



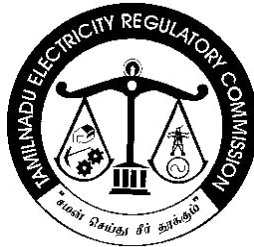
TAMIL NADU ELECTRICITY REGULATORY  
COMMISSION

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**Order on generic tariff for Solar power  
and related issues**

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Order No. 5 of 2019 dated 29 -03-2019



**BEFORE THE TAMIL NADU ELECTRICITY REGULATORY COMMISSION**

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

**Order No. 5 /2019, dated 29-03-2019**

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**In the matter of : Order on generic tariff for Solar power and related issues**

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In exercise of the powers conferred by Sections 181, 61 (h), 62 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 "Issue of Tariff Order for 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 (SAC) on the Consultative Paper in the meeting held on 05/03/2019, and on consideration of the views of the stakeholders and the SAC Members on the Consultative Paper, passes this suo motu Tariff Order on Solar Power.

This order shall take effect on and from the 1<sup>st</sup> of April, 2019.

Sd./-  
(T.Prabhakara Rao)  
Member

Sd./-  
(S.Akshaya Kumar)  
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 generic tariff for 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 as on 28.02.2019 is 11849.232 MW of which solar power constitutes 2495.1 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 Tamil Nadu Solar Policy 2019 has fixed a target of 9000 MW by 2023 for this State. This State has high solar insolation which is conducive for developing solar power projects.

1.4 Commission has so far issued seven tariff orders for procurement of solar power by the Distribution licensee. The first three tariff orders for solar power were issued in the years 2008, 2010 (two nos.), under the generation based incentive scheme launched by MNRE and the Jawaharlal Nehru National Solar Mission that promoted grid and off grid connected solar power generation. The next four tariff orders determining preferential tariff were issued vide Order No. 7 of 2014 dt.12.9.2014, Order No. 2 of 2016 dt.28.3.2016, Order No.2 of 2017 dt.28.3.2017 and the last order No.5 of 2018 dt.28.3.2018 for promoting solar power in the State in accordance with the provisions of the Electricity Act, 2003, the Electricity policies issued by the Government of India and the Commission's Power Procurement from New and Renewable Sources of Energy Regulations, 2008.

1.5 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 per unit in 2016 fell to Rs. 2.97 per unit in February 2017 in the bidding conducted for the Rewa Solar power plant in Madhya Pradesh which brought down the benchmark price of solar power to below Rs.3 per unit. It further fell to Rs.2.44 per unit in the auction held for the Bhadla Solar park in Rajasthan in May 2017. Again, there was a rise in the price of solar power in the auctions held in Gujarat in September 2017, March 2018

and in Karnataka in February 2018 where the prices increased to Rs.2.65, Rs.2.98 and Rs.2.94 per unit respectively.

1.5 Solar auction conducted by Solar Energy Corporation of India (SECI) in Uttar Pradesh (UP) in June 2018 saw a winning bid of Rs.3.32 per unit. Another auction conducted by the State agency Uttar Pradesh New and Renewable Energy Development Agency (UPNEDA) in UP in July 2018 saw the solar tariffs rise to Rs.3.48 to Rs.3.55 per unit. This auction was subsequently cancelled. Many tenders of SECI and other states were scrapped due to higher bid prices for solar power. This was followed by a cap fixed by Ministry of New and Renewable Energy (MNRE) in August 2018 on the Solar power tariff at Rs.2.50 per unit and Rs.2.68 per unit for the developers using domestic and imported solar cells and modules respectively. The solar auction of National Thermal Power Corporation (NTPC) held in August 2018 fetched tariffs of Rs.2.59 to Rs.2.60 per unit which included safeguard duty. Some of the auctions saw prices varying from Rs.2.9 to Rs.3.50 per unit. The bidding processes in the past one year show levels of volatility in solar power pricing creating uncertainty in contracting power projects through auction mode.

## **2.0 Need for a feed in tariff**

### **2.1 Legal framework:**

#### 2.1.1 Related Provisions of Electricity Act, 2003

##### 2.1.1.1 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;”*

## 2.1.2 Related Provisions of National Electricity Policy

### 2.1.2.1 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.”*

## 2.1.3 Related Provisions of Tariff Policy

### 2.1.3.1 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.”*

2.1.4 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.

.....”

2.1.5 The preamble of the Electricity Act,2003 promotes competition in the power sector. The National Electricity Policy 2005 also promotes procurement of energy from renewable energy sources and promotes purchase of renewable energy by the distribution companies through competitive bidding process. The National Electricity Policy and the Tariff Policy 2006 reconciled to the fact that it will take some time for the nonconventional energy sources to compete with conventional sources of energy and hence recommended procurement from such sources by distribution companies at preferential tariffs to be determined by

the Commissions. The Tariff Policy 2016 has reckoned that to keep the tariff low, states have to endeavour to procure power from renewable energy sources, except waste to energy plants, through competitive bidding and the Distribution licensee shall procure power from renewable energy sources from projects above the notified capacity, through competitive bidding process, from the date to be notified by the Central Government.

2.1.6 Commission's Regulations on Power Procurement from New and Renewable Sources of Energy provide for initiating the process for fixing the tariff suo motu or on an application by the distribution licensee or generator. The Regulations provide for determination of tariff by generic or specific order and to adopt a tariff if the tariff has been determined by a transparent process following guidelines issued by Central Government.

2.1.7 The Regulations of Central Electricity Regulatory Commission does 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.

2.1.8 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. According to Clause 4.3.1 of Solar Competitive bidding guidelines, *"The Procurer shall specify*

*that the tariff quoted by the bidder cannot be more than the tariff for grid-connected solar PV power plants, notified by the Appropriate Commission, if any, for the financial year in which the bids are invited.”*

## **2.2 Competitive bidding vs preferential tariff**

2.2.1 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 prices. In the tariff order of 2017, while determining preferential tariff, Commission observed that in case the utility is not able to generate enough capacity through bidding process, as a fall back it can contract balance capacity at feed in tariff. The tariff order of 2018 was issued by the Commission after detailed discussions of the status of various competitive biddings, the volatility that existed in the pricing of solar power and the necessity to have a feed in tariff as a benchmark price in the State. The control period of this Order No.5 of 2018 dt.28.3.2018 on solar power expires on 31.3.2019.

2.2.2 The Distribution licensee has contracted capacities of around 1500 MW at tariffs less than the preferential tariff determined in the orders of 2016

and 2017. However, the last bidding conducted by the distribution licensee in January 2019 failed to attract any bids.

2.2.3 The tariffs obtained in the various tenders floated by Solar Energy Corporation of India, NTPC, some of the States in the last one year are as follows:

Auctions conducted	Rates obtained in bidding in Rs. Per unit
Solar Energy Corporation of India (SECI) – 3 GW capacity tendered in January 2018 and auction conducted in July 2018	Lowest quote – 2.44 Range – 2.44 to 2.71
Maharashtra State Electricity Distribution Company Ltd.(MSEDCL) – 1 GW capacity auction in May 2018	2.71
National Thermal Power Corporation(NTPC) – 2 GW capacity – auction in August 2018	2.59-2.60
Uttar Pradesh New and Renewable Energy development Agency(Uttar Pradesh New and Renewable Energy development Agency(UPNEDA) –1000	3.48-3.50(tender cancelled)

MW capacity - auction in July 2018	
UPNEDA -550 MW capacity – auction in December 2018	3.02
Odisha – tendered in April 2018; auction in August 2018	2.79 - 3.19(tender cancelled)
KREDL – 100 MW capacity -auction in January 2019	2.91
Gujarat Urja Vikas Nigam Ltd.-700 MW capacity –auction in January 2019	2.84
Maharashtra -1000 MW capacity - auction in February 2019	Rs.2.74,2.75(Impact of safeguard duty not factored)

2.2.4 From the details above, it can be seen that the bidding processes in the past one year show levels of instability in solar power pricing. The rates of tariffs differ in each State. Having a feed in tariff in place would serve as an additional support mechanism. Commission also takes note of the fact that one of the factors in the competitive bidding guidelines for procurement of solar power issued by the Central Government is that a tariff notified by the Appropriate Commission would serve as a ceiling price.



