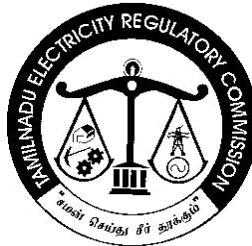




TAMIL NADU ELECTRICITY REGULATORY COMMISSION

Order on Rooftop Solar Generation

Order No. 3 of 2019 dated 25-03-2019



BEFORE THE TAMIL NADU ELECTRICITY REGULATORY COMMISSION

PRESENT: **Thiru S. Akshaya Kumar** - **Chairman**
 Dr.T.Prabhakara Rao - **Member**

Order No. 3 /2019, dated 25-03-2019

In the matter of : Order on Rooftop Solar generation

The Tamil Nadu Solar Policy 2019 was issued by the Government of Tamil Nadu on 04.02.2019. The Policy has set a target of 9000 MW to be achieved by 2023 of which 40% is earmarked for consumer category solar energy systems. One type of Solar energy grid feed-in mechanism prescribed in the Policy is the Solar energy net feed-in (consumer category) mechanism. Commission has passed orders on 25.03.2019 on the petition filed by TANGEDCO in M.P No.9 of 2017 in the matter of adopting revised accounting methodology in Rooftop Solar Generation following due regulatory process of obtaining stakeholders comments. The matter was also discussed in the 32nd meeting of the State Advisory Committee. The revised accounting methodology proposed by TANGEDCO and that was approved by the Commission in the order dt.25.03.2019, is in essence the Solar net feed-in mechanism to consumer category prescribed in the Solar Policy 2019. In exercise of the powers conferred by section 86 (1) (e) of the Electricity Act, 2003, (Central Act 36 of 2003), read with the National Electricity Policy, the Tariff Policy, Commission hereby issues the following order on Rooftop Solar Generation .

This order shall take effect on and from the 25th day of March 2019.

Sd./-
(T.Prabhakara Rao)
Member

Sd./-
(S.Akshaya Kumar)
Chairman

(By Order of the Tamil Nadu Electricity Regulatory Commission)

Sd./-
(S.Chinnarajalu)
Secretary

ORDER ON ROOFTOP SOLAR GENERATION

1.0 Introduction

1.1 Commission issued a suo motu order on 'Issues related to Tamil Nadu Solar Energy Policy' vide Order No.1 of 2013 dt.07.03.2013 based on 'Tamil Nadu Solar Energy Policy 2012'. This order inter alia covered issues related to solar purchase obligation to be met by various category of consumers, its enforcement mechanism, and net metering for domestic rooftop solar generators. In the said order, Commission directed Tamil Nadu Generation and Distribution Corporation (TANGEDCO) to submit a detailed procedure on net metering covering specified issues like standards and location of meters, tariff for excess generation/lapsed units, LT connectivity etc. and to obtain approval from the Commission. The procedure submitted by TANGEDCO was hosted in the Commission's website and stakeholders comments obtained. Considering the procedure submitted by TANGEDCO and the comments from stakeholders, Commission issued Order No.3 of 2013 dt.13.11.2013 on 'Order on LT connectivity and net metering in regard to Tamil Nadu Solar Energy Policy 2012'. The order covered eligibility of consumers under net metering, commercial arrangements, metering standards and location, LT connectivity, standards, operation and maintenance of Solar Power Generators (SPGs) etc.

1.2 TANGEDCO filed a petition seeking Commission's approval inter alia praying for a revised commercial settlement mechanism. The petition was taken on file vide M.P No.9 of 2017. TANGEDCO was directed to host the petition in the

website and invite stakeholders comments. Meanwhile, the Government of Tamil Nadu issued a new Tamil Nadu Solar Policy 2019 with effect from 04.02.2019. Clause 8.1.2 of this Policy prescribes a Solar net feed-in mechanism for the consumer category. The revised accounting methodology proposed by TANGEDCO in M.P No.9 of 2017 is similar to the mechanism in the Solar Policy of 2019. Based on the petition of TANGEDCO, comments received from stakeholders, reply affidavit and hearings, Commission passed orders in M.P No.9 of 2017 on 25.03.2019 for implementing the new mechanism for Rooftop Solar Generation. Consequent to the orders passed in the above petition, Commission issues this order.

