meter or metering arrangements have been made by the Licensee for supply of electricity. The premises exclude the structures of historic significance (unless permission is taken from appropriate authority);

(31) **"Renewable Energy Certificate (REC)"** means the certificate issued in

accordance with the Regulations and the procedures approved by the Central Electricity Regulatory Commission;

(32) **"Renewable Purchase Obligations (RPO)"** means renewable power purchase obligations;

(33) **"Settlement period"** means the period beginning from first day of April as per the English calendar year and ending with the thirty first day of March of the next year;

(34) **"Solar Energy Meter"** means a main meter used for measuring the Gross solar power units generated by the solar power project for the purpose of accounting and billing;

(35) **"Solar Grid Inverter"** means equipment that converts the DC (direct current) power from Solar Power modules to Grid-compatible AC (alternating current) power;

(36) **"Solar Photovoltaic Power"** means a solar photo voltaic power project that uses sunlight for direct conversion into electricity through Photo Voltaic technology based on technologies such as crystalline Silicon or thin film etc. as approved by MNRE from time to time;

(37) **"Solar Project"** means a Rooftop or ground mounted Photovoltaic and other small Solar Power generating station, installed in the premises, that uses sunlight for its direct conversion into electricity;

(38) **"Solar Project Developer (SPD)"** means a consumer or an entity whose Solar project has been approved by the Distribution Licensee;

(39) **"Solar Power Generator (SPG)"** means anyone who has started generating solar power from the approved project;

(40) **"State Nodal Agency"** means the agency in the concerned State or Union Territory as may be designated by the Commission to act as the agency for accreditation and recommending the renewable energy projects for registration and to undertake such functions as may be specified under clause (e) of sub-section (1) of Section 86 of the Act;

(41) **"Supplier of Power"** means a person or an entity having licence to supply electricity to the consumer;

(42) **"Tariff Order"** in respect of a Licensee means the last retail Tariff Order issued by the Commission for that Licensee indicating the tariff to be charged by the Licensee from various categories of consumers for supply of electrical

energy and services;

(43) **"Third Party Owned"** means a Solar Project owned by a Solar Power Developer that is installed on the roof or elevated structure or land for which a commercial lease or the premises as defined in 1(30) above or revenue share agreement with the owner has been entered into by the Solar Project Developer;

(44) **"Year"** or **"Financial Year"** means a period commencing on 1st April of an English Calendar year and ending on 31st March of the subsequent calendar year.

2.2. **Abbreviations:** In these Regulations the following are interpreted as:

i. **"EPC"** means Engineering Procurement & Construction Contractor authorized by the Distribution Licensee;

ii. **"kWp"** means kilo Watt peak, term used as a rating of the Solar Plant;

iii. "**MNRE**" means the Ministry of New and Renewable Energy of Government of India;

iv. "**RESCO**" means Renewable Energy Service Company.

2.3. All other words and expressions used in these Regulations if not specifically defined herein above, but defined in the Act, shall have the meaning assigned to them in the Act. The other words and expressions used herein but not specifically defined in these Regulations or in the Act but defined under any other law passed by the Parliament applicable to the electricity industry in the State or Union Territory shall have the meaning assigned to them in such law.

3. Scope of Regulations and Extent of Application

These Regulations shall be applicable to the grid connected solar projects subject to the fulfilment of eligibility criteria specified in these Regulations.

4. Eligibility Criteria

4.1. Solar Projects of capacity up to 500 kWp at one premise based on the technologies approved by Ministry of New & Renewable Energy of Government of India are eligible for connecting the project with Grid under these Regulations:

Provided that the Solar Project of rating higher than 500 kWp can be considered by

the Distribution Licensee if the distribution system remains stable with higher rating Solar Project getting connected to the grid.

4.2. The Eligible Consumer may install the Solar Project under these Regulations, provided the Solar Project is:

i. Within the permissible rated capacity as defined under these Regulations;

ii. Located at the consumer's premises;

iii. Interconnected and operated safely in parallel with the Distribution Licensee's network.

4.3. Consumers will generate solar power for self-consumption and are allowed to feed the excess solar power into the grid, which shall be adjusted under net metering as per provisions of these Regulations.

4.4. The maximum Solar Power Generation capacity to be installed at any eligible consumer premises shall not exceed his Contract Demand (in kVA) or Sanctioned load (in kW).

5. Third party owned Solar Project (RESCO Model)

In the third party owned Solar Power Project, the following conditions shall apply:

i. A Rooftop or Land Owner may lease out / rent the Rooftop Space/ Land to a Solar Project Developer on a mutual commercial arrangement. Under this arrangement, the owner of the roof / land engages an EPC to design and install the project. The commercial arrangement between the Project Developer and the Roof / Land owner will be submitted to the Buyer of the Solar Power / Distribution Licensee for records.

ii. In order to promote Solar Power Generation, the total bill for electricity (solar units adjusted / surplus, balance energy consumed) shall be collected by the Distribution Licensee from the consumer and thereafter, amount to be released to RESCO, if the consumer and the RESCO mutually agree and give a written undertaking to that effect to the Distribution Licensee;

iii. The Distribution Licensee shall notify the procedure for Empanelment of EPC Contractor.

iv. The Distribution Licensee may explore other business models that may facilitate the proliferation of Grid connected Rooftop solar projects.

6. Solar Power Generation Capacities

6.1. The Distribution Licensee may undertake demand aggregation and other related activities, to promote solar power capacity in its licensed area. The Distribution Licensee may act as RESCO or EPC to undertake solar power development:

Provided that in case the Distribution Licensee acts as RESCO or EPC, the income from such activity shall be considered as "Other Income" under the provisions of the applicable Tariff Regulations.

6.2. The Distribution Licensee shall arrange testing and sealing of the electricity meter of eligible consumers:
Provided that the electricity meters will be arranged by the Consumer/Solar Power Generator, in accordance with the approved specifications.

6.3. The Distribution Licensee shall facilitate the Solar Project Development:
Provided that the cumulative solar capacity allowed at a particular distribution transformer shall not exceed 75 percent of the capacity of the distribution transformer:

Provided further that the Distribution Licensee may allow solar power capacity connected to a particular distribution transformer and feeder connected to the same exceeding 75 percent of capacity upon consideration of a detailed load study carried out by it.

6.4. The Distribution Licensee shall update on a yearly basis of each of the distribution transformer, the distribution transformer capacity available for connecting the solar projects and shall provide the information on its website, as well as to the Commission.

7. Solar Project-Types

For the purpose of these Regulations, the Commission has covered the Solar Power Projects for Prosumer, which may be roof mounted, ground mounted, floating on water bodies or installed on Elevated structures.

8. Metering Arrangement

8.1. The Distribution Licensee shall allow installation of Solar Power Projects in its area of supply on non-discriminatory and first come - first serve basis for each Distribution Transformer separately and within the time line as provided in these Regulations.

8.2. The metering system shall be as per the Central Electricity Authority (Installation & Operation of Meters) Regulations, 2006 as amended from time to time:

Provided that the Meters shall comply with the Standards prescribed in **Annexure A**.

8.3. The Distribution Licensee shall also phase out the old meters gradually and shall introduce Advanced Metering Infrastructure (AMI) facility with RS 485 (or higher) communication port.

8.4. Bi-directional meter of the same accuracy class as the Consumer's meter existing before the commissioning of the Solar Project, shall be installed in replacement of existing meter:

Provided that such meters may be provided by the Distribution Licensee, or the Consumer subject to the same being from the approved list of the suppliers:

Provided further that if the meter is installed by the Distribution Licensee, cost of it shall be recovered from the Consumer before the COD of the Project.

8.5. The main Solar Meter shall be of 0.2s class accuracy and with facility for recording meter readings using Meter Reading Instrument (MRI) or wireless equipment. Check Meters shall be mandatory for Solar Project having capacity more than 20 kW. For installations having capacity less than or equal to 20 kW, the Check Meters would be optional:
Provided that the cost of Check Meter shall be borne by the Consumer, and such meter shall be tested and installed by the Distribution Licensee.

8.6. The meters installed if arranged by the Consumer shall be inspected, verified for the accuracy and sealed by the Distribution Licensee in the presence of the consumer or its representative (if he chooses to be present at the time of testing):

Provided that in case the Consumer is availing Time of Day tariff, meters capable of recording Time of Day consumption/generation shall be installed.

9. Inter-connection with the Distribution Network, Standards and Safety

9.1. The Distribution Licensee shall ensure that the inter-connection of the Solar Project with its distribution network conforms to the specifications, standards and other provisions specified in the CEA (Technical Standard for Connectivity of the Distributed Generation Resources) Regulations, 2013, CEA (Technical Standards for Connectivity to the Grid) Regulations, 2007 including amendments thereto, the CEA (Measures relating to Safety and Electric Supply), Regulations, 2010 including amendments thereto and the Joint Electricity Regulatory Commission for the State of Goa and UT's (Electricity Supply Code) Regulations, 2018 including amendments thereto and Joint Electricity Regulatory Commission for the State of Goa and UT's (State Grid Code) Regulations, 2010.

9.2. Solar Power generation with Net metering will be allowed for all the Consumers of the Distribution Licensee under the jurisdiction of the Commission at one location owned by one Solar Project Developer with/without battery back-up support::

Provided that, if an Eligible Consumer opts for connectivity with a battery back-up, the inverter shall have a separate back-up wiring to prevent the battery/ decentralized generation (DG) power from flowing into the grid in the absence of grid supply, and that an automatic as well as manual isolation switch shall also be provided:

Provided further that the Inverter shall comply with the Standards prescribed in **Annexure A**.

9.3. The Eligible Consumer shall be responsible for the safe operation, maintenance and rectification of any defect in the Solar Project up to the point of Net Meter, beyond which point such responsibility, including in respect of the Net Meter, shall be that of the Distribution Licensee:

Provided that the Solar Meter shall be maintained by the Distribution Licensee.

9.4. The Eligible Consumer shall provide appropriate protection for islanding of the Solar Project from the network of the Distribution Licensee in the event of grid or supply failure.