2.2.5 While issuing the last tariff order in 2018, Commission observed as follows:

“ Under the statutory provisions of the Act, section 62 and section 63 are two alternatives available to the Distribution licensees to procure power with the tariff being determined or approved by the Commission and the State Commission is bestowed with statutory powers to determine tariff. Policies, notifications of Government serve as guidelines and the same has been specified in the Commission’s Regulations. The provisions in the Tariff Policy 2016 for the Distribution Licensee to procure power through competitive bidding above the notified capacity from renewable sources aims for procurement of power at low tariffs. Though bidding guidelines have been issued, in view of the statutory provisions of the Act, Commission is of the view that a feed in tariff that reflects the prevailing market trend is necessary for the State.” For the same reason and the reasons stated above, Commission decides to issue this order.

### **3.0 Technology and standards for Solar photovoltaics**

3.1 Photovoltaics (PV) is the direct method of converting sunlight into electricity through a device known as the “Solar Cell”. Many different solar cell technologies such as mono-crystalline and poly-crystalline silicon, thin films such as amorphous silicon, micromorph, cadmium telluride, copper indium gallium selenide and concentrator-based high-efficiency III-V, etc. are available in the market today. Further, substantial R&D efforts are also underway globally for enhancing efficiencies, developing novel cell technologies that entail in reduction

of costs of these solar cells.

3.2. Standards - Each of these technologies have different cost implications based on their efficiency, reliability, mounting, tracking, land, water and other requirements. The final selection of the technology shall be left to the Solar Power Developers. The minimum technical requirements would be as per the regulations/specifications issued by the Central Electricity Authority and Ministry of New and Renewable Energy and the developers shall adhere to them. Building of a solar power plant within the committed schedule and achieving optimal performance over its life period depends on choice of various factors and these may be best left to the developer.

#### **4.0 Applicability of this order**

4.1 This Order shall come into force from 01.04.2019. The tariff fixed in this order shall be applicable to all solar power plants commissioned during the control period of the Order. The tariff is applicable for purchase of solar power by Distribution Licensee from Solar Power Generators (SPGs). The open access charges and other terms and conditions specified shall be applicable to all the SPGs, irrespective of their date of commissioning.

#### **5.0 Tariff determination process**

5.1 With regard to tariff determination process, the relevant portion of Regulation

4 of the Power Procurement from New and Renewable Sources of Energy Regulations, 2008 is reproduced below:

*“(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.*

*d) issuing general/specific tariff order for purchase of power from new and renewable sources based generators.”*

5.2 In line with the above regulation, Commission prepared a consultative paper on ‘Issue of Tariff order on Solar Power and related issues’ and hosted the same on 01.02.2019 in the Commission’s website inviting comments and suggestions from stakeholders. The consultative paper was also presented before the State Advisory Committee (SAC) meeting held on 05/03/2019 and discussed. The list of stakeholders who have conveyed comments on the consultative paper, summary of comments, list of members present in the State Advisory Committee meeting is annexed with this order as Annexure II,III and IV. Taking into account the important comments/suggestions received from the stakeholders and the SAC Members, parameters adopted by other State Electricity Regulatory Commissions, Central Electricity Regulatory Commission(CERC) and

deliberations on all issues, the Commission issues this “Order on generic tariff for Solar Power and related issues” .

## **6.0 Tariff/Pricing methodology**

6.1 Tariff / Pricing Methodology followed is as specified in Regulation 4(2) of the Power Procurement from New and Renewable Sources of Energy Regulations, 2008 reproduced in para 2.1.4 of this order.

### **6.2 Project specific or Generalized Tariff**

6.2.1 A generalized tariff mechanism would provide incentive to the investors for use of most efficient equipment to maximize returns and for selecting the suitable site while a project-specific tariff would provide each investor, irrespective of the machine type, the stipulated return on equity which, in effect, would shield the investor from the uncertainties involved. This order provides for power purchase by distribution licensees to meet their Solar Purchase Obligation as specified in the Commission’s Regulations and the commitment to promote renewable energy. The solar power plants commissioned in the State have mostly adopted similar technology with minor modifications. Hence, the Commission decides to issue a generalized tariff order for Solar Photovoltaic.

### **6.3 Single Part vs. Two Part Tariff**

6.3.1 Two part tariff is generally adopted when the variable component is significant. In the case of solar energy generation, no variable cost like fuel cost

is involved. Operation, maintenance and insurance cost could be taken care of by adopting suitable parameters. Therefore, the Commission proposes to continue with the single part tariff system for solar power generation.

#### **6.4 Cost-Plus Tariff Determination**

6.4.1 Regulation 4(6) of “Power Procurement from New and Renewable Sources of Energy Regulations, 2008” empowers the Commission to adopt “appropriate tariff methodology” to determine the tariff for solar power. Cost-plus tariff determination is a more practical method. It can be easily designed to provide adequate returns to the investor and a surety of returns will lead to larger investment in solar power plants. Commission in the last four tariff orders issued for solar power in 2014, 2016, 2017 and the latest Order No.5 of 2018 dt.28.3.2018 adopted cost plus single part levelled tariff taking into account the Accelerated Depreciation (AD) benefit as done by many other State Electricity Regulatory Commissions(SERCs). The Commission proposes to adopt the same methodology in this tariff order also.

#### **7.0 Tariff components**

7.1 The Commission has carried out a detailed analysis of the existing policies/procedures and commercial mechanisms in respect of solar power generation. The tariff determined in a cost plus scenario, would depend significantly on the following operating and financial parameters:

1. Capital cost
2. Capacity Utilization Factor
3. Operation and Maintenance expenses
4. Insurance cost
5. Debt-Equity ratio
6. Term of Loan and Interest
7. Life of plant and machinery
8. Return on Equity
9. Depreciation rate applicable
10. Interest and Components of Working Capital
11. Discount factor
12. Auxiliary consumption

## **7.2 Capital cost**

7.2.1 The cost of the equipments involved is an important factor in determination of overall cost of the plants. The main components of a photovoltaic power plant are the photo voltaic modules, inverters, module mounting structures, cables, control panels, switchyard etc. Apart from the above, erection of power plant involves cost of land, civil works and evacuation infrastructure.

7.2.2 Karnataka ERC issued a tariff order for solar power on 18.5.2018 where the capital cost was fixed as Rs.3.5 crores. Maharashtra ERC issued the tariff order for renewable energy on 18.8.2018 wherein a capital cost of Rs.2.62 crores

was adopted. Rajasthan ERC issued an order for solar power on 9.10.2017 adopting a capital cost of Rs.3.5836 crores per MW. Orders of other Commissions are dated prior to 2017. In the order dt.18.8.2018, MERC adopted two approaches for determination of tariff in that if the tariff obtained through competitive bidding in Maharashtra is lesser than the feed in tariff, the tariff discovered through competitive bidding tariff would be the generic tariff/feed in tariff. The capital cost of Rs.2.62 crores per MW adopted by MERC was based on the bid tariffs that reflected the prevalent market trends.

7.2.3 Market reports indicate a decline in price of solar PV cells from the date of issue of the previous tariff order in 2018. Literature on solar pricing and reports in leading magazines show a transition in module pricing from the place of origin to efficiency of modules. There is a wide range of availability of solar modules at different prices. The price of a solar module depends on quality, energy yielding capacity, availability and the demand in the market. With high degree of automation, economies of scale and day to day advancements in technology, manufacturers are able to produce less expensive products with good efficiency, meeting strict quality requirements. Therefore, the right choice of solar modules, technology rest with the developer.

7.2.4. Stakeholders have suggested for plant size based capital cost and some of them have suggested for capital cost of Rs 4 to 4.2 crores.

7.2.5 This tariff determination exercise being generic in nature Commission does not desire to specify range of tariffs considering different capital costs.

7.2.6 Considering the prevalent trend in prices of solar modules (reports in PV insight trends) and other costs involved including safeguard duty, Commission decides to adopt a capital cost of Rs.3.35 crores per MW.

