Solar Power - Grid Connected Ground Mounted and Solar Rooftop and Metering Regulations - 2015

And

Solar Power Tariff

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

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JOINT ELECTRICITY REGULATORY COMMISSION

(FOR THE STATE OF GOA AND UNION TERRITORIES)

In exercise of the powers conferred by Sub-Section (1) of Section 181 and Clauses (zd), (ze) and (zf) of Sub-Section (2) of Section 181, read with Sections 61, 62, 83 and 86 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) notifies these Grid-connected Solar Power Regulations 2015 to promote the development of Solar Energy.

1 Short Title, Commencement and extent

a. These Regulations shall be called the **"Joint Electricity Regulatory Commission for the State of Goa and Union Territories (Grid Connected Solar Power Regulations) - 2015".**

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

c. 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.

d. These regulations shall apply only to the Grid Connected Solar Power Projects, whether Ground Mounted or Rooftop mounted.

2 Definitions, Abbreviations and Interpretations

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

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

ii. "**Auxiliary Energy Consumption**", or "**AUX"** in relation to a period in case of a power generating station means the quantum of energy consumed by auxiliary equipment of the power generating station, and transformer losses within the generating station, expressed as a percentage of the sum of gross energy generated at the generator terminals of all the units of the generating station.

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

iv. **"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.

v. "**Capital Cost**" means the capital cost of the Solar Plant that includes cost of land and equipment but excludes the cost of transmission system, as per regulation 40.

vi. **"Capacity Utilisation Factor (CUF in abbreviation)"** means the annual average capacity utilization for generation of Solar power due to varying Solar Insolation due to

weather conditions, geographical location or the maintenance of the Solar Panels.

vii. "**CERC**" or "**Central Commission**" means the Central Electricity Regulatory Commission.

viii. "**COD**" or "**Commercial Operation Date**" or "**Date of commercial operation**" mean the date on which the generating plant is synchronised with the grid system.

ix. "**Control Period**" or "**Review Period**" means the period during which the norms for determination of tariff specified in these Regulations shall remain inforce and are subject to review after the control period (except Capital Cost & Statutory Changes).

x. "**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.

xi. "**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 & constituted under the Act.

xii. "**Consumer"** means any person who is connected to the electricity distribution system of the distribution licensee or the Government 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.

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

xiv. **"Contracted Load"** or "Contract Demand" means the maximum demand in kW, kVA or BHP, agreed to be supplied by the Distribution Licensee and as agreed between the licensee and the consumer.

xv. **"Distribution Licensee"** means a person granted a license under section 14 (b) of the Act. A licensed Supplier of Electricity is also covered under this definition.

xvi. **"Electricity Supply Code"** means the Electricity Supply Code specified under section 50 of the Act and subsequent amendments thereof, and the Electricity Supply code of the Commission.

xvii. **"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 consumer's own electrical requirements, such solar project can be self-owned or third party owned.

xviii. "**Existing Generating Station**" means a generating Solar Power Station, which has achieved COD prior to the coming into force of these Regulations.

xix. "**Gross Metering**" means total solar power generated without accounting for self-consumption / use.

xx. "**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 sales of energy or wheeling of energy as defined in these Regulations.

xxi. "**Generation Tariff**" means tariff for ex-bus supply of electricity from Solar PV generating station.

xxii. **"Group Net-Metering"** means adjustment of electricity consumption imported at another electricity service connection of the Prosumer within the same State or Union Territory and same licensed supplier of electricity ,with the surplus energy exported to the Grid from a Solar Power Plant in excess of 100% (one hundred percent) of imported energy at the location of the Solar Plant premises.

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

xxiv. "**Interconnection Point**" means the interface point of a Solar Power Project with the distribution network of the Distribution Licensees at appropriate voltage level as defined in these regulations.

xxv. **"Invoice"** means a periodical Bill / Supplementary Bill or an Invoice/ Supplementary Invoice" by the Distribution Licensee.

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

xxvii. **"Net metering"** means an arrangement whereby a Solar Power project is connected electrical service connection of a Prosumer and whereby solar energy exported to the Grid is deducted (adjusted) in terms of units from energy imported from the Supplier of Electricity / Distribution Licensee during the applicable billing period, to account for the net imported / exported energy.

xxviii. **"Obligated Entity"** means the licensed Supplier of Power, Distribution Licensee(s), Captive user(s) and Open Access Consumer(s), identified under Procurement of Renewable Power Energy Regulations of Joint Electricity Regulatory Commission 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.

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

xxx. **"Open access consumer"** means a consumer permitted by the Distribution Licensee / Commission to receive supply of electricity from a person, other than Distribution Licensee of his area of supply, and the expression(s) includes a generator and a licensee, who has availed of open access.

xxxi. "**Operation and Maintenance Expenses**" means the expenditure incurred on operation and maintenance of the project, or part thereof, and includes the expenditure on manpower, repairs, spares, consumables, insurance, and overheads.

xxxii. **"PPA"** means Power purchase agreement- for a fixed term between the Prosumer, Solar Project Generator or the Solar Power Developer as seller of Solar Power & the Distribution Licensee as buyer of the solar power.

xxxiii. "**Project**" means a solar generating station including the evacuation system up to inter-connection point.

xxxiv. "**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.

xxxv. **"Prosumer"** means a Consumer who is also a Producer of Solar Power.

xxxvi. **"Producer of Solar Power"** means an individual or an entity or a group intending to set up or has set up a Solar Power Project for the sole purpose of sale of the power so produced.

xxxvii. **"Premises"** means Rooftop of a house / factory/ Ware house / Government building/ Panchayat Bhavan / Community centre/ School/ dispensary / hospital / parking place / 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, 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 historic structure (unless permission taken from appropriate authority).

xxxviii. **"Renewable Energy Certificate (REC)"** means the certificate issued in accordance with the procedures approved by the Central Electricity Regulatory Commission.

xxxix. "**Renewable Energy Power Plant**" means the power plant other than the conventional power plant generating grid quality electricity from renewable energy sources.

xl. "**Renewable Energy Source**" means sources of power generation which do not use conventional fuel but use renewable source such as small hydro, wind, solar including its integration with combined cycle, biomass, bio fuel cogeneration, urban or municipal waste and other such sources as approved by MNRE.

xli. **"Renewable Purchase Obligations (RPO)"** means renewable power purchase obligations.

xlii. **"Review Period"** means the period during which the Capital Cost or any other financial parameter is required to be reviewed by the Commission, which shall be a financial year.

xliii. **"Rooftop Photovoltaic"** means a Rooftop PV and other small Solar Power generating station, installed in the Premises, that uses Sunlight for its direct conversion into electricity.

xliv. "**Salvage Value**" means the estimated value of an asset at the end of its useful life.

xlv. **"Settlement period"** means the period at the end of which solar net-metering settlement between the Distribution Licensee and the Prosumer and Solar Power Generator and the Distribution Licensee takes place.

xlvi. "**Solar Energy Meter (Solar Meter in short)**" 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.

xlvii. **"Solar Tariff"** means a solar energy purchase tariff fixed by the Commission under a Solar Power Tariff Order.

xlviii. **"Solar Tariff Order"** means a Solar Power generation tariff order issued by the Commission giving the rates at which solar power needs to be purchased by the Distribution Licensee from Solar Prosumers and Solar Producers.

