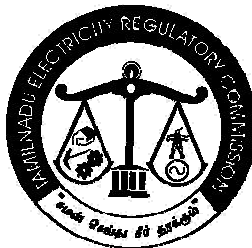




**TAMIL NADU ELECTRICITY REGULATORY
COMMISSION**

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

Order No. 5 of 2018 dated 28-03-2018



BEFORE THE TAMIL NADU ELECTRICITY REGULATORY COMMISSION

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

Order No. 5 /2018, dated 28-03-2018

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

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 issuing a 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 21/3/2018, 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 1st of April, 2018.

Sd./-
(T.Prabhakara Rao)
Member

Sd./-
(G.Rajagopal)
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 so far issued seventeen tariff orders in respect of various sources of renewable energy. These orders on renewable energy sources covered tariff determination for purchase of power by the Distribution licensee, issues related to open access and its promotional aspects.

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 in February 2018 is 10789.36 MW of which solar power constitutes 1902.245 MW which is inclusive of solar rooftop. 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.

1.4 Commission has so far issued 6 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 three 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 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 at the initial stage. Internationally and at the National level there is a shift from the feed in tariff regime to tariff based competitive bidding and reverse auctions. Competitive tariffs have been obtained through auctions. Opinions exist in support of and against feed in tariff mechanism and competitive biddings. Rapid fall in prices of solar modules changed the process of procurement from preferential tariff rates to competitive bidding. The price of solar power which constantly was in a downward trend saw a raise in the auctions held in Gujarat and Karnataka after it fell to Rs.2.44 (in the auction in May 2017 for Bhadla Solar park, Rajasthan) to Rs.2.65 and Rs.2.94 per unit respectively.

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 (2) of the Power Procurement from New and Renewable Sources of Energy Regulation, 2008, specifies as follows:

“(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 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 Central Electricity Regulatory Commission(CERC) in its Regulations on Tariff determination for renewable energy sources issued on 17.4.2017 has not fixed any generic tariff for wind and solar power for the reason that setting generic tariff based on norms may not provide the right price signals. However, the Central Commission has set financial and operational norms that would serve as ceiling norms for determination of project specific tariff.

2.1.8 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. The Ministry of New and Renewable Energy in a communication dt.12.1.2018 has clarified that the States/UTs can consider procuring power from solar and wind projects of less than the defined threshold prescribed (25 MW for wind and 5 MW for solar) in the competitive bidding guidelines through feed in tariff to be determined by concerned State Electricity Regulatory Commissions.

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 last tariff order of 2017, Commission observed as follows:

“1.3.4 The Government of India has given a huge thrust to promote renewable energy especially solar power. In line with the mandate of the Act for promotion of renewable energy and the various policies to promote clean energy, Commission decides to have a feed in tariff in place for the next control period that would serve as a benchmark price. In case the utility is not able to generate enough capacity through bidding process, as a fall back it can contract the necessary balance capacity at this feed in tariff. This would also serve as the applicable tariff for developers of projects who have signed energy purchase agreements under earlier tariff orders which could not be commissioned within the last control period.”

The control period of this Order No.2 of 2017 dt.28.3.2017 on solar power expires on 31.3.2018.

2.2.2 Consequent to the issue of the Tariff orders in 2016 and 2017, Commission has accorded approval to the Distribution licensee to proceed with

reverse bidding fixing the preferential tariff as the ceiling prices and 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. The last bidding by the distribution licensee fetched a tariff of Rs.3.47 per unit.

2.2.3 The country has witnessed numerous competitive biddings, reverse auctions in the solar power sector and it is common knowledge that tariffs for solar power have steeply reduced. A combination of factors of low module prices, loans with cheap rates of interest, location of projects, have lead to low tariff rates to the extent of Rs.2.44 per unit, in the auctions held for solar power. However, the auctions that took place in Gujarat and Karnataka after the auction at Bhadla Solar park in Rajasthan that fetched Rs.2.44 per unit have lead to higher tariffs of Rs.2.65 and Rs2.94 per unit.

2.2.4 Over the past few months, global factors that caused variations in the cost of solar panels and the proposed anti dumping duties have resulted in fluctuations in the cost of solar power. A state of volatility does exist.