7.2.5 The Capital cost as proposed is inclusive of all capital works i.e plant and machinery, auxiliaries, costs towards changing inverter during the life-time, land, civil work, erection and commissioning, financing and interest during construction, and evacuation infrastructure. The capital cost fixed for solar PV is inclusive of cost of module degradation. It is upto the developer to identify the appropriate land based on solar insolation and cost.

### **7.3 Capacity Utilisation Factor(CUF)**

7.3.1 The CUF considered in the earlier tariff orders on Solar power issued by the Commission was 19% for Solar PV power plant. The CUF is considered taking into account the efficiency factors of equipments, deration etc. and fast developing technology. The Commission has adopted the capital cost taking into account the cost of replacement of modules in respect of degradation during its lifetime. Most of the SERCs have adopted a CUF of 19% for Solar PV. TANGEDCO has requested to fix a CUF range as specified in the guidelines for competitive bidding issued by the Central Government. Stakeholders have mentioned that TANGEDCO refuses to pay for generation above the CUF of 19% and have requested to clarify in the order that payment for generation should not be restricted to CUF. One of the stakeholders have requested to pay for generation above the normative CUF of 19% at the Pooled Cost of Power



purchase. Some of the Solar Power Generators have filed cases before the Courts of law on the issue of restricted payments by TANGEDCO for the generation above the normative CUF. The matter is subjudice.

7.3.2 Commission decides to adopt a CUF of 19% for Solar PV projects.

#### **7.4 Operation and Maintenance(O&M) cost**

7.4.1 In the consultative paper, the Commission proposed O&M expenses at 1.4% of capital cost with an escalation of 5.72% from the second year. The Distribution licensee, TANGEDCO, has suggested for escalation of 5% from the second year onwards. Some of the stakeholders have requested for higher O&M costs. The Central Electricity Regulatory Commission's Regulations on Terms and Conditions of determination of Tariff from Renewable Energy(RE) sources, 2017 specify determination of O&M expenses in a Project specific case based on prevailing market information. In the wake of setting up of a number of small and large scale solar PV projects, the operation and maintenance costs have become cheaper and there are also advancements in automations to take care of operation and maintenance.

7.4.2 Therefore, Commission decides to retain O&M expense of 1.4% of capital cost of solar projects with an escalation of 5.72% from the second year as adopted in all its orders of solar power.

## **7.5 Insurance cost**

7.5.1 In the previous tariff orders for Solar power issued by the Commission, 0.35% of net asset value as insurance cost was adopted by the Commission. The Commission decides to adopt the same.

## **7.6 Debt and Equity**

7.6.1 The Tariff Policy lays down a debt equity ratio of 70: 30 for power projects. The Commission decides to adopt this ratio as specified in its Tariff Regulations 2005 and as adopted in the earlier Orders on new and renewable power.

## **7.7 Term of loan and Rate of interest**

7.7.1 Some of the stakeholders have requested for a term of loan of 12 years and rate of interest of 12%. TANGEDCO has requested to adopt rate of 10.05%. CERC and other State Electricity Regulatory Commissions adopted interest rates ranging from 10% to 12.30%. The CERC in its RE Tariff regulations on determination of tariff for renewable energy, 2017 has specified a normative interest rate of two hundred basis points above the average State Bank of India Marginal Cost of Funds based Lending Rate (MCLR one year tenor) prevalent during the last available six months and has adopted a rate of interest of 10.41% in its generic tariff RE order of 2019-2020 dt.19.3.2019.

7.7.2 The prevalent lending rate being the marginal cost of funds based lending rate at which the bank prices all its loans, Commission decides to adopt the latest

MCLR rate of 1 year of 8.55% notified by the State Bank of India in March 2019 plus 200 basis points which is 10.55% as proposed in the consultative paper.

7.7.3 The Commission decides to adopt a term of 10 years with 1 year moratorium as adopted by the Commission in its previous orders on Wind, Bagasse, Bio-mass power and Solar.

## **7.8 Life of Plant and Machinery**

7.8.1 Commission considers a life period of 25 years as adopted in its earlier orders for solar power.

## **7.9 Return on Equity (RoE)**

7.9.1 CERC in its RE Tariff regulations dt.17.4.2017 has specified Return on Equity of 14% to be grossed up with prevailing MAT on 1<sup>st</sup> of April of previous year and in its RE tariff order of 2019-2020 has considered RoE of 17.60% after grossing up with average MAT of 20.46% prevailing on 1<sup>st</sup> of April 2018.

7.9.2 Commission decides to adopt Return on equity of 17.60%.

## **7.10 Depreciation**

7.10.1 Stakeholders have requested to consider depreciation of 5% per annum. CERC in the RE Tariff Regulations 2017 has specified depreciation of 5.28% per annum for first 13 years and the balance depreciation to be spread over the

remaining useful life of the project considering salvage value as 10% of project cost. The Commission in its Orders on Wind, Bio-mass and Bagasse based energy issued during the year 2012 has depreciated the value of plant and machinery to 90% of the initial value for the life period using the straight line method which translates to 3.6% per annum. The same method was adopted in the tariff orders issued for solar power. Depreciation was calculated on 95% of the capital investment in the last four orders on solar power. The Commission decides to adopt the same method for the life period of 25 years

### **7.11 Interest and Components of Working Capital**

7.11.1 CERC in its RE Tariff Regulations 2017 has specified that Interest on Working Capital shall be at interest rate equivalent to the normative interest rate of three hundred (300) basis points above the average State Bank of India MCLR (One Year Tenor) prevalent during the last available six months for the determination of tariff. An interest rate of 11.41% has been adopted by CERC in its RE Tariff order of 2019-20.

7.11.2 The distribution licensee, Tamil Nadu Generation and Distribution Corporation Ltd.(TANGEDCO) has suggested an interest rate of 10.55%.Some of the stakeholders have suggested to consider rate of interest of 12%.

7.11.3 Commission decides to adopt the latest MCLR rate of 1 year of 8.55% notified by the State Bank of India in March 2019 plus 300 basis points which is

11.55%, with one month Operation and Maintenance cost and two months receivables as working capital components.

### **7.12 Auxiliary consumption**

7.12.1 Auxiliary consumption considered to be negligible in Solar PV generation, Commission has not considered auxiliary consumption in Solar PV generation in its earlier orders and decides to do the same in this order.

### **7.13 Discount factor**

7.13.1 A discount factor of 9.53% equal to the post tax weighted average cost of the capital on the basis of normative debt: equity ratio (70:30) is adopted for the purpose of levellised tariff computation.

## **8.0 Tariff Determinants**

8.1 . The financial and operational parameters in respect of Solar Power projects proposed in the paper are tabulated below:

Tariff Components	Values
Capital cost	Rs. 3.35 Crores/MW
CUF	19%
Operation and maintenance expenses	1.4% of Capital cost with escalation at 5.72% p.a from second year
Insurance	0.35% of net asset value

Debt-Equity ratio	70:30
Life of plant and machinery	25 years
Return on Equity	17.60%(pre-tax)
Term of Loan	10 years with 1 year moratorium period
Interest on loan	10.55%
Depreciation	3.6% on 95% of Capital cost
Working Capital components	one month O&M cost and two months receivables
Interest on working capital	11.55%
Discount factor	9.53%

## **9.0 Solar Power Tariff**

9.1 Solar power tariff is computed with reference to the determinants listed above. The tariff works out to Rs.3.04 per unit without accelerated depreciation and Rs.2.80 per unit with Accelerated Depreciation(AD). The Accelerated Depreciation (AD) benefit component of the tariff is Rs.0.23 per unit for Solar PV. The working sheet is enclosed in Annexure I.

## **10.0 Issues related to power purchase by Distribution licensee:**

1. Quantum of power purchase by the Distribution licensee
2. Plant capacity limitations
3. CDM benefits
4. Billing and Payments
5. Energy Purchase Agreement
6. Control Period /Tariff Review Period

## **10.1 Quantum of power purchase by the Distribution licensee**

10.1.1 The distribution licensee can purchase solar power from the Solar Power Generators (SPGs) to meet the Renewable power Purchase Obligation on account of solar power. 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 SPO obtaining approval from the Commission.