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

l. **"Solar Photovoltaic (PV) 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.

li. **"Solar Power Project Developer (SPD)"** means a consumer or an entity whose Solar project has been approved by the Distribution Licensee on the basis of the generic tariff approved by the Commission.

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

liii. "**Solar Power Premises**" means rooftops, land and elevated structures on the land, buildings or the infrastructure or part or combination thereof in respect of which a separate meter or metering arrangements have been made by the licensee for supply of electricity.

liv. "**Solar Power Project**" means a grid-connected solar generating station including the

evacuation system up to the Grid inter-connection point.

lv. "**Solar Thermal Power**" means the solar thermal power plant that uses sunlight for direct conversion into electricity through concentrated solar power technology based on either line focus or point focus principle and by converting solar insolation to convert water to steam for generating power from steam cycle turbine.

lvi. "**State 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.

lvii. "**Supplier of Power**" means a person authorised by the commission to supply electricity to the consumer.

lviii. "**Tariff Period**" means the period for which a tariff as determined by the Commission remains valid

lix. "**Tariff Order**" in respect of a licensee means the most recent retail tariff order issued by the Commission for that licensee indicating the rates to be charged by the licensee from various categories of consumers for supply of electrical energy and services.

lx. "**Third Party Owned**" means ownership in which a developer owns a Solar Power Project that is installed on the roof or elevated structure or land for which a commercial lease or revenue share agreement with the owner has been entered into by the Solar Power Developer.

lxi. "**Useful Life**" in relation to a unit of a solar photovoltaic/thermal power project means a period from the date of commercial operation (COD) specified in the regulations, of such generation facility for which tariff has been determined.

lxii. "**Weighted Average Cost of Capital (WACC)**" means the average of the costs of various sources of financing including debt and equity, each of which is weighted by its respective ratio in the total capital employed in the project.

lxiii. **"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.

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

i. **"EPC"** means Engineering Procurement & Construction Contractor.

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

iii. **"MMC"** means Minimum Monthly Charge as levied by the Distribution Licensee.

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

c. 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.

Chapter I.
Regulations and Application

3 Scope of Regulations and Extent of Application

a. In line with section 62 read with section 86 of the Act, these Regulations shall be applicable to the grid connected solar PV, and solar thermal projects,

Provided that these Regulations shall apply subject to the fulfilment of eligibility criteria specified in these Regulations.

b. Notwithstanding anything contained in these Regulations, the Commission shall adopt the tariff for a specific Distribution Licensee, if such tariff has been determined through a transparent process of bidding in accordance with the guidelines issued by the Central Government, as envisaged under Section 63 of the Act.

Provided that the tariff determined under the process of bidding is not higher than the generic tariff determined by the Commission.

4 Eligibility Criteria

Solar PV and / or Solar Thermal power projects of capacity equal to or more than 500 kWp, and Rooftop Solar Power of capacity equal to or more than 1 kWp but not more than 500 kWp at one location owned by one individual or entity or a house/ factory / Ware house / Government building / Panchayat Bhavan / Community centre/ School/ dispensary / hospital / parking Shed or place/ a solar plant on elevated structure / Group housing society / Resident welfare society/ market roof top or any such entity, 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. The Rooftop projects of ratings 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.

a. 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 in the consumer's premises.

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

b. These regulations do not exclude the right of relevant state authorities to undertake solar projects of any larger capacity through any alternative mechanisms also.

c. Solar Power connection with Gross / Net metering will be allowed for the consumers of the Distribution Licensees under the jurisdiction of the Commission at one location owned by one Solar Power Developer with / without battery back-up support. Consumers will generate solar power for self-consumption and are allowed to feed the excess solar power into the grid which will be adjusted under net metering as per provisions of these regulations, or consumer can opt for gross metering.

d. All eligible consumers of electricity in the area of supply of the Distribution Licensee can participate in the solar power generation.

e. The maximum Solar Power Generation capacity to be installed at any eligible consumer premises shall be governed by the eligibility of interconnection with the grid for that eligible consumer.

Provided, that the installed capacity is aligned with the JERC Electricity Supply Code provisions for permitting consumer connections.

5 Third party owned Solar Project

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

a. 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 a turnkey installer 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 the records.

b. The billing will be with one of the two parties that is decided and informed to the Distribution Licensee as a party authorized to bill.

c. The Solar Power Units generated will be allowed Open access, as per JERC-9/2009 “Open Access in Transmission and Distribution Regulations, 2009” or as amended and in force. Such third party owned project may normally result in an open access transaction with implications of wheeling charges and surcharge relating to cross subsidy. However, to encourage green energy, such Solar Projects set up under these regulations would be exempted from open access restrictions and associated charges for sale / purchase within the jurisdiction of the same licensee.

6 Solar Power Generation Capacities

a. The Distribution Licensee shall arrange sealing of the electricity meter (Net or Gross) of eligible consumers. However, the electricity meters will be arranged by the Consumer/ Solar Power generator, to the approved specification

b. The Distribution Licensee shall facilitate the Solar Project Development.

i. 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;

ii. 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. Capacities beyond the specified limits shall also be encouraged by the Commission once the Capacity targets required to meet the RPOs in the respective territories are achieved and the grid system is ready to take on extra Solar Power Transmission.

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

Chapter II.
General Principles of Solar Power Projects

7 Control Period.

a. These Regulations shall remain in force for 3 (three years) unless reviewed /revised earlier or extended by the Commission,

b. The tariff fixation parameters may be reviewed for each financial year (called the Review Period), to account for the effect of market dynamics which include, but not limited to:

The ceiling limit in respect of the Capital cost, the interest rate and other market related parameters for Solar Tariff determination.

c. The solar tariff determined under these Regulations, for projects commissioned during the control period, shall continue to be applicable for the entire duration of the Power Purchase Agreement Period as specified in these Regulations.

d. Notwithstanding anything contained in these Regulations, the parameters fixed for Solar tariff determination in respect of grid connected Solar power projects that have started generating solar power prior to notification of these Regulations for which approval of the Distribution Licensee was taken or where the project specific solar tariff was determined by the Commission remain unchanged. The provisions of these regulations having any impact on previously approved tariff shall not be considered.

8 Tariff Period

The Tariff period for grid connected Solar Power Plants shall be 25 (twenty-five) years that shall be reckoned from the date of commercial operation of the solar power projects or date of signing the PPA whichever is later.

i. Provided thata Power Purchase agreement (PPA) is signed between the Solar Project Developer and the Distribution Licensee mandated to buy the Solar Power;

ii. Provided thatthe full capacity of the Solar Project as approved, gets commissioned with the time line specified by the Commission, after signing of the PPA. If only a part of Plant capacity is commissioned within the specified time, the solar tariff applicable will be for the part capacity that is commissioned. The Tariff for the balance part of un-commissioned project will be dealt on its commissioning as per the solar tariff applicable for that part, if there is a change announced in Solar Tariff by the Commission.

iii. Provided also, that the Solar Power Project planned to be developed comes within the Commission's approved total Solar Capacity for respective distribution licensee.

