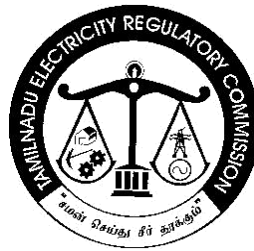




TAMIL NADU ELECTRICITY REGULATORY COMMISSION

Order on procurement of Solar power and Related Issues

Order No. 9 of 2020 dated 16-10-2020



BEFORE THE TAMIL NADU ELECTRICITY REGULATORY COMMISSION

PRESENT: **Thiru M.Chandrasekar** - **Chairman**
 Dr.T.Prabhakara Rao - **Member**
 Thiru K.Venkatasamy - **Member/Legal**

Order No. 9 /2020, dated 16-10-2020

In the matter of : Order on procurement of Solar power and Related issues

In exercise of the powers conferred by sections 181, 61 (h), and 86 (1) (e) of the Electricity Act 2003, (Act 36 of 2003), read with the National Electricity Policy, the Tariff Policy and Commission's Power Procurement from New and Renewable Sources of Energy Regulations, 2008, the Commission, after issue of consultative paper for public view on "Order on procurement of Solar power and Related issues" inviting comments from stakeholders, and after examining the views of all stakeholders, the views expressed by the Members of the State Advisory Committee on the Consultative Paper in the meeting held on 20/03/2020, issues this suo motu Tariff Order on Solar Power.

This order shall take effect on and from the 16th of October, 2020.

Sd./-
(K.Venkatasamy)
Member/Legal

Sd./-
(T.Prabhakara Rao)
Member

Sd./-
(M.Chandrasekar)
Chairman

(By Order of the Tamil Nadu Electricity Regulatory Commission)

Sd.-
(S.Chinnarajalu)
Secretary

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TAMIL NADU ELECTRICITY REGULATORY COMMISSION

Order on Procurement of Solar power and Related issues

1.0 Overview

1.1 Commission in exercise of the powers vested under the Electricity Act,2003 and in compliance with the mandate of the Act to promote renewable energy has been issuing tariff orders in respect of various sources of renewable energy since 2006. These orders on renewable energy sources covered tariff determination for purchase of power by the Distribution licensee, its promotional aspects and related issues.

1.2 The conducive policies of the Central and State Government for promotion of renewable power has helped the sector achieve remarkable progress.

1.3 The total capacity of renewable power in the State is 14144.35 MW of which solar power constitutes 4043.45 MW. The Government of India has fixed a target of 175,000 MW of renewable capacity by 2022. The target fixed for solar power by Government of India is 100,000 MW through deployment of 40,000 MW of rooftop solar projects and 60,000 MW of large and medium scale solar projects. The targeted capacity for this State is 8971 MW by 2022. Commission issued the last tariff order on solar power on 29.3.2019 vide Order No.5 of 2019. The control period of Order No.5 of 2019 on solar power expired on 31.3.2020. The validity of the Order No.5 of 2019 dt.29.3.2019 has been

extended upto the date of issue of the next order vide Commission's Order No.4 of 2020 dt.31.3.2020.

1.4 Preferential tariffs played a major role in promoting solar power in the initial stage. Over the last few years, there is a shift from the feed in tariff regime to tariff based competitive bidding and reverse auctions. The price per unit of solar power which was around Rs.4 fell to Rs. 2.97 per unit in February 2017 in the bidding conducted for the Rewa Solar power plant in Madhya Pradesh and fell further to Rs.2.44 per unit in the auction held for the Bhadla Solar park in Rajasthan in May 2017. Since then, the tariffs obtained through competitive bidding and reverse auctions have hovered around Rs.3 per unit.

1.5 The Solar Energy Corporation of India (SECI) has been conducting competitive biddings for solar power and many projects have been contracted through reverse auctions. The tender awarded by SECI to develop 2 GW solar power projects with manufacturing facility for 500 MW in December 2019 (Azure power) was at a tariff of Rs.2.92 per unit. The DISCOMS in many of the States have commenced procurement of solar power through State conducted biddings and are also purchasing solar power through the biddings conducted by SECI.

1.6 Commission issued a consultative paper discussing the approach for procurement of solar power by the Distribution Licensee and on related issues of open access and invited comments from stakeholders. Commission also conducted a State Advisory Committee meeting and discussed the issues in the

consultative paper. The list of stakeholders who furnished comments is annexed with this order as Annexure I and the summary of the comments received from the stakeholders is annexed as Annexure II. The list of members present at the State Advisory Committee (SAC) meeting held on 20/03/2020 is enclosed as Annexure III. Considering the important comments/suggestions received from the stakeholders and the SAC Members, legal provisions, present scenario in the country, orders passed by other State Electricity Regulatory Commissions, Central Electricity Regulatory Commission, Commission issues this order after due deliberations.

2.0 Legal framework:

2.1 Related Provisions of Electricity Act, 2003

2.1.1 Relevant provisions of Electricity Act, 2003 are reproduced below:

“Section 3(1): The Central Government shall, from time to time, prepare the National Electricity Policy and tariff policy, in consultation with the State Governments and the Authority for development of the power system based on optimal utilisation of resources such as coal, natural gas, nuclear substances or materials, hydro and renewable sources of energy.

Section 61: The Appropriate Commission shall, subject to the provisions of this Act, specify the terms and conditions for the determination of tariff, and in doing so, shall be guided by the following, namely:-

.....
(h) the promotion of cogeneration and generation of electricity from renewable sources of energy;

(i) the National Electricity Policy and tariff policy:

Section 62(1): The Appropriate Commission shall determine the tariff in accordance with the provisions of this Act for –

(a) supply of electricity by a generating company to a distribution licensee:

Section 62(2): The Appropriate Commission may require a licensee or a generating company to furnish separate details, as may be specified in respect of generation, transmission and distribution for determination of tariff.

Section 62(5): The Commission may require a licensee or a generating company to comply with such procedure as may be specified for calculating the expected revenues from the tariff and charges which he or it is permitted to recover.

Section 63: Notwithstanding anything contained in section 62, the Appropriate Commission shall adopt the tariff if such tariff has been determined through transparent process of bidding in accordance with the guidelines issued by the Central Government.