9.5. The Consumer shall be solely responsible for any accident to human being/ animals whatsoever (fatal/non-fatal/departmental/non-departmental) that may occur due to back feeding from the Solar Power Generator plant when the grid supply is off:

Provided that the Distribution Licensee shall have the right to disconnect the Solar Project from its distribution network at any time in the event of any threat of accident or damage from such Project to its distribution system for maintenance of distribution system so as to avoid any accident or damage to it:

Provided further that the Eligible Consumer may use his Solar Project in islanding mode for his own consumption.

9.6. The Distribution Licensee and Eligible Consumer shall discharge their respective duties and responsibilities as specified in the relevant Regulations of the Central Electricity Authority.

10. Communication Facilities

All grid connected Solar Projects shall have electricity meters with features to record energy for data storage for injection into the grid through Solar Meter as provided under these Regulations:

Provided that all projects shall have communication port for exchanging real time information with the Distribution Licensee:

Provided further that all meters shall have Advanced Metering Infrastructure (AMI) facility with RS 485 (or higher) communication port.

11. Billing, Energy Accounting and Settlement

11.1. The accounting of electricity exported from the Solar Generation and imported from the Grid by the Eligible Consumer shall become effective from the date of connectivity of the Solar Project with the distribution network.

11.2. For each billing period, the Distribution Licensee shall show separately:-

(a) the quantum of electricity Units exported by the Eligible Consumer;

(b) the quantum of electricity Units imported by the Eligible Consumer;

(c) the net quantum of electricity Units billed for payment by the Eligible Consumer; and

(d) the net quantum of electricity Units carried over (if surplus) to the next billing period:

Provided that, if the quantum of electricity exported exceeds the quantum imported during the billing period, the excess quantum shall be carried forward to the next billing period as credited Units of electricity;

Provided further that, if the quantum of electricity Units imported by the Eligible Consumer during any billing period exceeds the quantum exported, the Distribution Licensee shall raise its invoice / bill for the net electricity consumption after adjusting the credited Units:

11.3. The unadjusted net credited Units of electricity as at the end of each financial year shall be purchased at APPC of the concerned Distribution Licensee or Feed-in-Tariff determined for that Year without considering subsidy and Accelerated Depreciation, whichever is lower by the Distribution Licensee, latest by April 30th of the following year:

Provided that, at the beginning of each Settlement Period, the cumulative quantum of injected electricity carried forward will be re-set to zero.

11.4. In case the Eligible Consumer is within the ambit of Time of Day (ToD) tariff, the electricity consumption in any time block, i.e., peak hours, off-peak hours, etc., shall be first compensated with the quantum of electricity injected in the same time block:

Provided that any excess injection over and above the consumption in any other time block in a billing cycle shall be accounted as if the excess injection had occurred during off-peak hours.

11.5. The Distribution Licensee shall compute the amount payable to the Eligible Consumer for the excess solar energy purchased by it as specified in Regulation 11.3, and shall provide credit equivalent to the amount payable in the immediately succeeding billing cycles till the entire amount so computed is adjusted.

11.6. The Eligible Consumer shall have recourse, in case of any dispute with the Distribution Licensee regarding billing, to the mechanism specified by the Commission under Sections (5) to (7) of the Act for the redressal of grievances.

12. Penalty or Compensation – Failure in Metering System

In case of failure of metering system, the provisions of penalty or compensation shall be as per the provisions of the Joint Electricity Regulatory Commission for the State of Goa and UT's (Standards of Performance for Distribution Licensees) Regulations, 2015 for the Distribution Licensee.

13. Late Payment Surcharge

In case the payment by the Distribution Licensee under Regulation 11.3 above is delayed beyond 31st of May of that year, a late payment surcharge at the rate of 1.25% per month shall be levied on the Distribution Licensee.

14. Charges for Banking of Solar Power

The Solar Projects, whether self-owned or third party owned installed on Eligible Consumer's premises under these Regulations, shall be exempted from charges in respect of banking of electricity.

15. Renewable Purchase Obligation and Eligibility to Participate under REC Mechanism

15.1. The quantum of electricity consumed by the Eligible Consumer from the Solar Project under the Net Metering Arrangement shall qualify towards his compliance of Solar RPO, if such Consumer is an Obligated Entity.

15.2. The quantum of electricity consumed by the Eligible Consumer from the Roof-top Solar PV System under the Net Metering arrangement shall, if such Consumer is not an Obligated Entity, qualify towards meeting the Solar RPO of the Distribution Licensee:

Provided that the Distribution Licensee shall, with the consent of the Eligible Consumer, make all the necessary arrangements, including for additional metering, as may be required for the accounting of the Solar energy generated and consumed by the Eligible Consumer.

15.3. The unadjusted surplus units of Solar energy purchased by the Distribution Licensee under the provisions of Regulation 11.3 shall also qualify towards meeting its Solar RPO.

15.4. The Solar energy generated by an Eligible Consumer in a Net Metering Arrangement under these Regulations shall not be eligible for REC.

16. Procedure for Application and Registration

16.1. The Eligible Consumer shall apply to the concerned Distribution Licensee for connectivity of the Solar Project with the Licensee's distribution network along with a registration fee of Rs. 500 (five hundred), or such other amount as may be stipulated by the Commission from time to time; and the Distribution Licensee shall acknowledge receipt of such application:

Provided that the Distribution Licensee shall provide the option of making such application and payment of fees by electronic means online within two months from the date of publication of these Regulations.

16.2. The procedure for application for connectivity of a Solar Project with the network of the Distribution Licensee is set out at **Annexure 1** of these Regulations. The model Form, along with check-list, for application to be made by the Eligible Consumer to the concerned Licensee is at **Annexure 2**.

16.3. Before rejecting any application for setting up a Roof-top or Ground Mounted Solar PV System at a particular Distribution Transformer, the Distribution Licensee shall serve the applicant with a notice to rectify, within 15 days or such longer period as may be necessary, the deficiencies:

Provided that in case approval cannot be granted due to inadequate Distribution Transformer capacity, the application may be considered, in chronological order of date seniority and if the consumer so opts, after such capacity becomes available.

16.4. The Distribution Licensee shall implement a web-based processing system for processing of the application for solar Net Metering, which shall be set up within three months of the notification of these Regulations.

16.5. Matters relating to subsidy shall be dealt by the State Nodal Agency or as approved by MNRE from time to time.

16.6. The Distribution Licensee shall annually publish on its web, information relating to the Solar plants added in the year, ratings of each plants and other relevant information. The information shall also be submitted to the Commission by 30th April of the next year.

16.7. The plants with capacity more than 500 kWp shall be checked by the Chief Electrical Inspector associated with the Distribution Licensee.

Miscellaneous

17. Power to relax

The Commission may by general or special order, for reasons to be recorded in writing, and after giving an opportunity of hearing to the parties likely to be affected may relax any of the provisions of these Regulations on its own motion or on an application made before it by an interested person.

18. Power to amend

The Commission may at any time add, vary, alter, suspend, modify, amend or repeal any of the provisions of these Regulations.

19. Repeal and Savings

Save as otherwise provided in this Net Metering Regulations, 2019, JERC (Grid Connected Ground Mounted and Solar Rooftop and Metering) Regulations, 2015, together with amendments made from time to time, are hereby repealed.

Provided that for all purposes, including review matters pertaining to the period till notification of these Regulations, the issues relating to Net Metering shall be governed by the provisions of the JERC (Grid Connected Ground Mounted and Solar Rooftop and Metering) Regulations, 2015, including amendments thereto, as may be applicable:

20. Power to remove difficulties

In case of any difficulty arising while giving effect to the provisions of these Regulations, the Commission may either suo-motu or on a Petition, by an order, make such provisions not inconsistent with the provisions of the Act as may appear to be necessary.

(Rakesh Kumar)
Secretary

Annexure A: Energy Meter(s), Voltage level Harmonics, Standards: Harmonics & Inverter

Energy Meter(s) Details				
Sl.	**Meter Description**	**Accuracy**	**Load of Consumer**	**Voltage Level**
1	Single Phase 10-60 A, whole current	Class-I	Up to 10 kW	Single Phase LT 230 V Grid System Stability: to be examined by the Distribution Licensee
2	3 Phase 10-60 A, whole current	Class-I	More than 10 kW & up to 25 KW	Three Phase LT 400 V
3	LT AC 3-Phase 4-Wires CT operated static DLMS & AMR Compliant energy meter	Class- 0.5S or better	More than 25 kW & up to 100 KW	Three Phase LT 400 V
4	HT TPT Meter, DLMS Compliant & AMR Compatible	Class- 0.5S or better	Above 100 kW and up to 1MWp	Three Phase HT (11 kV)

Harmonics shall be as per IEEE 519 Standards. The permissible individual harmonics level shall be less than 3% (for both voltage and current harmonics) and Total Harmonics Distortion (THD) for both voltage and current harmonics of the Grid system shall be less than 5%.

Inverter Standards

Inverter should comply with IEC 61683/IS 61683 for efficiency and Measurements and should comply IEC 60068-2 (1, 2, 14, 30) / Equivalent BIS Standard for environmental testing. Inverter should supervise the grid condition continuously and in the event of grid failure (or) under voltage (or) over voltage, Solar Plant should be disconnected by the circuit Breaker / Auto switch provided in the Inverter.

Various Other Standards			
Sl.	**Parameter**	**Reference**	**Requirements**
1.	**Overall conditions of service**	State Distribution/Supply Code	State Distribution/Supply Code
2.	**Overall Grid Standards**	Central Electricity Authority (Grid Standard) Regulations 2010	Central Electricity Authority (Grid Standard) Regulations 2010
3.	**Equipment**	BIS / IEC / IEEE	BIS / IEC / IEEE
4.	**Meters**	Central Electricity Authority (Installation & operation of meters) Regulation 2006 as amended time to time	Central Electricity Authority (Installation & operation of meters) Regulation 2006 as amended time to time
5.	**Safety and supply**	Central Electricity Authority (Measures relating to Safety and Electricity Supply) Regulations, 2010	Central Electricity Authority (Measures relating to Safety and Electricity Supply) Regulations, 2010
6.	**Harmonic Requirements** **Harmonic Current**	IEEE 519 CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013.	IEEE 519 CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013.
7.	**Synchronization**	IEEE 519 CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013	Solar Plant must be equipped with a grid frequency synchronization device. Every time the generating station is synchronized to the electricity system. It shall not cause voltage fluctuation greater than +/- 5% at the point of connection.
8.	**Voltage**	IEEE 519 CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013	The voltage-operating window should minimize nuisance tripping and should be under operating range of 80% to 110% of the nominal connected voltage. Beyond a clearing time of 2 second, the Solar Plant must isolate itself from the grid.
9.	**Flicker**	IEEE 519 CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013	Operation of Solar Plant should not cause voltage flicker in excess of the limits stated in IEC 61000 standards or other equivalent Indian standards, if any.

