

**BEFORE THE HONOURABLE TAMILNADU ELECTRICITY REGULATORY
COMMISSION, CHENNAI**

M.P.No.9 of 2017

In the matter of Proposal for adopting revised accounting methodology in the existing net metering scheme approved by TNERC Order No.3 dated 13.11.2013 for the eligible 5 categories of L.T consumers so as to promote more solar Roof top systems in the state to achieve the target fixed by GoI.

And in the matter of

Tamil Nadu Generation and Distribution Corporation Limited
Represented by the Chief Engineer/Non-Conventional Energy Sources,
144 Anna Salai,
Chennai 600 002.

.....Petitioner

Vs

..... Nil

**PETITION FILED UNDER SECTION 86 (1)(E) OF THE ELECTRICITY ACT,
2003 AND UNDER REGULATION 16 OF THE TNERC CONDUCT
REGULATIONS, 2004.**

I, M.Balasubramanian, son of Thiru.Marimuthu, Male, aged about 55 years employed as the Chief Engineer/NCES in TANGEDCO and having office at 144, Anna Salai, Chennai – 600 002, do hereby solemnly affirm and sincerely state as follows:

1. I am the Chief Engineer/NCES, I am well acquainted with the facts of the case and I am authorized to file the present petition before the Hon'ble Commission.

2. This petition seeks approval for certain revisions in the existing net metering accounting methodology to encourage promotion of more Solar Roof top systems in Tamil Nadu under net metering scheme.

3. It is respectfully submitted that Tamil Nadu is endowed with about 300 clear sunny days in a year with high solar radiation, offering very good solar potential for solar based power generation in the State. Tamil Nadu State Solar policy has been announced by Hon'ble Chief Minister of Tamil Nadu on 19.10.2012 vide G.O.No.121, dated 19.10.2012. Clause 14 of the solar policy envisages establishment 3000 MW of solar PV power plants by 2015 as detailed below:

	Utility Scale (MW)	Solar Roof Tops (MW)	REC (MW)	Total (MW)
	(a)	(b)	(c)	(d)
2013	750	100	150	1000
2014	550	125	325	1000
2015	200	125	675	1000
Total	1500	350	1150	3000

4. It is respectfully submitted that various policy initiatives such as feed in tariff, gross metering, Net metering etc., in solar roof tops have played significant role in solar roof top programmes across the country mainly to promote more generation of solar energy. These initiatives have been a dominant factor for the Roof Top PV success stories in various countries.

5. It is respectfully submitted that the GoI has enacted several policies to promote Renewable/solar energy. Policies and Acts impacting direct RE/ solar energy development 2000 onwards include Electricity Act 2003, National Electricity Policy 2005, Tariff Policy 2006, Integrated Energy Policy 2006, National Action Plan on Climate Change (NAPCC) 2008, Generation based Incentives (GBI) for Solar-2009, Jawaharlal Nehru National Solar Mission (JNNSM) 2010, Renewable Energy Certificates (RECs) 2011, Clean Energy Cess – 2010.

Capital Subsidy is being given for Roof top solar in residential, hospitals, educational institutes, social sector at the rate up to 30% of the benchmark capital cost for general category states.

Fiscal incentives:

- concessional import duty
- excise duty exemption,
- accelerated depreciation
- tax holiday

6. It is respectfully submitted that the GoI has envisaged an ambitious cumulative Renewable Energy target achievement of 175 GW as follows:

- 100 GW Solar - (60 GW through utility scale & 40 GW by Roof top systems), 60 GW Wind, 10 GW Biomass and 5 GW Small Hydro by the year 2022.

The present solar installed capacity of the country is about 9235 MW.

The solar installations in the top 5 States, as on date is as given below:

Tamil Nadu	1653 MW
Rajasthan	1317 MW
Gujarat	1160 MW
Telangana	1073 MW
Andhra Pradesh	980 MW

It may be seen that Tamil Nadu is the state with highest solar installed capacity. Until, last year TN was not in the list at all. The addition during the year 2015-16 (around 957 MW), has taken TN to the top of the list. The anticipated addition during the coming years is also very promising.

The cumulative solar power for Tamil Nadu is targeted at 8900 MW (fixed by GoI), out of cumulative Solar installed capacity planned by GoI to be achieved by 2022, i.e., around 1,00,000 MW (both utility scale and roof top).