## **10.2 Plant Capacity limitations**

10.2.1 The Commission in the last tariff order for solar power had 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. Some of the stakeholders have requested to fix the plant capacity limit at 0.5 MW. TANGEDCO has requested to fix the capacity limit as 1 MW and above for sale to Board, CGP and third party sale. Commission has always maintained that the solar projects covered by this order shall be of capacity 1 MW and above.

## **10.3 CDM benefits**

10.3.1 In the earlier orders issued on renewable energy, the Commission adopted the following formula for sharing of CDM benefits as suggested by the Forum of Regulators (FOR):

“The CDM benefits should be shared on gross basis starting from 100% to developers in the first year and thereafter reducing by 10% every year till the sharing becomes equal (50:50) between the developer and the consumer in the sixth year. Thereafter, the sharing of CDM benefits will remain equal till such time the benefits accrue.”

10.3.2 The Commission accepted the formula recommended by the Forum of Regulators in its earlier order. The Commission decides to adopt the same formula. The distribution licensee shall account for the CDM receipts in the next ARR filing. The licensee has stated that so far the developers have not declared the CDM benefits. An auditor’s certificate to the above effect may be produced by the SPGs.

#### **10.4 Billing and Payments**

10.4.1 When a solar generator sells power to the distribution licensee, the generator shall raise the bill every month for the net energy sold after deducting the charges for power drawn from distribution licensee, reactive power charges etc. The distribution licensee shall make payment to the generator in 60 days of receipt of the bill. Any delayed payment beyond 60 days is liable for interest at the rate of 1% per month. TANGEDCO has requested to specify interest at 0.9% per month and to allow a rebate of 1% if the distribution licensee makes the payment within one month of presentation of bills by the SPG. Commission is not in agreement with the proposal of TANGEDCO to specify interest at 0.9%.



Stakeholders have represented grievances of delays in payments by the distribution licensee and to ensure prompt payment by the licensee. A rebate of 1% when allowed may encourage the licensee to make payments within the stipulated period. Therefore, Commission decides to consider the request of TANGEDCO. Where the distribution licensee pays the generator within one month of receipt of bill, a rebate of 1% on the claim made may be allowed.

### **10.5 Energy Purchase Agreement (EPA)**

10.5.1. The format for Energy Purchase Agreement (EPA) shall be evolved as specified in the Commission's "Power procurement from New and Renewable sources of energy Regulations 2008" and amended from time to time. The agreement shall be valid for 25 years or life of the plant specified in the respective tariff order. The distribution licensee shall execute the Energy Purchase Agreement or convey its decision in line with this order within a month of receipt of the proposal from the generator for selling the power. The agreement fees are governed by the Commission's Fees and Fines regulation.

### **10.6 Control Period /Tariff Review Period**

10.6.1 Regulation 6 of the Power Procurement from New and Renewable Sources of Energy Regulations, 2008 of the Commission specifies that 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.

10.6.2 As considered in the earlier orders of solar power, Commission proposes a control period of one year from 01.04.2019 and tariff period is 25 years.

**11.0 Issues related to 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

**11.1 Open access charges and line losses**

11.1.1 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 and in the order dt.28.3.2018, Commission adopted 40% in each of the charges.

11.1.2 Many of the stakeholders have requested to retain the charges at 40% of that applicable of conventional power. TANGEDCO has requested to fix the charges at 70% of that of conventional power.

11.1.3 The price of solar power has reached grid parity and is even less than the fuel cost of coal power plants. The concessions granted are being subsidized by other users of the network.

11.1.4 Scheduling and system operation charges are on the basis of transactions and the work done by SLDC is the same as in the case of conventional power. The scheduling and system operation charges have to be determined in a non-discriminatory manner with reference to the functions of SLDC and there cannot be any concession.

11.1.5 In this order, Commission decides to adopt 50% of the charges applicable for conventional power in each of the charges i.e transmission, wheeling charges, scheduling and system operation charges.

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

11.1.7 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.

## **11.2 Cross subsidy surcharge**

11.2.1 The Commission in its other tariff orders related to different sources of renewable power and in the orders for solar power ordered levy of 50% of cross subsidy surcharge applicable to conventional power for third party open access consumers. In the orders on Renewable sources of energy issued in 2018, levy of 60% of the cross subsidy surcharge applicable to conventional power was ordered. In the consultative paper for issue of present Solar Tariff order, Commission had proposed to withdraw the incentives in phases every year by reducing the same by 10% every year as followed in the last solar tariff order of 2018 and in tariff orders of other sources of renewable energy.

11.2.2 Some of the stakeholders have requested to retain the cross subsidy surcharges at its present level of 60% of that applicable to conventional power and certain associations have stated that levy of cross subsidy surcharge after collecting charges towards transmission, wheeling amounts to double taxation. It is to be noted that charges on transmission and wheeling are collected for usage of the network developed by the licensees whereas collection of cross subsidy surcharge by the distribution license is to meet the levels of cross subsidy in the area of supply of the licensee in accordance to section 42 (2) of the Act,2003 and the two cannot be equated with each other. TANGEDCO has requested to levy 100 % cross subsidy surcharge. Commission decides to levy 70% of cross subsidy surcharge applicable to conventional power as proposed.

### **11.3 Reactive Power Charges**

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

### **11.4 Grid Availability Charges**

#### **11.4.1 Charges for the start-up power supplied by the distribution licensee**

11.4.1.1 The question of start up power does not arise for Solar PV generators. The Distribution licensee has suggested levy of HT industrial tariff for any drawal above the generation in a month until notification of regulations on Deviation Settlement Mechanism. Occurrence of any such contingency may be dealt with as per the provisions in the relevant orders of the Commission.

#### **11.4.2 Stand by charges**

11.4.2.1 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.

### **11.5 Energy Accounting and Billing Procedure**

11.5.1 TANGEDCO has stated that as per the Solar Energy Policy 2019, the wheeling of energy will be permitted only during the generation of electricity and will be adjusted slot/block to slot/block and on daily basis during the billing period and excess energy fed into grid shall be treated as infirm power under sale to

DISCOM category only. The distribution licensee has also requested that the amount towards purchase of infirm power be given credit to the consumer for 60 days from the date of receipt of invoice.

11.5.2 All other stakeholders have requested to permit adjustments of generation from higher tariff slots to lower tariff slots and purchase of excess generation at its 100% value.

11.5.3 Commission has notified the Regulations on Deviation settlement Mechanism(DSM) for RE wind and Solar, and all other sources, stated below, on 20.3.2019, the draft of which was hosted in the Commission's website and stakeholder's comments obtained. The commercial arrangements shall come into force after six months when the distribution licensee has completed all requirements for implementation of the Regulations.

1. Tamil Nadu Electricity Regulatory Commission (Forecasting, Scheduling and Deviation settlement and Related Matters for Wind and Solar Generation) Regulations, 2019.

2. Tamil Nadu Electricity Regulatory Commission (Deviation Settlement Mechanism and Related Matters) Regulations, 2019.

11.5.4 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.

11.5.5 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.

11.5.6 After the billing period, the balance energy may be sold at the rate of 75% of the respective solar tariff fixed by the Commission in the respective orders to the generators.

## **11.6 Energy Wheeling Agreement and fees**

11.6.1 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.

## **11.7 Security deposit**

11.7.1 As regards the security deposit to be paid by captive /third party user, the Commission decides 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.

## **11.8 Power Factor disincentive**

11.8.1 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.

## **11.9 Metering**

11.9.1 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) Tamil Nadu Electricity Regulatory Commission's Regulations on Deviation Settlement Mechanism



## **11.10 Connectivity and Evacuation of power**

11.10.1 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.

## **11.11 Harmonics**

11.11.1 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.

## **11.12 Parallel operation charges**

11.12.1 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.

## **12. Directions**

12.1 Quarterly reports on the quantum of energy wheeled from the solar generators for captive consumption and third party sale 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.

## **13. Acknowledgement**

13.1 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.