10.	**Frequency**	IEEE 519 CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013	When the Distribution system frequency deviates outside the specified conditions (50.5 Hz on upper side and 47.5 Hz on lower side), There should be over and under frequency trip functions with a clearing time of 0.2 seconds.
11.	**DC injection**	IEEE 519 CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013	Should not inject DC power more than 0.5% of full rated output at the interconnection point or 1% of rated inverter output current into distribution system under any operating condition.
12.	**Power Factor**	IEEE 519 CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013	While the output of the inverter is greater than 50%, a lagging power factor of greater than 0.9 should operate.
13.	**Islanding and Disconnection**	IEEE 519 CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013	The Solar Project in the event of fault, voltage or frequency variations must island/disconnect itself within IEC standard on stipulated period.
14.	**Overload and Overheat**	IEEE 519 CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013	The inverter should have the facility to automatically switch off in case of overload or overheating and should restart when normal conditions are restored.
15.	**Paralleling Device**	IEEE 519 CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013	Paralleling device of Solar System shall be capable of withstanding 220% of the normal voltage at the interconnection point.
16.	**Note:** The standards/specifications shall be subject to amendments/revisions from time to time by the Distribution Licensee and the State Agency on respective websites.		

ANNEXURE-1 Procedure for Application for connectivity of Solar Project with Distribution Licensee's Network

a) A consumer intending to set up a Solar Project or who has already installed such a system may download the Application Form from the concerned Distribution Licensee's website and submit it, duly filled, along with technical details of the Project to the concerned office of the Distribution Licensee along with registration fee, or apply and pay the fee online.

b) The Distribution Licensee shall register the Application and acknowledge its receipt within three working days; or intimate the Applicant within that period of any deficiency or incompleteness.

c) The Distribution Licensee shall conduct a technical feasibility study within 15 working days from the registration of the Application considering the following aspects:

   i. AC Voltage level at which connectivity is sought;

   ii. Sanctioned Load / Contract Demand of the Applicant;

   iii. Rated Output AC Voltage of the proposed Solar Project;

   iv. Available cumulative capacity of relevant Distribution Transformer;

d) Before rejecting any application for setting up a Solar Project at a particular Distribution Transformer, the Distribution Licensee shall serve the Applicant with a notice to rectify, within 15 days or such longer period as may be necessary, the deficiencies.

e) If found technically feasible, the Distribution Licensee shall, within 7 working days of the completion of the feasibility study, convey its approval for installing the Solar Project. The approval shall indicate the maximum permissible capacity of the Project, and shall be valid for a period of 4 months from the date of approval, or such extended period as may be agreed to by the Distribution Licensee.

f) The Applicant shall, within the period of validity of such approval, submit the work completion report, along with relevant details (such as technical specifications, test reports received from manufacturer / system provider, etc.), with a request to the Distribution Licensee for the testing and commissioning of the Solar Project.

g) The Distribution Licensee shall complete the testing and commissioning of the Project within 10 working days from receipt of such request, and shall install the Net Metering

equipment and synchronize the Roof-top Solar PV System within 10 working days thereafter.

h) The Eligible Consumer and Distribution Licensee shall enter into a Net Metering Connection Agreement in the prescribed format (**Annexure-3**) after the Solar Project is installed but before it is synchronized with the distribution network.

ANNEXURE-2 Model Application Form for installation of Solar Project under Net Metering arrangement

Name of Distribution Licensee [ ]

Name of Administrative Office [ ]

(To be filled by the Applicant in Block Letters)

1. Applicant's Full Name :

2. Address of the premises at which Solar Project is to be installed. :

3. Telephone/Mobile No. :

4. E-mail ID (if available) :

5. Alternate Address for communication (if any) :

6. Category of existing electricity connection :

7. Consumer No. :

8. Sanctioned Load / Contract Demand (in kW /kVA/ HP). :

9. Voltage at which existing supply has been given (in volts). :

10. Proposed AC capacity of Roof-top Solar PV System to be installed (in kW). :

11. Voltage at the output of Solar inverter (in volts). :

12. Details of Registration Fee paid (Rs. 500/-). :

Date : _____ Signature of Applicant.

Application No. _____

Date of Receipt _____

List of documents attached with Application Form

1. Copy of the latest paid electricity bill.
2. General Power of Attorney in favour of signatory in case of Partnership Firms; certified true copy of the Resolution, authorizing the signatory to deal with the concerned Distribution Licensee, passed by the Board of Directors in case of Companies (as applicable).
3. Technical details of PV modules, Inverter and other equipment of system proposed to be installed.

4. Proof of payment of Registration Fee.

.....

ACKNOWLEDGEMENT

Received an Application from ……. for connectivity/installation of Solar Project of capacity of ……. kW as per details below: -

Date of Receipt	Applicant's Name	Application Number	Existing Consumer No.	Capacity of Roof-top Solar PV System
(1)	(2)	(3)	(4)	(5)

Date : (Signature and Designation of Authorized Officer).

ANNEXURE – 3 Model Net Metering Connection Agreement

This Agreement is made and entered into at (location)_____ on this (date)_____ day of (month)_____ (year)_____ between the Eligible Consumer (Name)_____ having premises at (address)_____ and Consumer No._____ as the first Party,

AND

The Distribution Licensee_____ (hereinafter referred to as 'the Licensee') and having its Registered Office at (address)_____ as second Party of this Agreement;

Whereas, the Eligible Consumer has applied to the Licensee for approval of a Net Metering Arrangement under the provisions of the Joint Electricity Regulatory Commission (Solar PV Grid Interactive System based on Net Metering) Regulations, 2019 (herein after referred to as 'the Net Metering Regulations') and sought its connectivity to the Licensee's Distribution Network;

And whereas, the Licensee has agreed to provide Network connectivity to the Eligible Consumer for injection of electricity generated from its Solar Project of _____ kilowatt;

Both Parties hereby agree as follows: -

1. Eligibility

The Solar Project meets the applicable norms for being integrated into the Distribution Network, and that the Eligible Consumer shall maintain the Project accordingly for the duration of this Agreement.

2. Technical and Inter-connection Requirements

2.1. The metering arrangement and the inter-connection of the Solar Project with the network of the Licensee shall be as per the provisions of the Net Metering Regulations and the technical standards and norms specified by the Central Electricity Authority for connectivity of distributed generation resources and for the installation and operation of meters.

2.2. The Eligible Consumer agrees, that he shall install, prior to connection of the Solar Project to the network of the Licensee, an isolation device (both automatic and in built within inverter and external manual relays); and the Licensee shall have access to it if required for the repair and maintenance of the Distribution Network.

2.3. The Licensee shall specify the interface/inter-connection point and metering point.

2.4. The Eligible Consumer shall furnish all relevant data, such as voltage, frequency, circuit breaker, isolator position in his System, as and when required by the Licensee.

3. Safety

3.1. The equipment connected to the Licensee's Distribution System shall be compliant with relevant International (IEEE/IEC) or Indian Standards (BIS), as the case may be, and the installation of electrical equipment shall comply with the requirements specified by the Central Electricity Authority regarding safety and electricity supply.

3.2. The design, installation, maintenance and operation of the Solar Project shall be undertaken in a manner conducive to the safety of the Roof-top Solar PV System as well as the Licensee's Network.

3.3. If, at any time, the Licensee determines that the Eligible Consumer's Solar Project is causing or may cause damage to and/or results in the Licensee's other consumers or its assets, the Eligible Consumer shall disconnect the Solar Project from the distribution network upon direction from the Licensee, and shall undertake corrective measures at his own expense prior to re-connection.

3.4. The Licensee shall not be responsible for any accident resulting in injury to human beings or animals or damage to property that may occur due to back- feeding from the Solar Project when the grid supply is off. The Licensee may disconnect the installation at any time in the event of such exigencies to prevent such accident.

4. Other Clearances and Approvals

The Eligible Consumer shall obtain any statutory approvals and clearances that may be required, such as from the Electrical Inspector or the municipal or other authorities, before connecting the Solar Project to the distribution Network.

5. Period of Agreement, and Termination

This Agreement shall be for a period for 25 years, but may be terminated prematurely

a) By mutual consent; or
b) By the Eligible Consumer, by giving 30 days' notice to the Licensee;
c) By the Licensee, by giving 30 days' notice, if the Eligible Consumer breaches any terms of this Agreement or the provisions of the Net Metering Regulations and does not remedy such breach within 30 days, or such other reasonable period as may be

provided, of receiving notice of such breach, or for any other valid reason communicated by the Licensee in writing.

6. Access and Disconnection

6.1. The Eligible Consumer shall provide access to the Licensee to the metering equipment and disconnecting devices of Solar Project, both automatic and manual, by the Eligible Consumer.

6.2. If, in an emergent or outage situation, the Licensee cannot access the disconnecting devices of the Solar Project, both automatic and manual, it may disconnect power supply to the premises.

6.3. Upon termination of this Agreement under Clause 5, the Eligible Consumer shall disconnect the Solar Project forthwith from the Network of the Licensee.

7. Liabilities

7.1. The Parties shall indemnify each other for damages or adverse effects of either Party's negligence or misconduct during the installation of the Solar Project, connectivity with the distribution network and operation of the System.

7.2. The Parties shall not be liable to each other for any loss of profits or revenues, business interruption losses, loss of contract or goodwill, or for indirect, consequential, incidental or special damages including, but not limited to, punitive or exemplary damages, whether any of these liabilities, losses or damages arise in contract, or otherwise.

8. Commercial Settlement

8.1. The commercial settlements under this Agreement shall be in accordance with the Net Metering Regulations.

8.2. The Licensee shall not be liable to compensate the Eligible Consumer if his Solar Project is unable to inject surplus power generated into the Licensee's Network on account of failure of power supply in the grid/Network.