2.2.5 Reports of Mercom India state that though tender activity increased in January, February 2018, auction announcements were almost non existent and the reduced activity was due to uncertainty in anti dumping and safeguard duties.

2.2.6 As has already been stated in the overview, opinions exist in favour of and against competitive bidding as well as preferential tariffs. In the State Advisory Committee meeting held on 21.3.2018, members expressed opinions in favour of competitive bidding as well as feed in tariffs, for MW and kW scale. The Chairman and Managing Director/TANGEDCO was of the opinion that in the wake of competitive bidding, feed in tariff could send wrong price signals and however suggested certain changes in components of tariff and left it to the Commission's decision. The Chairman and Managing Director/Tamil Nadu Energy Development Agency(TEDA) stated that essentially tariffs could be fixed for capacities of less than 5 MW and suggested size based differentiated tariffs for MW and kW scale systems. On determination of feed in tariff, one of the members of the SAC while offering views for wind power, stated that it is usual in the case of competitive biddings to have an undisclosed price, and sometimes cartelization is possible and therefore it would be right for the State Regulatory Commission to determine a tariff through a transparent exercise and have a benchmark price though it would be difficult to consider all developments.

2.2.7 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 and for the reasons stated in the paragraphs above, Commission is of the view that a feed in tariff that reflects the prevailing market trend is necessary for the State. The Central Commission's RE Tariff Regulations 2017 specify that the capital cost and tariff shall be as per prevailing market trends in project specific cases. Keeping in view the aim of the Act, energy security from renewable energy sources, procurement of power through low tariffs set by the Tariff Policy, Commission feels that determination of a feed in tariff for MW scale projects would be just. However, the licensee shall procure solar power through competitive biddings/reverse auctions following the bidding guidelines of the Government of India. While competitive biddings remain the main recourse to the distribution licensee for power procurement, a feed in tariff will serve as an additional support mechanism. The feed in tariff may serve as a kind of ceiling price for future biddings by the licensee and may also help the projects that have not been able to commission in the previous control periods.

2.2.8 With cheaper availability of solar PV power and no investment in the Solar Thermal sector even after issue of three tariff orders, Commission decides to do away with the determination of generic tariff for solar thermal power plants in the present control period. Stakeholders have requested to fix tariffs for kW

scale systems. With economies of scale and lesser tariff rates in utility scale projects, Commission presently does not desire to fix tariffs for kW scale systems.

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 01.04.2018. 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, the Commission prepared a consultative paper on “Issue of Tariff order on Solar Power and related issues’ and hosted the same on 02.03.2018 in the Commission’s website inviting comments and suggestions from stakeholders. The consultative paper was also presented in the State Advisory Committee (SAC) meeting held on 21/03/2018 and discussed.

The list of stakeholders who have conveyed comments on the consultative paper is annexed with this order as Annexure II and summary of comments as Annexure III. The Members present at the State Advisory Committee meeting on 21/03/2018 are enclosed as Annexure 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 specified in Regulation 4 of the Power Procurement from New and Renewable Sources of Energy Regulations, 2008 is reproduced below:

“(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. In case of small hydro projects with a capacity of more than 5 MW but not exceeding 25 MW capacities, Commission decide the tariff on case to case basis.

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.

(4) While determining the tariff, the Commission may, to the extent possible consider to

permit an allowance / disincentive based on technology, fuel, market risk, environmental benefits and social impact etc., of each type of new and renewable source.

(5) While determining the tariff, the Commission shall adopt appropriate financial and operational parameters.

(6) While determining the tariff the Commission may adopt appropriate tariff methodology.”

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 has decided to

continue with the single-part tariff for solar energy 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 three tariff orders issued for solar power 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 decides to adopt the same in this tariff order.