Sd./-  
(T.Prabhakara Rao)  
Member

Sd./-  
(S.Akshaya Kumar)  
Chairman

(By order of Tamil Nadu Electricity Regulatory Commission)

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

Capital cost	33500000
PLF	19.00%
Depreciation	3.60%
Interest	10.5500% (10 + 1) yr.
Dt:Eq.	70 & 30
O & M	1.4.% with 5.72 % escd.
Insurance	0.35 % of net asset value
Residual value	10%
ROE	17.60%
Life of Plant	25 Yr.
Aux.consump.	0%
W.Cap.	O&M 1m +Receivables 2m.
Inst. On W.Cap.	11.55%
Discount factor	9.53%

**Annexure I  
Solar PV MW scale**

Tariff Details-- Solar(PV)																									
Gross Gen	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	
Years	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
RDE	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800
Depreciation	1145700	1145700	1145700	1145700	1145700	1145700	1145700	1145700	1145700	1145700	1145700	1145700	1145700	1145700	1145700	1145700	1145700	1145700	1145700	1145700	1145700	1145700	1145700	1145700	1145700
Insurance cost	117250	113240	109230	105220	101210	97200	93190	89180	85170	81160	77151	73141	69131	65121	61111	57101	53091	49081	45071	41061	37051	33041	29031	25021	21011
Interest on Loan	2473975	2473975	2226578	1979180	1731783	1484385	1236988	989590	742193	494795	247398														
O & M	469000	495827	524188	554172	585870	619382	654811	692266	731863	773726	817983	864772	914237	966531	1021817	1080265	1142056	1207381	1276444	1349456	1426645	1508249	1594521	1685728	1782151
IOWC	121874	122585	118485	114433	110432	106484	102593	98761	94992	91290	87658	84101	80579	77096	73653	70253	66896	63579	60301	57061	53851	50671	47521	44401	41311
<b>Total</b>	<b>6096599</b>	<b>6120127</b>	<b>5892981</b>	<b>5667505</b>	<b>5443795</b>	<b>5221951</b>	<b>5002081</b>	<b>4784297</b>	<b>4568718</b>	<b>4355471</b>	<b>4144680</b>	<b>3936514</b>	<b>3733346</b>	<b>3535982</b>	<b>3343922</b>	<b>3157656</b>	<b>2976685</b>	<b>2800509</b>	<b>2629728</b>	<b>2463842</b>	<b>2303451</b>	<b>2148155</b>	<b>1997554</b>	<b>1851343</b>	<b>1709212</b>
<b>IOWC</b>	<b>3.683</b>	<b>3.677</b>	<b>3.541</b>	<b>3.405</b>	<b>3.271</b>	<b>3.137</b>	<b>3.005</b>	<b>2.874</b>	<b>2.745</b>	<b>2.617</b>	<b>2.490</b>	<b>2.365</b>	<b>2.239</b>	<b>2.123</b>	<b>2.005</b>	<b>1.895</b>	<b>1.791</b>	<b>1.692</b>	<b>1.598</b>	<b>1.509</b>	<b>1.424</b>	<b>1.343</b>	<b>1.265</b>	<b>1.191</b>	<b>1.120</b>
<b>O &amp; M</b>	<b>39083</b>	<b>41319</b>	<b>43682</b>	<b>46181</b>	<b>48823</b>	<b>51615</b>	<b>54568</b>	<b>57689</b>	<b>60989</b>	<b>64477</b>	<b>68165</b>	<b>72064</b>	<b>76186</b>	<b>80544</b>	<b>85151</b>	<b>90022</b>	<b>95171</b>	<b>100615</b>	<b>106370</b>	<b>112455</b>	<b>118887</b>	<b>125687</b>	<b>132877</b>	<b>140477</b>	<b>148513</b>
<b>Receivables</b>	<b>1016100</b>	<b>1020021</b>	<b>982163</b>	<b>944584</b>	<b>907299</b>	<b>870325</b>	<b>833680</b>	<b>797383</b>	<b>761453</b>	<b>725912</b>	<b>690782</b>	<b>656086</b>	<b>622891</b>	<b>590182</b>	<b>558933</b>	<b>529123</b>	<b>500728</b>	<b>473724</b>	<b>448076</b>	<b>423749</b>	<b>400715</b>	<b>378948</b>	<b>358413</b>	<b>339092</b>	<b>320961</b>
<b>Total</b>	<b>1055183</b>	<b>1061340</b>	<b>1025846</b>	<b>990765</b>	<b>961122</b>	<b>929140</b>	<b>898248</b>	<b>865072</b>	<b>822442</b>	<b>790389</b>	<b>759847</b>	<b>728150</b>	<b>700779</b>	<b>675276</b>	<b>651637</b>	<b>629835</b>	<b>609824</b>	<b>590561</b>	<b>572011</b>	<b>554148</b>	<b>536948</b>	<b>520367</b>	<b>504371</b>	<b>488926</b>	<b>474007</b>
IOWC	121874	122585	118485	114433	110432	106484	102593	98761	94992	91290	87658	84101	80579	77096	73653	70253	66896	63579	60301	57061	53851	50671	47521	44401	
Discount Factor	1	0.91	0.83	0.76	0.69	0.63	0.58	0.53	0.48	0.44	0.40	0.37	0.34	0.31	0.28	0.26	0.23	0.21	0.19	0.18	0.16	0.15	0.13	0.12	0.11
Present Value	<b>3.66</b>	<b>3.36</b>	<b>2.95</b>	<b>2.59</b>	<b>2.27</b>	<b>1.99</b>	<b>1.74</b>	<b>1.52</b>	<b>1.33</b>	<b>1.15</b>	<b>1.00</b>	<b>0.87</b>	<b>0.80</b>	<b>0.74</b>	<b>0.69</b>	<b>0.64</b>	<b>0.59</b>	<b>0.55</b>	<b>0.51</b>	<b>0.47</b>	<b>0.44</b>	<b>0.40</b>	<b>0.38</b>	<b>0.35</b>	<b>0.33</b>
Levelised tariff	<b>3.04</b>																								

Determination of accelerated depreciation benefit

Depreciation amount	90%																									
Book depreciation rate	5.28%																									
Tax depreciation rate	40%																									
Income Tax (Normal rate)	27.820%																									
Capital Cost	33500000																									
Years	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Book Depreciation	2.64%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	
Bk dep in lakhs	884400	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	1768800	
Accelerated Depreciation																										
Opening	100%	70%	35%	21.00%	12.60%	7.56%	4.54%	2.72%	1.633%	0.98%	0.59%	0.35%	0.21%	0.13%	0.08%	0.05%	0.03%	0.02%	0.01%	0.006%	0.004%	0.002%	0.001%	0.000%	0.000%	
Allowed	30%	35%	14.00%	8.40%	5.04%	3.02%	1.81%	1.09%	0.65%	0.39%	0.24%	0.14%	0.08%	0.05%	0.03%	0.02%	0.01%	0.01%	0.00%	0.002%	0.001%	0.001%	0.000%	0.000%	0.000%	
Closing	70%	35%	21.00%	12.60%	7.56%	4.54%	2.72%	1.63%	0.98%	0.59%	0.35%	0.21%	0.13%	0.08%	0.05%	0.03%	0.02%	0.01%	0.01%	0.004%	0.002%	0.001%	0.000%	0.000%	0.000%	
Accelerated Depreciation	10050000	11725000	4690000	2814000	1688400	1013040	607824	364694.40	218816.64	131289.98	78773.99	47264.39	28358.64	17015.18	10209.11	6125.47	3675.28	2205.17	1323.10	793.86	476.32	285.79	174.95	108.59	68.59	43.72
Net dep benefit	9165600	9956200	2921200	1045200	80400	-755760	-1160976	-1404106	-1549983	-1637510	-1690026	-1721536	-1740441	-1751785	-1758591	-1762675	-1765125	-1762595	1323.10	793.86	476.32	285.79	174.95	108.59	68.59	
Tax benefit	2549870	2769815	812678	290775	-22367	-210252	-322984	-390622	-431205	-455555	-470165	-478931	-484191	-487347	-489240	-490376	-491058	-491794	368	221	133	80	49	29	17	
Discount factor	1.00	0.91	0.83	0.76	0.69	0.63	0.58	0.53	0.48	0.44	0.40	0.37	0.34	0.31	0.28	0.26	0.23	0.21	0.19	0.18	0.16	0.15	0.13	0.12	0.11	
Average discount factor	1.00	0.96	0.87	0.80	0.73	0.66	0.61	0.55	0.51	0.46	0.42	0.38	0.35	0.32	0.29	0.27	0.24	0.22	0.19	0.17	0.15	0.14	0.13	0.12	0.11	
Net Energy gen	832200	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	
Energy gen with DCF	832200	1591991.84	1453475.61	1327011.42	1211550.65	1106135.90	1009893.08	922024.18	841800.58	768557.09	701686.38	640633.96	584893.60	534003.11	487540.50	445120.51	406391.41	371032.06	338749.25	309275.32	282365.85	257797.73	233367.23	214888.37	196191.33	
Tax benefit with DCF	2549870	2649317	709690	231832	-16282	-139731	-195974	-216392	-218900	-210358	-198215	-184342	-170151	-156359	-143309	-131144	-119900	-99697	75	41	22	12	7	4	2	
AD benefit	<b>0.2320</b>																									
Levelised tariff with AD	<b>2.80</b>																									