9 Solar Project-Types

For the purpose of these Regulations, the Commission has covered the Solar Power Projects for Prosumer as well as Producer types which may be roof mounted, ground mounted or installed on Elevated structures as under:

a. The Prosumer or the Producer will be allowed a feed-in tariff as determined under these regulations.

b. However, if any Consumer chooses to have a net metering the same shall also be allowed, and in that case the existing service connection meter shall be replaced with a bi-directional energy meter by the Distribution Licensee.

10 Solar Power Metering:

The Prosumer or Producer of Solar Power shall arrange for themselves a meter to register the Solar Power produced and fed to the Grid for sale to the Distribution Licensee and shall be billed accordingly, for making payments to the Solar Power Producer.

11 Net-metering

a. Solar gross metering as well as net-metering options is allowed. Net metering will be applicable to Solar Power generators having an electrical service connection for all consumer categories of the Distribution Licensee.

b. The Distribution Licensee shall allow installation of Solar Power Projects in its area of supply on non-discriminatory and first come - first serve basis and within the time line as provided in these regulations. In the interest of average of electricity purchase that impacts the Consumer tariffs, the proposals with subsidy will be given higher preference.

c. At the end of each billing cycle, the Distribution Licensee will take readings of imported and exported energy as shown by the bidirectional service connection meter. The Prosumer will be presented a bill for the difference between imported and exported energy (the net-imported energy). If during a billing cycle exported energy exceeds imported energy, the export surplus will be carried over to the next billing cycle.

d. Settlement Period shall be 1st April to 30th Sept and 1st Oct to 31st March, a final settlement energy bill shall be prepared by the Distribution Licensee at the end of settlement period. For final settlement at the end of a Settlement Period a maximum of 100% (one hundred percent) of the imported solar energy will be credited against exported energy for the purpose of net-metering.

e. Group Net-Metering facility is allowed to the Solar Prosumer at the consumer tariff applicable to the Consumer's service connection.
f. Excess energy exported to the grid (measured in kWh) can only be utilized to offset the electricity consumption (measured in kWh) and not for adjustment of any other fees or charges levied by the Distribution Licensee.
g. The Distribution Licensee in addition to energy billing shall be eligible to raise invoices for any other charges as allowed by the Commission.
h. Electricity Duty, if applicable, shall be payable on the net energy imported from the grid.
i. Rules, regulations and terms of service applicable to Consumers of the Distribution Licensee for the applicable class or category of service connection including but not limited to the consumption tariff, payment terms, contracted load or demand, load surcharge, peak load restrictions and security deposit, shall also be applicable to an electrical service connection with a Prosumer Solar Power project.
j. If, during a billing cycle a Prosumer imports power from the Distribution Licensee in excess of MMC, MMC shall not be chargeable.
k. A Prosumer or A Producer of Solar Power shall be exempted from charges in respect of electricity banking, wheeling, line losses and cross subsidy to the extent of Energy produced.

12 Facilities for Producer of Solar Power

a. For Feed in tariff for sales of power to the Distribution Licensee, the Commission shall issue Solar Energy Tariff Order each year before the end of the financial year for a Review Period that commences in April of the following year as determined in the Solar Energy Tariff Order.
b. The Solar Power Producer shall raise a bi-monthly bill for energy supplied to the Distribution Licensee, which shall be paid by the Distribution Licensee within 30 (thirty) days. Interest for payment delays shall apply. The monthly interest rate shall be 1.25% (one and a quarter percent). The date of delay will be counted beyond 30 days of bill submission with acknowledgement received from the Distribution licensee.
c. The Distribution Licensee shall permit unrestricted and uninterrupted evacuation of solar power through its distribution and transmission network.
d. Solar Power Producer may wheel power to a service connection of the Solar Producer subject to conditions given hereunder:
    i. Location: Producer of Solar Power and the service connection to which solar power is to be wheeled shall both be located within the same State or Union Territory without involving any other transmission network.
    ii. Wheeling charges: The wheeling of solar power shall be exempted from wheeling charges.
    iii. Banking: Solar energy generated can be banked by carry-over of the energy units produced to the next billing cycle if required, by the Solar Power Generator for a max. of 12 months but not beyond 31st March of the Financial Year. The banked energy can be drawn if Payment is not opted for by the SPG. There will be no banking charges for the banking of solar energy.
    iv. Purchase of solar energy: If at the end of a Settlement Period, the Solar Power fed into the grid exceeds the energy that has been imported, the excess

generated energy shall be paid for by the Distribution Licensee at the applicable Solar Tariff as per the invoice raised by the Solar Power Generator (SPG) as per the billing cycle or at the end of the Settlement Period whichever is opted by the SPG.

v. To measure the export of solar energy to the Grid, a bi-directional energy meter will be installed (although this meter is intended to measure uni-directional flow of energy from the Solar Power project to the Grid in case of Producer System, but the meter is to be of the bi-directional type to detect unauthorized import of power from the Grid).

vi. Solar Power producer shall also be exempted from charges in respect of any cross subsidy.

13 Generic Tariff

The Generic Tariff for Solar Power Projects as determined by the Commission for a specific year shall be applicable.

Chapter III.
Solar Power Importance & Despatch Priority

14 Despatch principles for electricity generated from Solar Power

a. All grid-connected Solar Power plants shall be treated as 'MUST-RUN' power plants and shall not be subjected to 'merit order despatch' principles.

b. The grid connected Solar Power plants of various capacities will be connected at Voltage levels indicated in these regulations. This shall be subjected to scheduling and despatch code as specified under Indian Electricity Grid Code (IEGC)-2010, as amended from time to time, except where specific provision has been made under the Joint Electricity Regulatory Commission (State Grid Code) Regulations, 2010, as amended from time to time.

Chapter IV.
Renewable Power Obligations –Solar

15 Quantum of Purchase of Electricity from Solar Power

The quantum of purchase of power from solar power projects by the utilities to discharge mandatory obligations shall be as specified in the Joint Electricity Regulatory Commission for state of Goa & Union Territories (Procurement of Renewable energy) Regulations, 2010. Beyond the RPO limits specified, the Distribution Licensee can go ahead with RPO purchase beyond it targets if such purchase does not adversely affect the average Power purchase cost. The Commission can be approached by the Distribution Licensee or Solar Power Generator to examine its implications including its impact on consumer tariff before taking a view in the matter.

16 Solar Power Capacity Targets for Distribution Licensee

a. Maximum cumulative capacity to be installed under these Regulations shall be decided by the Commission on yearly basis. The shortfall in Solar Capacity installed in any year shall be carried forward to the succeeding year provided that the cumulative capacity to be allowed at a particular distribution transformer shall not exceed the limits specified in

these regulations in respect of the rated capacity of the distribution transformer; on first-cum-first served basis. However, the Consumer or the Project Developer will have to apply afresh in the next financial year, in case the earlier application could not be considered due to approved solar capacity constraints in the previous year.

b. The Distribution Licensee shall update distribution transformer level capacity available for connecting solar projects under net metering arrangement on yearly basis and shall provide the information on its website as well as to the Commission and the respective State Agency.