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 Stakeholders have expressed views that rates obtained in competitive biddings are not to be compared as they have assistance in the form of viability gap funding, solar parks with government lands, sovereign guarantees. Since the issue of the last tariff order on solar power in Order No.2 of 2017 dt.28.3.2017, market reports (pvXchange -EU spot market module price, PV spot market price index) indicate a decline in price of solar PV cells by 20%. The

Central Commission's orders on capital costs of solar PV power prior to 2017 have shown a decrease in costs around 12% every year and about 54% to 60% cost of a MW scale project is attributed to solar modules with the balance of components making up for the rest of the price. Spot prices of solar cells per watt in the market show variations from Rs.11 to Rs. 14 per watt in the recent months. Leaving a sufficient buffer for variations and considering recent fluctuations in solar prices and other uncertainties, Commission decides to adopt a capital cost of Rs.3.5 crores per MW.

7.2.3 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. Achieving optimal performance depends on selection of technology and factoring in various parameters that influence the performance of the power plant.

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. Stakeholders have sought to fix a CUF of 23% for Solar PV power plants with trackers. This exercise being a generic tariff Commission has left the choice of selection of technology and other factors that increase the performance of the plant for the MW output prescribed to the developer. Therefore, 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 to fix O&M cost at 1% of the capital cost with an escalation of 5% from the second year onwards. The Central Electricity Regulatory Commission's Regulations on Terms and Conditions of determination of Tariff from Renewable Energy sources, 2017 specify determination of O&M expenses in a Project specific case based on prevailing market information. With 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 the last three orders of solar power.

7.5 Insurance cost

7.5.1 In the three 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 in the next order.

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 The distribution licensee, Tamil Nadu Generation and Distribution Corporation Ltd.(TANGEDCO) has suggested an interest rate of 8.45% per annum and a loan tenure of ten years with one year moratorium. CERC and other State Electricity Regulatory Commissions adopted interest rates ranging from 9.23% to 12.30 %. Interest rates have softened during this year. 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 proposed a rate of interest of 9.97% in its draft generic tariff RE order of 2018-2019.

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 7.95% notified by the State Bank of India in February 2018 plus 200 basis points which is 9.95% 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 energy.

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 of 1st of April of previous year and in its RE draft tariff order of 2018-2019 has considered RoE of 17.56% after grossing up with average MAT of 20.26% prevailing on 1st of April 2017. In the RE tariff order of 2017-18 also CERC had considered RoE of 17.56% grossed up with average MAT rate of 20.26%.

7.9.2 Commission decides to adopt Return on equity of 17.56% as adopted by CERC in its RE tariff regulations and in its RE tariff order of 2017-18.

7.10 Depreciation

7.10.1 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 three 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 In the Order on Renewables by the CERC, the components of working capital have been taken as O&M expenses for one month, receivables for two months and maintenance of spares at 15% of the O&M expenses. In the regulations on determination of tariffs for renewable energy of CERC, interest on working capital has been specified at 300 basis points above the average State Bank of India MCLR(one year tenor) prevalent during the last available six months. The distribution licensee, Tamil Nadu Generation and Distribution Corporation Ltd.(TANGEDCO) has suggested an interest rate of 9.45% by

adding 150 basis points to the 1 year tenor of State Bank of India's MCLR of 7.95%.

7.11.2 The Commission decides to adopt an interest rate of 10.95% as proposed in the consultative paper. As to the components of working capital, the Commission decides to adopt one month operation and maintenance cost and two months receivables for the solar power projects as followed in the previous orders of the Commission on solar power.

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 8.75% 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 adopted in this order are tabulated below:

Tariff Components	Values
Capital cost	Rs. 3.5 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	17.56%(pre-tax)
Term of Loan	10 years with 1 year moratorium period
Interest on loan	9.95%
Depreciation	3.6% on 95% of Capital cost
Working Capital components	one month O&M cost and two months receivables
Interest on working capital	10.95%
Discount factor	8.75%
Levellised Tariff without Accelerated Depreciation	Rs.3.11
Levellised Tariff with Accelerated Depreciation	Rs.3.05

9.0 Solar Power Tariff

9.1 Solar power tariff computed with reference to the determinants listed above works out to Rs. 3.11 per unit for Solar PV projects. The Accelerated Depreciation (AD) benefit component of the tariff is Rs.0.06 per unit for Solar PV. The tariff for the developers/generators availing AD benefit will be the tariff arrived at after deduction of AD benefit from the tariff as determined above. The working sheet is enclosed in Annexure I.

