

TAMIL NADU ELECTRICITY REGULATORY COMMISSION

Consultative Paper for procurement of Solar power by Distribution Licensee and related issues

(Comments/Suggestions are invited on or before 13.03.2020)

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 3972 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 expires on 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 has been conducting competitive biddings for solar power and many projects have been contracted through reverse auctions. The most recent 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. Many of the States have commenced procurement of solar power through State conducted biddings apart from purchase of solar power through the biddings conducted by SECI. 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.2.89 to Rs.3.05 per unit. UPERC has approved tariffs between Rs.3.17 and Rs.3.23 per unit for procurement of solar power by UP Power Corporation Limited (UPPCL) and the

state power distribution companies(Discoms). APERC has approved procurement of solar power through the earlier auctions conducted by SECI and NTPC by the DISCOMS at tariffs from Rs.2.72 to Rs.3.15 per unit.

1.6 Commission issues this consultative paper discussing the approach on procurement of solar power by the Distribution Licensee and on related issues of open access.

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 The Regulations of Central Electricity Regulatory Commission do not provide for determination of annual generic tariff for Solar PV and Solar thermal power projects but provide for determination of project specific tariff and while doing so the financial and operational norms as may be specified would be the ceiling norms.

2.6 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. Procurement of solar power on expiry of control period of solar tariff order of 2019

3.1 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. 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.

3.2 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....”

3.3 The tariffs being discovered through competitive bidding are lower than cost plus tariffs. In order that the rate at which power procured is reflective of the market price, Commission proposes procurement of solar power by the Distribution Licensee through the competitive bidding route under section 63 of the Electricity Act 2003 following the bidding guidelines issued by the Central Government or procure power from the projects contracted through competitive bidding process by SECI to comply with their RPO requirement.

4.0 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

4.1 Open access charges –Transmission, Wheeling, and Line losses

4.1.1 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.

4.1.2 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. Commission proposes 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.

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

4.1.4 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.

4.2 Cross subsidy surcharge

4.2.1 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 proposed tariff order to be issued, Commission proposes to levy 100% of cross subsidy surcharge applicable to conventional power.

4.3 Reactive Power Charges

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

4.4 Grid Availability Charges

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

4.4.1.1 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 is proposed to 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.

4.4.2 Stand by charges

4.4.2.1 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.

4.5 Energy Accounting and Billing Procedure

4.5.1 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.

4.5.2 In this context Para 8.1.1 on Solar energy gross feed-in(utility category) of Tamil Nadu Solar Energy Policy 2019 is extracted:

Para 8.1.1 "..... Utility category solar energy gross feed-in will be permitted at all voltage levels, subject to applicable wheeling and other applicable charges and conditions for various voltage levels as may be determined by TNERC. However, no wheeling facility is permitted at LT voltage level. Wheeling of energy will be permitted only, during the generation of electricity and will be adjusted slot/block to slot/block and excess energy fed into grid shall be treated as infirm power under sale to DISCOM category only."

4.5.3 Therefore, 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. Excess consumption will be charged at the tariff applicable to the consumer subject to the terms and conditions of supply.

4.5.4 After the billing period, the excess energy generated but not consumed, subject to the cap fixed in para 4.5.5, 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 lowest tariff discovered during the year through competitive bidding process in this State or SECI.

4.5.5 Capping of solar generating capacity - In order to limit the capacities contracted for wheeling that are disproportionate to the contracted demand/annual average consumption, Commission proposes as follows:

The solar capacity contracted by open access consumers including captive shall be such that there is no excess generation over the annual consumption. Any generation in excess of 10% of annual consumption in a financial year will not be considered for payment of unutilized energy stated in clause 4.5.4 above.

4.6 Energy Wheeling Agreement and fees

4.6.1 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.

4.7 Security deposit

4.7.1 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.

4.8 Power Factor disincentive

4.8.1 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.

4.9 Metering

4.9.1 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

4.10 Connectivity and Evacuation of power

4.10.1 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.

4.11 Harmonics

4.11.1 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. A minimum of 15 days notice period shall be given for payment of compensation charges.

4.12 Parallel operation charges

4.12.1 SPGs who opt for parallel operation with the grid shall pay 100% of applicable parallel operation charges to the distribution licensee as specified in relevant regulations/orders of the Commission.

5.0 Applicability of this order

5.1 This Order shall come into force on expiry of the control period of order No.5 of 2019 dt.29.3.2019 i.e from 01.04.2020. The open access charges and other terms and conditions specified shall be applicable to all the SPGs, irrespective of their date of commissioning.

(By order of Tamil Nadu Electricity Regulatory Commission)

(S.Chinnarajalu)
Secretary
Tamil Nadu Electricity Regulatory Commission