The Tamil Nadu Solar Policy 2012 envisaged solar power generation for 3000 MW by 2015. The details on solar installations under various categories, in TN, as on date are furnished below:

Sl. No	Scheme	Capacity in MW
	I. Grid Connected	
1.	Central Government scheme	26
2.	Preferential tariff(sale to Board)	1409
3	Preferential tariff (wheeling)	47
4.	REC (under APPC rate)	120
	II. Roof Top	
1.	HT consumers - 178 Nos; 75 MW LT consumers(net metering)- 4732 Nos; 16 MW	91
	Total	1693

7. It is respectfully submitted that The Tamil Nadu Solar policy 2012 mandates 6% Solar purchase obligation (starting with 3% till December 2013 and 6% from January 2014) for the HT Consumers (HT Tariff I to V) and LT Commercial (LT Tariff V).

The above obligated consumers may fulfil their SPOs by:

- a) Generating captive solar power in Tamil Nadu equivalent to or more than their SPO.
- b) Buying equivalent to more than their SPO from other third party developers of solar power projects in Tamil Nadu.
- c) Buying RECs generated by solar power projects equivalent to or more than their SPO.
- d) Purchasing power from TANGEDCO at solar tariff.

Consumers desirous of availing SPO exemption by captive solar generation shall necessarily install separate meters to measure captive generation.

8. It is respectfully submitted that in order to achieve the initial target of 1500 MW under utility scale, as per the Tamil Nadu solar policy, during December 2012, TANGEDCO floated tender for procurement of solar power from the developers willing to establish solar power plants in Tamil Nadu by following the procedures stipulated in the Tamil Nadu Transparency in Tenders Act, 1998 and Tender Transparency Rules, 2000. However TNERC dismissed the petition seeking approval for draft PPA and tariff on 15.09.2014.

In the mean time, certain consumers filed petitions before the Hon'ble Madras High Court and Hon'ble APTEL, New Delhi against the implementation of SPO. The Hon'ble APTEL issued orders on 21.01.2014 in favour of the petitioners in Appeal Nos. 92 & 109 of 2013 setting aside the Hon'ble TNERC's Order No.1 of 2013 dated 07.03.2013. TANGEDCO filed a petition in 2014 before the Hon'ble Supreme Court of India against this APTEL order. The final verdict of this case is still pending before the Hon'ble Supreme Court of India.

The cases in WP Nos.12390 & 29545 of 2013 before the Hon'ble Madras High Court against implementation of SPO have not come up for hearing till date. Hence, the implementation of SPO will be decided based on the final verdict of court case pending before the Hon'ble Supreme Court of India and Hon'ble Madras High Court.

Further, under preferential tariff scheme, 86 developers have executed EPA with TANGEDCO for a total capacity of 1484 MW and 78 solar power plants with a combined capacity of **1409 MW** have been commissioned.

9. It is respectfully submitted that the Hon'ble TNERC vide Amendment Notification dt:29.07.2011 fixed minimum quantum of Renewable Purchase Obligations (RPO) at 9% and Solar RPO at 0.05% to TANGEDCO for the year 2011-12 and the same was continued till 2014-15.

TANGEDCO has achieved the RPO targets as tabulated below:

During the year	RPO Target	RPO achieved
2009-10	13%	13.31%
2010-11	14%	14.63%
2011-12*	9%	14.80%
2012-13*	9%	17.51%
2013-14*	9%	10.34%
2014-15*	9%	9.73%

* RPO target of 9% includes solar RPO of 0.05%.

In continuation to the above, the Hon'ble TNERC in notification dt.07.03.2016, fixed the following Solar Purchase Obligation (SPO) to the distribution licensee:

During the year	Solar (RPO) Target
2015-16	0.5%
2016-17	2.5%
2017-18	5.0%

10. It is respectfully submitted that TANGEDCO floated tender for the procurement of 500 MW (Phase I) under reverse bidding on 20.10.2016, considering the tariff of Rs.5.10 per unit as upper limit. 20 firms have participated for the establishment of solar power plants of combined capacity of 122 MW. Tender was finalized and EPA has been executed on 10.2.2017 with the 2 firms for a total capacity of **20 MW** at a tariff rate of Rs.4.50 per unit.