8.3. The existing metering System, if not in accordance with the Net Metering Regulations, shall be replaced by a bi-directional meter (whole current/CT operated), and a separate generation meter may be provided to measure Solar power generation. The bi-directional meter (whole current/CT operated) shall be installed at the inter-connection point to the Licensee's Network for recording export and import of energy.

8.4. The uni-directional and bi-directional meters shall be fixed in separate meter boxes in the same proximity.

8.5. The Licensee shall issue monthly electricity bill for the net metered energy on the scheduled date of meter reading. If the exported energy exceeds the imported energy, the Licensee shall show the net energy exported as credited Units of electricity as specified in the Net Metering Regulations, 2019. If the exported energy is less than the imported energy, the Eligible Consumer shall pay the Distribution Licensee for the net energy imported at the prevailing tariff approved by the Commission for the consumer category to which he belongs.

9. Connection Costs

The Eligible Consumer shall bear all costs related to the setting up of the Solar Project, excluding the Net Metering Arrangement cost beyond the Net Meter.

10. Dispute Resolution

10.1. Any dispute arising under this Agreement shall be resolved promptly, in good faith and in an equitable manner by both the Parties.

10.2. The Eligible Consumer shall have recourse to the concerned Consumer Grievance Redressal Forum constituted under the relevant Regulations in respect of any grievance regarding billing which has not been redressed by the Licensee.

In the witness, where of (Name)_____ for and on behalf of Eligible Consumer and (Name)_____ for and on behalf of (Licensee) agree to this agreement.

Joint Electricity Regulatory Commission (Draft Solar PV Grid Interactive System based on Net Metering) Regulations, 2019 – Explanatory Memorandum

Joint Electricity Regulatory Commission
(For the State of Goa & Union Territories)

Table of Contents

JOINT ELECTRICITY REGULATORY COMMISSION

(FOR THE STATE OF GOA AND UNION TERRITORIES)

EXPLANATORY MEMORANDUM
Draft JERC (Solar PV Grid Interactive System based on Net Metering) Regulations, 2019

1. Introduction

1.1. In exercise of the powers conferred under Sub-Section (1) of Section 181 and Clauses (zd), (ze) and (zf) of Sub-Section (2) of Section 181, read with Sections 61(h), 66, 83 and 86(1)(e) of the Electricity Act, 2003 and all other powers enabling it in this behalf, the Joint Electricity Regulatory Commission (for the State of Goa and Union Territories) [hereinafter referred to as JERC or the Commission] has uploaded the draft JERC (Solar PV Grid Interactive System based on Net Metering) Regulations, 2019 on its website.

1.2. The Commission has invited comments/suggestions from stakeholders through Public Notices published in leading newspapers, which have also been uploaded on the Commission's website. The last date for submission of comments/suggestions from stakeholders on the said Regulations is __.05.2019.

1.3. This Explanatory Memorandum is being issued with the intent of explaining the rationale and objective behind the draft JERC (Solar PV Grid Interactive System based on Net Metering) Regulations, 2019.

1.4. It may be mentioned for the sake of clarity, that the term "Commission" in most of the cases refers to the Officers of the Commission for carrying out the research/due diligence on the available information for preparation of Explanatory Memorandum for JERC (Solar PV Grid Interactive System based on Net Metering) Regulations, 2019.

2. Background

2.1. The regulatory framework in India for the gross-metering based renewable projects (including solar) has been evolving over the years. The development of regulatory framework for the solar sector has progressed in line with the implementation of applicable policies, viz., the Jawaharlal Nehru National Solar Mission (JNNSM) at the national level and specific State solar policies in some States. This has resulted in enhanced capacity addition from the large capacity solar power projects.

2.2. Rooftop solar projects have thus far been implemented in India under either gross metering arrangements and later under Net Metering arrangements or captive consumption arrangements. States like Gujarat initiated the implementation of small capacity rooftop solar projects under the gross-metering arrangement, with defined commercial arrangement and interconnection requirements. Technical and commercial requirements for net-metering arrangement however need to be addressed adequately and thus, help the propagation of this segment of rooftop projects.

2.3. A grid connected net-metering arrangement requires a well-defined regulatory and commercial framework to address the issues related to third party owned systems, provisions under the Open Access Regulations, provisions related to banking of energy, Metering under TOD regime, etc.

3. Scope of Regulation

3.1. These Regulations shall be applicable to the grid connected Rooftop mounted, ground mounted and floating solar power projects subject to the fulfilment of eligibility criteria specified in these Regulations. These Regulations shall extend to the State of Goa and the Union Territories of Andaman and Nicobar Islands, Chandigarh, Dadra & Nagar Haveli, Daman & Diu, Lakshadweep and Puducherry.

4. Eligibility Criteria

4.1. **Definition of Eligible Consumer:** The definition of eligible consumer for the net metered project is important from the perspective of permitting third party ownership of rooftop solar systems, and to clarify whether power projects installed at other premises shall be considered under eligible projects.

4.2. Rooftop solar projects under net-metering are expected to be of size ranging from small to large size and will act as on-site generation-cum-consumption for the consumer. The connectivity with the grid will act as support facility to consumer to bank the surplus electricity generated in the grid for a defined period. There is a merit in allowing both self-owned as well as third party owned systems under the net metering arrangements where the primary purpose is to meet the internal electricity consumption requirement of the consumer. The third-party ownership can also mitigate the reluctance of owner for capital investment.

4.3. It is proposed that consumer's eligibility for net-metering be defined in such a way that it allows, both self-owned as well as third party owned systems, to be installed for meeting consumer's self-consumption.

4.4. The Joint Electricity Regulatory Commission has compared Regulations notified by some selected States in order to finalize the definition of Eligible Consumer. The State-wise comparison is shown below:

Net Metering Regulations	Definition of Eligible Consumer
JERC, 2015	**Eligible Consumer**: "Eligible consumer" means a consumer of electricity in the area of supply of the "Distribution licensee", who uses a solar power project installed in the consumer premises, to offset part or all of the

Net Metering Regulations	Definition of Eligible Consumer
	consumer's own electrical requirements, such solar project can be self-owned or third party owned. The eligible consumer may install the solar project under these Regulations, provided the Solar Project is: a) Within the permissible rated capacity as defined under these Regulations. b) Located in the consumer's premises. c) Interconnected and operated safely in parallel with the Distribution Licensee network.
Model FOR, 2013	Eligible Consumer: "Eligible consumer" means a consumer of electricity in the area of supply of the distribution licensee, who uses a rooftop solar system installed in the consumer premises, to offset part or all of the consumer's own electrical requirements, given that such systems can be self-owned or third party owned; The eligible consumer may install the rooftop solar system under net metering arrangement which; a) shall be within the permissible rated capacity as defined under these Regulations; b) shall be located in the consumer premises; c) shall interconnect and operate safely in parallel with the distribution licensee network.
GERC	The Eligible consumer for the Rooftop Solar PV System with Net Metering shall be a. a consumer of Local distribution Licensee; b. own or be in legal possession of the premises including the rooftop or terrace or building or infrastructure or open areas of the land or part or combination thereof on which the Solar PV System is proposed to be installed; c. connect the proposed Rooftop Solar PV System to the Distribution System of the Licensee; d. consume all of the electricity generated from the Rooftop Solar PV System at the same premises The Eligible Consumer may install the Rooftop Solar PV System under net metering arrangement which, a) shall be within the permissible rated capacity as defined under these Regulations. b) shall be located in the consumer's premises. c) shall interconnect and operate safely in parallel with the distribution licensee network.
RERC	**"Eligible Consumer**" means a consumer of electricity in the area of supply of the distribution licensee, who uses or proposes to use a rooftop or small solar system installed in the consumer premises, to offset part or all of the consumer's own electrical requirements, given that such systems can be self-owned or third party owned; The Eligible Consumer may install the rooftop solar system under net metering arrangement which, (a) shall be within the permissible rated capacity as defined under these Regulations. (b) shall be located on the consumer premises.

Net Metering Regulations	Definition of Eligible Consumer
	(c) shall interconnect and operate safely in parallel with the distribution licensee network.
KERC	"**Eligible Consumer**" means a consumer of electricity in the area of supply of the distribution licensee who has installed or proposes to install SRTPV for generation of electricity and supply to such distribution licensee on gross / net metering basis and who satisfies such other conditions as may be specified by the Commission for this purpose. The Eligible Consumer may install the rooftop solar system under net metering arrangement which, (a) shall be within the permissible rated capacity as defined under these Regulations. Interconnection of such plant with the distribution network shall be undertaken as specified under these Regulations and in compliance with the Grid code / Distribution Code and the Central Electricity Authority (Technical Standards for Connectivity of the Distributed Generation Resources) Regulation, 2013 as amended from time to time.
MPERC	**"Eligible Consumer"** means a consumer of electricity in the area of supply of the distribution licensee, who uses or proposes to use a rooftop or small solar system installed in the consumer premises, to offset part or all of the consumer's own electrical requirements, given that such systems can be self-owned or third party owned**;** The eligible consumer may install the renewable energy system under net metering arrangement which, a) Shall be up to the permissible individual rated capacity of 112 kW at LT; b) Shall be located in the consumer premises or common facility area in case of multi storied buildings; and c) Shall interconnect and operate safely with the Distribution Licensee network conforming to the relevant provisions of the Central Electricity Authority (Measures relating to safety and electric supply) Regulations, 2010 as amended from time to time.
MERC	"**Eligible Consumer**" means a consumer of electricity in the area of supply of the Distribution Licensee who uses or intends to use a Solar Photo Voltaic ('PV') generating System having a capacity less than 1 MW, installed on a roof-top or any other mounting structure in his premises, to meet all or part of his own electricity requirement, and includes a Consumer catering to a common load such as a Housing Society : Provided that such generating System may be owned and/or operated by such Consumer, or by a third party leasing such System to the Consumer. • The eligible consumer may install the solar project under these Regulations, provided the Solar Project is: • Within the permissible rated capacity as defined under these Regulations. • Interconnected and operated safely in parallel with the Distribution Licensee network.
PSERC	**"Eligible Consumer"** means a consumer of electricity in the area of supply of distribution licensee, who uses a rooftop SPV system installed in his premises to offset part or all of the own electrical requirements, given that such systems can be 'self-owned' or 'third party owned';

Net Metering Regulations	Definition of Eligible Consumer
	Any consumer in the area of supply of distribution licensee may install rooftop solar system under net metering arrangement which: a) shall be of minimum 1 kWp & upto 1 MWp (AC side) capacity with or without battery back up support b) shall be located in the consumer premises c) shall interconnect and operate safely in parallel with the distribution licensee network.