Section 86(1)(e): The State Commission shall promote cogeneration and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity to any person, and also specify, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee;”

2.2 Related Provisions of National Electricity Policy

2.2.1 Relevant provisions of National Electricity Policy are reproduced below:

“Section 5.2.20 Feasible potential of non-conventional energy resources, mainly small hydro, wind and bio-mass would also need to be exploited fully to create additional power generation capacity. With a view to increase the overall share of non-conventional energy sources in the electricity mix, efforts will be made to encourage private sector participation through suitable promotional measures.

Section 5.12.2 The Electricity Act 2003 provides that co-generation and generation of electricity from non-conventional sources would be promoted by the SERCs by providing suitable measures for connectivity with grid and sale of electricity to any person and also by specifying, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee. Such percentage for purchase of power from non-conventional sources should be made applicable for the tariffs to be determined by the SERCs at the earliest. Progressively the share of

electricity from non-conventional sources would need to be increased as prescribed by State Electricity Regulatory Commissions. Such purchase by distribution companies shall be through competitive bidding process. Considering the fact that it will take some time before non-conventional technologies compete, in terms of cost, with conventional sources, the Commission may determine an appropriate differential in prices to promote these technologies.”

2.3 Related Provisions of Tariff Policy

2.3.1 Relevant provisions of Tariff Policy, 2016 are reproduced below:

Para 6.4 “(1) Pursuant to provisions of section 86(1)(e) of the Act, the Appropriate Commission shall fix a minimum percentage of the total consumption of electricity in the area of a distribution licensee for purchase of energy from renewable energy sources, taking into account availability of such resources and its impact on retail tariffs. Cost of purchase of renewable energy shall be taken into account while determining tariff by SERCs. Long term growth trajectory of Renewable Purchase Obligations (RPOs) will be prescribed by the Ministry of Power in consultation with MNRE.

.....

(i) Within the percentage so made applicable, to start with, the SERCs shall also reserve a minimum percentage for purchase of solar energy from the date of notification of this policy which shall be such that it reaches 8% of total consumption of energy, excluding Hydro Power, by March 2022 or as notified by the Central Government from time to time.

.....

(iii) It is desirable that purchase of energy from renewable sources of energy takes place more or less in the same proportion in different States. To achieve this objective in the current scenario of large availability of such resources only in certain parts of the country, an appropriate mechanism such as Renewable Energy Certificate (REC) would need to be promoted. Through such a mechanism, the renewable energy based generation companies can sell the electricity to local distribution licensee at the rates for conventional power and can recover the balance cost by selling certificates to other distribution companies and obligated entities enabling the latter to meet their renewable power purchase obligations. The REC mechanism should also have a solar specific REC.

(iv) Appropriate Commission may also provide for a suitable regulatory framework for encouraging such other emerging renewable energy technologies by prescribing separate technology based REC multiplier(i.e granting higher or lower number of RECs to such emerging technologies for the same level of generation).Similarly, considering the change in prices of renewable energy technologies with passage of time, the Appropriate Commission may prescribe vintage based REC multiplier (i.e granting higher or lower number of RECs for the same level of generation based on year of commissioning of plant).

(2) States shall endeavor to procure power from renewable energy sources through competitive bidding to keep the tariff low, except from the waste to energy plants. Procurement of power by Distribution Licensee from renewable energy sources from projects above the notified capacity, shall be done through competitive bidding process, from the date to be notified by the Central Government.

However, till such notification, any such procurement of power from renewable energy sources projects, may be done under Section 62 of the Electricity Act, 2003.”

2.4 Regulation 4 of the Power Procurement from New and Renewable Sources of Energy Regulation, 2008, specifies as follows:

“(1) The Commission shall follow the process mentioned below for the determination of tariff for the power from new and renewable sources based generators, namely;-

- a) initiating the process of fixing the tariff either suo motu or on an application filed by the distribution licensee or by the generator.*
- b) inviting public response on the suo motu proceedings or on the application filed by the distribution licensee or by the generator.*
- c) (Omitted)*
- d) issuing general / specific tariff order for purchase of power from new and renewable sources based generators.*

“(2) While deciding the tariff for power purchase by distribution licensee from new and renewable sources based generators, the Commission shall, as far as possible, be guided by the principles and methodologies specified by:

- (a) Central Electricity Regulatory Commission*
- (b) National Electricity Policy*

- (c) *Tariff Policy issued by the Government of India*
- (d) *Rural Electrification Policy*
- (e) *Forum of Regulators (FOR)*
- (f) *Central and State Governments*

(3) The Commission shall, by a general or specific order, determine the tariff for the purchase of power from each kind of new and renewable sources based generators by the distribution licensee. ...

Provided where the tariff has been determined by following transparent process of bidding in accordance with the guidelines issued by the Central Government, as provided under section 63 of the Act, the Commission shall adopt such tariff.

.....”

2.5 Since the issue of the consultative paper, the Central Electricity Regulatory Commission has issued the RE Tariff Regulations 2020 on 23.6.2020. The Central Commission in its Regulations on Tariff determination for renewable energy sources has not fixed any generic tariff for wind and solar power.

2.6 CERC in the Statement of reasons provided for the RE Tariff Regulations 2020 has observed as follows:

“..As regards determination of generic tariff for solar PV projects and wind projects, the Commission is of the view that under the prevailing market conditions, when most of the solar and wind projects are being set up primarily through competitive bidding, determination of generic tariff based on norms will not provide right price signals...”

However, the Central Commission has set financial and operational norms that would serve as ceiling norms for determination of project specific tariff.

2.7 Government of India has issued guidelines for tariff based competitive bidding process for procurement of power from grid connected solar power

projects vide resolution No. 23/27/2017-R&R-1 dt.3.8.2017 and amendments issued from time to time.

3.0 Competitive bidding vs preferential tariff

3.1 In the Order No.2 of 2016, Commission permitted the distribution licensee to procure solar power through competitive bidding following Government of India guidelines if better rates than that determined by the Commission could be realized. Subsequently, Commission accorded approval to the Distribution licensee to proceed with reverse bidding fixing the preferential tariff as the ceiling price. In the subsequent orders issued by the Commission every year from 2017 to 2019, Commission has determined feed in tariffs that reflect the market price, keeping in view of the statutory provisions of the Act that provide for determination of tariff and the fact that the tariff could serve as a ceiling price for procurement of solar power by the Distribution Licensee.