2.0 Applicability :

2.1 This order on new scheme of rooftop Solar generation, namely, Solar net feed in-consumer category is applicable to all new applicants from the Eligible consumer category notified in para 3.0 of this order. The date of effect of this order is 25.03.2019, the date of passing of order by the Commission in M.P No.9 of 2017.

2.2 The existing consumers under the net metering scheme shall continue to be governed by the provisions in the Order No.3 of 2013 dt.13.11.2013.

3.0 Eligible consumers:

3.1 Consumers under Low Tension category except Hut and Agricultural category of tariff.

4.0 Permissible maximum capacity for an eligible consumer:

4.1 The maximum capacity of solar rooftop generating plant that an eligible consumer can install shall be upto 100% of his sanctioned/contracted demand with the distribution licensee.

5.0 Metering :

5.1 The consumers under the solar net feed-in scheme will have to install two meters. One is for measuring solar power generation and the other is to measure import and export of energy. The first meter, solar generation meter shall be placed after the inverter at the ground floor of the premises to facilitate easy access for meter reading. The second meter shall be a bi-directional meter which will replace the existing consumer meter (single phase or three phase) and used for commercial settlement of energy imported and exported. The first and the second meter will have to be installed at the same location where existing meter for recording consumption of energy is installed.

5.2 Installation of solar generation meter will help the licensee for demand forecasting and also for computation of total solar generation in the State. All consumers under the net feed-in scheme shall install solar generation meters to measure actual generation from the solar plant.

5.3 The meters shall adhere to the standards specified by the Central Electricity Authority (Installation and Operation of Meters) Regulation 2006 and as amended from time to time and Commission's relevant regulations/orders as amended from time to time. The cost of new/ additional meters provided for the net feed-in

scheme and the installation and testing charges shall be borne by the eligible consumers. The distribution licensee shall procure, test and install the meters. The eligible consumers shall have the option to procure and supply the meters. The Distribution Licensee shall host the list of manufacturers of such meters in their website. Position and sealing of meters will be guided by the same provisions as applicable to consumer meters in the Central Electricity Authority's metering regulations.

5.4 The assessor shall take the readings of both the solar generation meter and the bi-directional import/ export meter. A new meter card shall be evolved by the licensee. The meter card shall have provisions to enter data of meter readings, solar generation, units of import/ export, monetary value of imported and exported energy, available credit, payment to be made in each billing period to the distribution licensee on account of higher debit value, columns to incorporate initials of assessor, consumer, and any other requisite details as may be necessary. The meter reading taken by the licensee shall form the basis for commercial settlement. Metering configuration diagram is shown in Annexure I.

5.5 All service connection meters shall be configured for bidirectional energy recording and display, to enable new service connections and existing service connections for which meters are replaced in normal course of maintenance, to enter the solar net feed-in scheme anytime in future.

6.0 Commercial arrangements:

6.1 The electricity generated by the solar rooftop power plant shall be utilized for

self consumption by the consumer. The surplus/excess energy generated that is unutilized and that flows to the grid and recorded in the export register of the meter shall at the end of the billing period be calculated at a tariff fixed by the Commission and credited to the consumer's account. The energy that is imported from the grid by the consumer shall be calculated at the appropriate retail tariff and the monetary value of imported energy debited from the available credit on account of exported energy in the respective billing period. Any credit available in the account of the consumer after debiting value of imported energy shall be carried over to the next billing period for adjustments against subsequent billing. If the amount to be debited is higher than the credit in a billing period, the consumer shall pay the difference in charges within the specified period in Commission's Regulations. This process shall continue until the end of the settlement period. At the end of the settlement period, credit i.e the monetary value of surplus generation if any shall be settled by the distribution licensee, to the consumer within 15 days from the date of billing, by cheque. The payment shall not carry any interest if settled by the licensee within 15 days from the date of raising of bills. Beyond this period, payments will attract interest at the rate notified for interest on security deposit. 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.