4.5. Accordingly, JERC has defined the Eligible Consumer as

*"**"Eligible Consumer"** means a consumer of electricity in the area of supply of the Distribution Licensee, who uses a self-owned or third party owned solar power project installed in the consumer premises, to offset part or all of the consumer's own electricity requirements;"*

4.6. Further, the Eligible Consumer may install the solar project under these Regulations, provided the Solar Project is:

i. Within the permissible rated capacity as defined under these Regulations;

ii. Located at the consumer's premises;

iii. Interconnected and operated safely in parallel with the Distribution Licensee's network.

4.7. Also, the maximum capacity of rooftop solar system defined for grid connection in several States is ranging between 500 kW to 1 MW. The Maximum Capacity for rooftop solar system in selected States is as under:

Net Metering Regulations	Solar Roof Top	
	Minimum	**Maximum**
JERC 2015	1 kWp	500 kWp (More than 500kWp can also be considered by the Distribution Licensee if the distribution network remains stable with higher Rating)
GERC	1kWp	1 MWp (Maximum capacity shall be upto a maximum of 50% of consumer's sanctioned load/contract demand, except Residential consumer whereas in case of Residential Consumers, the Rooftop Solar PV System capacity shall be irrespective of their sanctioned load/contract demand and the installed Capacity shall not exceed 1 MWp)
RERC	1 kWp	1000kWp (Maximum Capacity shall not be more than 80% of the sanctioned connected load / contract demand of the consumer, and the installed capacity shall not be more than 1000kWp)
TNERC	1 kWp	(Maximum upto 100% of the Sanctioned/Contracted demand).

Net Metering Regulations	Solar Roof Top	
	Minimum	**Maximum**
KERC	1kWp	1 MW (Subject to further limit based on the Sanctioned load of the Consumer's installation or may be specified by the Commission from time to time)
MPERC	1 kWp	1 MW at HT
MERC	1 kWp	Capacity of the individual consumer shall not exceed contract demand or sanctioned load.
PSERC	1kWp	1MWp

4.8. Considering the above, the maximum capacity limit for rooftop solar system is proposed to be capped at 500 kWp at one premise to qualify under net-metering. However, Rooftop projects of rating higher than 500 kWp can be considered by the Distribution Licensee if the distribution system remains stable with higher rating Rooftop Solar Projects getting connected to the grid.

4.9. The draft Regulations also clearly specify that the maximum Solar Power Generation capacity to be installed at any eligible consumer premises shall not exceed his Contract Demand (in kVA) or Sanction load (in kW), since the primary objective of these Regulations is to encourage solar generation capacity for self-consumption under net-metering arrangement, rather than to set up solar generation capacity as a generator intending to sell power to a third-party.

5. Third Party Owned Solar Projects (RESCO Model)

5.1. In the third party owned rooftop PV net metering model, the developers or intermediaries lease out solar PV systems to interested rooftop owners. This is a popular model for residential home owners, where turnkey installers lease rooftop systems to individual households who in turn pay them a monthly lease rental. The owner of the house provides the rooftop and commissions a turnkey installer to design and install the system. Alternatively, the installers can also offer an integrated service of leasing, commissioning and maintaining the systems for homeowners and guaranteeing standards of performance. The electricity generated from such a system is used to meet the rooftop owner's internal electricity needs while the excess generation is fed into the grid on net metering basis. This model has the following benefits.

- **Benefits to rooftop owner**: The household owner avoids large upfront investment for the solar equipment and on occasion avoids assuming technology or performance risk of solar systems. Net-metering allows the rooftop owner to save on power consumed from the grid to the extent of

solar generation. A part of savings in power consumption is shared with the developer by way of a lease rental of the solar plant.

- **Benefits to developer**: The leasing company generates revenues by way of lease rental of the solar plant from the rooftop owner under a contract. As it continues to be owner of the equipment, it also qualifies for claiming depreciation on the capital cost of the PV systems, with associated direct tax benefits.

5.2. Further, the Distribution Licensee shall collect the charges payable by the consumer and thereafter, amount to be released to RESCO, if the consumer and the RESCO mutually agree and give a written undertaking to that effect to the Distribution Licensee.

5.3. Further, in order to remove difficulties faced by the consumer for implementation of Solar project, the Distribution Licensee shall notify the procedure for empanelment of EPC Contractor and also the Distribution licensee may publish the list of empanelled contractors on its website.

5.4. The existing Regulations permit only two business models, CAPEX and RESCO, whereas other business models can also be incorporated in the Indian context to help in the proliferation of Grid connected solar projects in India.

6. Solar Power Generation Capacities

6.1. The Distribution licensee may also act as RESCO or an EPC company in order to promote solar power capacity in its licensed area. Further, the Commission is of the view that if the Distribution licensee act as an RESCO or an EPC company, the income of the Distribution licensee from such activity shall be considered as “Other Income” as the same is for the promotion of solar power generation in the licensed area.

6.2. The Distribution Licensee shall arrange for sealing of the electricity meter, as the Meter shall be arranged by the consumer / Solar power generator.

6.3. The capacity of an individual rooftop PV system under net metering arrangement is subject to various parameters such as available capacity of the service line connection of the consumer, the connected load of the consumer and the cost implications of utility system augmentation (if required). The installation of net metered rooftop solar systems on consumer premises will utilize the same service line for excess power injection into the grid, which is currently being used by consumer for drawal of power from utility network. Thus, the capacity limits for installation of net-metering based rooftop solar systems has to address the following two requirements:

a) the individual capacity limit for system Transformer and the feeder line that can be installed on a particular consumer premises

b) the maximum (higher limit) capacity allowed to be installed under a net-metering arrangement.

6.4. In India, the supply of electricity to the consumers by the distribution utilities is generally given at a defined voltage level on the basis of contracted load of the consumer. The contracted load is generally defined as maximum demand in kW, kVA or BHP, agreed to be supplied by the Licensee and indicated in the Agreement executed between the licensee and the consumer. The connecting

voltage at low and medium tension voltages are defined such as 1 Phase 230 V, 3 Phase 415 V, 3 Phase 11 kV and 3 phase 33 kV, etc.

6.5. Since the system of supply (maximum demand for each voltage level, etc.) is already defined under the Supply Code applicable to the State as notified by the Commission, it can apply similarly for the net-metering based rooftop capacity. In other words, permitted maximum rated capacity of the rooftop solar PV system for any consumer shall be as per the Supply/Distribution Code applicable in the State read as if the rooftop PV solar system is equivalent to a Connected Load for the purpose of deciding the system of supply/interconnection, including the voltage level and the need for service line enhancements, etc. needed to connect to a higher voltage profile, is so desired by the eligible consumer. JERC Supply Code Regulations, 2018 state that wherever the existing transformation capacity at the sub-station end is loaded upto 75% of its capacity, the Licensee shall prepare a scheme for augmentation of such transformation capacity after factoring in (N-1) contingency. The Licensee shall display the monthly updated status of transformation capacity for each sub-station on its website.

6.6. Further, the Commission has gone through the Generation capacities in different States for Net metering, as summarized below:

Solar Net Metering Regulations	**Capacities of Distribution Transformer**
JERC, 2015	The Distribution Licensee shall facilitate the Solar Project Development: Provided that the cumulative solar capacity allowed at a particular distribution transformer shall not exceed the limit as specified in these Regulations as a percent of the peak capacity of the distribution transformer. Provided also that total solar power generation capacity (in MW) in the respective territories does not exceed the limits as per Procurement of Renewable Energy Regulations of the Commission.
Model FOR, 2013	The distribution licensee shall provide net metering arrangement to eligible consumers as long as the total capacity (in MW) does not exceed the target capacity determined by Commission; Provided a maximum cumulative capacity of……..MW[1] shall be allowed to eligible consumers under net metering, on yearly basis, in the area of supply of the distribution licensee; Provided that the cumulative capacity to be allowed at a particular distribution transformer shall not exceed 15% of the peak capacity of the distribution transformer. 1. To be decided by SERC
GERC	The Distribution Licensee shall provide net metering arrangement to Eligible Consumers. Provided that the cumulative capacity to be allowed at a particular distribution transformer shall not exceed 65% of the peak capacity of the distribution transformer;

	The distribution licensee shall update distribution transformer capacity available for connecting Rooftop Solar PV Systems under net metering arrangement on yearly basis and shall provide the information to the Commission.
RERC	The cumulative capacity to be allowed at a particular distribution transformer shall not exceed 30% of the capacity of the distribution transformer. The distribution licensee shall update distribution transformer level capacity available for connecting Rooftop PV Solar Power Plants under net metering arrangement on yearly basis and shall provide the information on its website as well as to the Commission.
TNERC	At the local distribution level, connectivity to rooftop solar systems shall be restricted to 90% of the distribution transformer capacity on the basis of first come first served. The Distribution licensee shall update the status of cumulative rooftop solar capacity connected to each Distribution transformer in their website.
KERC	The cumulative capacity shall not exceed the total capacity of the State as determined or approved by the Commission for this purpose.
MPERC	The cumulative capacity allowed at a particular distribution transformer shall not exceed 15% of the peak capacity of the distribution transformer
PSERC	The distribution licensee shall provide net metering arrangement to eligible consumers as long as the total capacity (in MW) of rooftop solar systems does not exceed the target capacity determined by the Commission. Provided further the cumulative capacity of rooftop solar system to be allowed to a particular distribution transformer shall not exceed 30% of the rated capacity of the distribution transformer.
MERC	The Distribution Licensee shall allow Net Metering Arrangement to Eligible Consumers as specified in these Regulations: Provided that the cumulative capacity of all Roof-top Solar PV Systems under Net Metering Arrangements connected to a particular Distribution Transformer of the Licensee shall not exceed 40% of its rated capacity. Provided further that the Distribution Licensee may allow Net Metering connectivity exceeding 40% of such rated capacity upon consideration of a detailed load study carried out by it.