10.0 Issues related to power purchase by Distribution licensee from SPGs:

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 Solar Power purchase Obligations (SPO) requirement. 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.

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.

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 orders. The Commission decides to adopt the same formula. The generators shall furnish details of receipts of CDM to the distribution licensee and the distribution licensee shall account for the CDM receipts in the next ARR filing.

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 suggested for levy of interest at 0.75% per month . However, Commission decides to adopt rate of interest of 1% per month for any delayed payment by the Distribution licensee beyond 60 days.

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 Commission decides to retain the control period of 1 year from the date of coming into force of this order, and the tariff period shall be 25 years.

11.0 Issues related to open access:

1. Open access charges – Transmission and Wheeling, and 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 last three tariff orders adopted 30% in each of the transmission, wheeling and scheduling and system operation charges as applicable to the conventional power to the Solar power.

11.1.2 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.

11.1.3 In the case of scheduling and system operation charges, the work done by SLDC is the same as in the case of conventional power. SLDC has to monitor the grid operations effectively on real time basis. 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.

11.1.4 Stakeholders have expressed views that open access projects are smaller in size and exposed to associated risks with land, transmission and connectivity and that it increases the cost of generation of solar power. In the case of other renewable sources, some of the stakeholders have sought to levy 100% of charges for renewable sources as the burden of concession to one category falls on other category of users.

11.1.5 Commission does not want to take away all the concessions at one go, and therefore decides that Transmission, Wheeling and Scheduling & System Operation charges are proposed at 40% of that applicable for conventional power plants notified by the Commission from time to time.

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 renewable power and in the orders for solar power, has ordered to levy 50% of the cross subsidy surcharge for third party open access consumers. In the consultative

paper, Commission proposed withdrawal of incentives in phases and proposed levy of 60% of cross subsidy surcharge as applicable for conventional power plants. The Distribution licensee has sought levy of 100 % of cross subsidy surcharge. However, in this order, Commission decides to levy 60% of cross subsidy surcharge applicable to conventional power.

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. The licensee has not adduced any reasons for the same. 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 The energy accounting shall be regulated by the Commission's Regulations on open access, DSM and Order on open access. 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. However, 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.

11.5.2 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.

11.5.4 The Commission decides that 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.

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 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.

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 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 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

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 consume power for their captive loads but wish to avail REC may opt for paralleling their generators with the grid without wheeling power. Such generators shall pay 40% of applicable parallel operation charges to the distribution licensee as specified in relevant regulations/orders.

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./-
(G.Rajagopal)
Member

Sd./-
(S.Akshaya Kumar)
Chairman

(By order of Tamil Nadu Electricity Regulatory Commission)

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

- Solar.(P/V)													
1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400	1664400
12	13	14	15	16	17	18	19	20	21	22	23	24	25
1843800	1843800	1843800	1843800	1843800	1843800	1843800	1843800	1843800	1843800	1843800	1843800	1843800	1843800
1197000	1197000	1197000	1197000	1197000	1197000	1197000	1197000	1197000	1197000	1197000	1197000	1197000	1197000
76416	72226	68037	63847	59658	55468	51279	47089	42900	38710	34521	30331	26142	21952
903493	955173	1009809	1067570	1128635	1193193	1261443	1333598	1409880	1490525	1575783	1665917	1761208	1861949
83140	84503	85948	87481	89106	90828	92653	94587	96637	98807	101107	103542	106121	108853
4103848	4152702	4204593	4259698	4318198	4380289	4446175	4516074	4590216	4668842	4752210	4840591	4934271	5033554
2.466	2.495	2.526	2.559	2.594	2.632	2.671	2.713	2.758	2.805	2.855	2.908	2.965	3.024
75291	79598	84151	88964	94053	99433	105120	111133	117490	124210	131315	138826	146767	155162
683975	692117	700766	709950	719700	730048	741029	752679	765036	778140	792035	806765	822378	838926
759266	771715	784916	798914	813753	829481	846149	863812	882526	902351	923350	945592	969146	994088
83140	84503	85948	87481	89106	90828	92653	94587	96637	98807	101107	103542	106121	108853
0.40	0.37	0.34	0.31	0.28	0.26	0.24	0.22	0.20	0.19	0.17	0.16	0.15	0.13
0.98	0.91	0.85	0.79	0.74	0.69	0.64	0.60	0.56	0.52	0.49	0.46	0.43	0.40