17 Solar Renewable Purchase Obligations Applicability

a. The quantum of electricity purchased by the Distribution Licensee of the respective distribution licensee area under the Commission's jurisdiction shall get computed towards the Solar RPOs for the Solar Power purchased from any consumer who is either a Non-obligated or an obligated entity with net metering or gross metering. The self-consumption of the Solar Power Generated will also be counted towards the RPOs of the Distribution licensee, if the Solar Power Generator is metered and such generation is certified by the nominated State Nodal Agency.

b. The Obligated entities including Open Access Consumers with load in excess of One (1) MW have to ensure compliance of their own RPOs. In case, the obligated entity is also a Solar Power Generator and feeding Solar Power in the grid of the Distribution Licensee, only one of the two Generator or Licensee would qualify for Renewable Power Obligation compliance, with 1st right to the Generator.

18 Certifying Authority- the State Nodal Agencies

a. The Commission has appointed the State Nodal Agencies who are certifying agencies for the RPOs generated by the obligated entities in the State or UT. The State Nodal Agencies will also support the Stake Holders in Electricity Distribution & Consumption in development of Renewable Agencies and associated matters. The details of these Nodal agencies are available on the web of the Commission.

b. The Consumers shall contact the State Agency of the respective area of jurisdiction for any guidance & help. However, the approval of setting Solar Power plant rests with the Distribution Licensee.

Chapter V.
Technical Parameters

19 Technology

a. Norms for Solar photovoltaic power projects under these Regulations shall be applicable for grid connected solar projects that directly convert solar power into electricity and are based on technologies as may be approved by MNRE from time to time.

b. Norms for Solar thermal power under these Regulations shall be applicable for Concentrated solar power (CSP) technologies viz. line focusing or point focusing, as approved by MNRE from time to time.

20 Technical and interconnection requirements

The Project Developers shall adhere to the National & International Standards specified by MNRE & CEA's Technical Standards for Connectivity of Distributed generation Resources- Regulation 2013.

21 Project Capacity Connectivity

The following conditions shall apply in respect of Plant Capacity and its Connectivity.

a. That a variation in the rated capacity of the solar power project agreed between the Distribution Licensee and the Solar Project Developer shall remain within a range of five percent;

b. That the Solar Project meets the technical requirements for grid interconnection with the network of the Distribution Licensee.

22 Investment in the Grid Augmentation

The cost of any augmentation required after the interconnection point in the grid system of the Distribution Licensee shall be borne by the concerned Distribution Licensee

Provided that such capital cost, as approved by the Commission, shall be a pass through in the Aggregate Revenue Requirement of such Distribution Licensee.

23 Power Quality, Protection and Controls

The power quality, protection and controls shall conform to the standards specified in the CEA (Technical Standards for connectivity to the grid) Regulations, 2007 applicable to the distribution system as amended from time to time.

24 Connectivity, Safety Protection and O&M of the Solar Plant

a. The Solar Power Output feeder from the location of the installation / premises shall have all time access by the Distribution Licensee, for isolating the Solar Power Project in case of repair on Power distribution system.

b. The solar project shall comply with the standards specified by the MNRE / Bureau of Indian Standards (BIS) and CEA. The responsibility of operation and maintenance of the Solar Power Plant including all accessories and apparatus lies with the consumer. The design and installation of the rooftop Solar Plant should be equipped with appropriately rated protective devices to sense any abnormality in the system and carry out automatically isolating the Solar Plant from the grid. The inverters used should meet the necessary quality requirements and should be certified for their quality by distribution licensee; the protection logics should be tested before commissioning of the plant.

c. The automatic isolation or islanding protection of Solar Plant should be ensured for

no grid supply and low or over voltage conditions and within the required response time. Adequate rated fuses and fast acting circuit breakers on input and output side of the inverters and disconnect/isolating switches to isolate DC and AC system for maintenance shall be provided. The consumer should provide for all internal safety and protective mechanisms for earthing, surge, DC ground fault, transients etc.

d. To prevent back feeding and possible accidents when maintenance works are carried out by authorized personnel of the Distribution Licensee, Double pole/Triple pole with neutral isolating disconnect switches which can be locked by Distribution Licensee personnel should be provided. Responsibility of handling / maintaining such disconnect switches will be the responsibility of the Owner of the premises in whose premises this Switch is installed. This disconnecting switch is in addition to automatic sensing and isolating device on grid supply failure, and also is in addition to any other internal disconnect switches provided or needed to be provided keeping in view the safety of humans and animals. In the event of LT/HT supply failure from the end of the Distribution Licensee, the consumer has to ensure that there will not be any Solar Power being fed to the LT/HT grid of Distribution Licensee. The Prosumer / Producer is solely responsible for any accident to human beings / animals whatsoever (fatal /non-fatal /departmental /non-departmental) that may occur due to back feeding from the Solar Plant when the grid supply is off. Distribution Licensee reserves the right to disconnect the installation at any time in the event solar power plant damaging to its grid or meter etc. or to prevent any accident or damage.

e. The Solar Power Developer shall abide by all the rules, codes and regulations issued by the Commission to the extent applicable and in force from time to time. The Solar Project Developer shall comply with JERC/Distribution Licensee /CEA requirements with respect to safe, secure and reliable function of the Solar Plant and the grid. The power injected into the grid shall be of the required quality as per limits specified in these regulations or any other standards prescribed by CEA from time to time that are applicable at the time of Solar Project installation.

f. The harmonic generation shall be restricted within the limit specified in the agreement or specified by the Central Electricity Authority as and when such regulations are issued. The CEA harmonic regulations shall be applicable the new plants after CEA regulations are notified.

g. The Solar Power Generator (SPG) may establish grid interactive solar power plant in the Rooftop or elevated surface with the following options:
   i. Grid interactive Solar Plant without battery.
   ii. Grid interactive Solar Plant with battery backup.

   However, in both the options, features as per these regulations shall be available so as to ensure islanding of the Solar Plant and prevent back feeding to Grid system of the Distribution Licensee.

h. The inverter standards shall be such that it should not allow Solar Power / battery power to extend to Distribution Licensee’s grid on failure of Distribution Licensee’s

grid supply, irrespective of the connectivity options.

i. The inverter standards for three phase and single phase Solar Power shall be as per these regulations. Solar Plants shall be allowed in house auto synchronization / de-synchronization facility with distribution system of the licensee at generation voltage level. The Consumer shall utilize the same service line for excess power injection into the Grid which is currently being used by the consumer for drawal of power from the Distribution licensee's grid and shall operate in synchronization with the grid system. Specific approval of the licensee will be required in case the above Power Generation limit is required to go beyond the approved limit, keeping in view the Capacity available in the Transformer where the Solar Power is to be grid fed, also the meeting of RPOs and the impact on average cost of Power Purchase by the Licensee.

25 Communication Facilities

All grid connected Solar Power Projects shall have electricity meters with features to record energy for 45 days data storage for injection into the grid through solar meter as provided under these Regulations. All projects with capacity of 10 (Ten) kWp and above shall have communication Port for exchanging real time information with the Distribution Licensee. For plant size of 1(One) MWp and above the Communication will be with State Load Despatch Centre (SLDC) also in addition to the Distribution Licensee.