Since the tendered solar capacity is not received in phase 1 tender, TANGEDCO has floated another tender for the procurement of 500 MW (Phase II) under reverse bidding considering the tariff of Rs.4.50 per unit as upper limit on 05.01.2017. Techno- Commercial bids were opened on 10.2.2017. 20 firms have participated for the establishment of solar power plants of combined capacity of 292 MW. Price bids of the eligible 17 Nos. for a combined capacity of 236 MW was opened on 18.02.2017 and the L1 rate was Rs.4.40/- per unit. It is proposed to issue LoI to 16 bidders for a combined capacity of **224 MW**. TANGEDCO has proposed to go for another tender (Phase III) for the procurement of 1500 MW under reverse bidding.

Consequence of RPO default: If the obligated entity does not fulfil the RPO or does not purchase the certificates (REC), the penal charges will be equivalent to the forbearance price multiplied by shortfall in units of RPO.

In spite of the strenuous efforts taken, for promotion of utility scale solar power in the State, TANGEDCO is not able to meet the desired Solar Specific RPO Obligation. It has been identified that there is huge potential for solar roof top systems in Tamil Nadu, particularly in small Towns / rural areas that needs to be harnessed to meet the Solar Obligation as well as the cumulative of solar power target of 8900 MW fixed by Government of India by 2022 against the 100 GW target for the whole of India. Further, as per the MNRE letter dt:30.07.2015 a target of 3500 MW upto 2022 has been fixed for Roof Top schemes for Tamil Nadu.

11. It is respectfully submitted that the following are Key Benefits of Roof top systems:

- Large number of solar roof top installations paves way for "DISTRIBUTED POWER GENERATION".
- Photovoltaic roof-top installations at the tail-end of the grid can enhance grid-stability and reduce T&D losses as power is consumed at the point of generation.
- Much potential for solar roof top systems in small Towns / rural areas, which offers local employment opportunities and also lead to rural development.
- Savings in land requirement and costs.
- Savings in development of new transmission infrastructure.
- Creation of value from under-utilized /unutilized rooftops.
- Solar PV projects are environment friendly and help in reducing GHG emissions. One GWhr of solar generation eliminates about 820 metric tons of CO2 emissions.
- PV system requires no water to produce electricity.

12. It is respectfully submitted that the following are advantages of promoting Roof top systems:

- Reduces requirement of land for solar Power.
- Reduces need for additional transmission infrastructure.
- Tail end voltage improvement.
- Higher investments in coal based generation can be avoided in future.
- Time run in bringing in the new conventional plants may be managed.
- Mitigates diesel generator dependency.
- Long term reliable power source.

13. It is respectfully submitted that the Solar Energy Policy 2012, the Hon'ble TNERC has issued an order on LT connectivity and net metering vide order No.3 of 2013 dated 13.11.2013.

The salient features of the above said order is furnished below:

- Net metering facility will be extended to Solar power systems connected to the electrical grid to feed excess power back to the grid with "Power credits" accruing to the photovoltaic energy producer.

- 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.
- 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.
- Connectivity is permitted up to 30% of the distribution transformer capacity on first come first served basis.
- Net metering is allowed (at multiple voltage levels) to promote rooftop penetration.

Solar PV System Size	Grid Connected
<10 kWp	240 V
10 kWp to < 15 kWp	240 V / 415 V
15 kWp to < 50 kWp	415 V
50 kWp to < 100 kWp	415 V
100 kWp	11 KV

- The following categories of consumers are eligible for availing net metering facility.

1.	HT Tariff II-A	Govt. Educational institutions, Govt. Hospitals, Water Supply and places of worship.
2.	HT III	Commercial
3.	LT I-A	Domestic.
4.	LT I-C	Bulk Supply, Railway colonies, Defence colonies.
5.	LT II – A	Public lighting, Water supply.
6.	LT II-B (1)	Govt/Aided Educational Institutions, Govt. Hospitals etc.
7.	LT V	Commercial

The approval for the implementation of net-metering facility to the eligible LT consumers is being carried out at field level of TANGEDCO. The eligible LT consumers who propose to establish roof top SPV plant are eligible for subsidy (State subsidy – Rs. Rs.20,000/- & Central subsidy-Rs.22,500/- per KW). The nodal agency for claiming subsidy is TEDA.

At present TANGEDCO has facilitated the following:

- (1) Roof top solar system for eligible LT consumers with net metering facility.

- (2) Roof top solar system for all the HT consumers without net metering facility (i.e) mere parallel operation by collecting parallel operation charges.