Annexure II

List of stakeholders who have submitted their views

Sl. No.	Name/Organisation
1	India Tax Payer
2	TANGEDCO
3	National Solar Energy Federation of India
4	NLC India Limited
5	Amplus Solar Power Private Limited
6	Swelect Energy Systems Limited
7	Green Power Market Development Group

Annexure III

Abstract of comments received from stakeholders on “Consultative Paper for issue of Tariff order for Solar power and related issues”

1. Need for feed in tariff

India Tax Payer

Purchase price of power has consistently been falling down for the past three years. Solar price has fallen down from Rs.18 per kWh to Rs. 2.97 per kWh. Price to the consumer has always increased. All purchase of power should be bid based. Fixing of purchase price by any agency may not be as accurate as a typical auction. All projects that quoted less than Rs.3.50 have not commissioned till date. As in the case of all tenders, there has to be a minimum price.

2. Components of Tariff

2.1 Capital cost/MW in Crores

TANGEDCO

A capital cost of Rs.3.50 crores has been proposed.

National Solar Energy Federation of India

Module market in India is very price sensitive. Chinese solar module ASPs increased by 14 percent in Q3 compared to the second quarter of 2017. Increased Cost of Imported Modules and other equipments due to levy of Goods and Service Tax (GST). GST on Mounting Structure, Inverter Transformer, Switchgear, Cables have increased.

NLC India Limited

Capital cost of Rs.4.50 cr/MW may be proposed.

2.2 Capacity Utilisation Factor(CUF)

TANGEDCO

CUF may be permitted upto 19% for plants without sun trackers and at 23% for plants with sun trackers and for such system tariff shall be arrived separately. Tariff may also be arrived for generation beyond the contracted CUF.

NLC India Limited

The procurer is restricting the payment to normative CUF, which is not appropriate. The generator needs to be paid for the actual CUF without limiting to normative CUF. Appropriate provision for degradation has not been given. In case repowering is required, replacement cost may be added.

2.3 O&M and Insurance cost

TANGEDCO

Operation and maintenance cost may be fixed at 1% on the capital cost with an escalation of 5% from the second year. Insurance may be at 0.35% of net asset value.

2.4 Debt and Equity

TANGEDCO

Has concurred with Commission's proposal.

2.5 Term of Loan and rate of Interest

TANGEDCO

Rate of interest may be fixed as 7.95% (MCLR) plus 100 basis points i.e at 8.95%. Term of loan may be considered as 10 years with one year as moratorium.

Amplus Solar Power Private Limited

Term of loan of 13 years with interest on term of loan at 9.97% i.e 7.97% SBIs MCLR one year tenor averaged for six months plus 200 basis points as per CERC's RE Tariff Regulations 2017 may be considered.

National Solar Energy Federation of India

Interest rate should be kept at 10.75%.

2.6 Life of Plant and Machinery

TANGEDCO

Has concurred with Commission's proposal.

2.7 Return on Equity

TANGEDCO

Has concurred with Commission's proposal.

National Solar Energy Federation of India

Solar Power project being a Renewable Energy Project, need a higher return as the project is comprised of higher risk. ROE at 16% post tax basis -20% for first 10 years on pre-tax basis and 24% from 11th to 25 years on pre-tax basis may be specified.

NLC India Limited

ROE at corporate tax instead of MAT may be suggested.

2.8 Depreciation

TANGEDCO

Has concurred with Commission's proposal.

National Solar Energy Federation of India

As per the principle adopted in the CERC RE tariff regulations, higher depreciation rate may be specified during the loan tenure for solar power project in order to address the cash flow related concern.

NLC India Limited

Depreciation has been proposed at 3.6% on the 85% Capital Cost. The total depreciation charged because of this is only 75% of the capital cost.

2.9 Interest and Components of Working capital

TANGEDCO

Interest rate on working capital may be fixed as 7.95% (SBI MCLR) plus 150 basis points i.e at 10.95%.