26 Installed Capacity

The maximum capacity of the Solar Project, as mentioned on AC side at the output of inverter based on rated inverter capacity, shall not be more than the limits as specified in these regulations of the Sanctioned Connected Load /Contract Demand (in kVA converted to kW at normative Power Factor of 0.90) of the consumer, and the minimum capacity shall not be less than 1 kWp. Eligible Consumers should assess their Rooftop Solarplant capacity based on the shadow-less clear Rooftop area / vacant space(s), actual annual energy consumption pattern and the capacity of Distribution transformer.

27 Life of Plant and Machinery

The normative useful life of solar power projects (based on photovoltaic and thermal technologies) is 25 Years.

28 Capacity Utilization Factor (CUF)

The capacity utilization factor for estimation of electricity generation from grid connected ground and rooftop mounted solar projects and the Solar Thermal Plants shall be as per Annexure A.

Chapter VI.
Metering, Billing, Payment & Adjustment

29 Energy Accounting and Settlement

29.1 Net Metering

a. For each billing cycle, the licensee shall show the quantum of electricity injected into the Grid by the Prosumer, the electricity billed by Distribution Licensee and, Solar Power net billed for payment or adjustment in the Prosumer's Electricity bill for that billing cycle.

i. Provided, that in the event the electricity injected into the Grid exceeds the consumed electricity during the billing cycle, such excess injected Solar Power units of electricity shall be carried forward to the next billing cycle as electricity units as credit for next billing cycle;

ii. Provided further that in the event the electricity supplied by the Distribution Licensee during any billing cycle exceeds the electricity injected into the Grid by the Prosumer of the Solar project, the Distribution Licensee shall raise invoice for the net electricity consumption after taking into account any electricity credit from previous billing cycle(s);

iii. Provided further, that in case the Prosumer 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. (This will be operative when the Licensee is ready with the Metering hardware and the Software);

iv. Provided also that the excess electricity measured in kilo-watt hours may only be utilized to offset the consumption measured in kilo-watt hours and shall not be utilized to compensate any other fee and charges imposed by the Distribution Licensee as per the instructions of the Commission;

v. Provided also that the Distribution Licensee in addition to consumer tariff shall be eligible to raise invoice for any other charges as allowed by the Commission;

b. At the beginning of each settlement period, cumulative carried over injected electricity will be reset to zero.

c. The electricity generated by the Rooftop Solar Plantof the Prosumer shall not be more than the limit specified in these regulations, but the electricity planned to be supplied to the grid will be defined beforehand, of the electricity consumption by the Prosumer at the end of the settlement period.

d. In case of any dispute in billing and settlement it would be settled by the Consumer Grievance Redressal Forum and by the Ombudsman appointed under Section 42(6) of the Electricity Act.

29.2 Gross Metering

The accounting and settlement shall be based on the billing cycle of the Consumer. However, the billing for entities having no consumer connection, the billing will be on bi- monthly basis.

30 Solar Power Billing and Banking mechanism

a. On commissioning of the Solar Plant and at the end of each of the billing cycle, the Distribution Licensee will take energy meter readings for import / drawl and export/injection of power and work out the net energy flow quantum from the consumer

to be treated as energy banked by the Consumer with the Distribution Licensee in the current billing cycle. In such scenario, the consumer will be issued Energy Account Statement along with the bill for charges like meter rentals, service charges 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 subject to the time limits specified in these regulations.

b. The Energy Bill for import will be prepared as per the retail supply tariff as approved by the Commission for the category to which the consumer belongs. The energy 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.

c. At the end of the next and subsequent billing cycles and at the end of settlement period, the Distribution Licensee will take the energy meter reading and work out the net flow taking into consideration the energy so far banked and not yet settled, if any. The procedure will be repeated at the end of every billing cycle. The settlement of net energy including any banked energy shall be done at the end of each settlement period based on consumption as per these regulations.

d. All Rules and regulations including tariff shall be governed by the orders of the JERC and the terms and conditions prescribed in the Application & Agreement (A&A) form. An additional form and the PPA shall be signed between the licensee and seller of such Solar Power and shall include necessary terms and conditions of meter reading, meter-rent, billing, payment scheduled, payment security arrangements, rate of delayed payment surcharge etc. and shall become part of A&A Form.

e. All the instructions, rules and regulations applicable to the consumers of the Distribution Licensee for the applicable class/category including but not limited to the Tariff rates, Payment Schedule, Late payment surcharge, Connected load/ Contract demand, Load Surcharge, Peak load restrictions, Advance Consumption Deposit etc., shall also be applicable to the Solar plant owner as a consumer of the Distribution Licensee. Electricity duty shall be levied as per the instructions of Government of India for UTs or State Government of Goa (as applicable for respective territories) amended from time to time of and any Electricity Duty applicable on the net power consumed from the grid.

f. As long as the consumer having set-up the solar power plant consumes power from the Distribution Licensee and /or generated from solar plant or banked solar energy up to or more than the Monthly Minimum Charges (MMC) level in any billing cycle, MMC shall not be levied.

g. Billing of the energy shall be carried out on the same billing cycle as is applicable to the Consumer. In case the project is by an entity which has no specific electricity connection then, the billing cycle will be on a bi-monthly basis.

h. Solar project developer shall raise the bill to the Distribution Licensee as per the billing cycle of the consumer .The billing cycle will be every two months for entities without any billing cycle so far fixed .

i. The payments to the solar project generators in respect of the energy supplied shall be made by the Distribution Licensee within 30 Days from the bill submission date along with acknowledgement obtained from the licensee.

31 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 standards of performance regulations for Distribution Licensee.

32 Rebate for early release of payment

a. For payment of bills of the generating company or project developer through letter of credit or a banking instrument within five working days of presentation of bills, a rebate of 2% (Two %) shall be allowed.
b. If payments of bills of the generating company or project developer are made through letter of credit or a banking instrument beyond five working days of presentation of bills but within thirty days of presentation of bills, a rebate of 1 % (One percent) shall be allowed.

33 Late Payment Surcharge on Solar Power Bills

In case the payment of any bill is delayed beyond a period of 30 Days from the date of presentation of bill, a late payment surcharge of 1.25% (one and a quarter percent) of billed amount per month calculated on a daily basis shall be levied by the generating company or project developer.

34 Charges for Banking of Solar Power and Cross Subsidy

The solar plant, whether self-owned or third party owned installed on eligible entity's premises, shall be exempted from charges in respect of electricity banking, wheeling charges and losses and cross subsidy for use of electricity with in the respective territories.

In case of Ground Mounted Solar Power plant set up for the purpose of Sale of Power, no banking is allowed.

35 Eligibility to Participate under REC Mechanism

a. In case the SPG opts for sale of Power to the Distribution Licensee at the Average cost of Power Purchase applicable for the specific year and getting RECs, the issuance of Renewable Energy Certificates shall be as per the eligibility criteria specified under Central Electricity Regulatory Commission (Terms and Conditions for recognition and issuance of Renewable Energy Certificate for Renewable Energy Generation) Regulations, 2010 and as notified by JERC

b. Net-metering injection is not eligible for REC. 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 Renewable Purchase Obligation (RPO) for the Distribution Licensee. In case the Consumer / Prosumer opts to claim REC for the Power Generated from the Solar Project, then the Electricity sold to the licensee will be at average cost of Procurement of Power as approved by the commission by the tariff order for each year.