3.2 SECI has been consistently conducting competitive biddings since the year 2017. NTPC and many of the States have conducted competitive biddings and awarded the contracts for development of solar power plant. To mention a few, the Maharashtra ERC has approved State bid tariffs under section 63 of the Electricity Act 2003 at prices ranging from Rs.2.90 to Rs.3.30 per unit in May 2020. Gujarat ERC in July 2020 has adopted tariffs of Rs.2.61, Rs.2.62 and Rs.2.64 discovered in the biddings conducted by Gujarat Urja Vikas Nigam Ltd..

The tariffs discovered through bidding for the past two years are all less than the National level Average Pooled Power Purchase Cost and are generally lower than cost plus tariffs.

4.0 Procurement of solar power on expiry of control period of solar tariff order of 2019

4.1 The Electricity Act, 2003, the National Electricity Policy and the Tariff Policy 2016 all have key enabling provisions that facilitate competitive bidding and these stipulations on competitive bidding aim to provide electricity at reasonable and competitive rates. With different tariffs being discovered in each competitive bidding, most State Electricity Regulatory Commissions have not determined tariffs under the regulated mechanism but have preferred procurement through competitive bidding. The Central Electricity Regulatory Commission has not determined any generic tariff for solar power since 2017. Karnataka Electricity Regulatory Commission determined solar tariff for grid connected solar PV projects less than 5 MW capacity in the order dt.1.8.2019 at Rs.3.08 per unit effective till 31st March 2020. The validity of the above order has been extended upto 31st March 2021. Many other State Electricity Regulatory Commissions have adopted the tariffs discovered through competitive biddings by the DISCOMS or the tariffs discovered in the competitive biddings conducted by SECI. Commission has also approved Distribution Licensee's proposal for purchase of solar power from SECI at a tariff of Rs.2.78 per unit in June 2020.

4.2 The Tamil Nadu Solar Energy Policy 2019 (para 8.1.1) states, “The solar energy is fed into the grid for energy sales to the distribution licensee or a third party under the open access facility or for captive consumption under open access. In the case of distribution licensees, the solar energy fed into the grid will be purchased by the distribution licensee at the prevailing solar energy tariffs as determined by the TNERC or a tariff determined by a bidding process....”

4.3 Suggestions from stakeholders vary from welcoming the step towards competitive bidding to requesting the Commission to determine tariffs for capacities below 5 MW. One of the stakeholders have remarked that there is a declining trend in the number of solar projects owing to the artificially low prices discovered in competitive bidding that has caused re-negotiation of PPAs by DISCOMS and is of the view that after the removal of ceiling for bidding, the tariffs may increase to the level of Rs.3.50 per unit. Views of the Commission are dealt in para 4.5 of this order.

4.4 Para 2.1 of Guidelines of tariff based competitive bidding process for Procurement of power from Grid connected Solar power projects is extracted below:

“2.1 Applicability of guidelines:

2.1.1. These Guidelines are being issued under the provisions of Section 63 of the Electricity Act, 2003 for long term procurement of electricity by the ‘Procurers’, from

grid-connected Solar PV Power Projects ('Projects') having size of 5 MW and above, through competitive bidding."

4.5 Competitive bidding process is a transparent process that may reduce the power procurement cost of the licensee and also take care of consumer interest due to the fact that they capture the market conditions. The project developers utilize the resources adopting advanced and efficient technology. The tariffs being discovered through competitive biddings are generally lower than cost plus tariffs. Ministry of New and Renewable Energy has recently removed the ceiling tariffs in a competitive bidding process. This may aid in awarding contracts to viable projects of any capacity.

4.6 In view of the reasons mentioned above, and keeping in view the principles and provisions on competitive bidding in the Tariff Policy, Electricity Act 2003, Commission's Regulations and the Central Commission's Regulations, Commission permits procurement of solar power by the Distribution Licensee, for compliance of RPO requirement, through the competitive bidding route under section 63 of the Electricity Act 2003 following the bidding guidelines issued by the Central Government by adopting ceiling tariffs that are obtained in the Tariff based competitive bidding process conducted by SECI and approved by the Commission for adoption. If the competitive bidding is not successful, the licensee may go for a bidding without prescribing a cap after obtaining prior approval from the Commission to conduct the bidding. The Distribution licensee may also procure power from the projects contracted through competitive

bidding process by SECI, the nodal agency that floats tenders and conducts e-reverse auction for procurement of power from solar and wind power projects, with prior approval of the Commission. In the case of smaller capacity plants not covered in the bidding guidelines, the licensee may conduct a separate competitive bidding seeking prior approval from the Commission.

4.7 For any deviation from the bidding guidelines, the Licensee shall obtain prior approval from the Commission. Where the licensee conducts the bidding, Energy Purchase Agreement, billing and payment shall be as per the terms in the bidding. Sharing of CDM benefits shall be at 100% in the first year and thereafter reduced by 10% every year till the sharing becomes equal(50:50) between the developer and consumer

4.8 If the rates obtained are comparable and below the variable cost of power from conventional fuel based power sources, the licensee may procure over and above the limit of the RPO.

5.0 Other related issues for projects under captive wheeling/open access

1. Open access charges – Transmission and Wheeling, Line losses
2. Cross subsidy surcharge
3. Reactive power charges
4. Grid availability charges
5. Energy Accounting and Billing Procedure

6. Energy wheeling agreement and fees
7. Security Deposit
8. Power factor disincentive
9. Metering
10. Connectivity and evacuation of power
11. Harmonics
12. Parallel Operation charges

5.1 Transmission, Wheeling charges & Scheduling and System operation charges and Line losses

5.1.1 Transmission, Wheeling and Scheduling & System Operation charges are generally regulated by the Commission's Tariff regulations, Open access regulations and Commission's order on open access charges issued from time to time. However, as a promotional measure, under section 86(1) (e) of the Act, the Commission in the first three tariff orders adopted 30% in each of the transmission, wheeling and scheduling and system operation charges, 40% in the order dt.28.3.2018 and in the last tariff order No.5 of 2019 dt.29.3.2019, Commission adopted 50% of that applicable for conventional power in each of the charges.