National Solar Energy Federation of India

Provision of maintenance of spares at 15% of O&M Expenses along with and two months' receivables for calculation of Working Capital may be included. Interest rate on Working Capital at 11.75% may be suggested.

NLC India Limited

One year delay period is encountered in getting realization of the bills and hence receivable period needs to be considered appropriately. Appropriate provision for 15% of O&M expenses may be provided for computation on working capital as is available in CERC regulations dt. 17.04.2017.

2.10 Auxiliary consumption

TANGEDCO

Has concurred with Commission's proposal.

Amplus Solar Power Private Limited

An auxiliary consumption of 0.25% of gross generation may be considered as per CERC RE Tariff Regulation 2017 dt.17.4.2017.

National Solar Energy Federation of India

Auxiliary consumption of at least 0.50% of total energy generated may be considered.

NLC India Limited

Auxiliary consumption of 0.25% of gross generation may be considered.

2.11 Discount factor

TANGEDCO

Has concurred with Commission's proposal.

National Solar Energy Federation of India

It would be prudent to take Pre-tax WACC for each year as Discount Factor for that year.

3. Plant capacity limitations

TANGEDCO

Plant capacity may be limited at 1 MW

4. CDM benefits

TANGEDCO

Developers have not declared receipt of CDM benefits. A suitable clause to verify receipt of CDM may be included in the order.

5. Billing and Payments

TANGEDCO

The interest for the delayed payment may be adopted at 0.75% per month in view of the prevailing interest rate.

NLC India Limited

Considering the inordinate delay in setting the bills and realization period, late payment surcharge may be considered as 1.25% p.m. The following payment security mechanism may be incorporated as in the Guidelines for Tariff Based Competitive Bidding process for procurement of power from Grid Connected Solar PV Power Projects No.23/27/2017-R&R dt. 03.08.17. The Procurer shall provide adequate payment security measures, as specified below.

5.3.1. Scenario 1: Direct Procurement by Procurer from Solar Power Generator:

The Procurer shall provide payment security to the Solar Power Generator through:

- a) Revolving Letter of Credit (LC) of an amount not less than 1 (one) months' average billing from the Project under consideration;

AND,

b) Payment Security Fund, which shall be suitable to support payment for at least 3 (three) months' billing of all the Projects tied up with such fund;

c) In addition to a) & b) above, the Procurer may also choose to provide State Government Guarantee, in a legally enforceable form, ensuring that there is adequate security to the Solar Power Generator, both in terms of payment of energy charges and termination compensation if any.

6. Energy Purchase Agreement

TANGEDCO

Views of the Commission accepted.

7. Control period/Tariff Review period

TANGEDCO

Has concurred with Commission's proposal.

NLC India Limited

A minimum of 6 months to 10 months is required for procurement of land. In case of constraint for power evacuation, the time and cost for the additional facility to be erected in the sub station would increase. The project viability is affected due to the steady increase in the module cost and uncertainty in Taxes and duties. Further, imposition of Safeguard duty / Anti dumping duty for the imported panels and other equipments for the solar projects is looking large. The project cost worked out during the conceptualization would get affected on the above reason. Hence for sustainability of the solar projects, the control period for tariff shall be TWO years.

8. Transmission and wheeling charges

TANGEDCO

Has concurred with Commission's proposal.

Amplus Solar Power Private Limited

It is agreed that cost of both wind and solar is reduced and new projects can compete with the conventional sources of energy. Open access projects are smaller in size and exposed to the associated risks with land, transmission and

connectivity and therefore cannot be compared with large scale projects. Investments have already been made in existing projects and sudden changes in existing incentive scheme could jeopardize cost recovery of projects.

M/s.Swelect Energy Systems Limited

Commission's proposal of withdrawing the incentive in phases every year by 10% and the increase in said open access charges from 30% to 40% as applicable to conventional sources increase the cost of generation of solar power. Per unit open access charges including scheduling and system operation charges for 1 MW solar power plant considering 17% PLF works out to 40 paise per unit.

9. Scheduling and System Operation charges

TANGEDCO

Has concurred with Commission's proposal.

10. Cross subsidy surcharge

TANGEDCO

100% cross subsidy charges may be levied.