6.2 The price of purchase of energy exported to the grid by the SPGs commissioned under the Solar net feed-in during a financial year shall be at 75% of the pooled cost of power purchase notified by the Commission for the respective

financial year in the orders issued on pooled cost of power purchase under Renewable Energy Power Purchase Obligations, 2010 or 75% of last feed in tariff determined by the Commission or 75% of tariff discovered in latest bidding whichever is less. The rate of purchase thus fixed is applicable to the solar power generator commissioned in the relevant financial year for the entire life period of the plant which is 25 years.

7.0 LT connectivity

7.1 The technical standards of connectivity shall be as specified in the CEA’s(Technical Standards of Connectivity for the Distributed Generation Resources) Regulations 2013 and as amended from time to time.

7.2 The maximum capacity for interconnection with the grid at a specific voltage level shall be governed by the Supply/Distribution code as amended from time to time. The interconnecting voltage levels of distributed generating sources relevant to capacity range is as follows:

Capacity	Connecting voltage
Upto 4 kW	240 V – single phase or 415 V Three phase at the option of the consumer
Above 4 kW and upto 112 kW	415 V- Three phase

8.0 Restrictions on grid penetration:

8.1 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.

9.0 Standards, Operation and Maintenance of Solar Power Generators (SPGs) :

9.1 The solar power generator and equipments shall meet the requirement specified in the CEA's (Technical Standards for connectivity of the Distributed Generation Resources) Regulations 2013 and as amended from time to time. The responsibility of operation and maintenance of the solar power generator including all accessories and apparatus lies with the solar power generators. The design and installation of the roof top Solar Photo Voltaic (SPV) should be equipped with appropriately rated protective devices to sense any abnormality in the system and carryout automatic isolation of the SPV from the grid. The inverters used should meet the necessary quality requirements. The protection logics should be tested before commissioning of the plant. Safety certificates for the installation should be obtained from the appropriate authorities.

9.2 The automatic isolation of the SPV 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 mechanism for earthing, surge, DC ground fault, transients etc. as per the CEA regulation/standards.

9.3 To prevent back feeding and possible accidents when maintenance works are carried out by distribution licensee's personnel in his network, suitable isolator/ isolating disconnect switches which can be locked by distribution licensee personnel should be provided. This is in addition to automatic sensing and isolating on grid supply failure etc and in addition to internal disconnect switches. In the event of distribution licensee LT supply failure, the SPG has to ensure that there will not be any solar power being fed to the LT grid of distribution licensee. The consumer is 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 SPG plant when the grid supply is off. The distribution licensee reserves the right to disconnect the consumer installation at any time in the event of such exigencies to prevent accident or damage to men and material.

9.4 The consumer shall abide by all the codes and regulations issued by the CEA/Commission to the extent applicable and in force from time to time. The consumer shall comply with CEA/TNERC/CEIG/ distribution licensee's requirements to the extent it is applicable with respect to safe, secure and reliable function of the SPG plant and the grid. The power injected into the grid shall be of the required quality in respect of wave shape, frequency, absence of DC components etc.

9.5 The SPG shall restrict the harmonic generation, flicker within the limit specified in the relevant regulations issued by the Central Electricity Authority.

9.6 The inverter should be a sine wave inverter suitable for synchronizing with the distribution licensee's grid.

9.7 Grid interactive solar PV system with battery backup is not under the purview of this order. Any battery backup shall be restricted to the consumer's network and the consumer shall be responsible to take adequate safety measures to prevent battery power/Diesel Generator(DG) power/backup power extending to distribution licensee's LT grid on failure of distribution licensee's grid supply.