5.1.2 The tariffs of solar power are lower than that of conventional power plants. The concessions granted are being subsidized by other users of the network and

ultimately borne by the consumers. In the consultative paper, Commission proposed to levy 100% of the charges applicable for conventional power in each of the charges i.e transmission, wheeling charges, scheduling and system operation charges. Stakeholders have viewed that levy of charges to the extent of 100% as applicable for conventional power increases the per unit charges from 46 paise to 92 paise, and given the low yield in solar power generation caused by diurnal variations, this may affect the viability of the project. Many of the stakeholders have suggested to retain the existing charges.

5.1.3 It is seen that the stakeholders have evaluated the increase in charges against the solar tariff of Rs. 3 per unit whereas the actual adjustment of power generated is against the retail tariff. Concessions provided to the solar power generators actually devolve on other stakeholders. Concessions can at best be provided during the initial stages of development of solar power projects. However, in view of the widespread situation caused by covid 19 pandemic with many restrictions in place for movement of public and lockdown announced by the Central/State Governments, Commission decides to retain the rates of open access charges as per the order No.5 of 2019. The levy of charges shall be at 50% of that applicable for conventional power in each of the charges i.e transmission, wheeling charges, scheduling and system operation charges.

5.1.4 In respect of the plants availing Renewable Energy Certificates (REC), 100% of the respective charges as specified in the relevant orders shall apply.

5.1.5 Apart from these charges, the SPGs shall have to bear the actual line losses in kind as specified in the respective orders of the Commission and as amended from time to time.

5.2 Cross subsidy surcharge

5.2.1 The Commission in its other tariff orders related to different sources of renewable power and in the orders for solar power has increased the levy of cross subsidy surcharge fixed initially at 50% to 60% and then to 70% in the last tariff order issued in order No.5 of 2019 to third party open access consumers. In the consultative paper issued, Commission proposed to levy 100% of cross subsidy surcharge applicable to conventional power. Many stakeholders have requested to retain the existing cross subsidy surcharge i.e at 70%. Commission decides to retain existing rates of levy of cross subsidy surcharge. The levy of cross subsidy surcharge shall be at 70% of the charges applicable to conventional power

5.3 Reactive Power Charges

5.3.1 Commission decides to adopt the reactive power charges as specified in its Order on Open Access charges issued from time to time.

5.4 Grid Availability Charges

5.4.1 Charges for the start-up power supplied by the distribution licensee

5.4.1.1 The question of start up power does not arise for Solar PV generators. Any Power drawn during the non generating period of solar power i.e beyond 7.00 AM to 6.00 PM shall be charged at HT industrial tariff. Power drawn during the solar generating period of 7.00 AM to 6.00 PM in excess of generation shall also be charged at HT industrial tariff.

5.4.2 Stand by charges

5.4.2.1 If the drawal by the captive user or third party buyer exceeds generation, the energy charges and demand charges shall be regulated as per the Commission's Open Access regulation and Commission's regulations on Deviation Settlement Mechanism (DSM) and other relevant orders.

5.5 Energy Accounting and Billing Procedure

5.5.1 The energy accounting shall be regulated by the Commission's Regulations on open access, DSM and Order on open access. If a solar power generator utilizes power for captive use or if he sells it to a third party, the distribution licensee shall raise the bill at the end of the billing period for the net energy supplied.

5.5.2 In the consultative paper, Commission proposed to adopt the provisions in the Tamil Nadu Solar Policy 2019 for all those SPGs commissioned from the date of this order i.e wheeling of energy for solar power will be permitted only during the generation of electricity and will be adjusted slot/block to slot/block for the billing period, and to charge excess consumption at the tariff applicable to the consumer subject to the terms and conditions of supply. Commission also proposed a cap on payment for unutilized energy generated.

5.5.3 Most of the stakeholders have requested to retain the energy accounting as in the previous tariff orders citing financial impacts that would be caused, the fact being investments were made keeping in mind the provisions at the time of commissioning of the power plant. Some of the stakeholders have pointed out that solar energy generation is more predictable than wind energy generation, and therefore to remove the cap on excess generation and permit adjustment of energy from higher to lower slot. The Solar power projects with advanced technology in generation and conversion capacity of invertors are capable of producing constant generation. The generated energy is being adjusted against a retail tariff higher than the cost of generation of solar power. The provisions in the Solar Policy 2019 could well be implemented.

5.5.4 However, on account of the unprecedented situation that arose due to the outbreak of the covid19 pandemic with many restrictions in public movement

in place, Commission decides not to amend the energy accounting procedure being followed.

5.5.5 The Energy accounting procedure as specified in the Order No. 5 of 2019 dt.29.3.2019 is retained.

5.5.6 Commission has notified the Regulations on Deviation Settlement Mechanism(DSM) for RE wind and Solar, and all other sources on 20.3.2019. The commercial mechanism will come into effect from a date to be notified by the Commission. Till such time the DSM is implemented in the State, if a solar power generator utilizes power for captive use or if he sells it to a third party, the distribution licensee shall raise the bill at the end of the billing period for the net energy supplied. The licensee shall record the slot wise generation and consumption during the billing period. Slot wise adjustment shall be for the billing period. Peak hour generation can be adjusted to normal hour or off peak hour consumption of the billing period and normal hour generation can be adjusted to off peak hour consumption of the billing period. Excess consumption will be charged at the tariff applicable to the consumer subject to the terms and conditions of supply.

5.5.7 When DSM is implemented, the licensee shall record the time block wise generation and consumption during the billing period. Time block wise

adjustment shall be made for the billing period. Excess consumption will be charged at the tariff applicable to the consumer subject to the terms and conditions of supply.

5.5.8 After the billing period, the excess energy generated but not consumed, may be sold at the rate of 75% of the respective solar tariff fixed by the Commission in the respective orders to the generators and where no tariff is fixed at 75% of latest tariff discovered in the competitive bidding. If there are more than one tariffs discovered through bidding process, the weighted average tariff shall be considered for payment.

5.5.9 Capping of solar generating capacity - Commission decides not to implement any cap on payment for the excess generation/unutilised energy.

5.6 Energy Wheeling Agreement and fees

5.6.1 The format for Energy Wheeling Agreement, application and agreement fees, procedure and terms & conditions shall be governed by Commission's following regulations in force and as amended from time to time:

1. Tamil Nadu Electricity Regulatory Commission's Grid Connectivity and Intra State Open Access Regulations, 2014
2. Power Procurement from New and Renewable Sources of Energy Regulations, 2008.