India Taxpayer

This State has the highest cross subsidy. Yearly discount on cross subsidy which would achieve a cross subsidy target of 10 paise or lesser over a period of 5 years may be announced.

11. Reactive power charges

TANGEDCO

Has concurred with Commission's proposal.

12. Grid availability charges

TANGEDCO

For drawal of energy more than the generation in a billing month, the energy so drawn may be billed at HT industrial tariff. Views of Commission on standby charges accepted.

13. Energy Accounting and Billing procedure

TANGEDCO

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 payment for the unutilized surplus energy, verification of CGP status shall be done as per Electricity Rules 2005 in respect of CGP under EWA and if the CGP has not fulfilled the twin rules of eligibility, the payment to the generator will be released after making payment of cross subsidy surcharge. At the end of the billing period, balance energy may be sold at the rate of 50% of the respective solar tariff fixed by the Commission.

14. Energy Wheeling Agreement and Fees

TANGEDCO

Views of Commission accepted. Normative CUF percentage of solar capacity to be taken into account for considering the contracted demand ceiling at the time of granting open access may be specified.

15. Security Deposit

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 three months energy to be wheeled under open access during the current year at the HT industrial tariff rate.

16. Power Factor Disincentive

TANGEDCO

Views of Commission accepted.

17. Metering

TANGEDCO

Views of Commission accepted.

18. Connectivity and Evacuation of Power

TANGEDCO

Views of Commission accepted.

19. Parallel Operation charges

TANGEDCO

SPGs who consume power for their captive loads but wish to avail 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.

20. Banking

India Tax payer

A twenty four hour banking is offered by the State Electricity Regulatory Commissions of Karnataka, Andhra Pradesh, Telengana and a few Northern states. The same may be provided. An appropriate banking charge may be fixed.

Other issues

M/s.Swelect Energy Systems

Redefining Pooled cost of power purchase for Generators under REC mechanism

Preferential tariffs for SPGs has drastically reduced from Rs.7.10 to Rs.4.50 during the last control periods. The proposed solar tariff revision will immensely impact the Solar power Generators. Solar Power Generators under REC mechanism will end up in realizing only a meager realization cost in view of the specific condition in payment of generators at Pooled cost of Power Purchase or 75% of the solar tariff whichever is less.

Deemed generation

Existing solar power developers are facing challenges in terms of delayed payments and backing down of solar power. Any loss of generation owing to unavailability of grid or resulting from backing down of operation shall be allowed

for claim of energy charges in full under deemed generation concept and payment made at the tariff rate as per PPA.

M/s.Green Power Market Development Group

The impact of the proposed open access charges will make RE transactions cheaper than the grid tariffs for HT commercial consumers across all injection and withdrawal voltages.

Annexure IV

State Advisory Meeting held on 21.3.2018

Members present

Sl.No.	Name
1.	Thiru S.Akshayakumar, Chairman/TNERC
2.	Thiru G.Rajagopal, Member/TNERC
3.	Dr.T. Prabhakara Rao, I.A.S,(R), Member/TNERC
4.	Thiru Vikram Kapur, I.A.S, Chairman and Managing Director/TANGEDCO, Chairman/TANTRANSCO and Principal Secretary to Government, Energy Department
5.	Dr.Jagmohan Singh Raju, I.A.S, Chairman and Managing Director/Tamil Nadu Energy Development Agency
6.	Thiru S.Ramasubbu, Chief Electrical Engineer, Southern Railway
7.	Thiru K.Kathirmathiyon, Secretary, Coimbatore Consumer Cause
8.	Thiru G.S.Rajamani
9.	Thiru A.Gurunathan, Confederation of Indian Industry on behalf of Thiru M.Ponnuswamy
10.	Thiru K.Alagu, Vice President, Tamil Nadu Chamber of Commerce and Industry
11.	Dr.K.Selvaraj
12.	Thiru T.Vijayarangan, Secretary, Anna Labour Union
13.	Dr.P.Valsalal, Associate Professor, Anna University on behalf of Dr.G.Uma, Professor and Head of Department, Electrical and Electronics Engineering, Anna University
14.	Thiru M.R.Krishnan, Deputy Director, Consumer Association of India