



TAMIL NADU ELECTRICITY REGULATORY COMMISSION

**Order on LT Connectivity and Net-metering, in regard to
Tamil Nadu Solar Energy Policy 2012**

Order No. 3 of 2013 dated 13.11.2013



TAMIL NADU ELECTRICITY REGULATORY COMMISSION

PRESENT : Thiru.S.Nagalsamy - Member

Order No. 3 of 2013, dated 13-11-2013

IN THE MATTER OF: **ORDER ON LT CONNECTIVITY AND
NET-METERING, IN REGARD TO
TAMIL NADU SOLAR ENERGY POLICY 2012**

1. In G.O (Ms) No. 121/Energy (C2)/ dated 19-10-2012 Government of Tamil Nadu have approved the Tamil Nadu Solar Energy Policy, 2012 which envisages generation of 3000 MW of Solar Energy by 2015, reduction of carbon emissions and projection of State of Tamil Nadu as a solar hub among other objectives. In letter No. 12009/C2/2012-1/ dated 06-11-2012, the Government have issued a policy directive under section 108 of the Electricity Act, 2003 (Central Act 36 of 2003) to this Commission for necessary action on the said policy. The Commission issued a suo-motu order titled "Issues relating to Tamil Nadu Energy Policy 2012" on 07-03-2013.
2. In the said Order it was specified that separate order on net-metering, LT connectivity etc., would be issued separately after obtaining the procedure from TANGEDCO and after obtaining comments/suggestions from the stake-holders. TANGEDCO has submitted the same on 18/5/2013. The procedure was hosted in the Commission's website on 24/7/2013 seeking comments from the stakeholders to be furnished on or before 15/8/2013. Taking into

account the procedure submitted by TANGEDCO, the comments received from the stakeholders and the model regulation issued by the Forum of Regulators, the Commission issued a draft order on Net-metering, LT Connectivity and Renewable Energy Certificate(REC) inviting comments/suggestions received from stakeholders to be furnished before 30/9/2013.

3. Taking into account the comments/suggestions received from the stakeholders, the provisions of Tamil Nadu Solar Energy Policy 2012 and in exercise of the powers conferred by clause (e) of subsection (1) of section 86 of the Electricity Act, 2003(Central Act 36 of 2003), the Commission issues the following order on LT connectivity and Net-metering in regard to Tamil Nadu Solar Energy Policy 2012.
4. This order shall come into force from the date of its issuance. Both the existing and new Solar rooftop/Solar systems which comply with this order are eligible for Net-metering.

(By order of the Commission)

(S. Gunasekaran)
Secretary
Tamil Nadu Electricity Regulatory Commission

Order on LT Connectivity and Net-metering, in regard to Tamil Nadu Solar Energy Policy 2012

1. Introduction

1.1 In the Commission's Order on the issues related to Tamil Nadu Solar Energy Policy 2012, dated 07/03/2013 the Commission had directed Tamil Nadu Electricity Generation and Distribution Corporation (TANGEDCO) to submit a detailed procedure on Net-metering, LT Connectivity etc., to the Commission. TANGEDCO has submitted the same on 18/5/2013. The procedure was hosted in the Commission's website on 24/7/2013 seeking comments from the stakeholders to be furnished on or before 15/8/2013. Taking into account the procedure submitted by TANGEDCO, the comments received from the stakeholders and the model regulation issued by the Forum of Regulators, the Commission issued a draft order on Net-metering, LT Connectivity and Renewable Energy Certificate(REC) inviting comments/suggestions received from stakeholders to be furnished before 30/9/2013. Taking into account the comments/suggestions received from the stakeholders, the Commission issues this Order on Net-metering, LT Connectivity in regard to Tamil Nadu Solar Energy Policy 2012.

2. Eligible consumers for Net-metering

2.1. The categories of consumers eligible for net-metering have been prescribed under Clause 15 and 22.1 of the Tamil Nadu Solar Energy Policy 2012. Such

categories have not been defined in the Commission's regulations or orders. To give more clarity and for easy implementation, the categories of consumers covered under HT tariff II-A, HT tariff III, LT tariff I-A, LT tariff I-C, LT tariff II-A, LT tariff II-B (1) and LT tariff V as specified in the Commission's retail tariff order in force are considered to be the "Eligible Consumers" for the purpose of Net-metering. Both the existing and new Solar rooftop/Solar systems which comply with this order are eligible for Net-metering.

3. Metering

3.1 Two meters have to be installed by the solar power generator. One is for measuring solar power generation and the other is for Import/Export measurement. The first meter, the solar generation meter, has to be installed at the generator end after the inverter at the ground floor of the premises to facilitate easy access for meter reading. Solar generation meter is optional for the eligible consumers who are not availing Generation Based Incentives (GBI). This second meter is a bi-directional meter which will replace the existing consumer meter (Single phase or three phase as per requirement) is used for commercial settlements. If the consumer wishes to have a record of the readings taken, he shall be allowed to do so by the licensee. The first and the second meter have to be installed at the same location where the present meter for consumption is installed.