36 Procedure for getting Permission to set up a Grid Connected Solar Plant

Any one intending to set up the Solar Power Project can get the solar Application-cum-Agreement form from the Distribution Licensee and shall submit the same to designated officer of the Distribution Licensee for grant of permission to set-up the plant. Such a form will be uploaded by the Distribution Licensee on their web site. After checking the feasibility, the applicant shall be issued Letter of Approval / Rejection by the Distribution Licensee within 30 (Thirty) days of receipt of the application. The consumer shall set up the plant and submit the work completion report along with Single Line Diagram of the synchronizing and protection arrangement issued by the plant supplier / EPC contractor confirming that the plant has been installed as per approved standards and specifications within the time indicated in these regulations. After site verification, the Distribution Licensee shall seal the Bi-directional energy meter(s) arranged and installed by the Solar Power Developer, and the plant will be treated as commissioned for net-metering or gross metering commercial operations from that date. In case of delay in setting up the solar plant, the SPG shall have to get further extension from the Distribution Licensee. Such extension will be granted for a maximum period of 2 (two) months only and the approval granted will lapse automatically if the solar project is not setup even in the extended 2-months period. However, he/ she shall be eligible to apply in the next financial year but his / her application shall be kept at the bottom of the list of applicants and he/ she will be permitted to set-up the plant only if all the applicants above him/ her are selected or rejected and there is still capacity available for allotment.

For Solar Projects with gross metering also, the above time lines will be followed.

37 Application Fee for Setting up a Solar Power Plant

The applicant shall pay application fee of Rs. 50 (Fifty) /kW along with the application to the Distribution Licensee.

Chapter VII.
Financial Principles for computing Tariff

38 Tariff Structure

The tariff for grid connected ground mounted and rooftop mounted Solar Power Plants shall be a single-part tariff consisting of the following fixed cost components:

a. Capital Cost of the Project;
b. Interest on long-term loans;
c. Depreciation;
d. Return on Equity;
e. Interest on Working Capital; and
f. Operation and Maintenance (O&M) Expenses;

39 Levellised Tariff Design

The tariff shall be determined on the levellised basis for the tariff period; and, for the purpose of levellised tariff computation, discount factor equivalent to weighted average cost of capital (WACC) shall be considered.

Provided thatthe Solar Project has been commissioned within the Control period during which the Power Purchase Agreement is signed allowing for Completion time as per these regulations even if it goes beyond the specific year for which the Solar Tariff is made applicable.

40 Capital Cost

a. The capital cost for Solar Power Projects for working out the Tariff shall be inclusive of all capital works including plant and machinery, civil works, erection and commissioning, financing and interest during construction, other misc. expenses such as overheads, administrative cost etc. during construction, and evacuation infrastructure up to the interconnection point, if any.

b. The normative capital cost ceiling limit for setting up of rooftop solar photovoltaic power projects shall be determined based on the capital cost of various items specified hereunder:

i. Cost of Modules at Site
ii. Land Cost for Ground Mounted / Capitalised Rooftop Rental or lease for Rooftop
iii. Civil & General works
iv. Mounting Structures
v. Power Conditioning Unit (PCU / Inverter)
vi. Cables & Transformers (if applicable)
vii. Preliminary and Operative expenses, Interest during Construction etc.

Provided that the Capital Subsidy or grant made available for the Project from Govt. of India or State Govt. or any agency shall be adjusted for working out the Tariff. The Generic Tariff as per these regulations shall be applicable after adjusting for same in the Capital Cost.

i. The normative capital cost ceiling limit for setting up of grid connected Solar Photo Voltaic Power projects shall be as decided by the Commission for each of the financial year.

ii. The normative capital cost for Solar Thermal Power projects shall be considered on project specific basis.

Provided that the normative capital cost for Solar power projects may be reviewed annually by the Commission.

41 Debt-Equity Ratio

For the purpose of determination of tariff, the following provisions shall apply:

a. Debt Equity ratio of 70:30 shall be considered. However, if the equity actually deployed is less than 30%(Thirty percent), the actual equity shall be considered and if the equity actually deployed is more than 30 % (Thirty percent)of the capital cost, equity in excess of 30 % (Thirty percent) shall be treated as normative loan.

Provided that the equity invested and loan drawn in the foreign currency shall be designated in Indian Rupees on the date of each investment, using the selling rates notified by the Reserve Bank of India on the date of such investment

b. The Commission shall take into consideration any capital grant or subsidy offered by the Central or State Government or any other agency, for the solar power projects while determining the tariff under these Regulations.

42 Interest and Financing Charges for Long Term Debt

a. The loans arrived at in the manner indicated in the Annexure A of these Regulations shall be considered as gross normative loan(s) for calculation of interest on loan. The normative loan outstanding as on April 1st of every financial year shall be worked out by deducting the cumulative repayment up to March 31st of the previous financial year from the normative gross loan.

b. Notwithstanding any moratorium period availed by the generating company or project developer, the repayment of loan shall be considered from the first year of commercial operation of the project and shall be equal to the annual depreciation allowed.

c. For the purpose of computation of tariff, the normative interest rate shall be considered as an average State Bank of India (SBI) Base rate prevalent during the first six months of the previous year plus 300 basis points.

d. The Commission shall allow obligatory taxes on interest, commitment charges for getting loan, finance charges and any exchange rate difference arising from foreign currency borrowings, as finance cost.

43 Interest on Working Capital

a. The working capital requirement with respect to Solar power projects shall be computed in accordance with the following:
   i. Operation & Maintenance expenses for one month;
   ii. Receivables equivalent to 2(Two) months of energy charges for sale of electricity calculated on the normative Capacity Utilization Factor;
   iii. Maintenance spares at the rate of 15% (Fifteen percent) of operation and maintenance expenses;

b. Interest on Working Capital shall be at an interest rate equivalent to an average State Bank of India Base Rate equivalent during the first six months of the previous year plus 350 basis points.

44 Return on Equity

a. The base value for the equity shall be 30% (Thirty percent) of the capital cost or actual equity (whichever is less) as determined under these Regulations.

b. The normative return on equity shall be

i. Pre-tax return of 20% (Twenty percent) per annum for the first 10 (Ten) years
ii. Pre-tax return of 24% (Twenty Four percent) per annum from 11th year onwards

45 Operation and Maintenance Expenses

a. Operation and Maintenance or O&M expenses shall comprise of repair and maintenance (R&M), establishment including employee expenses and the lease rental, if any, and administrative and general expenses including insurance.

b. The normative O&M expenses for Solar Power projects shall be decided by the Commission while deciding the Tariff for a specific Financial Year.

c. Normative O & M expenses allowed during the first year of control period (i.e. FY 2015-16) under these Regulations shall be escalated at the rate of 5.72% (Five point Seven Two percent)) per annum over the tariff period (i.e. from the 2nd year onwards).