10.0 Processing of application

10.1 Application for Solar Power connectivity shall be in Form-1 and shall be submitted to the respective section officer/designated officer of the distribution licensee along with a registration fee of Rs. 100 (Rupees One hundred only). The licensee shall acknowledge the receipt of the application.

10.2 Both the parties shall sign a net feed- in connection agreement as in Form-2.

10.3 The Distribution licensee will install the required energy meters and commission the solar metering facility within three weeks from the date of application by the consumer.

10.4 The distribution licensee will enhance and update their billing system such that relevant details of the net feed-in scheme are included in the bills of consumers. The billing data of each consumer shall be made available online along with a sample bill explaining various billing components.

10.5 The distribution licensee shall implement online applications for solar net feed-in scheme. The status of all applications received online or offline shall be displayed. The licensee shall maintain section wise data base of applications received, approval status, installation and commissioning data.

11.0 Renewable Energy Certificates and Renewable Energy Obligation

11.1 Net injection of power is not eligible for REC. The energy generated from Rooftop Solar power plant shall be accounted towards fulfillment of RPO obligation of distribution licensee.

Sd./-
(T.Prabhakara Rao)
Member

Sd./-
(S.Akshaya Kumar)
Chairman

(By order of Tamil Nadu Electricity Regulatory Commission)

Sd./-
(S.Chinnarajalu)
Secretary
Tamil Nadu Electricity Regulatory Commission

Form - 1
Rooftop Solar net feed-in Connection Application

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



I / we herewith apply for a solar energy net feed-in connection at the service connection and for the solar PV plant of which details are given below.

1.	Name of applicant	
2.	Address of applicant	
3.	Service connection number	
4.	Service connection tariff	
5.	Telephone number(s)	
6.	Email ID	
7.	Solar PV plant capacity (Watts)	
8.	Solar grid inverter make and type	
9.	Solar grid inverter has automatic isolation protection (Y/N)?	
10.	Has a Solar Generation Meter been installed (Y/N)?	
11.	Expected date of commissioning of solar PV system.	

Name:

Date:

Signature

Net feed- in Application Acknowledgement

Received an application for a solar energy net-feed in connection from,

Name.

Date:

Service Connection number:

Application registration no.:

Solar Plant Capacity:

Name of Officer:

Signature

Designation/TANGEDCO

FORM – 2

Solar Net feed-in connection agreement

This Agreement is made and entered into at (location) on this (date).....day of (month)..... between the Eligible Consumer, residing at (address) as first party

AND

----- distribution Licensee (herein after called as TANGEDCO) and having its registered office at (address)..... as second party of the agreement

And whereas, the TANGEDCO agrees to purchase the electricity generated from the eligible consumer's SPG plant of capacity watts and as per conditions of this agreement and regulations/orders issued by the Tamil Nadu Electricity Regulatory Commission.

Both the party hereby agrees to as follows:

1. Eligibility

1.1 Eligibility for net-feed in shall be as specified in the relevant order of the Tamil Nadu Electricity Regulatory Commission. Eligible consumer is required to be aware, in advance, of the standards and conditions his system has to meet for being integrated into grid/distribution system.

2. Technical and Interconnection Requirements

2.1 The eligible consumer agrees that his solar generation plant and net feed-in system will conform to the standards and requirements specified in the following Regulations and codes as amended from time to time.

(i) CEA's (Technical Standards for connectivity of the Distributed Generating Resources) Regulations, 2013

(ii) Central Electricity Authority (Installation and Operation of Meters) Regulation 2006

(iii) Tamil Nadu Electricity Distribution Code

(iv) Tamil Nadu Electricity Supply Code

2.2 Eligible consumer agrees that he has installed or will install, prior to connection of Photovoltaic system to TANGEDCO's distribution system, an isolation device (both automatic and inbuilt within inverter and external manual relays) and agrees for the TANGEDCO to have access to and operation of this, if required and for repair & maintenance of the distribution system.