3.2. 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. Central Electricity Authority's (CEA) draft regulation on Installation and Operation of Meters 2013 may also be adopted till such time the final regulation/amendment is notified. The type of meters (LT meter, HT meter, TOD meter etc) shall be as specified by the Commission in its relevant regulations/orders and as amended from time to time. The Distribution Licensee shall host the list of approved manufacturers of such meters in their website. The solar check meters shall be mandatory for solar installations having capacity more than 20 kW. For installations size of less than or equal to 20 kW, the solar check meters would be optional. The cost of new/additional meter(s) provided for the net-metering and the installation and testing charges shall be borne by the eligible consumers. The Distribution licensee shall procure, test and install the meters. The eligible consumers may supply the meters at their option. Position & sealing of meters will be guided by the same provisions as applicable to consumer meters in the Central Electricity Authority's metering regulations. Since hybrid generators are encouraged in the Tamil Nadu Solar Energy Policy 2012, separate sets of meters shall be installed and readings taken for each generator following similar procedure.

3.3 The assessor shall take readings of both the solar generation meter and the bidirectional Import/Export meter in case of the consumers availing GBI. A new type of meter-card to record the readings of generation details with the facility to incorporate both the assessor's and consumers' initials shall be provided by the

distribution licensee. Such cards shall also have the details of Generator's Bank Account Number to which the GBI have to be credited directly by the Tamil Nadu Energy Development Agency(TEDA). The meter reading taken by the distribution licensee shall form the basis for commercial settlement. At the end of every monthly/bi-monthly reading, the solar energy generation will be communicated to TEDA by the distribution licensee through e-mail with a copy to the consumer, to facilitate direct transfer of GBI amount to the generator. Net-metering configuration diagram is shown in Annexure I.

4.0 Commercial arrangements

4.1 Electricity generated from a Solar rooftop/Solar system and injected into the licensee's grid shall be capped commercially at 90% of the electricity consumption by the eligible consumer at the end of a settlement period. Excess energy generated beyond the 90% cap shall be treated as lapsed.

4.2 If the import of energy by the consumer is more than the export in a billing cycle, the net energy consumed has to be billed by the Distribution Licensee as per the tariff in force applicable to that category of consumers. Export of energy in excess of the consumption of the consumer in a billing cycle shall be carried forward to the next billing cycle. The settlement period for final settlement of net-metered energy shall be 12 months period from August – July. There shall be no carry forward of energy allowed to the next settlement period in the following year.

5. LT Connectivity

5.1 The Technical Standards for connectivity shall be as specified in the CEA's (Technical Standards for connectivity of the Distributed Generating Resources) Regulations, 2013 and as amended from time to time

5.2 The maximum capacity for interconnection with the grid at a specific voltage level is governed by the Distribution Code/Supply Code and as amended from time to time. The interconnecting voltage level of the distributed generating resources for various capacity ranges are tabulated below as specified in the said codes :

Capacity range	Connecting voltage
Upto 4 kW	240V – single phase or 415V – three phase at the option of the consumer
Above 4kW and upto 112kW	415V – three phase
Above 112kW	At HT/EHT level

5.3 This Connectivity norms are applicable to all the SPGs who seek connectivity at LT network of the distribution licensee. For the purpose of net metering, LT connectivity can be permitted for HT services subject to connectivity norms.

6. Restrictions on grid penetration

6.1. At the local distribution level connectivity to rooftop solar/solar systems shall be

restricted to 30% of the distribution transformer capacity on the basis of first come first served. The maximum cumulative capacity in the Distribution Licensee area shall be limited to the extent prescribed in the Tamil Nadu Solar Energy Policy 2012 and by the Renewal Purchase Obligation(RPO) specified in the Commission's Regulation on year to year basis.

7. Standards, Operation and Maintenance of Solar Power Generators (SPGs)

7.1 The solar power generator (SPG) 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.

7.2. 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.

7.3. To prevent back feeding and possible accidents when maintenance works are carried out by distribution licensee 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.

7.4. 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.

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

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

7.7. 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.

7.8. 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 alongwith a registration fee of Rs. 100 (Rupees One hundred only). The licensee shall acknowledge the receipt of the application.

7.9. Both the parties shall sign a net-metering connection agreement as in **Form-2**.

8. Applicability of Renewable Energy Certificates and RPO

8.1 Net-metering injection is not eligible for REC. The energy adjusted against net-metering arrangement shall qualify as deemed Renewable Purchase Obligation (RPO) for the distribution licensee.

9. Court cases

9.1. Cases have been filed in the appropriate judicial forums against the Commission's order on the issue related to Tamil Nadu Solar Energy Policy 2012 and the subject is subjudice to the extent of the prayer in the respective petitions. This Order is subject to the outcome of these cases.

(By order of the Commission)

(S. Gunasekaran)
Secretary
Tamil Nadu Electricity Regulatory Commission

Form - 1
Net Metering Connection Application

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

Date: [date]

I / we herewith apply for a solar energy net-metering 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:

Signature

Net-metering Application Acknowledgement

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

Name.

Date:

Service Connection number:

Application registration no.:

Solar Plant Capacity

Name of Officer

Signature

Designation/TANGEDCO

FORM – 2

Net-metering 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 benefit the eligible consumer for
the electricity generated from his SPG plant of capacity ----- watts and as per
conditions of this agreement and net- metering 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-metering has been 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-metering 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 Distribution 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.

2.5 Eligible consumer agrees that licensee will specify the interface/inter-connection 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 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 All the commercial settlement under this agreement shall follow the Net metering order issued by the TNERC.

7. Connection Costs

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

Distribution Licensee
Name

Address	Designation
Service connection Number	Office Address

(By order of the Commission)

(S. Gunasekaran)
Secretary
Tamil Nadu Electricity Regulatory Commission