46 Depreciation

a. The value base for the purpose of depreciation shall be the capital cost of the asset determined by the Commission. The salvage value of the asset shall be considered as 10% (Ten percent) and depreciation shall be allowed up to maximum of 90% (Ninety percent) of the capital cost of the asset.

b. Depreciation per annum shall be based on 'Differential Depreciation Approach' over the loan period and beyond the loan tenure shall be computed based on 'Straight Line Method' over the useful life. The depreciation rate for the first 12 years of the tariff period shall be 5.83% (Five point eight three percent) of the capital cost per annum and the remaining depreciation shall be spread over the remaining useful life of the project from the 13th year onwards.

c. Depreciation shall be accounted for w.e.f the first year of commercial operation of the Project:

However, in case the commercial operation of the asset is for a part of the year, depreciation charged shall be on pro-rata basis.

47 Accelerated Depreciation

a. The effect of Accelerated Depreciation for Solar Power Projects shall be calculated by the Commission while indicating yearly Tariff.

b. The Tariffs shall be worked out under the following scenarios:
   i. Tariff indicated is without availing the accelerated depreciation.
   ii. Tariff, if the accelerated depreciation is availed by the Project developer.
   iii. Tariff with Capital Subsidy.
   iv. Tariff without Capital Subsidy.

The applicable tariff will depend upon whether the Project developer is availing / intend to avail the benefit of accelerated depreciation as per the provisions of the Income Tax Act.

i. Provided that the following principles shall be considered for ascertaining income tax benefit on account of accelerated or higher depreciation, if availed, for the purpose of tariff determination:

Assessment of benefit shall be based on Capital Cost and accelerated or higher depreciation rate as per relevant provisions under the Income Tax Act;
Capitalization of solar power projects during second half of fiscal year;

Per unit benefit shall be derived on levellised basis at discount factor determined as per these Regulations:

ii. Provided further that in case the Solar Power Generator is not claiming accelerated or higher depreciation benefit, the Power Purchase Agreement entered into with the generating company or project developer shall include an undertaking by the generating company or project developer that accelerated or higher depreciation benefit would not be availed for the project.

iii. Provided also, that if accelerated or higher depreciation benefit has been claimed despite submission of the undertaking, the Distribution Licensee shall be entitled to recover the amount wrongly claimed along with penal charges @ 1.50 % (One & a half percent) per month on levellised tariff calculated on daily basis from the period of claiming accelerated depreciation from any bill that is next due or is pending for payment.

c. The Project developer claiming higher tariff (without Accelerated Depreciation Benefit) has to give an affidavit every year in the beginning of the financial year to the effect that the Project developer is not claiming / intends claiming the benefit of the accelerated depreciation from Income tax department. This affidavit is required to be submitted before the processing of 1st bill for sale of power or its adjustment towards the total electricity consumed.

48 Availing Subsidy

a. The Prosumers/ Producers interested in setting up of solar project can approach the State Agency the applicable MNRE, Govt. of India grant as per the prevailing instructions/guidelines.

b. The Solar Power plant will be eligible for the fiscal and other incentives as per New and Renewable Sources Energy (NRSE) Policy 2012 of Govt. of India

49 Impact of other Subsidies or Incentives by Central /State Government

In addition to subsidy from MNRE , the Commission shall take into consideration any other incentive or benefit available from the Central or State Government or any other agency, including accelerated or higher depreciation benefit, if availed by the

generating company, for the solar power plant while determining the tariff under these Regulations.

Provided thatthe Generation Based Incentive/Tariff Subsidy, if allowed by the Central/State Government would be governed by the terms and conditions of such scheme

50 Sharing of CDM Benefits

a. All risks, costs and efforts in development of such projects as CDM projects shall be retained by the Project Developer / lead entity as the case may be, who is responsible for developing and registering these projects as CDM projects.

b. The proceeds of the carbon credit from approved CDM Project shall be shared between the project developer and Distribution Licensee in the following manner, namely-

i. 100% (One Hundred percent) of the gross proceeds on account of CDM benefit to be retained by the developer in first year after the date of commercial operation of the generating station.

ii. In the second year, the share of the project developer shall be 90% (Ninety percent) and 1/3rd of this share will be deployed by the project developer for promotion of Renewable Energy, while 10% will be passed on to the Distribution Licensee. The 90% (Ninety percent) portion shall be progressively decreased by 10 % (Ten percent) every year till the proceeds shall be shared in equal proportion by the project developer/generating company and the distribution company.

iii. Provided, that 2/3rd of benefits such received by the Distribution Licensee shall be passed on to the consumers and balance 1/3rd shall be deployed for promotion of Renewable Energy by the distribution company.

c. The deployment of funds towards promotion of RE shall be done in a transparent manner and the Commission kept informed of such promotion of RE.

51 Financial and Fiscal Calculations

For the purpose of levellised tariff computation, the discount factor equivalent to Post Tax weighted average cost of capital shall be considered. The generic tariff shall be determined on levellised basis for the Tariff Period.

a. **Weighted average Return on Equity:** (RoE for 1st 10 Years*10 Years + RoE for beyond 10 Years*(balance of useful life beyond 10 Years)) / Useful life years and the Formula applicable will be:

(Pretax ROE<= RoE % for 1-10 Years, Equity absolute amount *ROE on Equity for 1st 10 Years, Equity absolute amount * RoE for balance Useful life after 1st 10 years)

The Tariff will be adjusted for any other Rate of effective Income Tax applicable to the Solar Power Generator.

b. **Discount factor for calculating Levellised Tariff:** ((Cost of Capital in % × 0.70 Long term loan Component × (1 – Corporate Income Tax %)) + (Weighted average Post Tax Return on Equity % × Equity %)).

52 Applicable Tariff

The Tariff applicable for each project at the time of signing the PPA shall be as approved by the Commission for each year.

a. Provided that the Power Purchase Agreement (PPA) is signed between the Solar Power Project Developer and the Distribution licensee in the Specific Year of the Control Period:
b. Provided that the Solar Project is commissioned within the time indicated in the these regulations;
c. Provided that the Solar Project envisaged is not commissioned in the time schedule specified above, the Tariff applicable for the project will be lesser of the two tariffs i.e. of the previous year when PPA was signed and the next year tariff during which the Project gets commissioned.

53 Power Bill Adjustment Rates for Solar Power fed into the Grid

The net metred Prosumer bill in solar project will get adjusted as per the Tariff of Solar Power Tariff decided by the Commission. If a prosumer is net exporter of solar Power, the Consumer will get the payment as per the settlement period.

54 Taxes and Duties

a. The tariff determined under these Regulations shall be exclusive of taxes and duties as may be levied by the appropriate Government for sale of Solar Power, however, the taxes and duties levied on solar electricity generation by the appropriate Government shall be allowed as pass through on actual basis.

b. Capital Cost or O&M Costs are inclusive of Taxes and Duties as well as the Service Tax etc. applicable on these components listed in this regulation.

Chapter VIII.
Miscellaneous

55 Power to give directions

The Commission may from time to time issue such directions and orders as considered appropriate for the implementation of these Regulations

56 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.

57 Power to amend

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

58 Deviation from provisions of these Regulations

The Commission may deviate from any of the provisions contained in these Regulations on a suo-moto basis having regard to the circumstances of the case:

Provided that the reasons for such deviation shall be recorded in writing.

59 Power to remove difficulties

In case of any difficulty arising while giving effect to the provisions of these Regulations, the Commission may either suo-moto or on a petition, by an order, make such provisions not inconsistent with the provisions of the Act as may appear to be necessary after giving a reasonable opportunity to those likely to be affected by such order for removing the difficulty.