2.3 Eligible consumer agrees that in case of a power outage on TANGEDCO's system, photovoltaic system will shut down, automatically and his plant will not inject power into Licensee's distribution system.

2.4. All the equipment connected to distribution system must be compliant with relevant international (IEEE/IEC) or Indian standards (BIS) and installations of

electrical equipment must comply with Central Electricity Authority (Measures of Safety and Electricity Supply) Regulations, 2010 as amended from time to time.

2.5 Eligible consumer agrees that licensee will specify the interface/ interconnection point and metering point.

2.6 Eligible consumer and licensee agrees to comply with the relevant CEA regulations in respect of operation and maintenance of the plant, drawing and diagrams, site responsibility schedule, harmonics, synchronization, voltage frequency, flicker etc.,

2.7 Due to TANGEDCO's obligation to maintain a safe and reliable distribution system, eligible consumer agrees that if it is determined by the TANGEDCO that eligible consumer's photovoltaic system either causes damage to and/or produces adverse effects affecting other consumers or TANGEDCO's assets, eligible consumer will have to disconnect photovoltaic system immediately from the distribution system upon direction from the TANGEDCO and correct the problem at his own expense prior to a reconnection.

3. Clearances and Approvals

3.1 The eligible consumer agrees to obtain all the necessary approvals and clearances (environmental and grid connected related) before connecting the rooftop solar photovoltaic system to the distribution system.

4. Access and Disconnection

4.1 TANGEDCO shall have access to metering equipment and disconnecting means of photovoltaic system, both automatic and manual, at all times.

4.2 In emergency or outage situation, where there is no access to a disconnecting means, both automatic and manual, such as a switch or breaker, TANGEDCO may disconnect service to the premise.

5. Liabilities

5.1 Eligible consumer and TANGEDCO will indemnify each other for damages or adverse effects from either party's negligence or intentional misconduct in the connection and operation of photovoltaic system or TANGEDCO's distribution system.

5.2 TANGEDCO and eligible consumer will not be liable to each other for any loss of profits or revenues, business interruption losses, loss of contract or loss of goodwill, or for indirect, consequential, incidental or special damages, including, but not limited to, punitive or exemplary damages, whether any of the said liability, loss or damages arise in contract, or otherwise.

5.3 TANGEDCO shall not be liable for delivery or realization by eligible consumer for any fiscal or other incentive provided by the Central/State government beyond the scope specified by the Commission in its relevant Order.

6. Commercial Settlement

6.1 The commercial settlement under this agreement shall be as per the order on Rooftop Solar Generation issued by the TNERC on 25.03.2019 .

7. Connection Costs

7.1 The eligible consumer shall bear all costs related to setting up of photovoltaic system including metering and interconnection costs.

7.2 The eligible consumer agrees to pay the actual cost of modifications and upgrades to the service line required to connect photovoltaic system in case it is required.

8. Termination

8.1 The eligible consumer can terminate agreement at any time by providing TANGEDCO with 90 days prior notice.

8.2 TANGEDCO has the right to terminate Agreement on 30 days prior written notice, if eligible consumer breaches a term of this Agreement and does not remedy the breach within 30 days of receiving written notice from TANGEDCO of the breach.

8.3 Eligible consumer agrees that upon termination of this Agreement, he must disconnect the photovoltaic system from TANGEDCO’s distribution system in a timely manner and to TANGEDCO’s satisfaction.

In the witness, whereof of Mr. for and on behalf of ...
(Eligible consumer) and Mr. for and on behalf of.....
(TANGEDCO) sign this agreement in two originals.

Eligible Consumer

Distribution Licensee

Name

Name

Annexure – I Metering configuration