6.7. Considering the above, it is proposed in the draft Regulations that the cumulative solar capacity allowed at a particular distribution transformer shall not exceed 75 percent of the capacity of the distribution transformer. However, the Distribution Licensee may allow solar capacity connected to a particular distribution transformer exceeding 75 percent of capacity upon consideration of a detailed load study carried out by it. The distribution licensee shall provide net metering arrangement to eligible consumers as long as the total capacity (in MW) of rooftop solar systems does not exceed the target capacity determined by the Commission.

7. Types of Solar Project Considered

7.1. The National Action Plan for Climate Change (NAPCC) released in June 2008 outlines the national strategy that aims to enable the country to adapt to climate change and enhance the ecological sustainability of India's development path. As a part of NAPCC, the Government of India launched the JNNSM.

7.2. Apart from promoting the ground mounted solar PV projects, the JNNSM also has a mandate to encourage the rooftop solar segment. Under Phase I of JNNSM, a separate scheme called 'Rooftop PV and Small-Scale Solar Generation Program (RPSSGP)' was implemented for developing solar PV projects with maximum capacity of 2 MW as rooftop or small-scale ground mounted solar projects.

7.3. The JNNSM was launched on the 11th January, 2010. The Mission has set the ambitious target of deploying 20,000 MW of grid connected solar power by 2022 is aimed at reducing the cost of solar power generation in the country through

- Long-term policy;
- large scale deployment goals;
- aggressive R&D; and
- domestic production of critical raw materials, components and products, as a result to achieve grid tariff parity by 2022.

7.4. Further, Government of India has revised the target of Grid Connected Solar Power Projects from 20,000 MW by the year 2021-22 to 100,000 MW by the year 2021-22 under the National Solar Mission, which was approved by Cabinet on 17th June 2015.

7.5. Further, the Cabinet in Phase II of the Grid connected Rooftop Solar program on 10.02.2019 has cleared the increase of central finance clearance for Resident solar to 40% for solar plants up to 3 kW and 20% for Plants between 3kW to 10kW.

7.6. In accordance with the JNNSM and National Solar Mission, and in order to encourage all types of installations, the Commission has covered the Solar Power Projects for Prosumer, which may be roof mounted, ground mounted, floating on water bodies or installed on Elevated structures, within the scope of these Regulations.

8. Metering Arrangement

8.1. The Commission has specified in the draft Regulations that the Distribution licensee shall allow installation of Solar Power Projects in its area of supply on non-discriminatory and first come - first serve basis for each Distribution Transformer separately.

8.2. The net metering arrangement is required to have a two-meter system, and the Licensee shall recognize all the installed meters for commercial settlements. Existing consumers availing rooftop solar net-metering arrangement will be required to replace their exiting consumer meters with new net-meter and a Solar Generation meter and the cost of new meters will be borne by the consumer and installed by the Distribution Licensee. This is in line with the existing regulatory framework adopted by various States with respect to the responsibility of bearing the cost of consumer meter.

8.3. Process of meter reading is important from the perspective that net-metering systems utility will be required to complete the commercial settlement at the end of the settlement period.

8.4. Given the fact that the commercial settlement for net-metering based consumers need to be done at the end of financial year, this may require the Licensee to adopt meter reading instrument (MRI) or wireless equipment for recording meter readings as it will facilitate faster compilation of relevant consumer metering details to complete the final year end settlement. Hence, net-meters are proposed to be MRI compliant or wireless enabled for remote reading. In case the consumer wishes to have a record of the reading taken, he shall be allowed so by the Licensee. The position of the solar meter should be accessible to the utility and be preferably alongside where the consumer meter is mandated under the Supply Code.

8.5. The Electricity Act has mandated Central Electricity Authority (CEA) to specify the metering Standards. Accordingly, CEA issued the CEA (Installation and Operation of meters) Regulations, 2006. The standards for net-meter can be the same as specified for Consumer Meters in Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006 and Electricity Authority (Installation and Operation of Meters) Amendment Regulations, 2010 as amended from time to time. State regulatory frameworks for Consumer Meter have adopted the CEA Regulations for the consumer meter standards and relevant provisions. As the net-meter will act as a consumer meter for commercial settlement with the utility, it is proposed that the existing metering specifications and standards can be adopted for net meters also.

8.6. Given the fact that the rooftop solar projects would generally be of small capacity of kW scale, the requirement of check meters can be avoided for the very small capacity projects. For example, under the Gandhinagar rooftop solar programme, the requirement of check meters has only been for the rooftop solar capacity above 20 kW. It is proposed that similar provision be adopted to avoid requirement of check meters for small capacity upto 20kW net metered projects. The requirement of check meters can be kept provisional for capacity less than and equal to 20 kW and consumer can bear cost for these check meters if required by the consumer. The main generation meter (solar meter) can be of 0.2s class accuracy and with facility for recording meter readings using Meter Reading Instrument (MRI).

8.7. Further the Distribution Licensee shall also phase out the old meters and install the meters having Advanced Metering Infrastructure (AMI) facility with RS 485 (or higher) communication port.

8.8. Further, the Commission has also compared the Metering arrangement of different States as shown under:

Net Metering Regulations	Metering Arrangement
Model FOR, 2013	• The metering system shall be as per the Regulations for installation & operation of meters for rooftop solar systems under net-metering arrangement to be notified by the competent Authority. • Until such time bi-direction meters (net meters) shall be installed for rooftop solar systems under net-metering arrangement. The net meters shall be of accuracy class 1.0 or better or as per the specifications notified by the competent authority. These meters shall be Meter Reading instrument (MRI) compliant or wireless equipment for recording meter readings. • The main Solar Meters shall be of 0.2s class accuracy and with facility for recording meter readings using Meter Reading Instrument (MRI). Check meters shall be mandatory for rooftop solar systems having capacity more than 20 kW. For installations size of less than and equal to 20 kW, the solar Check meters would be optional. Provided that the cost of new/additional meter (s) shall be borne by the eligible consumer and installed & owned by the distribution licensee. Provided further that in case the eligible consumer is under the ambit of time of day tariff, meters compliant of recording time of day consumption/generation shall be employed.
TNERC	• Meters to be installed by the Solar Power generator. Licensee to host the list of manufacturers of the meters on its website. • Meters shall be as specified in CEA Regulations, 2006 and CEA Regulations, 2013. Check meters shall be mandatory for rooftop solar PV system having rated capacity of more than 20kWp. The cost of new/additional meter(s) provided for the net-metering and the installation and testing charges shall be borne by the eligible consumers.
GERC	• The metering system shall be as per the Central Electricity Authority (Installation & Operation of Meters) Regulations, 2006as amended from time to time. • These meters shall be Meter Reading instrument (MRI) or wireless equipment compliant for recording meter readings. The main Solar Meters shall be of 0.2s class accuracy and with facility for recording meter readings using Meter Reading Instrument (MRI) or wireless equipment. Check meters shall be mandatory for Rooftop Solar PV Systems having capacity more than 20 kW.
GERC	• Bi-directional meter or alternately two separate meters for import and export of the same accuracy class as the consumer's meter existing before the commissioning of the Rooftop Solar PV System shall be installed in replacement of existing meter. Such meters may be provided by the distribution licensee or consumer. If the meter is installed by the distribution licensee in that case, cost of the same shall be recovered from the consumer. Industrial, Commercial and Other consumers utilizing both 'energy attribute' as well as 'renewable attribute' of the generated solar energy shall have to use ABT compliant meter.
RERC	• The metering system shall be as per the Regulations for installation & operation of meters for rooftop solar systems under net-metering arrangement specified in these regulations.

Net Metering Regulations	Metering Arrangement
	• The bi-directional (net meter) shall be installed at the interconnection point of the Eligible Consumer with the network of the distribution licensee: Provided further that consumers having ABT compliant meters shall not be required to install additional net meter. These meters shall have the facility for downloading meter readings using Meter Reading Instrument (MRI). Check meters shall be mandatory for rooftop solar systems having capacity more than 250 kW.
KERC	• Meters to be installed by the Solar Power generator. Licensee to host the list of manufacturers of the meters on their website. • Meters shall be as specified in CEA (Installation and Operation of Meters) Regulations, 2006 for the SRTPV Plants under both gross and net metering arrangement. Provided that for consumer eligible for gross metering arrangement, the bi-directional (net meter) shall be installed at the interconnection point of such consumer with the network of distribution licensee.
MPERC	• The metering arrangement for LT and HT system shall be as per the CEA (Installation & operation of Meters) Regulations, 2006 as amended. • Until such time bi-directional meters (net meters) are installed for renewable energy systems under net-metering arrangement, the net meters which may be used shall be of accuracy class 1.0 or better or as per the specifications notified by the CEA. These meters shall be Meter Reading instrument (MRI) compliant or wireless equipment for recording meter readings. Cost of new/additional meter (s) including installation charges thereof shall be borne by the eligible consumer and these are also installed by the Distribution licensee
MERC	• The Net Meter in the premises of the Eligible Consumer shall be procured and installed by the Distribution Licensee at its own cost and in accordance with the provisions of the Electricity Supply Code : Provided that, if the Eligible Consumer is within the ambit of Time-of-Day ('ToD') Tariff, the Net Meter installed shall be capable of recording ToD consumption and generation.
PSERC	• The net metering equipment (Bi-directional meters) and the Solar meter (unidirectional) as per CEA Regulations shall be installed and maintained by the distribution licensee at the cost of the eligible consumer: Provided the eligible consumer may procure the net meter/solar meter and present the same to the distribution licensee for testing and installation as per Regulation 21.2 of the Supply Code. Provided that in case the eligible consumer is under the ambit of TOD Tariff, the meter compliant of recording time of day consumption/generation shall be installed.