5.7 Security deposit

5.7.1 As regards the security deposit to be paid by captive /third party user, the Commission proposes to retain the present arrangements i.e. charges corresponding to two times the maximum net energy supplied by the distribution licensee in any month in the preceding financial year shall be taken as the basis for the payment of security deposit.

5.8 Power Factor disincentive

5.8.1 Power factor disincentive may be regulated for the power factor recorded in the meter at the user end as specified in the relevant regulations/orders in force.

5.9 Metering

5.9.1 The Commission proposes that metering and communication shall be in accordance with the following regulations in force and any specific orders of the Commission on metering and ABT whenever issued:

- (1) Central Electricity Authority (Installation and Operation of Meters) Regulations 2006 and as amended from time to time.
- (2) Tamil Nadu Electricity Distribution and Supply Codes
- (3) Tamil Nadu Electricity Grid Code
- (4) Tamil Nadu Electricity Regulatory Commission's Grid Connectivity and Intra State Open Access Regulations, 2014

5.10 Connectivity and Evacuation of power

5.10.1 The provisions contained in Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations,2007 and Central Electricity Authority (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations,2013, and its amendments shall be complied with. The connectivity and power evacuation system shall be provided as per the Act/ Codes/ Regulations/orders in force.

5.11 Harmonics

5.11.1 The SPGs shall follow the CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations,2013 in respect of harmonics. It is the responsibility of the generator to provide adequate filtering mechanism to limit the harmonics within the stipulated norms. It shall be done before connecting the generator to the grid and the harmonics shall be measured by the respective distribution licensee during the commissioning. If the SPGs inject the harmonics beyond the stipulated limit, they shall pay a compensation of 15% of applicable generation tariff rate to the distribution licensee in whose area the plant is located till such time it is reduced within the stipulated limit. The distribution licensee is responsible for measurement of harmonics with standard meters and issue notices for payment of compensation charges if the harmonics is beyond the stipulated limit. In the consultative paper, a minimum of 15 days notice period was proposed for payment of compensation charges. Stakeholders

have requested for a time period of 90 days for payment of compensation charges. Commission decides that a minimum of 30 days notice period shall be given for payment of compensation charges.

5.12 Parallel operation charges

5.12.1 In the consultative paper, levy of 100% parallel operation charges to the SPGs who require parallel operation was proposed. In view of the economic slowdown, Commission decides to retain the existing rates. The SPGs who opt for parallel operation with the grid shall pay 50% of applicable parallel operation charges to the distribution licensee as specified in relevant regulations/orders of the Commission.

6.0 Plant Capacity limitations

6.1 The Commission in previous tariff orders for solar power have limited the purchase by the distribution licensee from solar power plants of 1 MW capacity and above. The Commission decides to adopt the same in this order also. Commission decides that the solar projects covered by this order shall be of capacity 1 MW and above.

7.0 Applicability of this order

7.1 This Order shall come into force from the date of issue i.e from 16.10.2020. The open access charges and other terms and conditions specified shall be applicable to all the SPGs, irrespective of their date of commissioning.

8.0 Control period/Tariff period

8.1 Regulation 6 of the Power Procurement from New and Renewable Sources of Energy Regulations, 2008 of the Commission specifies the following:

“The tariff as determined by the Commission shall remain in force for such period as specified by the Commission in such tariff orders and the control period may ordinarily be two years.”

8.2 The Commission decides that the control period of this order shall be until 31.3.2021 and the tariff period shall be as per the bidding guidelines.

9.0 Directions

9.1 Quarterly reports on the quantum of energy wheeled from the solar generators for captive consumption and third party sale, and on the quantum of excess generation and payments made shall be furnished to the Commission by Tamil Nadu Transmission Corporation(TANTRANSCO)/State Load Despatch Centre(SLDC). Similar report on the solar energy purchased shall be furnished by the distribution licensee.

10.0 Acknowledgement

10.1 The Commission acknowledges with gratitude the contribution of the officers and staff of the Commission, the valuable guidance provided by the SAC members and the efforts taken by the stakeholders in offering their suggestions. The Commission is indebted to the valuable inputs offered by the Tamil Nadu Generation and Distribution Corporation Ltd.

(By order of Tamil Nadu Electricity Regulatory Commission)

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

Annexure I

S.No.	Name / Organisation
1.	Thiru.N.Murugesan, President, The South India Spinners Association, Coimbatore.
2.	Thiru.S.Neelakanta Pillai, Madipakkam, Chennai – 600091.
3.	Thiru.R.Ethiraj, Director / Generation, TANGEDCO, Chennai
4.	Dr.K.Selvaraju, Secretary General, The Southern India Mills Association, Coimbatore – 641018.
5.	Thiru.L.Narasim Prasad, Chief Advisor / Systems & Operations – Director (Systems & Operations) Chennai Metro Rail Ltd, Koyambedu, Chennai -600 107.
6.	Thiru.Martin Scherfler, Co-founder, Auroville Consulting, Auroville, Tamil Nadu – 605101.
7.	Thiru.N.Pradeep, Vice President, Tamil Nadu Electricity Consumer's Association, Coimbatore – 641018.
8.	Chief General Manager / Commercial, NLC India Limited, Chetpet, Chennai – 600 031.
9.	M/s. Dev International, Coimbatore – 641048.
10.	M/s.Grand Solar Pvt Ltd, Sun In Power On, Kilpauk, Chennai – 600 010.
11.	Thiru.P.M.Ramesh
12.	Thiru.K.M.Senthil
13.	Thiru.R.Sri Harshan
14.	Thiru.R.M.Azhal
15.	Thiru.G.Vinoth
16.	Thiru.S.Balashankar

17.	Thiru.S.Kamal
18.	Thiru.J.Kesavaraj
19.	Thiru.S.Shanmuga Rajavel
20.	M/s.R.S.Yarns and Power Private Limited,P.N.Road, Tirupur – 641602.
21.	M/s.Tamil Nadu Solar Power Generators Association, Nandanam, Chennai – 600036
22.	M/s.Tamil Nadu Solar Energy Developers Association, T.Nagar, Chennai - 600 017.
23.	M/s.National Solar Energy Federation of India, New Delhi – 110019.
24.	Thiru.U.Arunachalam, Managing Director, Kovai Solar Power Private Limited & Southern Power Solutions, Coimbatore.
25.	M/s.Swelect Energy Systems Limited, Mylapore, Chennai – 600004.
26.	M/s.Greenam Energy Private Limited, Guindy, Chennai – 600032.
27.	M/s.Southern Power Solutions, Peelamedu, Coimbatore – 641004.
28.	M/s.Kovai Solar Power (P) Ltd, Coimbatore – 641018.
29.	Thiru.R.Veeraprakash
30.	Thiru.S.Sahayaraj, Chief Executive Officer, Euphoria Green Technologies.
31.	Thiru.Kalkibharadan
32.	M/s.U-Solar Clean Energy Solutions, Pvt Ltd, Bangalore – 560001.
33.	M/s.India Tax Payer, Coimbatore – 641002.
34.	Members of TamilNadu Solar Power Generator's Association (TANSPA), Chennai.
35.	M/s.Distributed Solar Power Association, New Delhi – 110020.