## Annexure II

### List of Stakeholders who have submitted their views

Sl.No.	Name of stakeholder
1.	Thiru S.Narayanasamy, former Member/Generation
2.	Thiru A.D.Thirumoorthy, Member, State Working Group for RE
3.	CBPUR Renewable Energy Projects Pvt. Ltd.
4.	Tamil Nadu Solar Energy Developers Association
5.	Tamil Nadu Solar Power Generators Association(TANSPA)
6.	Elegant Power Care,
7.	Power TV Power Bank
8.	Green India Equipments Pvt.Ltd.
9.	Srinivas Impex
10.	KL Solar Company Pvt.Ltd.,
11.	Vigor Solar Energy Pvt.Ltd
12.	Progen Energy Solutions
13.	Unimech Systems (India) Pvt.Ltd.
14.	Ensun Energy Systems Pvt.Ltd
15.	OLITEC
16.	Sun Best
17.	Apple Electricals
18.	Shriram Solar
19.	Senthil Solar
20.	JK Solar
21.	Dev Solar(Dev International)

22.	Hi Lite Technologies
23.	Focusun Energy Systems
24.	Creative Eco Solutions
25.	Swelect Energy Systems Limited,
26.	National Solar Energy Federation of India
27.	Watsun Infrabuild Pvt Ltd.
28.	Tamil Nadu Spinning Mills Association(TASMA)
29.	Tamil Nadu Electricity Consumers' Association(TECA)
30.	The Southern India Mills Association(SIMA)
31.	Agni Solar Systems
32.	Sootless Energy Private Limited
33.	TANGEDCO

## Annexure III

### Abstract of comments received from various stakeholders on “Consultative Paper on Tariff Order for Solar Power”

#### **1. Applicability of the order**

##### **CBPUR Renewable Energy Projects Pvt. Ltd.**

In order to provide investor confidence and improve bankability of such capital intensive projects, the applicability of incentives/charges shall be for a period of not less than 15 years from the date of commissioning/commercial operation date.

##### **Tamil Nadu Spinning Mills Association(TASMA), Tamil Nadu Electricity Consumers’ Association(TECA)**

Applicability of forthcoming order on Solar energy and other related issues is to be revisited in view of issuance of Solar Policy 2019 published on 4.2.2019.

##### **TANGEDCO**

Proposal of Commission accepted.

#### **2. Project specific tariff**

##### **CBPUR Renewable Energy Projects Pvt. Ltd.**

Project size based different tariffs for at least two categories viz. projects less than 5 MW and projects more than 5 MW may be fixed. Small projects of size 1 MW to 5 MW may be exempted from tariff based bidding and allowed to sell power based on feed in tariff fixed by the Commission.

#### **3. Capital cost/MW in Crores**

##### **Thiru S.Narayanasamy, former Member/Generation**

Capital cost of Rs.3.35 crores appears to be very low. A sum of Rs.4.00 crores per MW would be reasonable.

### **Thiru A.D.Thirumoorthy,Member,State Working Group for RE**

Capital cost of project will be higher in case of capacities less than 5 MW. Due to imposition of safeguard duty price of modules have increased. Plant size based cost per MW is as follows:

≤2 MW – Rs.4.2 crores; >2 MW≤5MW -4.1 crores;>5MW≤15 MW – 3.9 crores;  
>15 MW≤ 50 MW -3.8 crores;>50 MW≤100 MW – 3.6 crores;>100 MW ≤250 MW  
– 3.4 crores;>250 MW – 3.3 crores

**Tamil Nadu Solar Energy Developers Association,Elegant Power Care, Poweer TV Poweer Bank,Green India Equipments Pvt.Ltd.,Srinivas Impex, KL Solar Company Pvt.Ltd.,Vigor Solar Energy Pvt.Ltd.,Progen Energy Solutions, Unimech India Systems (India) Pvt.Ltd.Ensun Enrgy Systems Pvt.Ltd.,OLITEC,Sun Best,Apple Electricals,Shriram Solar,Senthil Solar,JK Solar, Dev Solar, Hi Lite Technologies, Focusun Energy Systems, Creative Eco Solutions**

In MW scale, capital cost of Rs.4.5 crores/MW proposed for 1 MW to 3 MW and Rs.4.0 crores/MW for 4 MW to 10 MW.

### **CBPUR Renewable Energy Projects Pvt. Ltd.**

Capital cost of Rs.4.25 crores may be considered.

### **Tamil Nadu Spinning Mills Association(TASMA)**

Capital cost of Rs.4.5 crores may be considered.

### **Tamil Nadu Solar Power Generators Association(TANSPA)**

The safeguard duty on modules imported from China and increase in exchange rate has negated the decline in price of solar PV cells. The net price of solar modules in INR has largely stayed the same. Land cost will be higher than previous years. Evacuation facilities are getting exhausted. New plants may have to be set up in Northern Tamil Nadu where the land cost is higher. To achieve a CUF of 19%, developers will have to install approximately 10% to 15% more capacity on DC side. This results in increase in capital cost.

### **Tamil Nadu Electricity Consumers' Association(TECA)**

Each State has considered varied capital costs. Suitable details need to be provided for capital cost.

## **TANGEDCO**

Capital cost of Rs.3.35 crores per MW agreed upon.

### **4. Capacity Utilisation Factor**

**Thiru A.D.Thirumoorthy,Member,State Working Group for RE, Tamil Nadu Solar Energy Developers Association,Dev Solar**

For the Solar plants selling energy to Distribution licensee, excess generation beyond CUF of 19% shall be paid by the Distribution licensee at the price of APPC.

**Thiru S.Narayanasamy, former Member/Generation**

The solar power plants already commissioned may be surveyed and CUF fixed based on the survey. The actual CUF appears to be lower than the figure proposed by the Commission.

## **TASMA**

While CUF is taken as reference value, TANGEDCO is pegging CUF at 19%and when actual generation goes beyond 19%, TANGEDCO refuses to pay. TANGEDCO however accepts the energy generated and distributes to the customers at a cost which amounts to undue enrichment. The matter is under litigation. Tariff order needs to spell out the purpose for which CUF is fixed.

## **The Southern India Mills Association (SIMA)**

CUF is arrived based on figures collected over a period of year and estimated at 19%. TANGECO is not accepting any generation above 19% CUF. It may be clarified in the order that 19% CUF is taken only for determination of solar tariff and that TANGEDCO need not restrict solar generation over and above 19%.

## **TANGEDCO**

CUF may be specified in range as in bidding guidelines issued by Central Government. Tariff specified may be applicable for the plants maintaining annual generation within contracted range of CUF. Separate tariffs may be arrived for the plants generating below contracted CUF range and above contracted CUF range. As excess energy is payable to open access consumers, the CUF specified above may also be made applicable to open access consumers.