8.9. Accordingly, the following provisions are proposed for facilitating net-metering based rooftop solar projects:

"

a. *The Distribution Licensee shall allow installation of Solar Power Projects in its area of supply on non-discriminatory and first come - first serve basis for each Distribution Transformer separately and within the time line as provided in these Regulations.*

b. *The metering system shall be as per the Central Electricity Authority (Installation & Operation of Meters) Regulations, 2006 as amended from time to time:*

Provided that the Meters shall comply with the Standards prescribed in ***Annexure A****.*

c. *The Distribution Licensee shall also phase out the old meters gradually and shall introduce Advanced Metering Infrastructure (AMI) facility with RS 485 (or higher) communication port.*

d. *Bi-directional meter of the same accuracy class as the Consumer's meter existing before the commissioning of the Solar Project, shall be installed in replacement of existing meter:*

Provided that such meters may be provided by the Distribution Licensee, or the Consumer subject to the same being from the approved list of the suppliers:

Provided further that if the meter is installed by the Distribution Licensee, cost of it shall be recovered from the Consumer before the COD of the Project.

e. *The main Solar Meter shall be of 0.2s class accuracy and with facility for recording meter readings using Meter Reading Instrument (MRI) or wireless equipment. Check Meters shall be mandatory for Solar Project having capacity more than 20 kW. For installations having capacity less than or equal to 20 kW, the Check Meters would be optional:*
Provided that the cost of Check Meter shall be borne by the Consumer, and such meter shall be tested and installed by the Distribution Licensee.

f. *The meters installed if arranged by the Consumer shall be inspected, verified for the accuracy and sealed by the Distribution Licensee in the presence of the Consumer or its representative (if he chooses to be present at the time of testing):*
Provided that in case the Consumer is availing Time of Day tariff, meters capable of recording Time of Day consumption/generation shall be installed."

9. Inter-connection with the Distribution Network, Standards and Safety

9.1. Net-metering based rooftop solar systems are small capacity systems and can be expected to proliferate fast when the Policy and Regulations are conducive. The pace and level of proliferation of net-metering based rooftop would have an impact on the local grid, which has to address technical, safety and grid security issues arising out of possible reverse flow of electricity in the local grids.

9.2. The Commission with respect to safety standards has proposed that the Eligible Consumer shall provide appropriate protection for islanding of the Solar Project from the network of the Distribution Licensee in the event of grid or supply failure.

9.3. The net metering connection agreement also serves as an agreement that clarifies the roles, responsibilities and liabilities of the two Parties during the period the net-metering arrangement is connected to the grid. It must cover aspects related to the safety of the grid and PV system, connection cost, termination clauses, etc.

9.4. The connection agreement has been framed with reference to various standards and regulations relevant to connection of small and distributed system to the grid.

9.5. It is to be noted that the technical requirements under the connection agreement is as per the CEA requirements with respect to safe, secure and reliable function of the Solar Plant and the grid. The harmonic generation shall be restricted within the limit specified in the agreement or specified by the Central Electricity Authority (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013.

9.6. Accordingly, the Commission has proposed the following clauses in this regard, in the draft Regulations:

"

a. *The Distribution Licensee shall ensure that the inter-connection of the Solar Project with its distribution network conforms to the specifications, standards and other provisions specified in the CEA (Technical Standard for Connectivity of the Distributed Generation Resources) Regulations, 2013, CEA (Technical Standards for Connectivity to the Grid) Regulations, 2007 including amendments thereto, the CEA (Measures relating to Safety and Electric Supply), Regulations, 2010 including amendments thereto and the Joint Electricity Regulatory Commission for the State of Goa and UT's (Electricity Supply Code) Regulations, 2018 including amendments thereto and Joint Electricity Regulatory Commission for the State of Goa and UT's (State Grid Code) Regulations, 2010.*

b. *Solar Power generation with Net metering will be allowed for all the Consumers of the Distribution Licensee under the jurisdiction of the Commission at one location owned by one Solar Project Developer with/without battery back-up support::*

   Provided that, if an Eligible Consumer opts for connectivity with a battery back-up, the inverter shall have a separate back-up wiring to prevent the battery/ decentralized generation (DG) power from flowing into the grid in the absence of grid supply, and that an automatic as well as manual isolation switch shall also be provided:

   Provided further that the Inverter shall comply with the Standards prescribed in ***Annexure A****.*

c. *The Eligible Consumer shall be responsible for the safe operation, maintenance and rectification of any defect in the Solar Project up to the point of Net Meter, beyond which point such responsibility, including in respect of the Net Meter, shall be that of the Distribution Licensee:*

   Provided that the Solar Meter shall be maintained by the Distribution Licensee.

d. *The Eligible Consumer shall provide appropriate protection for islanding of the Solar Project from the network of the Distribution Licensee in the event of grid or supply failure.*

e. *The Consumer shall be solely responsible for any accident to human being/ animals whatsoever (fatal/non-fatal/departmental/non-departmental) that may occur due to back feeding from the Solar Power Generator plant when the grid supply is off:*

Provided that the Distribution Licensee shall have the right to disconnect the Solar Project from its distribution network at any time in the event of any threat of accident or damage from such Project to its distribution system for maintenance of distribution system so as to avoid any accident or damage to it:

Provided further that the Eligible Consumer may use his Solar Project in islanding mode for his own consumption.

f. *The Distribution Licensee and Eligible Consumer shall discharge their respective duties and responsibilities as specified in the relevant Regulations of the Central Electricity Authority.*"

10. Communication Facilities

10.1. The Commission has proposed in the draft Regulations that all grid connected Solar power projects shall have electricity meters with features to record energy for data storage for injection into the grid through solar meter. Further, all projects shall have communication Port for exchanging real time information with the Distribution Licensee.

10.2. The Distribution Licensee shall also install the meters having Advanced Metering Infrastructure (AMI) facility with RS 485 (or higher) communication port.

11. Billing, Energy Accounting and Settlement

11.1. After Commissioning of the Solar power plant and at the end of each billing cycle, the Distribution Licensee shall take energy meter readings for import and export of power and work out the net energy flow quantum. The consumer will be issued Energy Account Statement along with the bill for charges like meter rentals, service charges, or any other as applicable, etc., and banked energy will be carried forward for accounting in the next billing cycle or till the time Consumer intends it to be banked.

11.2. The issue of injection of electricity, which is in excess of the consumer's internal consumption needs to be analyzed over two periods:

- The carry forward to be allowed in a particular billing period, which is usually a month for consumer-end energy accounting and billing.
- The carry forward to be allowed beyond the billing period and at the end of the settlement period (which is generally a financial year).

11.3. The settlement period for undertaking the final settlement of the net-metered energy is generally 12-month period which has been adopted by most utilities to remove the effect of seasonality in generation. The commercial settlements involve either settlement only in terms of energy or settlement of the net excess energy at avoided-cost rate/generic tariff, Average Power Purchase Cost (APPC), etc.

11.4. The carry forward of excess injection to next billing cycle is a well-accepted mechanism as it allows benefit to consumer to utilize any surplus generation in one billing cycle against energy consumption in the subsequent billing cycle, which can also be due to variability of electricity generation across different months in a particular financial year or variability in consumption patterns on the part of the consumer.

11.5. In these Regulations, it is proposed that the carry forward of energy from one billing cycle to the next billing cycle shall be permitted but within the same settlement period and the utility can reflect the credit (in energy terms) to consumer for any excess injection.

11.6. The Commission has also compared the Settlement Period of different States as under:

Net Metering Regulations	Settlement Period
JERC	Six Monthly basis on 30th September & 31st March of every year
Model FoR, 2013	**"**Settlement Period" means the period beginning from first of April in an English calendar year and ending with the thirty first of the March of the next year;
TNERC	Settlement period shall be 12 months from April to March of the financial year i.e 1st of April of the current year to the 31st of March of the succeeding year.
MPERC	period beginning from first day of April as per English calendar year and ending with the thirty first day of the March of the next year
MERC	period beginning from the first day of April of a calendar year and ending with the thirty-first day of March of the following calendar year
PSERC	period beginning from first day of October in an English calendar year and ending with thirtieth day of September of next year

11.7. From the above, it is observed that most of the States are following yearly settlement and hence, the Commission has opted for the same, as it takes care of the seasonality of generation as well as consumption.

11.8. The Commission for determining the Energy Accounting rate has compared the rate at which the excess energy is injected into the grid by different SERCs, as shown in the Table below:

Net Metering Regulations	Treatment of Excess Energy Injected into the Grid
JERC, 2015	**Net Metering** • If the electricity injected into the grid exceeds consumed electricity, such excess units shall be carried forward to the next billing cycle;
Model FoR, 2013	**Net Metering** If the electricity injected into the grid exceeds consumed electricity, such excess injected electricity shall be carried forward to the next

Net Metering Regulations	Treatment of Excess Energy Injected into the Grid
	billing period as electricity credit may be utilized to net electricity injected or consumed in future billing periods
RERC	**Net Metering** In the event the electricity injected exceeds the electricity consumed during the billing period, such excess injected electricity shall be paid by the Distribution Licensee at **feed in tariff** determined by the Commission from time to time for Solar Photo Voltaic generation in next billing period provided that such export is above 50 units. Net energy credits less than 50 units under Net Metering achieved in the particular billing period shall be adjusted in the next billing period till credit of 50 units is achieved
GERC	**Net Metering:** **For Residential and Government consumers** • If the electricity injected into the grid exceeds consumed electricity, such excess injected electricity shall be purchased by the concerned Distribution Licensee at the APPC rate determined by the Commission for the year in which the Rooftop Solar PV System is commissioned for whole life of the Rooftop Solar PV System. **For Industrial, Commercial and Other Consumers utilizing the 'energy attribute' of the generated solar energy from the Rooftop Solar PV System and not registered under REC mechanism.** • If the electricity injected into the grid exceeds consumed electricity, such excess injected electricity shall be purchased by the concerned Distribution Licensee at the APPC rate determined by the Commission for the year in which the Rooftop Solar PV System is commissioned for whole life of the Rooftop Solar PV System.
GERC	**Net Metering:** **For Residential and Government consumers** • If the electricity injected into the grid exceeds consumed electricity, such excess injected electricity shall be purchased by the concerned Distribution Licensee at the APPC rate determined by the Commission for the year in which the Rooftop Solar PV System is commissioned for whole life of the Rooftop Solar PV System. **For Industrial, Commercial and Other Consumers utilizing the 'energy attribute' of the generated solar energy from the Rooftop Solar PV System and not registered under REC mechanism.** • If the electricity injected into the grid exceeds consumed electricity, such excess injected electricity shall be purchased by the concerned Distribution Licensee at the APPC rate determined by the Commission for the year in which the Rooftop Solar PV System is commissioned for whole life of the Rooftop Solar PV System.
KERC	**Net Metering**

Net Metering Regulations	Treatment of Excess Energy Injected into the Grid
	If the electricity injected into the grid exceeds consumed electricity, such excess injected electricity shall be paid by the distribution Licensee at the Tariff as agreed to in the PPA.
MPERC	**Net Metering:** In the event of the quantum of electricity injected exceeds the electricity consumed during the billing period, such injected excess electricity shall be carried forward to the next billing period as electricity credit and may be utilized to calculate net electricity injected or consumed in future billing periods.
MERC	**Net Metering:** If quantum of Electricity exported exceeds the Quantum of Energy Imported: The excess quantum shall be carried forward to the next billing period as credited units of Electricity. The unadjusted net credited units of Electricity at the end of each financial year shall be purchased by the Distribution Licensee at its Average cost of Power Purchase as approved by the Commission.
PSERC	**Net Metering** In case the electricity injected exceeds the electricity consumed from licensee's supply system during the billing cycle such excess injected electricity shall be carried forward to the next billing cycle as electricity banked and may be utilized in the next billing cycle(s) within the settlement period.