36.	Thiru.S.Jeyabalan, Managing Director, JK Solar, JK Technology, Madurai – 625020.
37.	M/s.Statkraft Markets Private Limited, New Delhi – 110017.
38.	Thiru.K.M.Senthil
39.	Thiru.K.S.Venkatagiri, Executive Director, Confederation of Indian Industry, Hyderabad – 500084.
40.	CBPUR Renewable Energy Projects Pvt. Ltd.
41.	Thiru.Deepak Krishnan, Associate Director, Energy Program, World Resources Institute India, Bengaluru- 560004.
42.	M/s.Continuum Wind Energy (India) Pvt Ltd, Egmore, Chennai – 600008.
43.	Dr.Anoop Singh,Professor,Centre for Energy Regulation,IIT,Kanpur.
44.	M/s.TVS Eurogrip
45.	Citizen consumer and civic Action Group,Chennai

Annexure II

Abstract of comments received from stakeholders on the Consultative Paper on 'Procurement of Solar power and Related issues'

1. Procurement of solar power

Prayas (Energy Group)

The competitive bidding route is a welcome step and should be the default mode of procurement going forward. Commission may also consider directing the DISCOMs to appropriately modify the bidding documents so that procurement is not just based on least cost of generation, but could better reflect the best value for the TN system considering its load shape and other aspects like need for flexibility, transmission availability etc. Given the changing demand-supply mix in the state, the Commission may also consider directing the DISCOMs to initiate competitive bidding based procurement of RE + Storage capacity in the future.

Statkraft

There is a declining trend in solar investment in the country and Tamil Nadu state in last two years owing to artificially low tariffs discovered in few central agencies conducted bids which have led to a plethora of issues for the existing and prosperous developers with Discoms re-negotiating signed PPAs, introducing unreasonably low ceiling tariffs in bids etc. There has been a reduction in the rate of decline of in solar module costs and this has been offset by various factors like unfavorable exchange rates, increasing cost of capital, increased difficulty and cost for procuring land etc. This has now led to the Hon'ble Ministry of New and Renewable Energy removing the ceiling tariff provisions from bids to be conducted henceforth. The tariffs are expected to increase to levels of around Rs.3.5/kWh.

Thiru A.D.Thirumurthy

Commission shall not allow bidding for procurement of solar power unless the distribution licensee submits a report on RPO met till such date and future requirement. DISCOM shall include generation from rooftop solar plant (under Net Feed-in and net meter category) and also captive consumption category.

Auroville Consulting, Citizen consumer and civic Action Group

Cost plus tariffs may be considered for small and medium solar energy capacity. As per Tamil Nadu Solar Energy Policy gross feed in shall be allowed at all voltage levels. This calls for gross feed-in tariffs that consider real cost of small and medium capacity solar generation. Solar feed in tariffs may be determined for capacity ranges of (1-10 KW),(11-100 KW),(101-500 KW)(501-1000 KW) utilizing MNRE benchmark costs.

Tamil Nadu Electricity Consumer's Association(TECA)

Has requested to fix tariff for projects upto a capacity of 25 MW. Capping of 1 MW for Solar rooftops may be removed.

The Southern India Mills Association(SIMA)

Has requested to fix the feed in tariff citing low tariffs in competitive bidding.

CBPUR Renewable Energy Projects Pvt. Ltd.

The size of the projects impacts the economies of scale and is a main factor in determination of tariff that affects the feasibility of Solar power projects. Cost per MW for a 50/100MW project cannot be taken as a benchmark for a 1 or 2MW project.

TANGEDCO

Citing MNRE's clarification letter dt.12.1.2018 which clarified that States can consider procuring power from solar and wind projects of less than the defined threshold in the bidding guidelines through feed in tariff, and the RPO targets fixed, TANGEDCO has requested to fix feed in tariffs for solar projects of capacity upto 5 MW. For capacity above 5 MW, TANGEDCO has concurred to procure power through the bidding route of through SECI.

Other Stakeholders

Few other stakeholders have requested to determine tariffs for capacities below 5 MW.

2. Transmission, Wheeling, Scheduling and System Operation Charges

National Solar Energy Federation of India Confederation of Indian Industry, SWELECT Energy Systems

Commission's proposal of withdrawing promotional measures by increasing open access charges from 50% to 100% of that applicable of conventional sources is a huge discouragement to the existing and new Solar Energy Generators. Levying 100% charges does not differentiate non conventional from conventional sources of energy. The increase in levy from 50% to 100% increases the open access charges from 46 paise per unit to 92 paise per unit. Given the seasonal and diurnal variation in solar power generation, the yield is lower compared to other renewable energy sources. The charges may be retained at 50% of that applicable for conventional power.

**Kovai Solar Power (p) Ltd., Southern Power Solutions, Thiru Veeraprakash,
Dev Solar , Euphoria Green Technologies,JK Solar**

Transmission and Wheeling charges may be levied on energy instead of capacity.

Dr. Anoop Singh,Professor,IIT,Kanpur

Additional cost on account of removal of exemptions for wheeling and intrastate transmission charges would only reduce the cost advantage for Captive and OA consumers but would not eliminate it. Further cost reduction in cost of RE projects and increasing tariff of such consumers in future would negate any adverse implications of the proposed amendments. The additional revenue to the utilities on account of removal of above exemptions would be much smaller as compared to the total cost of power procurement of the state and the revenue gap. increasing share of energy injection by Variable Renewable Energy (VRE) sources is placing stress on system operation on account of variability and uncertainly associated with the electricity generation from such sources. The state's grid code and the applicable regulations for forecasting and deviation settlement should be tightened to ensure that the generators improve the forecasting accuracy and bear the financial impact on account of deviations due to forecasting error. This would improve grid operation and reduce overall financial impact on the sector due to the associated uncertainty.