## **5. Operation and Maintenance (O&M)expenses**

### **TASMA**

O&M cost may be revised by revising capital cost suitably. O&M cost should at least be fixed at Rs.9 Lakhs.

### **TANSPA**

The major cost in O&M is salaries and minor spares. The cost of the same have increased. Specifying a fixed cost per MW as in Karnataka ERC and Maharashtra ERC may be considered.

### **TANGEDCO**

Escalation at the rate of 5% may be adopted.

## **6. Insurance cost**

### **TASMA**

Insurance cost may be reconsidered, as capital cost itself is not correctly fixed.

### **TANGEDCO**

Proposal of Commission accepted.

## **7. Debt – equity ratio**

### **TANGEDCO**

Debt – equity ratio of 70:30 may be adopted.

## **8. Term of Loan**

### **SIMA,TASMA,TECA**

Term of loan may be considered as 12 years.

### **TANGEDCO**

Term of loan of 10 years with one year moratorium may be adopted.

## **9. Rate of interest**

### **TANSPA**

There is a higher risk rate involved in selling power to TANGEDCO and therefore rate of interest may be increased.

### **SIMA,TASMA,TECA**

Rate of interest of 12% may be considered.

### **TANGEDCO**

The rate of interest for the term loan which is a component of capital cost may be adopted as MCLR plus 150 basis points i.e at 10.05%.

## **10. Life of plant and machinery**

### **SIMA**

In today's improved technology and continuous intervention, the life span may be reduced to 20 years.

### **TANGEDCO**

Proposal of Commission concurred with.

## **11. Interest on working capital**

### **SIMA,TASMA,TECA**

Rate of interest of 12% may be considered.

### **TANGEDCO**

Rate of interest on working capital may be adopted as 10.55%.

## **12. Return on Equity**

### **TANGEDCO**

Proposal of Commission accepted.

### **13. Depreciation**

#### **TASMA,TECA**

Depreciation may be increased to atleast above 5% per annum from the proposed 3.6%.

#### **SIMA**

Depreciation may be considered at 5 %, as in solar power plants residue is not reusable even as scrap.

#### **TANGEDCO**

Depreciation of 3.6% per annum may be adopted.

### **14. Auxiliary consumption**

#### **TANGEDCO**

Proposal of Commission accepted.

### **15. Discount factor**

Proposal of Commission accepted.

### **16. Solar power tariff**

#### **TASMA,TECA**

A right tariff considering the right cost on investment needs to be fixed.

#### **SIMA**

Upward revision of solar tariff may be considered.

#### **TANGEDCO**

Solar tariff of Rs.2.96 without accelerated depreciation benefit and Rs.2.73 with accelerated depreciation is suggested.

## **17. Quantum of solar power purchase by the distribution licensee**

### **TASMA,TECA**

There is no Solar Purchase Obligation in this State as the order of the Commission has been struck down by Hon'ble APTEL. To avoid ambiguity, the expressions 'Solar RPOs/ Solar RECs' may be used.

## **18. Plant capacity limitations**

### **TASMA, SIMA, National Solar Energy Federation of India, Swelect Energy Systems Limited, TECA**

The capacity limitation at 1 MW may be revised to 0.5 MW.

### **TANGEDCO**

The plant capacity limitation of 1 MW and above may be made applicable for sale to Board as well as for CGP and third party sale. The licensee has requested to add a clause that the solar plants under this generic order may be called as Utility category systems which may be defined as 'the installations relating to Solar photovoltaic Energy(Solar PV) where the objective is sales of solar energy to a distribution licensee or a third party or self consumption'.

## **19. CDM benefits**

### **TASMA,TECA**

No obligating Nations are interested to buy CERs because of economic meltdown everywhere. Until the situation is reversed, norms for sharing of CDM benefits need not be prescribed.

### **TANGEDCO**

Proposal of Commission of sharing CDM benefit is accepted. The developers have so far not declared receipt of CDM benefits. A suitable clause to verify receipt of CDM, such as furnishing of an auditor certificate by SPGs on sharing of CDM benefits or otherwise accepted.

## **20. Billing and payment**

### **TASMA,TECA**

TANGEDCO does not make payment in 60 days and does not pay by seniority. Provision to pay by seniority may be introduced in the tariff order and payment by discounts prohibited.

### **SIMA**

TANGEDCO makes payment only after a period of 9 to 12 months. Commission may ensure prompt payment with due interest.

### **TANGEDCO**

The interest for the delayed period may be adopted at 0.9% per month. If the distribution licensee makes the payment within one month of presentation of bills by a generating company, a rebate of 1% shall be allowed.

## **21. Energy Purchase Agreement**

### **TASMA,TECA**

Draft EPA may be placed in public domain and approved after receiving stakeholders comments.

### **TANGEDCO**

Views of Commission accepted.

## **22. Control period/Tariff period**

**Tamil Nadu Solar Energy Developers Association, Thiru A.D.Thirumorthy,Member,State Working Group for RE , National Solar Energy Federation of India,Swelect Energy Systems Limited**

Control period may be fixed for three years.

### **TANGEDCO**

Control period of 1 year accepted.

### **23. Open access charges and line losses**

#### **Thiru S.Narayanasamy, former Member/Generation**

Recent Solar Policy of GoTN seems to be applicable only to LT. Most HT consumers want to install Solar power plants according to their sanctioned demand. Such consumers may be permitted to connect solar plant to the grid without any payment for energy pumped back to the grid. Restrictions imposed in clause 9.3 of Open Access Regulations may be relaxed.

#### **Thiru A.D.Thirumoorthy, Member, State Working Group for RE**

Charges may be retained at 50% of that of conventional power for a period of ten years from the date of commissioning.

#### **CBPUR Renewable Energy Projects Pvt. Ltd.**

Commission may continue with 40% of charges for conventional power for each of the charges, transmission, wheeling and scheduling and system operation charges

#### **TASMA.TECA**

The need to revise the OA charges from 30% to 40% and from 40% to 50% should be demonstrated.

#### **TANSPA**

The present 40% of the charges of conventional power for solar power may be continued as the price of solar has not substantially reduced.

#### **SIMA**

Increase of charges by 10% need not be made a routine affair.

#### **National Solar Energy Federation of India, Swelect Energy Systems Limited**

10% increase will result in increase of OA charges by 24%. 40% open access charges may be considered for next three control periods.

### **Watsun Infrabuild Pvt Ltd.**

Onerous OA charges would derail the capacity addition in the State making it extremely difficult for the State to meet its capacity addition by 2022. The existing open access charges may be continued atleast till 2022.

### **TANGEDCO**

70% (in each) of Transmission, Wheeling, Scheduling and System Operating charges as applicable to the conventional power may be adopted for solar power.

### **24. Cross subsidy surcharge**

#### **Thiru A.D.Thirumoorthy, Member, State Working Group for RE**

Cross subsidy surcharge may be retained at 60% of that applicable for conventional power.

### **TASMA,TECA**

When captive consumers pay transmission, wheeling charges and meets out T&D losses, levy of cross subsidy surcharge amounts to double taxation. Considering the obligation to promote renewable energy, revision of cross subsidy surcharge may be revisited.

### **TANSPA**

Third party sale of solar power is negligible in Tamil Nadu due to high cross subsidy surcharge. Increasing cross subsidy surcharge further to 70% will make third party sale unviable.

### **SIMA**

Current level of cross subsidy may be retained.

#### **National Solar Energy Federation of India, Swelect Energy Systems Limited**

Cross subsidy at 60% may be considered for next three control periods.

### **Watsun Infrabuild Pvt Ltd.**

Existing cross subsidy surcharge may be continued atleast till 2022.

## **TANGEDCO**

100% of the applicable cross subsidy surcharge may be prescribed for all category of solar generators as it is meant to compensate the distribution licensee.

### **25. Reactive power charges**

## **TANGEDCO**

Proposal of Commission accepted.

### **26. Grid availability charges**

## **TANGEDCO**

Proposal of Commission accepted. However, if the drawal is more than the generation in a month, the energy so drawn may be billed at HT industrial TF I until implementation of DSM regulations.