11.9. The Commission is of the view that presently the Capital cost of Renewable Energy is witnessing a downward trend and the preferential/Feed-in-Tariff rate is also reducing with improvement in technology and economies of scale. Accordingly, the Commission has hence, in order to encourage the consumers to adopt for Net Metering, proposed in the draft Regulations that the excess energy injected into by the consumer into the grid at the end of the year shall be settled by the Distribution Licensee at the rate of Feed-in-Tariff or the APPC of the year of solar generation, whichever is lower.

11.10. It is proposed in the draft Regulations that the Energy Bill for net import will be prepared as per the retail supply tariff as approved by the Commission for the category to which the consumer belongs. The excess energy in the Credit of the consumer banked with the Distribution Licensee from the Solar Plant shall be set-off against the energy imported from the Distribution Licensee's grid at the JERC's approved retail supply tariff applicable to the particular consumer category.

11.11. Further, the Commission is also of the view that the Distribution Licensee shall compute the amount payable to the Eligible Consumer for the excess solar energy purchased by it and shall provide credit in energy units in the immediately succeeding billing cycle.

11.12. Further, the net metering regulatory framework for rooftop solar projects needs to address the energy accounting and commercial settlement mechanism across the Time-of-Day (ToD) periods for banked energy. Hence, it is proposed in the draft Regulations that the electricity consumption

in any time block (e.g., peak hours, off-peak hours, etc.) shall be first compensated with the electricity generation in the same time block. Further, any cumulated excess generation over consumption in any other time block in a billing cycle shall be accounted as if the excess generation occurred during the off-peak time block. This will safeguard the commercial interests of the utility. The comparison of TOD framework across different States is as under:

Net Metering Regulations	TOD Tariff
JERC	In case the Prosumer is under the ambit of time of day tariff, the electricity consumption in any time block (e.g., peak hours, off-peak hours, etc.) shall be first compensated with the electricity generation in the same time block. Any cumulated excess generation over consumption in any other time block in a billing cycle shall be accounted as if the excess generation occurred during the off-peak time block. (This will be operative when the Licensee is ready with the Metering hardware and the Software)
Model FoR, 2013	In case the eligible customer is under the ambit of time of day tariff, as determined by the Commission from time to time, the electricity consumption in any time block (e.g., peak hours, off-peak hours, etc.) shall be first compensated with the electricity generation in the same time block. Any cumulated excess generation over consumption in any other time block in a billing cycle shall be accounted as if the excess generation occurred during the off-peak time block.
RERC, MPERC, MERC	The Eligible Consumer under the ambit of time of day tariff, as determined by the Commission from time to time, the electricity consumption in any time block (e.g., peak hours, off-peak hours, etc.) shall be first compensated with the electricity generation in the same time block.

Based on the above analysis, the Commission has proposed the following clauses in this regard, in the draft Regulations:

a. *The accounting of electricity exported from the Solar Generation and imported from the Grid by the Eligible Consumer shall become effective from the date of connectivity of the Solar Project with the distribution network.*

b. *For each billing period, the Distribution Licensee shall show separately:-*

(i) *the quantum of electricity Units exported by the Eligible Consumer;*

(ii) *the quantum of electricity Units imported by the Eligible Consumer;*

(iii) *the net quantum of electricity Units billed for payment by the Eligible Consumer; and*

(iv) *the net quantum of electricity Units carried over (if surplus) to the next billing period:*

Provided that, if the quantum of electricity exported exceeds the quantum imported during the billing period, the excess quantum shall be carried forward to the next billing period as credited Units of electricity;

Provided further that, if the quantum of electricity Units imported by the Eligible Consumer during any billing period exceeds the quantum exported, the Distribution Licensee shall raise its invoice/bill for the net electricity consumption after adjusting the credited Units.

c. *The unadjusted net credited Units of electricity as at the end of each financial year shall be purchased at APPC of the concerned Distribution Licensee or Feed-in-Tariff determined for the Year of solar generation without considering subsidy and Accelerated Depreciation, whichever is lower by the Distribution Licensee, latest by April 30th of the following year:*

Provided that, at the beginning of each Settlement Period, the cumulative quantum of injected electricity carried forward will be re-set to zero.

d. *In case the Eligible Consumer is within the ambit of Time of Day (ToD) tariff, the electricity consumption in any time block, i.e., peak hours, off-peak hours, etc., shall be first compensated with the quantum of electricity injected in the same time block:*

Provided that any excess injection over and above the consumption in any other time block in a billing cycle shall be accounted as if the excess injection had occurred during off-peak hours.

e. *The Distribution Licensee shall compute the amount payable to the Eligible Consumer for the excess solar energy purchased by it as specified in Regulation 11.3, and shall provide credit equivalent to the amount payable in the immediately succeeding billing cycles till the entire amount so computed is adjusted.*

f. *The Eligible Consumer shall have recourse, in case of any dispute with the Distribution Licensee regarding billing, to the mechanism specified by the Commission under Sections (5) to (7) of the Act for the redressal of grievances.*

12. Penalty or Compensation – Failure in Metering System

The Commission has proposed the provisions of penalty or compensation as per the provisions of the Joint Electricity Regulatory Commission for the State of Goa and UT's (Standards of Performance for Distribution Licensees) Regulations, 2015 for the Distribution Licensee.

13. Late Payment Surcharge

The Commission has proposed a late payment surcharge at the rate of 1.25% per month on the Distribution Licensee, in case the payment of any bill payable under these Regulations is delayed beyond 31st of May of that year.

14. Charges for Banking of Solar

The Commission has proposed exemption from electricity banking charges for self-owned as well as third party owned solar projects installed on the eligible consumer's premises under these Regulations.

15. Renewable Purchase Obligation and eligibility to Participate under REC Mechanism

15.1. Renewable Purchase Obligation (RPO) targets for the obligated entities (distribution utility/captive consumer/open access consumer) are defined by the Commissions. Net-metering based rooftop solar system represents a scenario where generation and consumption of electricity shall happen within the consumer premises. Hence, the key issue

is to evaluate the applicability of RPO framework for such systems and analyse the requirements for the energy accounting from such systems.

15.2. As per the current RPO framework, the captive consumers can be categorized into: Captive consumers defined as Obligated Entity under State RPO Regulation (Type 1) – generally for captive capacity of 1 MW and above (this limit can vary from State to State). These consumer categories having RPO targets would like to claim the benefits of self-consumption from net-metered based rooftop solar project for meeting their own RPO compliance. Captive consumers not defined under the definition of Obligated Entity under State RPO Regulation (Type 2) – generally for captive capacity less than 1 MW and other consumers. The generation and consumption of renewable power from these consumers is therefore not accounted for in the overall RPO framework. The distribution utility to which the latter category of consumers (Type 2) are connected can be given the benefit of deemed RPO for self-consumption of electricity by consumers, who are not defined as obligated entities under the RPO framework. This will encourage utilities to facilitate implementation of small capacity net-metering based rooftop solar projects. It is proposed that the quantum of electricity consumed by an eligible consumer, who is not defined as an obligated entity, from the rooftop solar system under net-metering arrangement shall qualify as deemed Renewable Purchase Obligation (RPO) for the distribution licensee.

15.3. Renewable Energy Certificate (REC) mechanism is a market-based instrument to promote Renewable Energy and facilitate compliance of Renewable Purchase Obligations (RPO). While considering applicability of RECs for net-metered systems, the following issues need to be considered:

- Settlement of solar energy for net-metered based rooftop solar PV projects is deemed to happen at retail tariff rates applicable for the eligible customer.
- Net-metering based projects will enjoy other concessional benefits such as capital subsidy / generation-based incentive or exemption of open access related charges, banking charges and wheeling charges, etc.

15.4. In the above context, the Commission has proposed that net-metering based rooftop solar PV projects shall not qualify for REC. However, the quantum of electricity consumed by an eligible consumer, who is not defined as an obligated entity from the Solar Power Plant under net-metering arrangement shall qualify as deemed RPO for the Distribution Licensee.

16. Procedure for Application and Registration

16.1. The Commission has defined the procedure for application for connectivity of a solar project attached as Annexure 1 of the Regulations. The Commission has also stipulated a registration fee of Rs. 500 for the connectivity. The Commission is also of the view that the Distribution Licensee shall not reject any application without giving a 15 days' notice period for rectifying the deficiencies.

16.2. Further, the Commission is of the view that a web-based application processing system shall be developed by the Distribution licensee in order to make the application process more transparent. The Distribution licensee shall make the web-based application processing system within 3 months from the notification of the Regulations.

16.3. The Commission is of the view that the distribution licensee shall publish the relevant information regarding the solar plants added during the year along with their ratings in its website and the same information shall be submitted to the Commission once in a year i.e. by 30th April every year.