Thiru A.D.Thirumurthy

Increase of charges by 50% will lead to unnecessary stress in operating the plant and in turn repayments to banks. Very negligible circuit length is exclusively utilised by the RE sector. Charges may be levied on energy generation basis instead of on capacity.

Distributed Solar Power Association

Commission may retain the discount in each of the charges as the solar plants built for private consumption does not have the scale to achieve low tariffs.

CBPUR Renewable Energy Projects Pvt. Ltd.

Commission may fix charges at 50% of that applicable for conventional power for each of the charges especially for projects with capacities less than 5 MW in order to achieve the targeted capacity.

TECA

Charges may be fixed on energy basis.

Tamil Nadu Solar Energy Developers Association

Withdrawal of promotional measures and increasing open access charges is huge discouragement to the existing and new solar power generators. Transmission and wheeling charges may be levied on energy instead of capacity.

The South India Spinners Association

Solar irradiance is not available for 24 hours. The PLF of 18% to 24% depends on the location of plant. The proposed 50% increase in open access charges will increase the existing open access charges by 100%.

SIMA

Increasing the OA charges by another 50% by treating solar power on par with conventional power will give a great shock to the investors. Commission may retain the present status.

Tamil Nadu Solar Power Generator's Association(TANSPA)

The proposal to levy 100% charges will be a huge discouragement for future projects and huge financial blow for already commissioned projects. The proposed increase in charges will result in an increase of 0.46 paise per unit. Open access charges alone would work out to 30% of solar tariff. All open access charges may be fixed on per unit basis considering that the CUF of solar power plant is very low. The charges may be maintained at the present level.

TANGEDCO

Has accepted the proposal of the Commission.

3. Cross Subsidy Surcharge

National Solar Energy Federation of India Confederation of Indian Industry, SWELECT Energy Systems

Cross subsidy surcharge increases from Rs.1.39 to Rs.1.98. The overall increase in open access charges is Rs.1.05. The primary objective of harnessing solar power and promoting solar power gets defeated. CSS may be maintained at the same level.

Kovai Solar Power (p) Ltd., Southern Power Solutions, Thiru Veeraprakash, Dev Solar , Euphoria Green Technologies, JK Solar, The South India Spinners Association

Cross subsidy surcharge may be maintained at existing levels.

Thiru A.D.Thirumurthy

Cross Subsidy Surcharge may be maintained at 70% to promote solar plants.

Distributed Solar Power Association

Commission may continue the promotional measures and retain existing cross subsidy surcharges.

CBPUR Renewable Energy Projects Pvt. Ltd.

Commission may levy 50% of that applicable for conventional power.

Tamil Nadu Solar Energy Developers Association

Withdrawal of promotional measures and increasing open access charges is huge discouragement to the existing and new solar power generators. Existing levels may be retained.

TECA

Commission may issue guidelines for complete elimination of Cross Subsidy Surcharge.

SIMA

The current level of cross subsidy surcharge may be retained.

TANSPA

Levy of 100% Cross subsidy surcharge will be a huge financial blow for future projects and already commissioned projects.

Auroville Consulting, Citizen consumer and civic Action Group

The cross subsidy levels for solar energy may be kept at the existing levels and may be revisited when at least 80% of the Tamil Nadu Solar Energy Policy 2019 targets have been achieved.

TANGEDCO

Has concurred with the views of the Commission.

4. Reactive charges

TANGEDCO

Has concurred with the proposal.

5. Grid availability charges

TANGEDCO

Has accepted the tariff proposed for the generating and non generating period.

Has accepted the proposal on standby charges.

NLC India Limited

During summer Solar generation starts as early as 5.15 A.M and ends as late as 6.50 P.M. Therefore, considering the whole year non generating period should be defined as beyond 5.00 A.M to 7.00 P.M. However, billing shall be on net energy generated by the solar plant. Only if net import is higher, excess drawal should be charged.

6. Energy Accounting

National Solar Energy Federation of India Confederation of Indian Industry, SWELECT Energy Systems

Banking facility is not available for Solar power. Atleast, energy adjustments slot/block to slot/block and adjustment from higher slot to lower slot should be made available without which open access would become unviable. The existing mode of energy adjustment may be retained. The cap on excess generation may be removed. The proposed system of energy adjustment will discourage new investors. Promotional measures made available to the already commissioned plants may be retained.

Kovai Solar Power (P) Ltd., Southern Power Solutions, Thiru Veeraprakash, Dev Solar, Euphoria Green Technologies,JK Solar

The proposal of energy adjustment will discourage investors and developers in investing in Solar power.

SIMA

In the case of Solar there is no banking facility and therefore no cap need be fixed on excess generation.

Dr.Anoop Singh,Professor,IIT,Kanpur

Following two options can help ameliorate the financial loss to generators while also addressing concerns of the distribution utility and the system operator.

- Payment for excess energy injection to be linked to the prevailing rate under the deviation settlement mechanism.
- Such excess energy to be either paid for REC equivalent price (floor price) or equivalent RECs be allocated to the generators.

Tamil Nadu Solar Energy Developers Association

Without the prevailing mechanism of adjustment of energy, harnessing of solar power would be unviable. Adjustment of energy on the basis of block/slot to block/slot and higher to lower slot may be allowed. Cap on excess energy generation may be removed.

Thiru A.D.Thirumurthy

Commission may allow higher to lower slot adjustment for at least 10 years of plant operation to achieve viability. Commission may propose deferred consumption charges for adjusting higher slot generation to lower slot consumption which would be additional revenue to DISCOM. Renewable energy is to be promoted to reduce carbon emission and contain the climate change.

Changes in the adjustment methodology, increasing the charges will deter further growth in the RE sector especially solar projects. This activity is against Global agenda and National agenda of reducing carbon emission. Until the energy storage technology becomes viable existing adjustment pattern can be allowed.