60 Review of regulations

The Commission, at the end of three years from the date of notification of these Regulations or even earlier if considered necessary, proper and desirable by it considering the circumstances then prevailing, shall undertake a comprehensive review of these Regulations with the objective of improvement in the principles, procedures and methodologies.

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कीर्ति तिवारी
सचिव
संयुक्त विद्युत विनियामक आयोग
(गोवा और केंद्र शासित प्रदेशों के लिए)

Annexures

Annex. A. To be announced every Year Separately

Annex.B Summary of Boundary Parameters of a Solar Plant

Sl.	Particulars	JERC's Standards for Solar Power Generation Plants
1.	Eligibility	Consumers with Single or Three Phase supply Connection. For Single Phase Consumers, the Distribution Company has to take a view of Grid System balancing.
2.	Cap on Banking of Surplus Power	30 %(Thirty percent) of the Annual generation capacity, banking period for electricity a maximum of 12 months, but not beyond the end of the Financial Year
3.	Settlement Period	Six Monthly basis on 30th Sept. & 31st March of every year
4.	Tariff for Excess Generation	As per these Regulations of this Commission
5.	Restriction on Grid Penetration (Distribution Transformer (DT) Capacity)	30 % (Thirty percent) of the Distribution Transformer Capacity
6.	REC Eligibility	Allowed as approved by State Nodal Agency, if Solar Power so generated is used for in house consumption or sold to the distribution company at the Average Cost of Power Purchase approved by the Commission (if the same is lower than the Solar Tariff) for a Specific Financial Year.
7.	Maximum System Size at one location	500 kWp for Solar Project and higher size can be considered, if Distribution Transformer Capacity allows and Distribution Licensee is agreeable because of its Grid system. The Ground Mounted Solar Plant can be of any size, subject to the overall MW limits specified
8.	Total Capacity for each licensee	As per these regulations.
9.	Project Owner	Any one – a consumer or a Project Developer to be decided mutually between themselves.
10.	Energy off taker	The distribution licensee / company
11.	Incentive for Rooftop Owners or Vacant Space Owners	To be a Prosumer (Producer and a Consumer of Power) or to be a Producer of Solar power.
12.	Sharing Concept of Power Generated or billing on Gross metering of Solar Power Generated.	To use it in house / Commercial establishment/ Industrial unit or any eligible entity and feed to the Grid excess so produced and have adjustment for power units supplied by the Distribution Licensee/ Company during Non-Solar time & Non-Solar Days on Net Metering. Alternatively, Sell the Solar Power to the Grid on Gross Metering basis.

Annex.C 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 4MWp	Three Phase HT (11 kV)
5	HT TPT Meter, DLMS Compliant & AMR Compatible	Class- 0.5S or better	More than 4MWp	Three Phase HT (11/22/33 kV) as per site availability

Harmonics 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 of Safety and Electricity Supply) Regulations, 2010	Central Electricity Authority(Measures of 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.		

Annex.D Meter Configuration options

The metering system for solar power project, under net-metering or gross metering as per Solar Power Developer's Option, shall be advised by the distribution licensee.

In case of net metering the meter has to be bi-directional meter to register both import of grid electricity as well as export solar electricity.

Annex.E RPO Targets / Requirements

As tentatively applicable for 2014-15 & Tentative Requirements for further Years up to FY 2016-17

Sl.	Solar RPOs % of the Sale of Power	Goa	Andaman & Nicobar	Chandigarh	Daman & Diu	Dadra &Nagar Haveli	Lakshadweep	Puducherry
		a	b	c	d	e	f	g
		Sale of Power MUs & Equivalent MW where indicated						
1		3078.09	231.49	1423.46	2083.87	5387.71	48.77	2545.00
		Solar RPOs in KWh.						
2	0.6% of Sales for FY2014-15	18468.54	1388.94	8540.76	12503.22	32326.26	292.62	15270.00
3	Indicative Eq. MW of Solar Plant 2014-15	11.54 MW	0.87 MW	5.34 MW	7.81 MW	20.20 MW	0.18 MW	9.54 MW
4	0.85% of Sales for FY 2015-16	26163.77	1967.67	12099.41	17712.90	45795.54	414.55	21632.50
5	Indicative Eq. MW of Solar Plant 2015-16	16.35 MW	1.23 MW	7.56 MW	11.07 MW	28.62 MW	0.26 MW	13.52 MW
6	1.15% of Sales for FY 2016-17	35398.04	2662.14	16369.79	23964.51	61958.67	560.86	29267.50
7	Indicative Eq. MW of Solar Plant 2016-17	22.12 MW	1.66 MW	10.23 MW	14.98 MW	38.72 MW	0.35 MW	18.29 MW

Financial Year	Minimum Quantum of Renewable Purchase Obligations (RPO) Solar RPOs % power Sale by the Distribution Licensee/ Company
2014-15	0.60
2015-16	0.85
2016-17	1.15
2017-18	1.50
2018-19	1.85
2019-20	2.20
2020-21	2.60
2021-22	3.00

Annex.F Setting-up Grid Interactive Solar Plants: Time lines

Solar Power Developer (Customer) Approaches the Designated Officer of the Distribution Licensee who will issue letter of approval in 15 working days after assessing the transformer capacity and Connection arrangement and the Solar Power developer will set up the Solar Power Plant in 180 days from the date of approval by the licensee. For Ground mounted projects the Solar Power developer can take time up to 365 days from the date of approval. The Solar Power developer failing to meet these deadlines will have to seek fresh approval.

Customer sets up the Solar Plant and Submits the Completion report to designated officer of the Distribution licensee along with Single Line diagram of the Solar Project, which shall be verified by the Distribution licensee within 10 working days in respect of Site verification, installation, sealing & initial reading of energy meter(s).

Application Format

To Date:
The Section Officer/Designated Officer
Distribution Licensee
[Name of office]

I / We herewith apply for a Solar Energy Gross Metering / Net-metering / bi-directional metering Connection at the service connection for the Solar Power Project of which details are given below:

Sl.	Details Required	Details Furnished
1.	Name of Applicant	
2.	Address of applicant	
3.	Service connection number	
4.	If there is Electricity Connection in the name of the applicant, please provide details	
5.	Is it for an individual premises or for a Group/ Society	
6.	Land Line Number(s)	
7.	Mobile Phone Number	
8.	Email Contact if available	
9.	Solar Plant Capacity kWp	
10.	Solar Inverter make & type	
11.	Solar Project inverter has automatic isolation protection	Yes
12.	Has a Solar Generation Meter been installed (Y/N)?	Will be arranged by the Solar Power Generator and Installed by the Distribution Licensee.
13.	Expected date of commissioning of Solar Project	
14.	Concerned safety requirement fulfilled (Y/N)	Will be fulfilled
15.	Any other information desired by the Distribution Licensee	

DECLARATION

I do hereby declare that the information furnished above is true to my knowledge and belief.

Signature with Name:
Position if on behalf of a Group or a Society
Address:

Annex.G Indicative PPA

Between the Solar Project Developer & the Distribution Licensee / Company

Available on the JERC Web site