The MNRE, Government of India, has fixed an ambitious target of 3500 MW for Roof Top Solar Systems for Tamil Nadu by 2022. However with the existing policy, TANGEDCO has been able to promote only 91 MW under solar roof top programme, which includes 75 MW under parallel operation without net metering facility to HT consumers and 16 MW with net metering facility to eligible LT consumers.

In order to achieve the desired goal, TANGEDCO now proposes to facilitate net metering facility with revised accounting methodology to the existing 5 categories of LT consumers (already approved by Hon'ble TNERC), without any financial mismatch.

The existing Net metering accounting mechanism, involves the following issues:

- At the time of implementation of Net metering scheme the capital cost was high and now drastic reduction in the capital cost has been witnessed.
- The solar units (now less cost due to drastic reduction of PV cost) are being adjusted with higher tariff than the market sale rate to solar energy.
- The net units fall within the lower slab after adjustment (Domestic/commercial).
- The 100 units free scheme for domestic category announced by the GoTN did not exist at the time of issue of net metering regulations by TNERC.

Due to the above factors, TANGEDCO incurs huge revenue loss.

The other consumers also avail GoI subsidy through TEDA and also avail the existing net metering benefits.

14. It is respectfully submitted that the Telangana Electricity Regulatory Commission recently came up with its Net Metering Rooftop Solar PV Grid Interactive Systems) Regulation, 2016. Following are some of the highlights of the regulation:-

The net metering facility, of an eligible consumer shall be in three phase service where a single phase consumer is also eligible for net metering up to 5 KW. The tariff payable to an eligible consumer under the net-metering arrangement at the settlement period will be the average power purchase cost of a Distribution Licensee.

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

The Rooftop Solar PV System under the net metering arrangement, whether self-owned or third party owned installed on the Eligible Consumer's premises, will be exempted from Transmission Charge, Wheeling Charge, Cross Subsidy Surcharge, etc.,

Parameter	Telengana	Andrapradesh
Gross Metering at 11 kV (optional)	Latest Solar PPA rate	APPC rate
Net Metering - Cumulative capacity permitted to distribution transformer	50 %	60%
Maximum Rooftop Capacity permitted w.r.t. sanctioned load	80 – 100 %	80%
Banking Period	June – December	April - March

15. It is respectfully submitted that in India also, the Solar PV costs have reduced drastically owing to improvements in the technology and economies of scale among manufacturers. The average cost of solar PV modules imported into India has fallen by almost 20% over the past three months.

TANGEDCO is already undergoing severe financial crunch owing to mammoth losses in wheeling/banking of wind energy. Since TANGEDCO is keen to promote solar roof top in the state and to avoid the similar situation for solar, it is essential to address the issue rightly at this stage.

16. It is respectfully submitted that, TANGEDCO proposes that after giving due credit to the consumer to utilize the solar energy for self consumption and to export the surplus energy if any, to the grid at a justifiable rate of **50% of the least of the solar tenders' rate during the latest previous financial year or 50% of the solar Preferential Tariff rate issued by TNERC corresponding to the financial year, whichever is less.**

The tariff for surplus solar energy has been arrived duly taking into consideration the following factors:

- The consumers are given the privilege of exporting only surplus power to TANGEDCO, after meeting their self consumption.

- The surplus Solar Power injected by the consumers is infirm power and involves crucial grid management.
- Higher operation and maintenance cost involved in running base load plants of TANGEDCO in day to day operation leading to increase cost of generation.
- No land cost and evacuation cost involved as in the case of MW scale projects that contributes to 10% to 20% of the project cost.
- The consumer exports the surplus energy to the grid without incurring any cost, for which the entire power evacuation infrastructure, operation and maintenance of the HT/LT network is to be borne by TANGEDCO.
- TANGEDCO is forced to procure the entire surplus solar energy injected by the Net metered consumers during non peak hours and during times of low cost power available in the grid in view of promoting Solar Energy / Roof Top Systems.
- TANGEDCO has to supply electricity to all the net metered consumers during the non sunny and night hours including peak hours by purchasing high cost power from other sources in times of need.
- The TANGEDCO extended facilitation to install solar panel to utilize the energy against their consumption. Hence, it is not obligatory that the excess energy injected into the grid to be banked and paid at higher rate with profit.
- The Solar PV module cost has now reduced drastically.
- The consumers avail GoI / Govt of Tamil Nadu subsidy through TEDA.