The South India Spinners Association

Imposition of conditions is a huge discouragement to the Solar project developers. While banking facility is not available, at least the adjustment of energy on basis of block/slot to block/slot and higher slot to lower slot for excess generated power may be allowed. Cap on excess generation may be removed.

Distributed Solar Power Association

Commission may retain the existing energy accounting procedure.

CBPUR Renewable Energy Projects Pvt. Ltd.

Commission may retain the existing energy accounting allowing inter slot adjustments. The excess energy may be sold at 100% of the respective solar tariff fixed by the Commission in the respective orders to the generators or at the prevailing Average Power Purchase Cost (APPC) price.

Tamil Nadu Solar Producers Association, Tamil Nadu Solar Power Generators Association

The proposal to only allow slot/block to slot/block adjustment and remove the present arrangement where production during normal slot can be adjusted against normal slot or off-peak slot, hugely discourages the Solar Industry. While grid stability might be stated as the reason for such a proposal, it is pertinent to note that Solar energy production is more firm and predictable than wind. But the removal of adjustment of Normal slot production against off-peak slot

consumption has been proposed only for Solar. The present arrangement of energy adjustment may be retained.

TECA

Commission may issue guidelines for energy banking of excess power and adjustment of energy on basis of block/slot to block/slot and higher slot to lower slot for excess generated power. Cap on excess generation may be removed.

Auroville Consulting, Citizen consumer and civic Action Group

For the excess energy flow, the following options may be offered to the generator: (i) carry over to the next financial year and (ii) payment at APPC . Payment at APPC may be justified on the ground that if renewable power is available at the same average rate as conventional power , renewable energy should be given a preference on account of its contribution to achieving the State Policy and RPO targets.

TANGEDCO

Has accepted the views of the Commission. However, with reference to the request for fixing of feed in tariff for small projects, has suggested to make payment at 75% of FiT where there is no tariff. Further, TANGEDCO seeks to adopt normative CUF to cap generation in respect of SPGs under wheeling category to prevent misuse through addition of solar panels and also to specify penalty for unauthorized connections.

7. Security Deposit

TANGEDCO

Generators who wheel under captive category shall make a security deposit of an amount equivalent to energy to be wheeled under open access during the

previous financial year at the appropriate tariff as a safety measure in case of failure to fulfil the captive status.

8. Power Factor Disincentive

TANGEDCO

Has concurred with the views of the Commission.

9. Metering

TANGEDCO

Has accepted the proposal of the Commission.

10. Connectivity and evacuation

TANGEDCO

Has accepted the proposal of the Commission.

SIMA

TANGEDCO enforces backing down of solar power plants. A suitable compensation mechanism may be evolved to protect the interest of solar generators.

11. Harmonics

SIMA

Harmonics are measured by the Distribution Licensee before connecting the generator to the grid failing which 15% compensation is levied for payment within a notice period of 15 days. Time limit to provide harmonics may be enhanced to 90 days from the proposed 15 days.

12. Parallel Operation Charges

TANGEDCO

Has suggested that both REC generators and non REC generators may pay 100% of applicable parallel operation charges.

NLC India Limited

The clause should be specific that it is not applicable for SPGs under sale to Board category.

SIMA

Parallel operation charges are only when solar panels are installed within same premises and the power consumed within the premises. Has requested not to levy parallel operation charges where solar energy is wheeled after transmission to the grid. In other cases, has requested to levy the present rates of 40% of the charges.

Thiru A.D.Thirumurthy

Parallel operation charges may be levied at 50% of that applicable for conventional power plants since solar plants operate only during day time when compared to other conventional plants which operate for 24 hours. The solar plant which does not export does not have any impact on the grid but stabilises the grid voltage and reduces the losses.

13. Applicability

National Solar Energy Federation of India Confederation of Indian Industry, SWELECT Energy Systems

The promotional measures / benefits made available to Solar Project Developers as per TNERC Order at the time of synchronization of the Solar PV Plant, which are already commissioned, may be extended without any revision.

CBPUR Renewable Energy Projects Pvt. Ltd.

The applicability of the incentives/charges may be for a period of not less than 15 years from the date of commissioning/Commercial operation date(COD)..This will provide a much needed boost in the capacity addition and in the process strengthen the grid resulting in improved power quality, as well as aid in local job creation

The South India Spinners Association

The promotional benefits made available at the time of commissioning of the solar power plants may be extended without any revision.

TANSPA

Investment decisions of Solar plants already commissioned were taken keeping in mind the provisions prevailing at the point of commissioning of the plants. Changing any of the provisions will affect the financial prospects. If adjustments in lower slots is not allowed almost 50% of the energy cannot be adjusted and will get paid at 75% of solar tariff. The capital cost was substantially higher three to four years back. Hence, the concessions applicable at the time of commissioning of the plant be extended without any revision for the already commissioned solar power plants.

U-Solar Clean Energy Solutions

A solar plant takes 6 to 9 months to set up and commission the plant. A lot of financial resources are committed based on a certain policy. Removing of all concessions alters the economics of any plant. Date of implementing such changes may be deferred.

Other stakeholders

Harnessing of solar power and utilizing the same through open access would be unviable without the prevailing energy adjustment methodology, increased transmission charges, cross subsidy surcharge, parallel operation charges and the proposed cap in generation. The generated energy may be allowed to be utilized in lower time slots.

Annexure III
State Advisory Committee Meeting held on 20.3.2020

Members present

Sl.No.	Name
1.	Thiru. M.Chandrasekar, Chairman, TNERC
2.	Thiru. Dr.T.Prabhakara Rao, I.A.S., (R), Member, TNERC
3.	Thiru. K.Venkatasamy, Member, TNERC
4.	Thiru. Vikram Kapur, I.A.S., CMD, TANGEDCO Ltd., and Chairman, TANTRANSCO, and Principal Secretary to Government, Energy Department
5.	Thiru. M.R.Krishnan, Deputy Director, Consumer Association of India, Chennai
6.	Thiru S..Sankaranarayanan, General Manager, Tamil Nadu Energy Development Agency
7.	Ms.V.Geetha, Additional Secretary to Government, Energy Department, Government of Tamil Nadu
8.	Thiru A.Jesu Thayanand, Under Secretary to Government, Co-Operation, Food and Consumer Department
9.	Thiru T.Vijayarangan, Secretary, Anna Labour Union, Chennai