### **27. Energy accounting and billing procedure**

#### **Thiru A.D.Thirumoorthy,Member,State Working Group for RE**

Adjustment of normal hour generation to off peak hour consumption charges by introducing banking charges in kind for all old plants. This adjustment shall not be stopped at any point of time as all investments in solar are made based on this tariff order.

#### **Dev Solar, Tamil Nadu Solar Energy Developers Association**

Adjustment of peak generation to normal and off peak and normal hour generation to normal and off peak hours may be allowed. Excess generation beyond CUF of 19% shall be paid at 75% of Solar preferential tariff.

#### **CBPUR Renewable Energy Projects Pvt. Ltd.**

Inter slot adjustments may be allowed for the solar energy generated. most of small and medium scale manufacturing industries will be affected of only slot to slot adjustment is allowed. Since minimum capacity for solar wheeling is fixed at 1 MW, excess generation shall be adjusted against off peak hour consumption. Excess energy may be sold at 100% of respective solar tariff fixed by the Commission in the respective orders or at prevailing APPC price.



## **TASMA,SIMA,TECA**

Solar power in excess of consumption may be allowed for purchase at 100% value instead of 75% of feed in tariff

## **TANSPA**

Changing the adjustment mechanism to time block wise adjustment on implementation of DSM will be detrimental to the distribution licensee and captive users. Presently, the captive users generate power at higher tariff periods and use it at lower tariff period.

## **National Solar Energy Federation of India, Swelect Energy Systems Limited**

For existing and new grid connected Solar PV power plants, Commission may continue and allow adjustment of solar power on block/slot to block/slot and higher slot to lower slot for excess power (peak to normal and normal to off peak slot) i.e adjustment of excess power from normal hours generation against consumption during night hours. Commission may also devise a mechanism to introduce banking charges in kind for all existing and new plants and shall not stop or withdraw the facility at any point of time as all investments are made based on adjustment propositions in the tariff order. Energy charges for SPGs under REC mechanism be fixed equivalent to that of pooled cost of purchase approved by the Commission from time to time.

## **TANGEDCO**

As per the Solar Energy Policy 2019, the wheeling of energy will be permitted only during the generation of electricity. The licensee shall record slot wise generation and consumption on daily basis during the billing period and will be adjusted slot/block to slot/block on daily basis during the billing period and excess energy fed into grid shall be treated as infirm power under sale to DISCOM category only. After the billing period, any excess energy that has been wheeled on daily basis beyond the slot's consumption shall be treated as infirm power and to be sold to the distribution licensee at the rate of 75% of the respective solar tariff fixed by the Commission in the respective orders. The amount towards the purchase of infirm power may be given credit to the HT consumer within 60 days from date of receipt of eligible invoice.

At the end of each financial year or at the end of the month in which the wheeling under captive category comes to an end whichever is earlier, before

releasing the payment for the unutilized surplus energy, verification of CGP status in accordance to Electricity Rules 2005 will be made and if the CGP does not fulfil the twin rules of eligibility, payment to the generator will be released after making payment of the cross subsidy surcharge.

#### **28. Energy wheeling agreement and fees**

**Thiru A.D.Thirumoorthy, Member, State Working Group for RE, Dev Solar, Tamil Nadu Solar Energy developers Association, National Solar Energy Federation of India, Swelect Energy Systems Limited**

Wheeling may be allowed to all HT services without insisting on minimum sanctioned demand.

#### **TANGEDCO**

Normative CUF of the Solar capacity may be specified for considering contracted demand ceiling at the time of granting open access.

#### **29. Security deposit**

#### **TASMA,TECA**

Tariff order is for Solar Energy Generator. Security deposit is a matter related to consumption end and therefore need not be mentioned in this tariff order.

#### **TANGEDCO**

To ensure that adequate security is available, the Generators who wheel energy under captive category shall make a security deposit of an amount equivalent to the three months energy to be wheeled under open access at HT TF I.

#### **30. Power factor disincentive**

#### **TASMA,TECA**

Tariff order is for Solar Energy Generator. Power factor disincentive need not be mentioned in this tariff order.

#### **TANGEDCO**

Proposal of Commission accepted.

### **31. Metering**

#### **TANGEDCO**

Views of Commission accepted.

### **32. Connectivity and evacuation of power**

#### **TASMA,SIMA,TECA**

Suitable compensation mechanism should be evolved to protect interests of Solar Energy Promoters from back outs enforced by TANGEDCO.

#### **TANGEDCO**

### **33. Harmonics**

#### **TANGEDCO**

Proposal of Commission accepted.

### **34. Parallel operation charges**

#### **TANGEDCO**

SPGs who consume power for their captive loads but wish to avail to REC may opt for paralleling their generators with the grid without wheeling power. Such generators shall pay 100% of applicable parallel operation charges to the distribution licensee as specified in relevant regulations. In case of non REC developers, the parallel operation charges may be fixed at 60% of that applicable for conventional power.

### **35. Other issues**

#### **Thiru A.D.Thirumoorthy,Member,State Working Group for RE**

Commission may include rooftop solar plant for all LT and HT categories and net energy exported paid at APPC. Solar connectivity in LT services may be allowed upto 100% of Distribution transformer. This will enable full utilization of LT line and transformer capacity. Existing net meters provided in domestic and commercial services may continued to be in service for their lifetime.

## **Tamil Nadu Solar Energy Developers Association**

Notification No.TNERC/DC/8-22 is meant for generators and not for HT consumers. Solar connectivity may be permitted to all consumers connected to all voltage levels including EHT, HT services providing net feed in meters. Solar connectivity in LT services may be allowed upto 100% of Distribution transformer. This will enable full utilization of LT line and transformer capacity. Existing net meters provided in domestic and commercial services may continued to be in service for their lifetime.

### **Dev Solar**

Solar connectivity may be permitted to all consumers connected to all voltage levels including EHT, HT services providing net feed in meters. Solar connectivity in LT services may be allowed upto 100% of Distribution transformer. This will enable full utilization of LT line and transformer capacity. Existing net meters provided in domestic and commercial services may continued to be in service for their lifetime.

### **TASMA,TECA**

HT consumers may be permitted to install Solar power plants within their premises or over the industrial rooftops and connect such power plants to company's power bus.

### **National Solar Energy Federation of India, Swelect Energy Systems Limited**

State shall consider 'MUST RUN' status for solar PV power plants and the power plants shall not be backed down. Any loss of generation owing to unavailability of grid or resulting from backing down should be compensated in full under deemed generation concept. Delivery point may be fixed at Solar generating station end.

### ANNEXURE-IV

**List of State Advisory Committee(SAC)members who participated in the  
33<sup>rd</sup> Meeting of SAC held on 05-03-2019**

Sl. No.	Name of the Member
1	Thiru S. Akshayakumar, Chairman, TNERC
2	Dr. T. Prabhakara Rao, I.A.S., (R) Member, TNERC
3	Thiru. Md.Nasimuddin, I.A.S., Principal Secretary to Government, Energy Department, GoTN
4	Thiru. Vikaram Kapur, I.A.S., Chairman & Managing Director, TNEB & TANGEDCO, Chairman & Managing Director (Addl Charge) Tamil Nadu Energy Development Agency
5	Representative of Thiru. M. Ponnusamy, Chairman, Confederation of Indian Industry (Tamil Nadu)
6	Thiru. K.V.V. Sathyanarayana Chief Electrical Engineer, Southern Railways.
7	Thiru. G.S. Rajamani, Bengaluru.
8	Thiru. K. Alagu, Tamil Nadu Chamber of Commerce and Industry, Madurai.
9	Thiru. K. Kathirmathiyon, Secretary, Coimbatore Consumer Cause, Coimbatore.
10	Dr. A.S. Kandasamy, Athapur (Post), Rasipuram Taluk, Namakkal.
11	Dr. K. Selvarajan, Singanallur, Coimbatore.
12	Thiru. T. Vijayarangan, Secretary, Anna Labour Union, Chennai.
13	Thiru. M.R. Krishnan, Deputy Director, Consumer Association of India, Chennai.