17. It is respectfully submitted that, TANGEDCO proposes the revised accounting methodology under net metering duly taking into account the above factors. A comparison of the existing net metering methodology and the proposed methodology is furnished below:

Sl. No.	Existing net metering methodology	Proposed net metering methodology
1.	Eligible for seven categories of consumers. (2 Nos. HT and 5 Nos. LT)	At present requested for existing 5 categories of LT consumers eligible for net metering.
2.	Total grid consumption (Import units) is adjusted against surplus solar injected (export) and the billing is for net units (import – export).	The value of import units are to be calculated at the appropriate tariff rates. The value of solar export as recorded in the net meter shall be calculated at the rate of 50% of the least of the solar tenders' rate during the latest previous financial year or 50% of the solar Preferential Tariff rate issued by TNERC corresponding to the financial year, whichever is less. Net billing which will be in value, shall be the monetary value adjustment of import and export units in the respective billing cycle. If payable by consumer, then it shall be paid by him within the due date. If payable by TANGEDCO, the credit value will be carried forward and paid at the end of the settlement period.
3.	The settlement period for net-metered energy is 12 months.	Settlement period is 12 months i.e April to March of the Financial year.
4.	Excess export units if any are carried over to the next billing cycle till the end of settlement period. Any excess export beyond the settlement period shall be treated as lapsed.	The surplus monetary value payable by TANGEDCO to the consumer shall be adjusted in the subsequent bills.
5.	Excess energy exported to the grid beyond the 90% Cap during a particular settlement year shall be treated as lapsed.	There is no ceiling on energy exported to the grid.
6.	No mention about maximum solar capacity with regard to sanctioned load.	50% of contracted demand for LT consumers.
7.	No control period.	One year control period - Financial year.
8.	Separate solar generation meter provided for consumers above 20 KW.	It is proposed to install meters to all net metering consumers, at the solar generation end to measure the actual generation and also to levy appropriate taxes, if any in addition to the net meter (bi-directional meter).

18. It is respectfully submitted that in view of the various factors discussed above, the following revisions in the existing net metering scheme are proposed by TANGEDCO under revised accounting methodology:

1. Existing 5 categories of eligible LT consumers shall be covered under the proposed mechanism.
2. The bi-directional meter (net meter) shall be provided as per the procedure in vogue to measure the total grid consumption (import) from the grid and the excess solar generation fed into the grid after self consumption (export).
3. Under the proposed mechanism, the value of grid consumption (import) shall be calculated at the appropriate tariff. The value of excess solar generation fed into the grid after self consumption (export) as recorded in the net meter shall be calculated by TANGEDCO at the rate of **50% of the least of the solar tenders' rate during the latest previous financial year or 50% of the solar Preferential Tariff rate issued by TNERC corresponding to the financial year, whichever is less.** Net billing which will be in value shall be the monetary value adjustment of import and export units in the respective billing cycle. Amount, if any, to be paid by TANGEDCO shall be adjusted against the import consumption bill amount in the respective billing cycle. If net bill is payable by consumer, then it shall be paid by him within the due date. However, in case when the surplus money value of solar units fed into the grid (export) exceeds total money value of grid consumption (import), the monetary value of surplus solar energy shall be carried over to the next billing cycle for adjustment against subsequent bills. No interest shall be claimed by the consumer for the amount carried over to the next billing cycle till the end of the settlement period and paid, if any, at the end of the financial year. Settlement period of 12 months will be from April to March of the Financial year.
4. The maximum solar roof top capacity shall be restricted to 50 % of the Contracted Demand. Further if the solar capacity is added beyond 50% of the contracted demand of LT consumers, the quantum of export as recorded in the net meter shall be considered for net billing only upto 50% of the contracted demand of the LT consumers.

5. The revisions in the existing net metering scheme proposed by TANGEDCO shall also be applicable to the existing LT net metering consumers.
6. The control period and settlement period shall be one year (Financial year).
7. It is proposed to install meters to all net metering consumers, at the solar generation end to measure the actual generation in addition to the net meter (bi-directional meter) and also to levy appropriate taxes, if any.

Under the said circumstances, it is humbly prayed that this Hon'ble Commission may be pleased to pass an appropriate order to consider the revisions in the existing net metering policy under revised accounting methodology mentioned in para 18 of this petition and pass such further or other orders as this Hon'ble Commission may deem fit and proper and thus render justice.

